ICT FOR WOMEN'S EMPOWERMENT IN RURAL BANGLADESH

Anindita Sarker

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ABSTRACT

The sociocultural environment of Bangladesh is characterised by gender discrimination. One way in which many believe this can be counteracted is by improving access to information for women and girls.

ICT for women's empowerment (ICT4WE) and ICT for development (ICT4D) research takes the view that Information and Communication Technologies (ICTs) can empower women to overcome their socioeconomic isolation and deprivation in the international development context. Consequently, many government and non-government organizations have been working to support women's access to and use of ICTs by giving them devices and other technical support in developing countries like Bangladesh. However, little research has explored the context-specific challenges and factors that regulate women's access to and use of ICTs in developing countries.

Understanding and addressing context-specific challenges and regulatory influences is the key to making ICT initiatives more appropriate and sustainable. The aim of this research was to explore the potential of ICTs to enable women's empowerment through understanding the experiences of the rural women at the grass-roots level. This thesis describes how women's access to and use of ICTs are shaped by sociocultural regulation, NGO-regulation, and self-regulation.

Using Grounded Theory methods, this research focuses on developing theory by understanding the participants' worlds, their experiences, and challenges in accessing and using ICTs. A holistic understanding of the impacts of ICTs and women's empowerment was prioritised to understand the complex nuances of these phenomenon. Data collection was conducted in two rounds of research in three geographical locations in Bangladesh.

The outcome of this study will help to better understand and address context-specific and intersectional needs, challenges and priorities related to ICT4WE and ICT4D.

The theoretical contribution of my study is the multi-dimensional ICT4WE model which can be used to support the context-specific design and implementation of ICTs and ICT-supported women's empowerment and development initiatives. The methodological insights and considerations of this study will guide future researchers to be responsive to the context-specific requirements for collecting quality data.

Keywords: Gender, ICTs, Women's empowerment, ICT4WE, ICT4D, sociocultural regulation, Bangladesh, Grounded Theory.

DECLARATION

This thesis is an original work of my research and contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Anindita Sarker

30 December, 2020

PUBLICATIONS DURING ENROLMENT

Frings-Hessami, V., Sarker, A., Oliver, G., & Anwar, M. (2019). Documentation in a community informatics project. *Journal of Documentation*.

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GLOSSARY

List of Acronyms

3G Third Generation

a2i Access to Information Programme of Bangladesh Government

CBO Community Based Organisation

GD Group Discussion

FDG Focus Group Discussion

GAD Gender and Development

GE Gender Equality

GSMA Global System for Mobile Communications Association

ICT Information and Communication Technology

ICT4D Information and Communication Technology for Development

ICT4WE Information and Communication Technology for Women's Empowerment

IMF International Monetary Fund

IS Information System

ITU International Telecommunication Union

NGO Non-Government Organisation

NIP National ICT Policy

PAR Participatory Action Research

PPP Public-Private Partnership

PROTIC Participatory Research and Ownership with Technology, Information and Change

SDG Sustainable Development Goal

UDC Union Digital Centre

UN United Nations

UNDP United Nations Development Programme

UNESCO United Nations Educational, Scientific and Cultural Organization

UNFPA United Nations Population Fund

USAID United States Agency for International Development

WAD Women and Development

WID Women in Development

WSIS World Summit on the Information Society

WTDC World Telecommunications Development Conference

List of Bangla Terms

Apa Term of address for elder sister. Also used as a term of address female staff of the local NGOs.

Bhai Term of address for elder brother. Also used as a term of address male staff of the local NGOs.

Char Riverine Island

Haor Wetlands

Hisab chhara Countless times

Huzur Islamic scholar or leader

Khomotayon Empowerment

Niyom *Rules and regulation*

Owaz Public gatherings in which prominent religious leaders give lectures on Islam and contemporary social issues.

Naachagaana Singing and dancing

Parda ('Purdah') *In Bangla, this word literally means curtain or veil. At the same time, it is used to refer to both the practice and mores of concerning the segregation of women from men in Islam.*

Sahi tarika *The right way. It is used to address how Muslim women should behave according to the religious rules and regulation*

Sothikbhabe Doing something accurately

Unnoyon Development

Part 1: RESEARCH DESIGN, REVIEW AND METHODOLODY

The aim of this research is to explore the potential and challenges of ICTs to contribute to women's empowerment or disempowerment in the context of rural Bangladesh. Chapters included in this part help to understand the context of the research as well as the reasoning for selection of Critical Theory as the research paradigm and Constructivist Grounded Theory as the research methodology.

Chapter 1 Introduction helps to understand the background of this research, motivations of this research, research objectives, problem statement, and research questions whereas Chapter 2 presents the insights from existing literature which helped to situate the study in the wider context of ICT4WE and ICT4D. Chapter 3 presents the research methodology and data collection including selection of research sites, participants, methods of data collection, ethics approval, and data analysis, and data management. This Chapter helps to understand how the Constructivist Grounded Theory methodology has been applied int this research and how well it compliments to the objectives of this research. Chapter 4 presents my responsive process of data collection, field realities and their impact on my research. How I paid attention to the context-specific requirements during data collection and how it contribute to the quality of the data in this research is discussed in Chapter 4.

CHAPTER 1: INTRODUCTION

1.1 CHAPTER OVERVIEW

This first chapter provides an overview of the thesis. It starts with the introduction, background and motivation for this research, followed by a discussion of the research scope, research objectives, research questions and original contribution to the knowledge. Before concluding, the chapter briefly presents the organisation of the thesis.

1.2 INTRODUCTION

Information and Communications Technology (ICT) is often considered as a catalyst for socio-economic development in the international development discourse (Aziz, 2020). A rich body of literature shows that widespread access to and use of ICTs has the ability to overcome existing digital divides and empower marginalised communities, such as women in developing countries (Gomez & Camacho, 2011; Islam & Slack, 2016; Laizu, Armarego, & Sudweeks, 2010b; Marcelle, 2002; United Nations, 2005). At the same time, widespread access to and use of ICTs and the shift towards a digital world have economic and sociocultural impacts which can increase the effect of existing inequalities (Burrell, 2010; James, 2005). Digital technologies are not always successful in empowering people and digital divides including unequal access and limited usage can heighten social exclusion among rural people the poor, women and other disadvantaged groups (Hilbert, 2011). Appropriate contextualisation is needed to understand the impact of ICTs on people's lives because we know very little about the actual experiences with new technologies of the marginalized, particularly rural women in the developing world (Burrell, 2012; Tacchi & Chandola, 2015).

Critical attention also is needed to understand the role of different actors including development participants, practitioners, donors, researchers, and scholars involved in ICT for Development (ICT4D) programs (Buskens, 2010). ICT users' agency is not the only kind of agency at play, because the state, development agencies and telecommunication companies play central roles in shaping the expansion of ICTs among new users in new regions (Tenhunen, 2008). A critical exploration of ICT and development helps to understand how development priorities are decided and how women's experiences and perspectives are understood in the context of human development and ICTs (Tacchi & Chandola, 2015).

Despite significant achievements in multiple sectors including economic, agriculture, health and other areas, Bangladesh, the subject of this thesis, is still far from achieving the Sustainable Development Goals (SDGs) proposed by the United Nations (UN) (Khabar, Shams, Sarker, Saha, & Biswas, 2020). In the context of rural Bangladesh, ICTs are considered as having the potential for empowering women through access to information and through overcoming physical boundaries and restrictions (Ahmed, Islam, Hasan, & Rahman, 2006; Hossain & Islam, 2012; Islam & Slack, 2016; Laizu et al., 2010b).

A review of the current literature[1] shows that there is a significant gap in understanding the diverse, and not always positive experiences of rural women with ICTs. Consequently, my research aims to understand the role and impacts of ICTs on women's empowerment in a more holistic way, prioritising the women's context-specific needs, challenges and priorities. This approach helps to understand the meaningful contribution of ICTs in the lives of rural women in Bangladesh.
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[1] See Chapter 2 literature Review

1.3 BACKGROUND

Bangladesh is a very small country (147,570 square kilometres) by international standards, but with about 160 million people, it is the eighth most densely populated country in the world.[2] According to the World Bank data of 2019[3], around 65% of the total population of Bangladesh live in villages and agriculture is the main source of family sustenance and livelihood. The geographical location and physiographic condition of the country make it extremely vulnerable to climate change, which has an impact on poverty, climate-sensitive livelihood sectors and core food security.

The majority of the world's poorest billion people are women and girls and among them around 81 million are Bangladeshi.[4] They are often the most disadvantaged and poorest of the poor because of their lower access to resources, economic vulnerability, and subordination within patriarchal societies based on socioeconomic inequality (Batliwala, 1994). Amartya Sen emphasises diversities and heterogeneities when considering concepts such as poverty and wellbeing (Sen, 2001). Sen argues that wellbeing is not derived from a simple given bundle of commodities, rather it 'depends crucially on a number of contingent circumstances, both personal and social' (Sen, 2001, p. 70). Sen's Capability Approach has introduced a holistic way to understand poverty and wellbeing which 'moves the theoretical focus away from purely materially-oriented attempts to alleviate poverty to one that puts gender constraints and opportunities into the picture' (Stillman & Denison, 2014, p. 204). Consequently, it is useful to explore women's multidimensional experience of poverty depending on their age, ethnicity, race, linguistic background, ability, citizenship and sexual orientation (Obayelu, 2005).

Women's lives are mostly confined to the private sphere and households, whereas men are linked to the public sphere. Even when women are linked to the public sphere (for example, employment, economic exchange), they overwhelmingly have private sphere responsibilities (such as household care, child care) which in most cases increase the workload of the women. Furthermore, women's limited access to resources and absence in the decision-making process traditionally give the power to men to dominate the society (Morrell & Sterling, 2006).

Even though the male/female ratio is roughly equal in Bangladesh, women are in fact, overwhelmingly poor and disadvantaged compared to men (Guhathakurta, 2017). Rural parts of the country are comparatively more conservative than urban areas in terms of women's mobility, freedom of choice, education and employment rates. In both urban and rural areas, girls are often considered to be financial burdens, and from the time of birth, they receive less investment in their health care and education. For instance, a (UNICEF., 2006) report shows that for about 48 per cent of Bangladeshi women, their husbands made final decisions about their health, while 35 per cent said that their husbands made decisions regarding visits to family and friends. Despite progress, women's employment rates still remain low, and their wages are roughly 60-65 per cent of male wages (The World Bank, 2008)[5] .

These are key issues for women's empowerment in Bangladesh. As a benchmark, the UN SDGs target gender equality and empowerment of all women and girls at all levels (SDG 5)[6]. The UN World Summit on the Information Society (WSIS) Forum operates as a key platform for discussing the role of ICTs as

[2] http://www.worldometers.info/world-population/bangladesh-population/
[3] https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=BD
[4] CARE Bangladesh's statement on women's empowerment. Link:
http://www.carebangladesh.org/publication_list.php?pub_cat=Women%20Empowerment
[5] The World Bank, Whispers to Voices: Gender and Social Transformation in Bangladesh 2008
[6] http://www.un.org/sustainabledevelopment/sustainable-development-goals/

a means of implementation of the SDGs and targets.[7] The Bangladesh government and NGOs are working to achieve these SDGs.

In this context, both government and non-government sectors undertake ICT initiatives around climate change adaptation and agriculture in order to eradicate poverty and enhance development (Imam, Hossain, & Saha, 2017). These ICT initiatives are very important and timely, because people require timely and needs-based information for climate resilient agricultural production which ultimately contributes to their overall wellbeing.

Lack of access to information has a direct impact on women's subordination. The provision of information is also a way for women to overcome this situation (Paul, Sarkar, & Naznin, 2016). ICT and women's empowerment-focused research emphasises the potential role of ICT for women's empowerment (ICT4WE) through informational agency (Ahmed et al., 2006; Laizu et al., 2010b; Mehta & Mehta, 2014; Wamala, 2012; Yusuf & Alam, 2011).

The National ICT Policy-2009 Bangladesh emphasises social equity by supporting mainstream social advancement opportunities for women and other disadvantaged groups.[8] The report on ICT Use and Access by Individuals and Households, Bangladesh 2013 shows that 74.9% of rural women are now using mobile phones with 1.3% using the Internet and 1% using computers.[9] The Internet use rate is very low in rural areas compared to urban areas. A higher proportion of men (2.9%) use the Internet in rural areas. Overall, these basic statistics reflect the fact that women are lagging behind men in access to and use of ICT in rural Bangladesh. However, a more detailed understanding of the situation of women is absent.

My research came under the umbrella of the collaborative research program, Participatory Research and Ownership with Technology, Information and Change (PROTIC) between Oxfam and Monash (2015-2019). Bangladesh has a long history of non-government organisations (NGOs) working for various development issues since the independence of the country. NGOs have key roles in social development and thus work conducted with Oxfam, as a respected agency, has the potential for high impact. This provides a major incentive to select Oxfam's working areas as research sites. However, my research was independent of the specifics of the PROTIC project. Nonetheless, it will be a contribution to the ongoing and future works of Oxfam, other NGOs and the Bangladesh government on ICT for development, specifically ICT4WE.

1.4 PROTIC PROJECT

PROTIC was motivated by Participatory Action Research (PAR) principles and working for women's economic empowerment in agriculture, animal husbandry and aquaculture. It encourages connectedness and information seeking by rural women through using their smartphones. Specifically, the objective of the project was to empower rural women in agriculture through mobile technology in terms of giving their voices a key role in project design, implementation, and further decision-making, including policy making recommendations.

Initially, PROTIC started working as a pilot project in two villages selected from Coast and sandy island. The Pilot phase was planned to identify priority areas for interventions and strategies for the main phase of the project (Sarrica, Denison, Stillman, Chakraborty, & Auvi, 2017). After pilot run for one and a half years, another diverse ecological zone, Haor, was included in the project in the implementation phase (Tithi, Chakraborty, Akter, Islam, & Sabah, 2020).

[7] http://www.itu.int/net/wsis/

[8] National ICT Policy of Bangladesh 2009 http://www.bcs.org.bd/app/webroot/img/upload/page/11.pdf

[9] http://www.bbs.gov.bd/

PROTIC focused on both research and implementation aspects of development. By following a PAR methodology the project aimed to incorporate learning from the field to the implementation (Sarrica et al., 2017). Monash University funded the project to conduct research interventions and Oxfam worked to plan and implement the project in with the support of three local non-government organisations (NGO) in three different geographical locations. A telecommunication company, WinMiaki Ltd., was selected as technology partner to provide the agriculture and weather-related information services. Besides that, local universities and a research organization specializing in community development through PAR was also involved to support the project development (Tithi et al., 2020).

PROTIC handed out 300 smartphones to 300 women farmers. The participants were selected if they had met either of the following criteria: 'i) female-headed family, ii) person with disabilities, and iii) reflect the economic profile of the overall village population'(Sarrica et al., 2017, p. 502). The women also received training and staff assistance to learn and use their devices. PROTIC participants accessed information through SMS and outbound dialling (OBD) in Bangla language on a regular basis. The OBD service was introduced to facilitate participants' understanding of the text messages and specially to support women who could not read written texts. The project had also set up a dedicated call centre for the participants free of cost. Women also used various apps in their smartphones, two of which were developed by the project.

As research was an important component of PROTIC, the project supported in-depth research on different issues to achieve common goals related to gender, ICTs and development (Khabar et al., 2020). Four other doctoral students were recruited as part of the project, which enabled a wide range of collaborations and knowledge sharing opportunities with multiple stakeholders.

1.5 MOTIVATION

The practical motivation for the research is derived from the existing gender inequality and women's unequal sociocultural position in Bangladesh which has a direct impact on their engagement with ICT. My personal life and working experience as a development worker have given me this insight.

Being a woman in the context of Bangladesh, I have faced gender discrimination and inequality from the very beginning of my life. This is also true for almost every woman in Bangladesh. Women and girls in rural areas face more discrimination as the sociocultural environment is particularly conservative and restrictive.

Existing gender inequality determines women's sociocultural position by prescribing expected gender roles and influencing women to follow those roles. The position of women in gender and in class relations regulates the choices and the amount of power that women have within the social structures as individuals and collectively (Arens, 2011). Religion and particularly Islam shapes the world view of people (Hartmann & Boyce, 1983) and determines men and women's expected social positions. In other words, sociocultural structures mould and constrain women's agency (Arens, 2011). Gender roles are constructed in individual, interactional, and structural ways which create environmental constraints and opportunities that usually benefit men more than women. Gender roles also prescribe expected behaviours for both men and women which limit women's freedom of choice, freedom of mobility, access to resources and independent decision-making opportunities.

A traditional viewpoint considers gender inequality as 'natural' and makes no effort to change the situation. Kabeer (2012) explains this situation through Bourdieu's idea of 'doxa', the 'aspects of tradition and culture which are so taken-for-granted that they have become naturalised' (Kabeer, 2012, p. 218). When women internalize their subordinate status and think of themselves as 'persons

of lesser value', their sense of their own rights and entitlements is weakened. They may accept any situation that reinforces their subordinate status. This is the lack of agency which is directly linked to the patriarchal socialisation process and makes women accept their subordination. These long-lasting gender-related inequalities have a significant role in determining women's access to and use of ICT. The gap in ICT usage between women and men can be considered to be the result of both socioeconomic differences and constraining, underlying, gender-specific effects (Hilbert, 2011). Women's lack of access to information is thus a contributory cause and effect of this gender discrimination.

My interest in this area has motivated me to explore relevant theoretical and practical themes, such as the impacts of ICTs on women's lives, the role of sociocultural challenges and women's unequal social position determining their role with ICTs, and defining women's empowerment. However, the shape that gender, religion and class relations take are diverse because of the structural variables like history, culture, religion, ideology, moral values are different in different contexts (Arens, 2011). For this reason, this study particularly deals with the context-specific factors related to women's access and use of ICTs in rural Bangladesh society.

1.6 DEFINITIONS OF TERMS

Before introducing specific aspects of the research undertaken, it would be useful to define a number of terms which help to define the scope of the research. The following terms can be understood and applied to different domains or research contexts related to ICT, Gender and Development. This section on definitions is helpful to understand the terms and their meanings based on the context of this research.

1.6.1 Information and Communication Technology (ICT)

While exploring the significance of ICTs in the lives of women, it is important to understand the range of technologies that are included under this acronym. ICT does not indicate any particular form of technology, rather it includes any communication device or application, including radio, television, mobile phones, computer and network hardware and software, satellite systems as well as the services and applications associated with them, such as video-conferencing and distance learning (Gurumurthy & Chami, 2014). The concept of ICT has been defined in different ways, but the definition given by the United Nations Educational Scientific and Cultural Organization (UNESCO) is comprehensive. UNESCO defines ICTs as forms of technology that are used to transmit, store, create, share or exchange information in various forms (Richardson, 2008). Even though the newer ICTs like mobile phones and computers dominate discussions of ICTs, print media, radio and television are the traditional mediums which facilitate the spread of information, especially in the context of developing countries (Gurumurthy, Chami, Babbar, Vasudevan, & Sudharma, 2014).

In my research, the term ICT includes only the technologies mostly used by the rural women participants. The most common ICT used by the rural women was the mobile phone and very few participants used laptop and desktop computers. Some of the rural women also had access to television and radio but no particular findings came out related to women's access to television. Rather, there was an ongoing shift in the practices of accessing and using information where women reported more about accessing and using both online and offline information through their mobile phones and, in some cases, computers. Donner, through a variety of papers (Donner, 2008, 2010, 2015; Mudliar, Donner, & Thies, 2012), has made the point that use of the Internet is increasingly becoming mobile, especially in the context of the developing countries. He indicates that the Internet is accessed by mobile devices and platforms, rather than fixed computers.

In the context of Bangladesh, the use of ICTs is becoming very popular. The report on ICT Use and Access by Individuals and Households, Bangladesh 2013[10] shows that mobile technologies, especially mobile phones, are the most used forms of ICT in rural Bangladesh. The rate of take-up of ICT has already been noted and this number is increasing as mobile technologies have been promoted as tools of development by both government organisations (GOs) and NGOs. This is also in line with the objective of this research to understand how ICT can be effectively used to empower rural women by addressing their needs, challenges and priorities.

1.6.2 International Development

International development has been related to 'different things at different times, in different places, and by different people in different professions and organizations' (Chambers, 1997, p. 1744). Dominant ideas related to international development have often been grouped around economic development and economic growth or growth as generated by economists or used in economics. Targeting developing countries to facilitate economic growth as a way to reduce poverty and moving forward was the main development objective for international aid donor organisations like World Bank and the International Monetary Fund, (IMF) (Fund., 2016).

The meanings and ways of achieving 'international development' have evolved over time through the incorporation of other dimensions such as social development, community development, women's empowerment, and ICT4D (Cornwall, 2003; Fitzpatrick, Kwon, Manning, Midgley, & Pascall, 2006; Kwon, 2005; Momsen, 2010), but economic development has always been considered as a core indicator for understanding international development. The underlying meaning of development has been defined as good change by Robert Chambers, where development is defined as to do better through policies, programs and projects (Chambers, 1997). The idea of describing development as good change predominantly associates international development with good intentions like helping people to get out of poverty and lead quality lives, but the idea and process of international development are not something that are unquestioned. International development as something completely positive was challenged by other authors who highlighted the negative effects of development which they described as overlooked issues (Moyo, 2009; Rist, 2002, 2007).

In response to this criticism, development has also been understood in terms of degrees of freedom across a full range of human activity – economic, social, psychological, and political - by the economist Amartya Sen. He persuasively argues that enhancing a range of freedoms can lead to development which is the most efficient means of realising general welfare (Sen, 2001).

In line with this way of thinking, the issue of participation and power are now also part of the mainstream development discourse (Williams, 2004). In the process of development, whose voice is being represented? Who is representing the voice of the communities? How do different actors co-exist and interact in the international development process? Who plans and implements development activities and who takes decisions? (Cornwall, 2003). These questions are important to understand participation's power effects and to re-politicise participation in the process of international development, particularly as they pertain to women's lives (Williams, 2004).

Based on the literature, in my research, development is consequently understood as a process, but it is not considered unconditionally positive. I am conscious of existing power relations and the role of different actors in the development decision making processes while exploring and understanding the ICT4D projects in this research. Individual agency, wellbeing, decision making capacity and participation are considered important aspects of development in this research.

[10] http://www.bbs.gov.bd/

1.6.3 Rural

The term 'rural' can mean different things to different people, organizations, and government. The US Census Bureau defines rural as 'any population, housing, or territory not in an urban area'[11]. Mostly agricultural areas are rural and rural areas have a lower population density than urban areas. As the primary participants of this research, terms like rural community and rural women have been used several times. In rural Bangladesh, people live in villages, which are the smallest territorial and official unit for administrative purposes. According to the most recent Bangladesh Bureau of Statistics census data, there are 68,038 villages with a national average of 232 households per village[12]. Union Parishads or Unions are the smallest rural administrative and local government units in Bangladesh and consist of wards. Generally, one village is considered as one ward. The Union Parishad Chairman and the members, both male and female, are elected by the respective villagers of that Union.

1.6.4 Community

The term 'community' is one of the most commonly used terms in international development field but it has also been defined with various interpretations (Kepe, 1999). In the case of improving the lives and livelihoods of rural people, the way 'community' is understood in the context of international development and government policies and programmes is important to my research.

There are some basic features used to define 'community' such as that a community is situated in the same geographical location or share common economic, social or cultural relations (Dikeni, Moorhead, & Scoones, 1996; Olson & Bernard, 1977). These basic features are also reflected in the definition given by Green and Mercer (2001) in which they highlighted community 'as a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings' (Green & Mercer, 2001, p. 1929). Sharing common sets of values, whether from the same race or ethnic or religious background or organisational association, and interacting and exchanging information frequently were central in defining communities across different disciplines (Freilich, 1963; Rein, 1997). However, the response is not universal. People with diverse backgrounds experience 'being a part of the community' differently (Green & Mercer, 2001).

The definition provided by the Division of Health Promotion of the World Health Organisation (WHO) is more comprehensive as it includes all the above-mentioned features and demonstrates a clear definition of the term 'community'. According to WHO, community is 'a specific group of people, often living in a defined geographical area, who share a common culture, values and norms, are arranged in a social structure according to relationships which the community has developed over a period of time. Members of a community gain their personal and social identity by sharing common beliefs, values and norms which have been developed by the community in the past and may be modified in the future. They exhibit some awareness of their identity as a group, and share common needs and a commitment to meeting them' (WHO, 1998, p. 5).

The comprehensive definition of 'community' provided by the WHO was influential in understanding and defining the research community in this study. The rural Bangladeshi women are the primary participants in this research but their experiences were not understood in isolation; rather, the rural community in which they were situated was also explored. In this thesis, the term 'community' refers to the particular village community where the rural women live. Similarly, 'community people' refers to the people living in their village apart from their family and relatives. The term 'Community Based

[11] https://gis-portal.data.census.gov/arcgis/apps/MapSeries/index.html?appid=7a41374f6b03456e9d138cb014711e01
[12] http://203.112.218.65:8008/

Organisations' (CBO) refers to organisations consisting of the same village community people including both women and men.

1.7 PROBLEM STATEMENT

The literature review presented in Chapter 2 was conducted to obtain a better understanding of the existing work and research trends and gaps in the context of ICT for development and women's empowerment in Bangladesh or in similar contexts. It was found that:

- Most of the literature focuses on the positive impacts of ICTs and ignores the context-specific challenges women are facing in case of accessing and using ICTs.
- With regards to challenges and barriers, existing research focuses mostly on the general technological and structural challenges at surface level and misses the underlying influence of deep-rooted structural challenges determining women's role with ICTs.
- A conceptual gap has also been identified between the feminist arguments of power and empowerment and the arguments found in ICT for development or ICT for women's empowerment literature.
- The existing research concentrates mostly on meta-theories which in most cases limit the opportunity to identify the unique factors of women's experience at the micro or individual level in a bottom-up way.

It can be concluded that most of the studies investigate ICT4WE in a narrow way. An assumption has been made that improved economic benefits and increased used of ICTs inevitably improve the position of women. The real impact of ICT interventions in the daily lives of rural women in Bangladesh and whether or not those interventions actually act to empower women or result in further disempowerment is not considered. My research focuses on this particular issue where understanding the diverse experiences of the rural women with ICTs from the grassroots was the key driving factor.

1.8 RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

1.8.1 Research Objectives

Based on the issues identified above, this research investigates how ICTs can effectively and meaningfully contribute to empower women by addressing the context-specific needs, challenges and priorities where it is used. Consequently, the primary objectives of this research are as follows:

1. To explore the main uses and impacts of ICTs on women's lives.
2. To identify the challenges and barriers women face in accessing and using ICTs in the context of rural Bangladesh.
3. To develop a gender sensitive model, concepts and theories to identify the intersectional and context-specific information needs and challenges for ICT4WE and ICT4D.
4. To develop meaningful recommendations for policy makers and NGOs working in the context of Bangladesh.

1.8.2 Research Questions

To achieve the aim and objectives, this research has three main research questions and relevant secondary questions. In the context of rural Bangladesh:

Main research question: 1
How do ICTs impact rural women's lives?

Secondary questions:

a. What ICTs are women currently accessing and using?
b. What are the main uses of ICTs in women's lives?
c. What impacts (both positive and negative) have ICTs introduced into women's lives?

Main research question: 2
What factors influence women's active engagement with ICTs?

Main research question: 3
How can the use of ICTs contribute to the empowerment of rural women?

1.9 METHODOLOGY AND RESEARCH SCOPE

These research questions will be answered using the methodology outlined in Chapter 3. This study focused on understanding the context-specific needs, challenges and priorities for ICT for development and empowerment initiatives for rural women. A holistic understanding of the impacts of ICTs and women's empowerment was prioritised to understand both positive and negative impacts and the complex nuances of these phenomenon. By using Grounded Theory methodology, this study explored how rural women's access to and use of ICTs are shaped by sociocultural regulation, government and NGO-regulation, and self-regulation.

I conducted extensive fieldwork to understand the topic from the perspective of the women and other stakeholders and collected data in six villages from three geographical locations[13] in Bangladesh. Some data collection was also undertaken at national level. Selected academics, community informatics practitioners and development professionals from Bangladesh, the United Kingdom and Italy were interviewed.

This research also focused on developing Critical Theory by understanding the participants' worlds, their experience and their achievements and challenges in accessing and using ICTs. This study examines ICT4D and ICT4WE practices from rural women from the grassroots, their family, community as well as government and NGO development perspectives. The PROTIC project was taken as a case study for in-depth understanding about ICT for development and women's empowerment initiatives run by NGOs. This study was not limited to PROTIC participants only as non-PROTIC participants' experiences were equally important to understanding women's experience outside the development program. Since the research was conducted in Bangladesh, the results are specific to that context and may be useful for similar contexts but are not generalisable to every country.

1.10 SIGNIFICANCE OF THE RESEARCH

This study has sought to produce policy recommendations and guidelines for addressing gender and intersectional needs, challenges and priorities in ICT initiatives for rural women in the context of Bangladesh. This was done by recommending the procedures and processes required to be taken into consideration by policy makers, development institutions and practitioners. This study has emphasised understanding women's empowerment and impacts in a more holistic way by investigating participants' experiences in their situated contexts. The findings in the study are crucial in providing theoretical, practical and methodological suggestions for understanding and addressing context-specific women's needs in ICT4D initiatives in rural Bangladesh.

[13] Coastal in the south, Sandy Island in the north and Haor Basin in the north-east of Bangladesh.

1.11 ORIGINAL CONTRIBUTION TO KNOWLEDGE

The contributions of this study illuminate the pathways to understanding the need for sociocultural and contextually viable and appropriate solutions to women's active engagement with ICTs. Understanding these pathways and solutions may help policy makers, local and international development organisations, practitioners, researchers, ICT designers and industries to better design and implement technology and interventions. The contributions of this research are three-fold: theoretical, practical and contribution to methodology.

1.11.1 Contribution to Methodology

The methodological contribution of my research will guide future researchers to be responsive to the sociocultural requirements and more effective application of qualitative research methods to collect intensive and quality data. My research adapted the approach sensitive to the participation patterns. Chapter 4 discusses how observation or shadowing was undertaken in this research and how it contributed to collecting authentic stories of the participants.

1.11.2 Theoretical Contribution: The ICT4WE Model

This study provides original theoretical insights to further the conceptualization of women's experiences with ICT in countries like Bangladesh. Consequently, by using the lens of Critical Research and techniques of Grounded Theory, it has developed an ICT4WE model and accompanying concepts. The model and accompanying concepts are completely derived from the data. The ICT4WE model represents a complex process with interconnected dimensions and factors for the appropriate design and implementation of ICT and related interventions.

My research has also enriched and contributed to the theoretical landscape of ICT4D and Information Systems (IS) research by focusing on context-based and process-oriented descriptions and explanations of information through a continuous interplay between data collection and analysis (Urquhart, Lehmann, & Myers, 2010). This model leads to practical and useful recommendations for policy makers, development organisations and practitioners to design and implement gender-sensitive technology and interventions based on context-specific and gender and intersectional needs, challenges and priorities.

1.11.3 Practical Contribution: Guidelines for Designing and Implementing Gender-sensitive Technology and Interventions

The study has produced a set of recommendations to facilitate context-specific ICT design and implementation support for rural women in Bangladesh. These recommendations will also contribute to localising UN SDGs, particularly SDG Five, to achieve gender equality and empower all women and girls (United Nations, 2020) through the use of. These contributions will assist development organisations, policy makers, government bodies and other relevant stakeholders to co-design more appropriate and sustainable ICT4D programmes for rural women by adequately reflecting their needs.

As a practical contribution, this research has provided in-depth understandings on the impact of ICT in women's lives by identifying the significant factors that determine their access to and use of ICTs in the context of rural Bangladesh. Studying the initiatives of the PROTIC project as a case study of ICT4D in Bangladesh, this research has provided insights into gender relations and their relevance to NGO work and policy development. The recommendations developed as the outcome of this study will facilitate context-specific ICT design and implementation to support rural women in Bangladesh and in similar contexts.

1.12 ORGANISATION OF THE THESIS

The thesis is organised in three parts consist of eight chapters. Part 1: Research design, review and methodology includes four chapters includes Chapter 1: Introduction, Chapter 2: Literature review, Chapter 3: Research methodology and data collection, and Chapter 4: Researcher's observations. Part 2: Stories from the field includes two chapters, Chapter 5: CHAPTER 5: Rural women's access to and use of ICTs and Chapter 6: Understanding the impacts of ICTs and women's empowerment. And finally, Part 3: The model and contributions consist of two chapters, Chapter 7: Discussion of the findings, development of the model and Chapter 8: Conclusion.

Chapter 1 presents the introduction to this research including background, principal motivation, problem statement, scope, research objectives, and research questions. The significance of the research and expected contribution to knowledge are also discussed in Chapter 1.

Chapter 2 sets the context of the research and establishes its relevance to the existing research and literature. This chapter situates the research in Bangladesh as well as in the wider international context. The terms used in the research are defined and the essential concepts which contributed to the development of the research questions and scope of the study are discussed.

Chapter 3 describes the research methodology and data collection and discusses the theoretical lens. The reason for using the Critical Theory approach is discussed in this chapter. The choice of Constructivist Grounded Theory as a research methodology for data collection, analysis and theory building is also discussed in detail. The chapter presents the research methodology followed throughout the study including the research design and methods of data collection and analysis, as well as theory building.

Chapter 4 presents the researcher's experiences including practical reflections on the data collection process, field realities, challenges and limitations. This chapter is important for understanding both the insider and outsider roles of the researcher conducting this research. Discussions in this chapter help in understanding the role of the practical data collection process to address the context specific field requirements.

Chapters 5 and 6 are developed to report on the findings. All the findings and insights reported in these chapters are based on the qualitative data collected in this research. Chapter 5 particularly provides an in-depth understanding of rural Bangladeshi women's access to and use of ICTs. An introduction to the research sites, women's access to and use of ICTs including the types of ICTs used, how they were used, frequency of use, and women's diversified experiences with ICTs are discussed. Chapter 5 particularly answers RQ1a and RQ1b.

Chapter 6 provides an in-depth understanding of both the positive and negative impacts of ICTs on the lives of the rural women which answers RQ1c. Various understandings of women's empowerment ware also reported along with the findings related to the challenges faced by the women in accessing and using ICTs which is RQ2.

Chapter 7 presents the theoretical model of this research. Discussions on research findings based on the dimensions and facets of the model have been presented. Chapter 7 answers RQ3.

Finally, Chapter 8 contains the summary of the objectives of the research, the summary of the study's contributions to theory and practice and the recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 CHAPTER OVERVIEW

This literature review investigates the theoretical and practical knowledge about ICT for Development and Women's Empowerment situations in the context of developing countries and particularly in the context of rural Bangladesh. Since the main focus of this research is the role of ICTs in women's empowerment, the concepts and literature related to this topic need to be explored. This section focuses on the concepts that are central to this research.

There is a common tendency in the overall ICT4D and ICT4WE research to focus on the positive impacts of ICTs (Ahmed et al., 2006; Laizu et al., 2010b; Yusuf & Alam, 2011), rather than context-specific challenges and barriers to accessing and using ICTs (Buskens & Webb, 2009; Hilbert, 2011; Mehta & Mehta, 2014; Tacchi, Kitner, & Crawford, 2012). However, some studies argue that ICTs can in fact contribute to existing unequal gender relations (Chib & Chen, 2011; Masika & Bailur, 2015) and can disempower women (Pei & Chib, 2020; Rakow & Navarro, 1993; Stark, 2020). Such studies helped me to understand the contemporary thinking on ICTs and women's empowerment. Reviewing further literature also helped me to understand the research trends and processes related to the ICT, gender and development fields. Databases such as JSTOR, ProQuest, Emerald Insight, SpringerLink, Taylor & Francis online, ScienceDirect, and Wiley online library were used as retrieval tools to access published research articles. Books published by prominent scholars in the fields of ICT, gender and international development were also used as reference sources.

For my Grounded Theory research, the literature review was progressed throughout the study. At the beginning of my research, the literature search was based on broad concepts including ICT, mobile technology, power, empowerment, women's empowerment, international development and ICT4D. In later stages, the literature search became more specific, based on concepts emerging from the initial findings including the shared use of ICTs and privacy, women's agency and use of technology, gender, technology and empowerment in developing world, women's technology use and monitoring of such use.

Literature searching strategies also helped me to finalise the research objectives and research questions for this study. Consequently, topics in this chapter include power, empowerment, women's empowerment, and measuring women's empowerment. ICT for development and women's empowerment is also described to understand the potential of ICT for women's empowerment in the context of rural Bangladesh. Intersectionality in the context of gender and development, gender digital divide and existing research and practices is also discussed in this chapter. Reviewing relevant literature was helpful in refining the concepts for the development of the ICT4WE model in this research which will be discussed in Chapter 7.

2.2 UNDERSTANDING THE DIGITAL DIVIDE AND THE GENDER DIGITAL DIVIDE

The digital divide refers to the existing social exclusion in terms of accessing technological resources in a digital world. Warschauer (2002) highlighted that meaningful access to ICTs depends on various complex factors including physical and digital access, social resources and relationships, and institutional structure which need to be taken into account to understand how the digital divide works (Warschauer, 2002).

As identified by Rogers (2003), there are always early and late adopters of new technologies. However, problems arise when structural or systemic issues contribute to ongoing difficulties in taking up new technologies. This unequal diffusion of digital technology leads to a new form of disparity (including

gender disparity), based on peoples' power to access information and communication digitally which can be defined as digital divide (Hilbert, 2011).

Some basic questions are central to understanding the concept of digital divide, including 'who' (individuals vs. organizations/communities, vs. societies/countries/world regions), 'which characteristics' (income, education, geography, age, gender, or type of ownership, size, profitability, sector, etc.), and 'how' (access vs. usage vs. impact), to 'what' (phone, Internet, computer, digital TV, etc.) (Hilbert, 2010, p. 10).

Considering the focus of this research, gender is the main dimension to consider in order to understand rural Bangladeshi women's access to and use of ICTs and the impacts of technologies on their lives. Attributes such as age, income, literacy, ownership of ICT devices, marital status and religion are also relevant to understanding how adoption of ICTs by rural women is influenced by these factors as well as how ICTs contribute to the intersectional inequalities. Previous research has also shown that ICT adoption patterns are characterized by these long-established determinants of inequality and intersectional aspects of social life (Hilbert, 2010; Mossberger, Tolbert, & Stansbury, 2003; Warschauer, 2002).

When the concept of digital divide first emerged, it was mostly linked to the physical availability of the technology and access to technological resources (Cushman, McLean, Zheng, & Walsham, 2008). However, the digital divide should not be seen as a binary division between 'haves' and 'have-nots', rather it is more about degrees of access to information technology, based on a variety of factors (Cisler, 2000; Warschauer, 2003). Thus, the notion of binary divide does not consider the experiences of diverse groups existing in the society as it overemphasizes the importance of the physical presence of computers and connectivity. The binary divide also fails to explain the 'complex reality of various people's differing access and usage of digital technology' (Warschauer, 2003, p. 44) and excludes other factors that allow people to use ICT meaningfully (Warschauer, 2002). For example, as Warschauer (2003) discussed, not only economic but also social inequalities lie behind the lower usage of ICTs in African countries compared to western countries.

In line with this way of thinking, ICT is not something external to be implanted to bring about certain results. Rather it is very much shaped by social systems and processes (Hilbert, 2010; Warschauer, 2004). There is no single dominant factor shaping digital divide, so the integration of social resources in the process of social inclusion and exclusion needs to be considered along with the distribution of technological resources (Cushman & Klecun, 2006; Cushman et al., 2008; Warschauer, 2003).

As previously observed, women's access to and use of ICTs has become a policy issue internationally. However, there continues to be 'a gender gap in both with fewer women accessing and using ICTs compared to men' (Mumporeze & Prieler, 2017, p. 1285) . A more holistic understanding of digital divide allows us to understand the reasons for this gap. This gap in ICT access and usage between women and men 'is the product of both socio-economic differences and some combination of underlying, gender-specific effects' (Bimber, 2000, p. 2). Based on a study conducted in European, Asian and North American contexts, Huyer, Hafkin, Ertl, and Dryburgh (2005) found that compared to men, women spend less time accessing and using ICTs and this is likely to be the case for women in developing countries, particularly those in rural areas. Women have less time, less economic control, fewer learning opportunities and household priorities like their children's education and social relations (Ghadially, 2007; Mumporeze & Prieler, 2017).

Gender-specific expectations and roles benefit men more than women (Busch, 1995; Hargittai & Shafer, 2006). Gender differences are considered as social constructs (Bandura & Walters, 1977) where 'different societies and cultures construct gender roles, which are regarded as a model or good

manners for an individual of that particular gender. Such relations also influence the gender gap in ICTs' (Mumporeze & Prieler, 2017, p. 1287). For example, gender-specific expectations and roles in many developing countries do not allow women adequate time to be become familiar with ICTs, which sometimes also makes women underestimate their skills in accessing and using ICTs (Mumporeze & Prieler, 2017). Men are seen as more tech savvy and women more likely to be technophobic (Fallows, 2005) which also supports the argument that technology is gendered (Hilbert, 2011).

2.3 ICT FOR DEVELOPMENT (ICT4D)

Technology is generally understood as an important and determining dimension for development. As a medium of access to information and knowledge, ICTs have the potential to expand opportunities for economic and social change in poor rural communities (Tacchi, 2014). However, potentialities do not often translate into realities, and it is important to be aware of not only the possibilities, but also the context-specific challenges.

Existing and emerging literature highlights the relationship between ICTs and socio-economic development (Gigler, 2011; Heeks, 1999; Madon, 2000; Walsham, 2017). The link between ICTs and development defines ICTs as means of accessing, using and sharing information among people for development (Hudson, 2001). On the other hand, it can be argued that ICTs can increase the socio-economic gap due to existing social and economic inequalities, which tend to favour the privileged and not reach the disadvantaged (Burrell, 2010; Heeks, 1999). In this context, a deeper understanding of the relationship between ICTs and development including both positive and negative aspects is needed (Heeks, 2008; Madon, 2000).

ICT4D approaches consider ICTs not only as development tools but also as development platforms (Heeks, 2008). Heeks (2008) mentions four relevant steps in ICT4D initiatives to support such platforms (see Figure 2.1): 'readiness' indicates having policies and infrastructure to support availability of ICTs, 'availability' is to support the poor and disadvantaged to become active users in case of rolling out ICTs, 'uptake' ensures the application and implementation of ICT for development initiatives as per the needs and demands from the community and finally, 'impact' represents the achievement of socio-economic development goals.

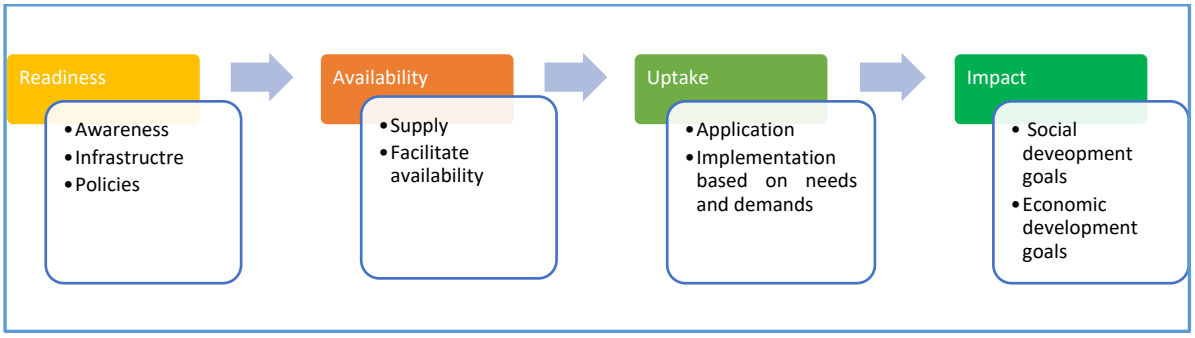

Figure 2- 1. Steps for ICT4D initiatives. Adapted from (Heeks, 2008)

Readiness, availability, and uptake present ongoing needs for innovation in infrastructure, hardware, and software where impact indicates the sustainability and scalability of the ICT4D initiatives (Heeks, 2008). So readiness, availability and uptake remain relevant throughout the ICT4D initiatives to achieve sustainable development (Heeks, 2017). Heeks (2008) also suggested a shift from a monodisciplinary to a transdisciplinary approach combining computer science, IS, and development studies. He also recommended understanding the participation of marginalised people in ICT4D

initiatives and what they themselves actually demand. Walsham (2017, p. 36) similarly refers to the need for a 'multidisciplinary field with multidisciplinary authors' in ICT4D research and practices.

Donner (2010) highlighted that the new forms of development supported by ICTs are particularly compelling within the discourse of participation, but there is a danger of overemphasising the digital, rather than social aspects and effects of participation. In this case, balancing social and technical aspects is mandatory. Similarly, sociomateriality as a concept 'stands out as a symbol for the interest in the social and the technical, and in particular, the subtleties of their contingent intertwining' (Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014, p. 809). The sociomateriality discussion considers that 'the social and the material are inherently inseparable' (Orlikowski & Scott, 2008a, p. 456). This relational underpinning of sociomateriality has two major assumptions: i) all materiality is associated with social processes and contexts; and ii) all social actions are related to materiality (Leonardi, 2012). Materiality is not only about the physical dimensions, rather it refers to the ways that physical and digital materials are arranged in different contexts (Leonardi, 2012). Use of technology can influence norms, expectations, interactions, accountability, and behavioural practices (Orlikowski, 2007) as human agency is also endorsed in response to technology's material agency (Leonardi, 2012). It is important to understand the aspects of social and material agency for the design and implementation of any socio-technical project.

From a research perspective, understanding people's experiences with ICT in a natural setting is useful for understanding the impact of ICT in people's lives. It needs to be emphasised that the contribution of ICTs to empowerment does not just rely on a person's access to ICTs, but on how well he or she can use it in the way they choose. It is therefore difficult to suggest simple causation for the effects of ICTs without exploring people's experiences. As a consequence, my research aims to follow Grounded Theory to understand the actual impact of ICT4D initiatives on peoples' lives from their experiences on the ground. Grounded Theory has not been extensively used before because most research uses 'meta-theories' that are not amenable to ground-level testing. As Anwar (2015, p. 65) has suggested, 'many theories used in ICTD are meta theories, e.g., the Capability Approach, Actor Network Theory, policy studies, or econometrics. As an applied field with many reference disciplines and little indigenous theory, ICTD can benefit from Grounded Theory'.

2.4 GENDER AND ICTs

Over recent decades, the dominant development narratives on ICTs have emphasised that uptake of ICTs has the potential to improve access to information and services and to enable actions for social justice or positive social transformation (Hafkin, 2006; O'Donnell & Sweetman, 2018; Wamala-Larson & Stark, 2019). Gender issues in ICTs only received their first international platform at the fourth World Conference on Women in Beijing in 1995 (Hafkin, 2002) where the issues of gender equality (GE) in the context of digital communications was addressed.

At the World Conference on Women in Beijing, a platform of actions was adopted where 'Women and Media' was included 'as one of the critical areas to be addressed to GE within and across societies' (Padovani, 2016, p. 403). Core components in supporting GE through new technologies were identified as 'Increase the participation and access of women to expression and decision-making in and through the media and new technologies' and 'Promote a balanced and non-stereotyped portrayal of women in the media' (Padovani, 2016, p. 404).

Subsequently, the World Telecommunications Development Conference (WTDC) organized by the International Telecommunication Union (ITU) in Malta in 1998 also played a significant role in this process of including gender issues in ICT programs and policies (Hafkin, 2002). A series of papers on gender issues were presented at the conference, and that event also helped to bring the key

stakeholders, including government bodies and international development agencies, together to discuss, plan and work for that inclusion of gender issues. Another milestone was the 1998 UN Economic Commission for Africa (ECA) Conference on Women and Economic Development, where 'gender and ICTs' was chosen as one of the main themes for discussion (Marcelle, 1998). These conferences and relevant discussions among development stakeholders significantly contributed to the inclusion of gender and ICTs on the agenda in the World Summit on the Information Society (WSIS) in Geneva in 2003 where ICTs were presented as vital tools for women's empowerment (Opoku-Mensah, 2004).

Since that time, the role of ICTs as a tool for development, minimising gender inequalities and women's empowerment has been a feature of the literature on ICTs and Development (Gurumurthy, 2004; Gurumurthy & Chami, 2014; Hafkin, 2006; Sey, 2011; Tenhunen, 2018). However, there is also the risk that this discussion and policy and programs related to it can contribute to, or create or reinforce existing inequalities 'in terms of who benefits and whose voice is heard' (O'Donnell & Sweetman, 2018, p. 217). This is because technology is most commonly understood as a technical tool that society can use, but not something that is also influenced by society (Gurumurthy, 2004). Technology reflects the societies that create it, and access to and (effective) use of technologies is affected by 'intersecting spectrums of exclusion' (O'Donnell & Sweetman, 2018, p. 217). In that case, how technology exists and works in the sociocultural world and how it shapes and is shaped by the sociocultural landscape needs to be well understood (Sandys, 2005).

Contextually, gender and development in ICTs takes its focus from the perspective of women's rights and gender justice (O'Donnell & Sweetman, 2018). Compared to men, women's access to and (effective) use of technology is more restricted, affecting their rights and gender equality (Jouhki, 2013; Tacchi et al., 2012; Tenhunen, 2008, 2018). Highlighting unequal access to and (effective) use of technology emphasises the context and relationship between gender and technology to understand the dynamism and influence of both the components on each other. 'Existing power relations in society determine the enjoyment of benefits from ICTs; hence these technologies are not gender neutral' (Gurumurthy, 2004, p. 1).

Existing symbolic representation of technology is also sharply gendered (Wajcman, 1991a). Feminist technology studies have pointed out that women's exclusion from science and more particularly from the design, access to and use of technology is a product of this existing gender construction where, culturally, affinity with technology is considered more essential to the constitution of male gender identity than female (Tenhunen, 2018; Wajcman, 1991b).

Table 2-1 showing different strands of feminist thought on 'women's relationship with technology' has been adapted and modified from Gurumurthy (2004), adding in the dimensions of Gender Performativity and the Intersectional landscape.

Table 2- 1. Women's relationship with technology (adapted and modified from Gurumurthy (2004)

Approach	Primary Thrust	Central concepts	Critique/Comment
Women in technology / liberal approach	To uncover the women hidden from history.	Sees technology as inherently neutral. Sees the challenge to be improving women's access to technology in a society that is gendered by stereotypical sex roles.	Does not critique technology itself.
Marxist approach	To examine the social relations of technology in terms of class.	Sees women's exclusion from technology as due to the gender division of labour, and the historical and cultural view of technology as masculine. Sees technology as reflecting male power as well as capitalist domination.	Technology still seen as masculine and 'misused' under Capitalism.
Eco-feminist approach	To show that technology, like science, is part of the masculine project of the domination and control of women and nature.	Gives value to 'feminine' knowledge and skills arising from women's biology and presumed closeness to nature. Has been used to critique military and reproductive technologies.	Takes an essentialist position, seeing gender as (at least partly) biological.
Third world and Subsistence perspectives	To argue the inappropriateness of Western / modern technologies to the Third World.	Challenges western systems of knowledge and technology by asserting that these are colonising and displace local knowledge and experience. Offers a new vision of technology that is democratic, non-colonial, and non-patriarchal.	Puts too much emphasis on people-based knowledge systems, rejecting possible adaptation of modern technologies for progressive purposes.
Gendered/ 'technology as culture' approach	To reject the view that technology is inherently neutral or inherently masculine.	Understands gender and technology as cultural processes which can be negotiated and transformed. The relationship between gender and technology is seen as the core issue. Technology is understood to be 'shaped by local histories, geographical conditions, and everyday cultural practices' (Gaiiala 2002).	Based on the interactions between social power relations and the culture of technology.
Gender Performativity and Intersectional landscape	To argue that experience with technology is not only gendered but also intersectional. the	Understanding Gender and technology based on the subsequent relationship with sociocultural characteristics including gender, social class, race, religion, caste, ethnicity disability, age, marital status, literacy status, rural-urban status, occupation and many more.	Considers sociocultural and contextual diversity and intersectionality to understand women's relationship with technology.

This summary of theories and approaches presents the changing trends of our understanding of the integration and acceptance of modern technologies into peoples' lives. Liberal and Eco-feminist approaches consider 'technology' as neutral and do not consider the influence of gender and the influence of culture. The Third-world and Subsistence perspectives promote participatory or grassroots participation in political, economic, social and technological decision-making and offer a non-colonial and non-patriarchal vision of technology (Wood, 2000) but the relationship between gender and technology and how these two components shape each other is not addressed. In fact, the first three approaches in table 2-1 demonstrate a simplistic understanding of technology use as something that works the same way, irrespective of culture and contexts.

Considering sociocultural contexts in the discussion of gender and technology helps to understand the integration process of ICTs in that particular context. This approach also opens up the intersectional landscape (Crenshaw, 1988) and relationship with sociocultural characteristics including gender, social class, race, religion, caste, ethnicity, disability, age, marital status, literacy status, rural-urban status, occupation and many more. Women have multiple identities and their identities interplay with gender to determine their experience with technology. Intersectionality as an analytical tool allows both researchers and development practitioners to understand 'the complex ways in which inequalities and oppression manifest themselves, thereby designing interventions that speak to the lived realities of a much wider range of people' (Kagal & Latchford, 2020, p. 16).

Furthermore, in the past, the words sex and gender were used interchangeably but in the 1970s more precise definitions of both terms were adopted. The dominant perspective of considering gender and sex as interchangeable, where the essential natures of women and men were considered unchangeable, was questioned by considering gender as a sociocultural construct. The word sex was consequently used to refer to a person's 'biological maleness or femaleness and gender to the non-physiological aspects of being female and male' (Lips, 2020, p. 7). Sociologists and feminist scholars have, as a consequence, widely used the understanding of gender as a social construct which relies on the rejection of considering gender as a biological issue. Gender as social construct emphasises that gender is determined through sociocultural relations that are not static and can change over time (O'Brien, 2009). Feminist scholars have thus argued that femininity and masculinity are not natural sets of behaviours but rather culture-specific sets of behaviours which one has to learn as a social being (Lips, 2020; Young, 1997).

Gender identity regulates the individual's role, performance and existence in society. The concept of 'gender' promotes different sets of expectations of males and females which they need to perform to be accepted, understood and respected in society; this is called gender performativity (Butler, 1988). Philosopher and gender theorist Judith Butler's idea of gender performativity is useful to understand how gender norms and expectations affect individual agency and regulate people's actions as male and female (Butler, 1988). Gender performativity underlies the dominant conceptualisation of women as being lesser (Joy, Belk, & Bhardwaj, 2015). Sociocultural norms shape how gender is performed or expressed and this gender performativity also influences how men or women relate to technology and how society expects them to relate to technology.

Based on these understandings, my research explores the relationship between gender and technology by understanding women's interaction and relationship with technology. This approach argues that technology is not neutral, but very much intersectional and influenced by culture. Considering the influence of gender and technology on each other, it can be said that gender affects technology just as technology affects gender (O'Donnell & Sweetman, 2018).

2.5 UNDERSTANDING INTERSECTIONALITY

An understanding of the complex intersections of gender and other social identities is important for exploring the realities of particular contexts of women's access to and use of ICTs.

Critical race theorist and legal scholar Professor Kimberlé Crenshaw offered intersectionality as a tool for contextualising African American women's experience of discrimination and oppression (Adewunmi, 2014; Crenshaw, 1989; Wamala-Larson & Stark, 2019). She demonstrated that that African American women were subjected to multiple forms of discrimination via sexual and racial discrimination but the existing single-axis thinking undermined that multidimensionality in the African American women's experience. Crenshaw argued that legal thinking and disciplinary knowledge 'did not recognise that black women's experiences of inequality occurred at the intersection of racism and sexism' (Wamala-Larson & Stark, 2019, p. 15) which contributes to the 'struggles for social justice' (Cho, Crenshaw, & McCall, 2013, p. 787).

Intersectionality challenges the idea of 'sameness' and acknowledges that every person has a unique experiences of marginalisation and suppression which needs to be considered (Crenshaw, 1989). Thus, it cannot be assumed that every woman experiences technology in the same way because not all women experience the same version of 'womanness' (Kagal & Latchford, 2020, p. 15). The Intersectional approach thus aims to avoid over-generalised addressing of gender imbalances by understanding gender as a dynamic cultural process in relation to the technology environment (Crenshaw, 1988, 1989; Gurumurthy, 2004; Gurumurthy & Chami, 2014; Tenhunen, 2008).

As an analytical tool, intersectionality helps to identify where power originates, intersects, and collides. This is important for a holistic, context-specific and inclusive discussion of Gender, ICT and Development (Cho et al., 2013; Crenshaw, 1989). For instance, women and men from the same sociocultural context may not enjoy equal access to ICTs where, because of inequal gender roles and construction, women may have only limited access to ICTs. At the same time women's experience of ICT use can be very different based on their social class, marital status and age and other contextual factors. For example, young girls and women may face more restrictions in case of accessing and using ICTs (Tenhunen, 2018).

However, there is a lack of systematic research on the intersectional aspect of gender and access and use of ICTs in which race, class, caste, religion, and other relevant dimensions are taken into account along with gender to understand the impacts of technology and the Internet (Bailur & Masiero, 2017). Following the binary (male/female) approach can only 'represent a subset of a much more complex phenomenon' (Crenshaw, 1989, p. 140).

A single-axis framework can erase 'the conceptualisation, identification and remediation' of intersectional discrimination by restricting the investigation to the experiences of 'otherwise-privileged members of the group' (Crenshaw, 1989, p. 140). Women's experience of accessing and using ICTs is multidimensional and by considering only gender there is always a risk of overemphasising women's voices, which can create a partial or incomplete understanding of the actual scenario. Based on intersectional factors, women's experiences can be quite different, and a binary approach does not investigate intersectional inequality and hierarchy.

Using an intersectionality lens for international development is critical because this also helps to understand these systems of power, hierarchy, and inequality (Gurumurthy, 2004; Kagal & Latchford, 2020). In international development, constant attention and critical reflection are needed for effective implementation of the lens of intersectionality rather than adopting it just as a technical tool. In my thesis, the way intersectional factors influence rural women's access to and use of ICTs in their

situated contexts has been explored and discussed. My research findings also help us understand how the intersectionality lens was used in selecting rural women as ICT for development project participants and addressing their needs, challenges and priorities throughout the project implementation cycle.

2.6 POWER

'The concept of empowerment is clearly rooted in the concept of power and in its inverse, powerlessness or the absence of power' (Kabeer, 1994, p. 224). The concept of power and its expressions can range from domination and resistance to collaboration and transformation (VeneKlasen & Miller, 2002). Understanding power in terms of 'power over' relations is the most commonly recognised form of power (VeneKlasen & Miller, 2002). On the other hand, as more collaborative and transformative, power can be understood as 'power with', 'power within' and 'power to' (Williams, 1994).

'Power with' is about collective strength and finding common ground among different interests based on mutual support and collaboration. 'Power with' can encourage equitable relations and transform social conflict, whereas 'power within' is about the awareness of self-worth, dignity, self-esteem and possibilities (VeneKlasen & Miller, 2002). 'Power within' affirms 'power-to' when persons can make and fulfil their choices for dignity. 'Power within' needs to be considered as a core idea in gender analysis and approaches to empowerment (Institure of development Studies, 2020).

The concept of 'power-to' is closely associated with liberal forms of analysis where power is defined as an exercise of agency. Agency represents the processes of making choices and putting them into effect (Kabeer, 2005). 'Power to' is the likelihood that an actor will be in a position to carry out his/her own will despite any resistance (Allen, 2016). With mutual support, 'power to' opens up the opportunities for joint action, or 'power with'. Similarly, Lukes (2005) defines power as a dispositional concept, meaning that power is a potentiality, not an actuality; indeed a potentiality that may never occur. If someone has the potentiality but can never actualise it, then there will be some 'more powerful' factors or reasons which restrict the potentiality of the less powerful or powerless. 'Power-over' is relevant to this situation.

Different definitions have been put forward on the concept of 'power over'. Allen (2016) suggests that power is a kind of 'power over' where certain persons exercise power over others. 'Power over' is inherent in implicitly accepted procedures within institutions which systematically and routinely benefit certain individuals and groups at the expense of others (Bachrach & Baratz, 1962).

Feminist approaches to 'power to' and 'power over' also need to be considered. Most liberal feminist approaches conceptualize power as a resource or a positive social good which is currently unequally distributed and needs to be distributed amongst women and men in more equitable ways (Allen, 1998). On the other hand, radical feminism, socialist feminism, intersectional feminism, and post-structuralism conceptualise power as a form of domination (Allen, 2016). They critique the distributive model of the liberal feminists and argue that power is not a resource or critical social good, but rather it is a social or material relation conditioned by domination. Although feminists have often used a variety of terms to refer to oppression, patriarchy and subjection, the common thread in these analyses moves it from more neutral discussions of power to a specific kind of 'power over' relation that is unjust or illegitimate (Allen, 1998, 2016).

All four of the above-mentioned dimensions of power are important but their focus still remains on either 'power over' or 'power to' and that is why these definitions are not sufficient to understand power holistically. My discussion emphasises the importance of unpacking the concept of power in

order to understand its relationship to social inequality and injustice and think about transformation and equity through the use of power. If we consider power as domination or oppression, then we can also understand power as a form of resistance (Kabeer, 1994).

Furthermore, from the point of view of the traditional patriarchal power structure which exists in the society of Bangladesh, 'power over' is more applicable. 'Power within' and 'Power to' is mostly applicable to understanding women's empowerment, including self-esteem, assertiveness and agency. 'Power with' helps to understand the solidarity and collective empowerment situation among groups with common interests like the rural women in this research. All these forms of power are interlinked because as a restrictive structure, 'power over' is always used in patriarchal societies to control women's 'power with', 'power to', 'power within' forms of agency (Kabeer, 1994).

Consequently, my research is more closely aligned with VeneKlasen and Miller (2002) visible, hidden and invisible dimensions of power to understand the situation of women's empowerment. The visible dimensions of power are easily identifiable, explicit and clearly manifested which is reflected in the policy and formal rules, structures, authorities, institutions and procedures of decision making (VeneKlasen & Miller, 2002). Both hidden and invisible dimensions of power are not easily defined, but rather veiled or obscured. Hidden dimensions of power are the influences that control who gets to the decision-making table and what gets onto the agenda, whereas invisible dimensions of power are not only about the decision making process, but also include the influence of power in developing the minds and consciousness of the different players involved (VeneKlasen & Miller, 2002). Invisible power refers to the process of constructing the meaning of what is acceptable in the society. Processes, practices, cultural norms, and customs shape people's understanding of their needs, roles, possibilities, and actions in ways that deter effective action for change. 'Among marginal groups, socialisation internalises feelings of subordination, apathy, self-blame, powerlessness, unworthiness, hostility, anger, etc.' (VeneKlasen & Miller, 2002, p. 40).

Similarly, Lukes (2005) emphasised the need to think about power more broadly and to consider the dimensions of power that are less obviously accessible to observation. He recommended a deeper analysis of power relations and paid attention to the impositions and latent conflicts among different power relations that sustain the coercive and non-coercive forms of power (Lukes, 2012). He also highlighted the need to understand the dimensions of power that influence people to acquire certain beliefs and result in their consent and adaptation to domination (Lorenzi, 2006).

Therefore, whenever we discuss the gender inequalities and discrimination which exist in society, we can easily identify the visible dimensions of power that contribute to it. For example, the National ICT Policy of Bangladesh states a general aim to ensure access to ICT for all but no clear reference is made to address poor or socio-economically disadvantaged communities or groups like rural women (Aziz, 2020). These dimensions of power can be described as direct and material, i.e., 'visible', outcomes of restrictive power relations. However, we must also consider hidden and invisible dimensions of power, and latent conflicts between power relations which contribute to sustaining inequalities including gender and class, among others. In this research, both hidden and invisible dimensions of power help to understand the socialisation, control, power relations, and underlying power issues influencing women's access to and use of ICTs. In reality, the hidden and invisible dimensions are closely related and the distinction between the two is blurry. So, in this thesis, where the visible and invisible dimensions of power are discussed, the latter category also includes the hidden dimensions of power.

2.7 UNDERSTANDING GENDER AND DEVELOPMENT, EMPOWERMENT AND WOMEN'S EMPOWERMENT

It is important to understand the history of gender and development (GAD) in order to understand and define women's empowerment and agency. The GAD approach understands women as agents of change rather than as passive recipients of development assistance (Mwije, 2014). The GAD approach is more holistic compared to Women in Development (WID) and Women and Development (WAD). Both WID and WAD introduced women into development from a welfare perspective (Rai, 2011). Analysis of women's subordination was considered in both WID and WAD but 'the essentially relational nature of their subordination had been left largely unexplored' (Miller & Razavi, 1995, p. 12). GAD considers the underlying factors and assumptions related to current social, economic, and political structures which is critical for understanding women's empowerment and agency (Rathgeber, 1990). A GAD perspective not only leads to the design of intervention and affirmative action strategies for better integration of women into development, but also considers a fundamental investigation of social structures and institutions to understand social power dynamics (Rathgeber, 1990).

My research explores the context-specific and processual understanding of women's empowerment. The model for rural women's empowerment by Lennie (2001) is helpful to understand the contextual forms and features of women's empowerment. From her findings, she presented four interrelated forms of empowerment of rural women including technological, social, political and psychological. Accordingly, to understand empowerment as a process, Naila Kabeer's comprehensive view of empowerment is helpful where she focuses on three interrelated factors necessary for empowerment: 'resources', 'agency' and 'achievements' that contribute to develop a person's 'ability of choice' (Kabeer, 1999, 2012). A processual understanding of empowerment is different from more instrumentalist understandings. Instrumentalists mainly consider the measurement and quantification of empowerment, while processual understanding focuses on the sociostructural process by which those who have been denied the ability to make strategic life choices acquire such an ability (Kabeer, 1999).

'Resources' as catalysts for empowerment refers to the material conditions needed to reduce inequality (Grabe, 2012). This incorporates not only access but also future claims to material, human and social resources. 'Agency' includes the process of decision making as well as negotiation, deception and manipulation. 'Achievements' refer to the outcomes of agency. Kabeer's approach is also significant for my research as it focuses on agency and highlights the profound importance of social context in empowerment processes. Amartya Sen also refers to the expansion of agency in defining empowerment (Ibrahim & Alkire, 2007). Agency can be defined as 'what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important' (Sen, 1985, p. 203).

The concepts of agency and empowerment refer to a condition in which a person or a group of persons act to acquire more control over their own lives (Arens, 2011). Additionally, the ability to choose is central to the process of empowerment, where to be disempowered implies to be denied choice. Some choices have greater significance than others in terms of their consequences in women's lives (Kabeer, 1994). Choice may relate to survival imperatives but it may also take the form of other strategic life choices (Kabeer, 1999). Kabeer (1999) emphasises two different sets of qualifications to understand choice where the first set refers to the 'conditions of choice' including the need to distinguish between choices made from the vantage point of alternatives and from the absence of alternatives. The second set of qualifications refers to the 'consequences of choice' to understand if the made choices are challenging to destabilising social inequalities or merely expressing or reproducing those inequalities (Kabeer, 1999, p. 461). This conceptualisation of different sets of choices is helpful to understand the inter-dependence of individual and structural change in processes

of empowerment where structures shape individual choices. This highlights those circumstances where agents can be forced to improvise in structurally constrained ways (Sewell Jr, 1992). Choices define the parameters within which different categories of actors are able to pursue their interests, promoting the voice and agency of some and constraining that of others. And finally, it helps to shape individual interests so that people can express their goals and what they value, reflecting their social positioning as well as their individual histories, tastes and preferences (Kabeer, 2005).

In addition, multiple components influence each other in the process of empowerment but empirical research does not adequately identify these components and the links that bring it about (Grabe, 2012). Early conceptualizations and investigations of empowerment within psychology focused primarily on individual psychological components, such as perceptions of personal control, giving limited attention to context and social structures (Perkins, 1995). The critical roles of social structure and cultural influences need to be understood for better conceptualisation of women's empowerment. People's or agents' thoughts, motives, and intentions are constituted by the cultures and social institutions into which they are born. These cultures and institutions are reproduced by the structurally shaped and constrained actions of those agents (Sewell Jr, 1992). My research emphasises the exploration and identification of the context-specific components of women's empowerment to develop meaningful recommendations to promote women's empowerment in the context of rural Bangladesh.

2.8 MEASURING WOMEN'S EMPOWERMENT

The measurement of women's empowerment is conceptually complex and methodologically challenging (Malhotra & Schuler, 2005; Mason, 2005). On one hand, the measurement of empowerment must involve standards that lie outside localized gender systems and a recognition of universal elements of gender subordination (Malhotra & Schuler, 2005). However, the literature on gender and empowerment shows that the role of gender in development cannot be understood without understanding the sociocultural as well as political and economic contexts, because the concept of empowerment only has meaning within those specific contexts. Furthermore, although ICT interventions are used for the empowerment process in many developing countries in the world, there is no standard method for measuring and tracking changes in levels of empowerment. In most of the literature, women's empowerment has been defined as a process (Kabeer, 1999, 2011), where it indicates a transition from disempowerment to empowerment. The process emphasises that women must be agents of their own change rather than only recipients (Malhotra & Schuler, 2005). My research also emphasises that women's active participation in the change process (empowerment) with ICT is important to any research and design process. They cannot simply be considered as end users.

To understand the dimensions of participation, in the mid-1970s, sociologist Giele (1977) devised a sixfold framework of dimensions of women's status to assess and compare the legal status and social positions of women in different societies. This framework focuses on 'women's status' through political expression; work and mobility; family formation; duration and size; education, health and sexual control; and cultural expressions (Giele, 1977).

Additionally, in 2005, Moghadam and Senftova proposed a framework with seven domains of women's capabilities, participation, and rights, and 44 indicators including bodily integrity, literacy, and economic participation. This framework includes non-quantitative information, specifically references to adoption of international women's rights instruments (Moghadam & Senftova, 2005). At the same time, Malhotra and Schuler developed a comprehensive framework describing the various dimensions along which women can be empowered (Malhotra & Schuler, 2005). Their framework was inspired by the central human functional capabilities developed by Nussbaum (2011). In practice, the

frameworks for measuring empowerment depend on universal standards such as human rights and focus on more general issues rather than indicators that are sensitive to context. In fact, the conceptualisation and measurement of women's empowerment must consider context-specific dimensions because empowerment is not an end result, rather it is the beginning of a continuous process.

The dimensions of empowerment, its contextual nature, and various environments (such as micro, meso and macro) at which it can be measured are also important (Laizu et al., 2010b). Considering the insights of the above-mentioned writers, there are a multiplicity of quantitative and qualitative approaches for measuring women's empowerment in the literature. Quantitative analyses of empowerment based on socio-economic indicators, such as health, education, income and labour force participation, are useful as first approximations, though they may not be sensitive enough to capture the shades of gender power relations and context-specific influences. In order to understand the sociocultural context within which women's behaviour in social interaction and gender relationships takes place, an in-depth qualitative approach is essential (Pradhan, 2003).

Based on this review, my research first concentrates on the context-specific micro level indicators for women's empowerment and then its link to macro and global issues. This approach helps to focus on the context-specific indicators for women's empowerment through ICT interventions.

2.9 ICT, WOMEN'S EMPOWERMENT AND AGENCY

As has been suggested, empowering women through ICTs is related to their particular disadvantages, challenges and opportunities for agency. ICTs are not 'gender neutral' because they are shaped by their developers from the basic content to the functionalities (Melhem, Morrell, & Tandon, 2009). Such issues can be easily masked in a techno-centric analysis which does not account for, ignores, or underplays gendering in technology, and this is also relevant to development theory and its concern for participation and inclusion (Donner, 2010). Gender relations in communication and learning need to be explored in the study context rather than simply women and technology.

While general trends in the extraordinary uptake of mobile technologies in the Global South are also known; women are generally considered to lack agency because of gender relations, cost, cultural factors and lack of easy to access mobile infrastructure. Their lack of skill with interfaces such as apps or literacy limitations with SMS are also raised as relevant (Donner, 2015).

Despite these constraints, it is still claimed that there is a link between access to and usage of ICTs and reduced poverty for women (Elder, Samarajiva, Gillwald, & Galperin, 2013). Women's empowerment has a strong relation to various aspects of development and among them economic development is considered as one of the most significant indicators of women's empowerment as discussed in Section 2.3. Additionally, Kleine (2010) in her adaptation of the influential Capability Approach, also focuses on economic growth playing an important role in human wellbeing and capabilities. But as I have argued, this type of 'blind approach' will never be able to address the specific need as gender inequality and women's sociocultural position are not only related to poverty. Poverty is not always material or economic, it has other dimensions related to the individual's context, including gender, sociocultural, political and religious identities. Thus, while economic development helps to reduce poverty and foster empowerment, considering it as the principal dimension to indicate an improved life can be misleading. For example, a woman's access to income will only result in empowerment if she has control over her income and future claim to material, human and social resources. If control remains with others, her development can be held back because she lacks personal agency (Kabeer, 1999).

Furthermore, studies note that ICTs have the potential to, or have improved living standards in Bangladesh by increasing access to opportunities in the areas of health, education and livelihoods (Islam & Slack, 2016) and increased prosperity (Alam, Yusuf, & Coghill, 2010; Yusuf & Alam, 2011), as well as reduced travel times and reduced isolation (Islam & Slack, 2016) by ensuring women's access to information.

At the beginning of 2000, the early wave of optimism surrounding 'ICTs and development' mostly considered the potential of ICTs for empowering women. But recent studies have shown that support for new technologies or ICT interventions for empowering marginalised women both economically and socially is not universal and ICT interventions 'could equally result in a negligible or even negative impact on existing gender relations' (Masika & Bailur, 2015, p. 43; Pei & Chib, 2020). In a comparative study conducted in both India and Uganda, Masika and Bailur (2015) suggested that empowerment through ICTs is not unproblematic, it is however illustrative of contextual and situated agency. A static and one-sided viewpoint on agency might be inadequate to explain the lived experiences of marginalized women. Close examination of specific sociocultural contexts and environments is needed as these limit the individuals' capabilities to act and lead a valued life.

To understand the agency–structure dynamics, the taxonomy proposed by Pei and Chib (2020) is useful. They defined agency as peoples' negotiation 'to act upon structural constraints to suit their own needs, which might even result in the re-shaping of the structural hierarchy in the long run' (Pei & Chib, 2020, p. 5). They described how structural oppression is recurrently reinforced via 'access', 'surveillance', and 'intervention'. 'Access' refers to the use of hierarchical power to access women's mobile spaces by enforcing access to and connection with their mobile phones. Access is used to control their activities and mobility both online and offline. Access paves the way for 'surveillance', the practice of constant monitoring of women's behaviour. 'Intervention' is a leveraged level of oppression to establish control over women by actively coercing their behavioural modification via technologically mediated means, e. g. complete or partial ban on women's usage of technology. Pei and Chib (2020) also highlighted the agentic resistance strategies including 'avoidance', 'accommodation', and 'collaboration' by the women. 'Avoidance' is the strategy used to escape from patriarchal pressure where women 'hide mobile communication from access and surveillance'(Pei & Chib, 2020, p. 9). 'Accommodation' refers to the strategy where women deliberately veil their own interests, desires, and real purpose of using mobile phones by accommodating themselves with structural orders at a surface level. 'Collaboration' is about the 'social connections enabled by the mobile phone [that] allow for collaboration among individuals that could result in an emergent collective power' (Pei & Chib, 2020, p. 10).

Similarly, (Masika & Bailur, 2015, p. 43) introduced two concepts of agency namely 'adaptive preference' and 'patriarchal bargain' to understand how women decide to adopt technology. 'Adaptive preferences' have been defined as choices made by a person wherein (s)he unconsciously downgrades and re-contextualizes his/her desires for what (s)he cannot access', while 'patriarchal bargain' refers to the various ways in which women strategise within a set of real constraints.

Existing research shows that there is a need for holistic frameworks to be emphasized for ICT4D scholars and practitioners to consider lived human experiences (Hoan, Chib, & Mahalingham, 2016),as without paying close attention impacts cannot be properly understood (Tacchi et al., 2012). The notion of 'restricted agency' as mentioned by (Hoan et al., 2016) pays significant attention to social structures and power relations which influence one's capability to act and make choices.

Some researchers also argue that the use of ICTs contributes to a person's identity construction. Hassan and Unwin (2017) identified that 'on the phone' is the most instantly noticeable aspect where the type, brand and make of the ICTs contribute to the person's social status. 'Identity (with)in the

phone' reflects the identity stored within the device and not preferably shared on public platforms or on social media and 'identity through the mobile phone' indicates how people are portrayed based on their expected use of mobile phones rather than their actual use (Hassan & Unwin, 2017). The dominance of social usage of ICTs by women in developing countries also results in limited agency to access and use ICTs. Based on their study conducted in Pakistan, Hassan and Unwin (2017) reported that research participants had primarily used their mobile phones for social purposes and most of them could not find other types of use for their mobile phones.

In summary, the literature reviewed here points to the conclusion that the adoption of mobile phones and usage guarantees neither gender equality or agency, nor sustained functioning of gendered social power structures (Chib & Chen, 2011). Particular mobile phone use practices enable the forces of structure and agency by 'situating women in intensified struggles between obedience to traditional patriarchal orders and their pursuit of modern desires that address individual autonomy and freedom' (Pei & Chib, 2020, p. 12).

Understanding women's encounters with the traditional social power structures and other social and institutional structures is consequently fundamental to women's empowerment in the context of rural Bangladesh. There is a gap in the literature exploring the influence of social power dynamics and agency and addressing it in the context of ICT for women's empowerment research. In this regard this research will develop some meaningful insights and recommendations for stakeholders by identifying the information needs and challenges in the context of rural Bangladesh.

2.10 BANGLADESH NATIONAL ICT POLICY AND THE GENDER STRATEGY

Having discussed the general literature I now examine the specific situation of Bangladesh and how these themes and ideas have (or have not) been applied in that particular context. 'Digital Bangladesh' is the national digital initiative of the government of Bangladesh to promote wide-ranging emphasis on digital technologies and initiatives for a poverty free and more inclusive society by 2021 (Aziz, 2020). It was first introduced as an electoral pledge by the current ruling party, the Awami League, and has now become a key political commitment (Islam & Grönlund, 2011).

The government of Bangladesh plans and implements ICT policies and programs with the support of, and under the influence of, the prevailing ideologies of international agencies such as the United Nations Development Programme (UNDP) and United States Agency for International Development (USAID). The National ICT Policy (NIP) of Bangladesh aims to bring economic growth and social development though digitisation (Bangladesh., 2002; Hasan, 2016). The policy also aims at building an ICT-driven nation and knowledge-based society and a wide ICT infrastructure to ensure access to information by every citizen.

The NIP offers a long-term plan for socio-economic and human development using ICTs. To implement that policy, relevant strategies are developed with practical actional plans and implementation guidelines. However, for this research, the government of Bangladesh's Gender Strategy for the Access to Information Programme (a2i) is more relevant as this strategy articulates the gender-responsiveness of the program. This strategy also helps to contextualise government initiatives for empowering women and in this research, the rural women in Bangladesh. The a2i program commenced 'with a proclaimed goal to leverage ICT in public service delivery and build necessary capacity of the stakeholders to promote the use of ICTs in development' (Access to Information Programme, 2009, p. 4). This project supports decentralisation of administrative services such as education, health and agriculture through ICTs for more convenient access by the citizen. The Public-Private Partnership (PPP) model is used to accelerate ICT infrastructure and public services at local

government (Union Parishad) level. To ensure more inclusive and accessible services in rural Bangladesh, 4500 Union Digital Centres (UDC) have been established across the country (Aziz, 2020).

The NIP and its strategies largely take a technocentric approach in which sociocultural issues and challenges related to gender disparity, social inclusion, inequality and intersectional identities are not adequately addressed. 'Strategies for enhancing the social, cultural, political and civic participation of citizens are explicitly missing in the policy text' (Aziz, 2020, p. 10). In its Gender Strategy, only general actions are mentioned for gender sensitive interventions, such as collection of sex-aggregated data; regular analysis of data; revision of policies; and provisions to ensure financial stability for underserved women and men. However, there is no mention of how the contexts and situations of marginalised women and their gender-specific and intersectional needs and demands will be addressed in the policies and programs. However, technocentric approaches for socio-economic development cannot contribute much to digital inclusion (Avgerou, 2010), where inclusion can be defined as freedom and peoples' control over their lives (Sen, 2001). Furthermore, a contextual gap in the technocentric approach results in limitations in digital policies in developing countries (Palvia, Baqir, & Nemati, 2015). Interaction with new technology is not same for everyone. For example, in the context of Bangladeshi ICT projects, the powerless majority of the rural poor do not have access to UDC facilities (Aziz, 2020). With this technocratic context in mind, while Gender Strategy includes gender sensitivity at organisational, staff, partner, institution and program levels, this strategy does not ensure the design or implementation of programs based on gender intersectional needs and priorities. A more comprehensive approach focusing on participation of the more marginalised women and social innovation needs to be included in the NIP and its strategies (Helsper, 2008) .

Indeed, while 'Service at the Doorstep' is the slogan of the a2i program, and the Gender Strategy refers to ensuring equal participation for underserved men and women (Access to Information Programme, 2015, p. 1), a2i and the Gender Strategy do not address the needs of more marginalised women. No strategies are specifically mentioned for ensuring women's participation or addressing women's needs and the intersectional contexts within women's situations are also not considered. In fact, the strategy of addressing men and women in the same way is not appropriate as the contexts and factors determining men's and women's participation are very different. Inappropriate or inadequate addressing of women's needs and participation may in fact increase the existing gender digital divide.

As an example, although the training and skills development of women entrepreneurs is addressed, as well as the role of other stakeholders, the role of family and society and sociocultural rules and regulation is not recognized. Furthermore, creating jobs and ensuring a gender responsive ICT innovation fund from government is stated as a strategy for both men and women, but how such funding will be equitably distributed, particularly to more marginalised rural women, is not discussed. This may also contribute to a disparity between men and women participating in the same process. Affordable accessibility is also mentioned but there is no action plan for addressing implementation needs in rural areas which may lead to a disparity between policy claims and realities (Aziz, 2020).

In conclusion, the NIP focuses more on infrastructural development in the country and does not contextualise sociocultural challenges, including specific gender divides. Both NIP and the Gender Strategy present a generalized approach to ensuring access to ICTs and 'services at the doorstep' but how they will address the needs of disadvantaged communities or groups such as rural women is not clearly articulated (Access to Information Programme, 2015).

2.11 CURRENT RESEARCH AND PRACTICES: BANGLADESH CONTEXT

According to the Global System for Mobile Communications Association GSMA (2020) reports, Bangladesh has achieved widespread wireless telecommunications coverage. The 3G (third generation) band currently covers around 93% of the Bangladeshi population's mobile Internet area compared with just 21% in 2017, while the 4G (fourth generation) band was launched in February 2018. Compared to other South Asian countries, wireless technology in Bangladesh is still expensive in terms of price and speed (Aziz, 2020) and access to the Internet is eight times lower in rural areas than in urban areas (Alam, 2014). In this regard, infrastructural issues such as unstable networks and electricity supply in rural Bangladesh continue to be challenges.

Existing studies related to ICT, gender, development and women's empowerment in Bangladesh mostly consider ICTs as a potential enabler to improve the lives of individuals, communities and peoples (Hossain & Islam, 2012). However, there are not many studies. The impacts of ICTS are considered mostly positive for combating poverty and bringing sustainable changes into people's lives (Ahmed et al., 2006; Hossain & Islam, 2012; Islam & Slack, 2016; Laizu et al., 2010b). The mobile phone is the most used ICT in rural Bangladesh (Islam & Grönlund, 2011). No comparative analysis of women's experiences of using smartphones and feature phones has been found in the course of this literature review.

Five areas have been mentioned where the use of mobile phones has had positive impacts on rural people (Rahman, Abdullah, Haroon, & Tooheen, 2013). These included social security, social status of women, economic mobility, disaster and emergencies, and bridging the digital divide.

Existing studies on Bangladesh have also investigated the impacts of ICT for development projects in the lives of rural women (Ashraf, Grunfeld, Afza, & Malik, 2011; Barua & Diacon, 2003; Haneef, Pritchard, Davies, Bird, Islam, & Barrett, 2014; Hultberg, 2008; Laizu, Armarego, & Sudweeks, 2010a; Laizu et al., 2010b). The findings from these studies suggest that women in rural Bangladesh have been empowered with the support of particular development programs in both their personal and social lives. Faster access to information, less need for travel and money saving and less effort and time needed for communication have been highlighted as impacts of mobile phone use in rural Bangladesh, where villages become more connected to the wider world (Islam & Slack, 2016). It was similarly noted that mobile phones have improved their socio-economic status and opportunities compared to the women who have not adopted mobile phones. The importance of long-term development initiatives to benefit rural women is also emphasized (Laizu et al., 2010b). However, such positive impacts are presented without any critical analysis or context-specific dimensions.

Some awareness of this limited research approach can be seen in the literature. Women's low literacy and lack of skills and other infrastructural challenges are considered as contributory to limited ICT uptake. Along with that, sociocultural restrictions and gender discrimination are also acknowledged in recent studies (Islam & Slack, 2016; Laizu et al., 2010a, 2010b; Rowntree, 2019; Tithi et al., 2020). In Bangladesh, 37 per cent of women who have mobile phones but do not use the Internet believed that the Internet was not relevant to them, and this was preventing them from using it (Rowntree, 2019). However, as I have noted in the previous sections of this chapter, a more critical investigation of these issues and analysis is not found. For example while discussing the issue of women's empowerment using ICT tools, (Laizu et al., 2010a) only indicated women's lack of in-depth learning of technology, education and active engagement with ICTs as reasons when results differed between two research sites. Furthermore, the influence of sociocultural and other contextual factors is not adequately analysed.

To add to this problem, while the influence of culture and social norms is mentioned, the diversity and the influence of intersectional factors in the same culture was not addressed or discussed. For example, Islam and Grönlund (2011) considered Bangladesh as a homogenous country except for indigenous culture. Their study reported no 'noticeable characteristics or activities that can distinguish the adopters from the non-adopters in terms of their prevailing human culture' (Islam & Grönlund, 2011, p. 10). Yet, as is argued in this review chapter, sociocultural diversity at the rural level is a real factor, and exploring and understanding the context-specific practices and realities of ICT use is important. In this regard, such factors as shared access to and use of technology, a different concept of privacy and subsequent possible risks and impacts are significant. These factors have important design and implementation implications to make technology for women contextually viable. This is taken up further in Section 2.12.

In conclusion, women's access to and use of ICTs are often portrayed as being of great socio-economic benefit and ways to empowerment in Bangladesh. However, the existing evidence suggests that inadequate measures to address gender inequalities and related factors in ICT4D initiatives may be disproportionately beneficial to men, though women are now often the primary partners in the rural economy (Hossain & Beresford, 2012). As Hossain and Beresford have said, 'Incorporating women in the digital economy in a way that empowers them requires a reassessment of women's participation to avoid 'gender blindness' (Hossain & Beresford, 2012, p. 467).

2.12 SHARED ACCESS AND USE OF ICTs: PRIVACY, IMPACT AND DESIGN IMPLICATIONS

One issue that could be expected to arise in the Bangladesh context, but which is not directly discussed in the literature relating to Bangladesh, is that of shared access to and use of ICTs. Because of increased infrastructure and growing affordability, South Asia is one of the fastest-growing technology markets and it also has one of the largest online gender disparities in the world (Sambasivan, Ahmed, Batool, Bursztein, Churchill, Gaytan-Lugo, Matthews, Nemar, Thomas, & Consolvo, 2019). A variety of ways of accessing and using technologies are reported in different sociocultural contexts (Ahmed, Haque, Chen, & Dell, 2017; Ahmed, Haque, Haider, Chen, & Dell, 2019; Dell, Perrier, Kumar, Lee, Powers, & Borriello, 2015; Wyche, Lampe, Rangaswamy, Peters, Monroy-Hernández, & Antin, 2014).

More shared and collaborative use of technology is reported in the collectivist Global South, whereas in western contexts more personal use of technology by a single person is assumed and practiced (Ahmed et al., 2017; Ahmed, Mim, & Jackson, 2015; Thompson, Higgins, & Howell, 1991). Collaborative use and shared devices are considered as data privacy challenges in western contexts. In contrast, Sambasivan et al. (2019) argue that South Asian women often share their ICT devices with family members for sociocultural and economic reasons which cannot be explained away through western ideas of privacy or safety. Hofstede's (1984) cultural scale shows that people in the Indian subcontinent are more communal than those in European or American regions.

Consequently, the notion of privacy is not something static or universal, as it can vary across cultures, contexts and time (Ahmed et al., 2019; Sambasivan et al., 2019). Dominant western contexts of understanding privacy as an individualistic value cannot simply be applied in societies like Bangladesh (Ahmed et al., 2017). From a western human rights perspective, interference and monitoring is inappropriate (Patrick & Kenny, 2003). Existing studies show that communally sharing mobile devices is both culturally accepted and necessary in societies like Bangladesh. In many rural families with limited resources there is no option but to share a common device among the family members (Ahmed et al., 2017; Sultana, Guimbretière, Sengers, & Dell, 2018).

Apart from the economic imperative, the influence of the traditional patriarchal power structure explains how sharing devices, particularly those used by women, becomes the sociocultural norm. Women in the Global South share their mobile phones with family, friends and relatives on a regular basis and consequently gender powerlessness plays an extensive role in the violation of women's digital privacy. Men are found frequently violating women's digital privacy by inspecting their devices, although the reverse is not true (Ahmed et al., 2017). Women's mobile phones are often considered as family devices (Sambasivan et al., 2019). Women's devices are also monitored (Sambasivan, Checkley, Batool, Ahmed, Nemer, Gaytán-Lugo, Matthews, Consolvo, & Churchill, 2018) which refers to when someone else checks women's phones purposefully rather than simply using it. Women's use of ICTs also enables surveillance in intimate relationships. Hannaford (2015) shows how the virtual presence of migrant Senegalese husbands creates suspicion, control and surveillance over their wives.

Based on research about shared mobile phone use and non-use by rural women in Uganda, (Burrell, 2010) shows how shared access to and use of mobile phones is structured through and reinforces systems of inequality. Extensive sharing of women's devices can risk their personal information being used in an abusive way. An inadequate understanding of how to secure personal information can also lead to digital abuse (Sambasivan et al., 2019).

However, the situation is complex. Women in communal and traditional situations perceive the idea of shared access and monitoring differently. Some women accept monitoring over phones and think it is for their safe use of technology, whereas others feel coerced (Sambasivan et al., 2019). Privacy has also different connotations across cultures and places. In most cases family members are more concerned about managing their relationships rather than taking care of privacy (Crabtree, Tolmie, & Knight, 2017). Privacy can be very contextual, and audience dependent (Nissenbaum, 2004) and also very much conditioned by an individual's experiences as well as sociocultural expectations (Sambasivan et al., 2018).

To address digital privacy challenges in the context of accessing and using a shared device, different design recommendations are proposed, some of which support privacy by creating secret accounts (Ahmed et al., 2019). For example, the 'tiered privacy model' proposed by Ahmed et al. (2019, p. 1) still suggests the technical approach of maintaining two accounts; a shared one and a secret one. This may still not be a satisfactory or practically viable solution on the ground because women can still feel the need to share. Rather than technocentric solutions, understanding privacy and violation of privacy in socially and culturally situated ways is more important. Culturally sensitive solutions are more viable ways to support women. Design solutions that match women's needs as well as their realities and the expectations of their partners and families are needed.

2.13 CHAPTER SUMMARY

This literature review has situated the focus of the study in both broad and specific contexts. The scope of this study therefore centres on the following concepts. It:

- Demonstrates the diversity and complexity of women's experiences of accessing and using ICTs.
- Provides constant attention and critical reflection to understand and consider gendered and intersectional dimensions of ICT access and usage by the rural Bangladeshi women.
- Explores different aspects of power including power-over, power-with, power-within, and power-to to understand the systems of power, hierarchy, and inequality and its influence over the situation related to ICT and women's empowerment.
- Investigates invisible and hidden forms of power along with the visible forms to understand the underlying issues affecting women's meaningful engagement with ICTs.

- Prioritises understanding people's experiences with ICTs in a natural setting and considers the critical role of social structure and cultural influences for conceptualisation of women's empowerment. Rather than depending on any meta-theories, a multi-dimensional understanding of empowerment is explored from the experiences of the research participants by using Grounded Theory methodology.
- Considers the contribution of ICTs for empowerment holistically by understanding both positive and negative impacts.
- Considers not only women's access to or ownership over ICTs but also their freedom of choice and independence in using ICTs to understand the actual scenario of women's agency in technology use. More critical analysis is needed to understand how women's access to and use of ICTs contributes to their agency development rather than considering agency as the default outcome of technology adoption.
- Explores policies, research and development practices in the context of Bangladesh for better understanding and addressing of the context-specific factors.
- Addresses contextual and cultural understanding of the digital privacy challenges of accessing and using shared devices which may lead to the development of culturally sensitive and viable design solutions.
- Critically considers the role of development programs, organisations and actors influencing women's experience with ICTs rather than only understanding women's roles as participants.

ICT use cannot be properly understood without considering the local contexts, social relations and power structures within which they are used (Tacchi et al., 2012). For the design and implementation of ICTs and ICT4D interventions, local opportunities and challenges need to be identified and considered. The next chapter outlines the research methodology that is adopted to undertake this study to understand both the local opportunities and challenges related to rural women's access and use of ICTs.

CHAPTER 3: RESEARCH METHODOLOGY AND DATA COLLECTION

3.1 CHAPTER OVERVIEW

This study aims to create a model for understanding how ICTs can better contribute to empowering rural Bangladeshi women by addressing the context-specific needs, priorities and challenges they face in the case of accessing and using ICTs. This chapter presents in detail the research methodology followed throughout the study. In this chapter, I situate the study within a broader methodological argument and describe the research paradigm. I next discuss the theoretical framework, research approach, and my choice of Grounded Theory. The Grounded Theory method has divergent approaches taken by different practitioners. In this chapter, I therefore explain these to explain my choice of Constructivist Grounded Theory. I then detail the research design including the methods of data collection and analysis. The processes of institutional ethics approval, data generation, analysis, theory building and management are also discussed, including transcription process, the subsequent coding process and the measures I took to code and manage my data followed by the chapter conclusions. More practical reflections on the data collection process and field realities are outlined in Chapter 4 because greater framing is required to understand how my practical data collection process addressed the context specific field requirements.

3.2 CHOOSING THE APPROPRIATE RESEARCH PARADIGM

Information Systems (IS) is defined as an integrated set of apparatuses and mechanisms for collecting, storing, and processing data through which people can inform or be informed (Allen, 1996; Zwass, 2017). Information systems can be designed for a respective community with required hardware and software supporting their requirements. Both information and communication are the key elements of information systems (Pang & Schauder, 2007).

This research is influenced by one of the most commonly used classifications within IS literature, the 'three-fold distinction' comprising Positivist, Interpretivist and Critical Theory paradigms proposed by Orlikowski and Baroudi (Myers & Klein, 2011; Orlikowski & Baroudi, 1991). Orlikowski and Baroudi offer a useful discussion on the Positivist, Interpretivist and Critical Theory paradigms. This 'three-fold distinction' helped me to obtain a detailed understanding of the different paradigms, in line with the requirements of my study.

Positivism primarily aims to verify a set of hypotheses, and positivists believe that one 'reality' is 'out there' and it can be discovered (Guba, 1981). The focus of positivist research is mainly on quantitative data, deductive reasoning and generalisability of the research findings to demonstrate characteristics of this reality (Gilliand & McKemmish, 2004).

In contrast, the Interpretivist paradigm takes the position that reality is socially constructed and uses inductive reasoning to explore the social world. Interpretivist studies are often of an exploratory nature and aim to describe and understand the social world and the multiple meanings it can have to actors (Williamson, 2013b). However, interpretivist studies do not emphasize social change. The Critical Theory paradigm shares similarities with the Interpretivist paradigm as, ontologically both of them assume that reality is interpreted and constructed by social actors as individuals or as members of social groups (Williamson, 2013b), but also emphasises social change. Consequently, of the three classifications, I consider Critical Theory the most appropriate for my research because it is both exploratory and transformative (Myers & Klein, 2011). This transformative and critical approach is intended to contribute to efforts that transform unequal social conditions. An example of this approach could be my research here being used by Oxfam and possibly other development organisations in their future work with marginalized communities. The practical dimension of the

Critical Theory approach contributes to empowering people by enabling the identification and exposure of existing oppression, control, or domination.

The Critical Theory paradigm has also become popular in IS research to help to understand people's experience as users and the overall impact of technology on people's lives. It is an important approach for analysing the role of significant social issues such as freedom, power, social control and the values determining people's engagement with ICT. 'Critical Theory's methodology is aimed at the reconstruction of previously held constructions' (Guba & Lincoln, 1994, p. 112). In the context of IS, Critical Theory can expose the role that ICT plays in reinforcing existing social structures (Cecez-Kecmanovic, 2011). The Critical Theory paradigm is adopted for this research as it emphasises addressing the structural inequality and contradictions that exist in social systems to critique the conditions of status quo (Cecez-Kecmanovic, 2011; Howcroft & Trauth, 2005; Myers & Klein, 2011; Walsham, 2005).

My research follows an inductive iterative reasoning to explore the current situation of ICT and women's empowerment in rural Bangladesh and suggests positive transformations based on the context-specific findings.

3.3 PHILOSOPHICAL ASSUMPTION AND THEORETICAL FRAMEWORK OF THE STUDY

Critical Theory is the most appropriate theoretical framework for the objectives of this study as it emphasises exploring the existing situation and sociocultural, and other required transformations (Cecez-Kecmanovic, 2011; Myers & Klein, 2011). Critical Theory takes the relativist approach and epistemologically it takes a dialectical approach in its exploration of forms of knowledge (Guba & Lincoln, 1994). It seeks out contradictions in the construction of social order to reveal hidden forms of control in order to seek change and reform in the existing social order (Williamson, 2013b).

Critical Theory outlines three elements to promote social change. These include 'insight', 'critique' and 'transformation' (Alvesson & Deetz, 2000). 'Insight' leads to exploration and in-depth understanding of the context, while 'critique' is concerned with the social practices of control and reproduction. This encourages the researcher to critically understand the reality beyond the regular interpretation in a way which can result in 'transformation' in theories and social arrangements. (Myers & Klein, 2011). These steps involve a careful description of the situation and the need for careful interpretive analysis and diagnosis of the social situation (Myers & Klein, 2011) before proceeding to proposals for social transformation. Consequently, beyond a description and understanding of surface realities, my research has been concerned to uncover the nature of structural influence on social actors based on their intersectional and social identities. The intersectional and social identity factors which impact upon women's access and usage of ICTs include gender, social class, race, religion, caste, ethnicity, age, marital status, literacy status, rural-urban status, occupation and many more. Intersectionality is an analytical tool that considers every person's unique experiences of marginalisation and suppression (Crenshaw, 1989).

The summary of Critical Theory in Section 3.2 illuminates the relationship between digital divides and inequality. Digital divide, which is the uneven distribution of technological resources, is not the only factor that creates inequality; rather it is part of a socio-technical physical, digital, human and social resources divide (Cushman et al., 2008). ICTs are 'implicated in social inequalities associated with class, gender, race, ethnicity and age (among others)' (Halford & Savage, 2010); however, there are 'very limited, and even restrictive, ways of exploring this interface analytically' (Halford & Savage, 2010).

In most cases, digital divide discussions separate 'technology' and 'social process' related discussions, which misses the opportunity to understand digital divide and inequality as part of a social process. This inequality also leads to capability deprivation which directly impacts the individual's interaction with, and adoption of technology (Cushman et al., 2008). Critical Theory also emphasises the process where a person or a subject constructs meaning from within collective consciousness (Gray, 2013). Beliefs, religion and sociocultural norms and practices play a significant role in developing this collective consciousness. Understanding the role of collective socio-culture consciousness influencing rural women's access and use of ICTs is one of the main areas of investigation in this study.

3.4 RESEARCH APPROACH

An appropriate research approach guides the research towards expected outcomes based on the objectives. This can be achieved through a 'plan and procedures of research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation' (Creswell, 2013b, p. 3). Research approaches can be quantitative, qualitative or mixed method in nature. These three approaches are not disconnected, rather they represent different points on a continuum (Creswell, 2013a; Williamson, 2013b).

Quantitative studies mostly rely on positivist principles and survey results based summaries (Neuman, 2014) whereas quantitative researchers follow deductive reasoning to answer 'what', 'who', 'where' and 'when' questions. Qualitative studies rely more on the principles from interpretive or critical social science. Qualitative research tries to explore the participants' perspective on the particular phenomena to respond to complex questions including 'why' and 'how' questions (Creswell, 2013a; Williamson, 2002; Williamson, 2013b).

This research takes a qualitative approach because this approach supports the exploration and analysis of participants' views using rich description and explanation (Creswell, 2013a). The qualitative approach was useful to understand women's experiences with ICTs in their natural settings in the following ways; firstly, to explore the current situation of women's access to and use of ICTs; secondly, to critically analyse the underlying factors of existing sociocultural domination and alienation impacting women's engagement with ICT; and thirdly, to think about and suggest improvements for women's active engagement with ICTs in that particular context. This research focuses on obtaining an in-depth understanding of a complex sociocultural research context rather than conducting a survey to collect a pre-set list of facts; thus, a qualitative research approach is appropriate. Figure 3-1 represents the philosophical assumptions of this study.

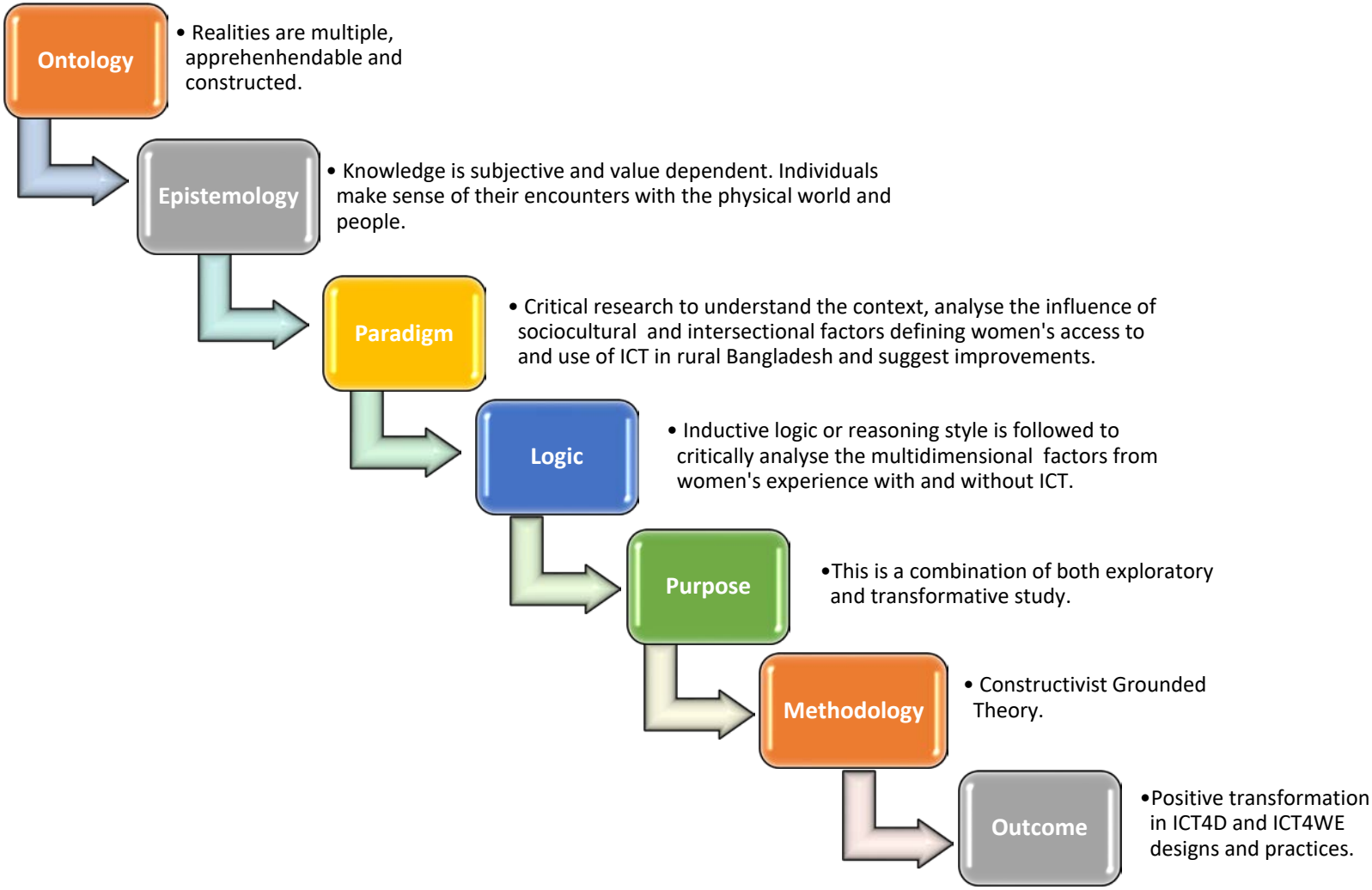

Figure 3- 1. Philosophical assumptions supporting this thesis

3.5 GROUNDED THEORY

Grounded Theory is a widely used research methodology among researchers across a wide range of disciplines (Guba & Lincoln, 1994). It has flexible guidelines for gathering and analysing data and exploring emerging concepts in order to generate middle-range theory (Charmaz & Belgrave, 2007). Data collection in Grounded Theory research can be viewed as a 'zigzag' (Creswell, 2013a) where data collection and analysis are conducted simultaneously.

Grounded Theory as a form of inquiry is based on an iterative cycle of data collection, constant comparison and analysis, which leads to the development of the emerging concepts and theory generation. The data collection methods in Grounded Theory consist of systematic guidelines and steps for gathering, synthesising, analysing and conceptualising qualitative data to construct theory (Charmaz, 2006).

Grounded Theory Method was formalised in the mid-1960s by Barney Glaser and Anselm Strauss who first introduced Grounded Theory in their book titled The Discovery of Grounded Theory (1967). Since its inception, variations of Grounded Theory have evolved depending on the researcher's ontological and epistemological stand and how they use the Grounded Theory Methodology (Glaser & Strauss, 1967)

Despite the initial collaboration of Glaser and Strauss, the two authors eventually disagreed about the meaning and procedures of Grounded Theory (Creswell, 2013a). The main point of their difference centres around beliefs about and approaches to analysing the data. Glaser remained more faithful to the original Grounded Theory approach to data analysis, while Strauss (with Corbin) reformulated the original version (Glaser, 1992). Data analysis is described very loosely in the original book (Glaser & Strauss, 1967). Later, Strauss and Corbin suggested the need for clear methodological rules for data analysis processes (Strauss & Corbin, 1998) although Glaser has criticized Strauss's Grounded Theory approach as very much 'prescribed' and 'structured' (Glaser, 1992) .

Another issue of difference between Glaser and Strauss is whether verification should be an outcome of Grounded Theory analysis or not. Strauss indicated that induction, deduction and verification are essential (Strauss & Corbin, 1997); however, Glaser (1992) believes that Grounded Theory is inductive only. Glaser and Strauss are often considered the first generation of Grounded Theorists, whereas the second generation are those who interpreted Glaser and Strauss's Grounded Theory in a new way and further developed it. One of the major criticisms of first-generation Grounded Theory was the lack of methodological rules. However the methodological framework is well articulated by the second-generation Grounded Theorists (Creswell, 2013a).

This research follows the second-generation Grounded Theory and more specifically the Constructivist Grounded Theory of Kathy Charmaz (Charmaz, 2006) because this method relies upon understanding the participants' perspectives and communicates the findings by placing the participants' voice at the centre of the discussion. Community participation is central in this research and community voice played an active role throughout the research in the case of data collection, data analysis and formulation of the theoretical and practical contribution of the study. The processual emphasis in second-generation Grounded Theory is particularly useful for analysing relationships between human agency and social structure that position theoretical and practical concerns in social justice studies (Charmaz, 2011).

My research thus can be categorized as social justice research as it explores the gender dimensions of ICT use by understanding women's agency and the role of influential social structure in a particular context. 'A critical stance in social justice in combination with the analytic focus of Grounded Theory

broadens and sharpens the scope of inquiry' (Charmaz, 2005, p. 508). The informing role of social justice literature is essential to producing theories well-grounded in the data (Urquhart & Fernandez, 2013). That is why the indication of 'setting aside theoretical ideas' as suggested in its earlier iteration is not an accurate representation of Grounded Theory (Urquhart, 2001).

Grounded Theory is appropriate for this study for several reasons. First, Grounded Theory is inductive by nature, so it is suitable for critical social research, especially when little research or literature exists in the area under study, or the existing literature does not explain the phenomena satisfactorily (Eisenhardt, 1989). This is the case for the combination of ICT, sociocultural influences, and the experience of rural women in Bangladesh. Second, Grounded Theory's original purpose is to inductively generate formal theory via substantive theory which is directly linked to the evidence from the field (Urquhart, 2001). It allows the identification of patterns in data and by analysing these patterns, theory is developed based upon the data (Glaser & Strauss, 1967). This corresponds to the aim of this study, to develop a theoretical framework based on the experiences of rural Bangladeshi women, rather than limiting understanding within an existing theory or framework.

3.6 CONSTRUCTIVIST GROUNDED THEORY

After the introduction of Grounded Theory in 1967, readers and researchers were invited to use Grounded Theory more flexibly. Kathy Charmaz accepted that invitation and proposed a constructivist approach to Grounded Theory where she argues for an effective way of developing theories and better understanding of the world that we study (Charmaz, 2006). This suggested approach by Charmaz incorporates two main considerations: a) flexible guidelines rather than methodological rules and requirements; and b) practices rather than explanation. Charmaz emphasises that a constructivist approach should be considered as a set of principles and practices not as prescriptions (Charmaz, 2006, 2011).

Constructivist Grounded Theory follows the interpretivist tradition of qualitative research but with critical analytical aspects which enable the discovery of diverse local worlds and multiple realities as well as the complexities of particular worlds, views and actions (Creswell, 2013a). According to Charmaz, Constructivist Grounded Theory emphasises theory development based on the researcher's learning about the experiences within embedded, hidden networks, situations, and relationships (Charmaz, 2006). Along with exploring the visible hierarchies of power, communication, and opportunities in a research context, the constructivist approach helps to understand the research participants' experiential views, implicit meaning, and the convolutions of particular situations (Charmaz, 2005; Creswell, 2013a). For this reason, this approach is appropriate for exploring sensitive issues such as sociocultural regulation, the role of different power structures and marginalisation happening beyond surface realities. To understand context-specific realities and complexities, Charmaz places more importance on the views, values, beliefs, feelings, assumptions, and ideologies of individuals than on methodological precision, although she describes the practices of gathering rich data, coding the data, writing memos, and using theoretical sampling (Charmaz, 2006; Creswell, 2013a).

Compared to the traditional approaches to Grounded Theory, the Constructivist approach is less structured and prioritises the emerging patterns in the data and connections rather than looking for proof or reasoning. The Constructivist Grounded Theory method aims to:

- conceptualise the studied phenomenon to understand it in abstract terms
- articulate theoretical claims pertaining to scope, depth, power and relevance
- acknowledge subjectivity in theorising and hence the role of negotiation, dialogue and understanding

- offer an imaginative interpretation (Charmaz, 2006, p. 127).

In this study, the choice of Constructivist Grounded Theory methods and Critical Theory as a research paradigm and theoretical framework are influenced by each other. These choices emphasise understanding the personal and social construction of realities in the practical world. Furthermore, both consider the researcher's self-reflexive views as important to better understand the relevant factors related to the researcher's interactions in the research context.

Consequently, this Constructivist approach to Grounded Theory has been adopted because I am interested in uncovering the nature of structural influence on the social actors based on their social identities (gender, class, education, marital status etc.) beyond surface realities, and how structural influences are impacting women's access to and use of ICT in the context of rural Bangladesh. Constructivist Grounded Theory emphasises reflexivity and adopts sensitizing concepts such as power, privilege, equity, and oppression (Charmaz, 2011) and therefore it is particularly useful for social justice inquiry.

3.7 MAJOR COMPONENTS OF THE GROUNDED THEORY METHOD

To collect rich data, Charmaz and Bryant suggested that Grounded Theory method needs to be considered as a 'family of methods' (Bryant & Charmaz, 2007) as there are several unique characteristics applicable to the Grounded Theory Method compared to other research methods. Across different versions, the major components of the Grounded Theory method comprise the following, which are further detailed below:

- Coding
- Constant comparison
- Theoretical sampling
- Memo writing
- Theoretical saturation.

3.7.1 Coding

Coding is undertaken to categorise segments of data under a theme or short name that summarises and accounts for each piece of data. In Grounded Theory, coding is the first step towards analytical interpretation of the data which requires researchers to ask analytical questions at different stages of data collection. According to Charmaz, coding in Grounded Theory is a fundamental link between data collection and the development of theory grounded in that data (Charmaz, 2006; Charmaz & Belgrave, 2007). Different types of coding are done at different stages of Grounded Theory data analysis and in this research, I performed four types of coding including initial coding, focused coding, axial coding and theoretical coding.

Initial coding is the very first round of coding when researchers remain open to exploring theoretical possibilities that can be identified in the data (Charmaz & Belgrave, 2007). Through continuous comparison in different initial codes, we learn about the diversified aspects of the participants' views and start considering them analytically as the first step for developing theoretical categories. Initial coding practices include word-by-word coding, line-by-line coding, incident to incident coding. I mostly used incident-to-incident coding as I found it was more meaningful and appropriate for this research. After the initial coding, I used focused coding to identify more absorbed themes and axial coding to relate categories and sub-categories. The different coding objectives and practices will be discussed in the data analysis section of this chapter and the next.

3.7.2 Constant Comparison

Constant comparison was one of the earliest strategies used in Grounded Theory research. This strategy is used to identify categories from the codes; it helps researchers to identify the incidents and activities happening in the data (Charmaz, 2006). The purpose of this method is to avoid data overload during the early data analysis phase. Constant comparison is perceived as an essential element of the Grounded Theory method which shapes the development, theoretical understanding and representation of the issue being studied.

3.7.3 Theoretical Sampling

Theoretical sampling supports theoretical exploration of categories (Charmaz & Belgrave, 2007) and guides the researcher in regard to where and whom to sample next. Theoretical sampling also helps to identify the information needed to fill the gaps in categories identified in data to achieve theoretical saturation (Charmaz, 2006). Researchers can confuse theoretical sampling with sampling of participants, thus failing to reach the full potential of developing categories in a Grounded Theory research. Theoretical sampling informed 'the choice of adding new participants and new concepts' (Charmaz & Belgrave, 2007), in this research. For example, I added adolescent girls and boys as new groups at a later stage when I found that there were gaps in understanding how young girls and boys access and use ICTs. Theoretical sampling starts early in the research process and continues throughout the research (Charmaz, 2006). In my research, theoretical sampling was beneficial from the start. It resulted in a second phase of data collection to address the emerging questions identified in the analysis.

3.7.4 Writing Memos

Writing memos is fundamental to Grounded Theory research because it supports researchers in analysing data and codes early in the research process (Charmaz, 2006). Researchers start memo writing when the coding of data starts and continue throughout the research across different stages. Memo writing helps researchers to capture ideas that arise during data collection and analysis, and encourages researchers to analyse data early in the data collection process and look for connections between different parts of the data.

Throughout this research, I found memo writing a useful exercise to make 'comparisons between data and data, data and codes, codes and codes, codes and categories, categories and categories' (Charmaz, 2006, p. 72) for theory building. I started writing memos at the very beginning of data collection. My early memos helped me to explore and record what was happening in the data. I also kept my observation notes as memos. The early memos played a significant role in informing my choice of methods for collecting data from different groups of participants, and to make required changes in the initial data collection plan. During the data coding and analysis phase, I also wrote memos to track and trace the categories identified in the data and look for possible comparisons and connections.

3.7.5 Theoretical Saturation

Theoretical saturation is a Grounded Theory strategy which helps the researcher identify the core categories in order to form a comprehensive theory from the data (Urquhart, 2001). Researchers are encouraged to continue data collection and analysis simultaneously until saturation occurs (Morse, Stern, Corbin, Bowers, Charmaz, & Clarke, 2009). Theoretical saturation is achieved through constant comparison of the incidents and themes found in the data. Theoretical saturation is not the saturation

point in data; rather it is the stage where categories and the relationships among different categories identified from the data reach the saturation stage (Charmaz, 2008, 2011).

To reach theoretical saturation the research process needs to come to a state where no new issues or themes are identified and no new insights are obtained from the data (Bowen, 2008; Strauss & Corbin, 1998). There are no guidelines for reaching theoretical saturation, but this research follows the rigorous process of data coding, analysis and condensation for theoretical saturation.

3.8 RESEARCH DESIGN

The Research Design (see Figure 3-2) presents the different stages of data collection and analysis according to the Constructivist Grounded Theory principles. Data collection in Grounded Theory provides systematic guidelines and steps for gathering, synthesising, analysing and conceptualising qualitative data to construct theory (Charmaz, 2006).

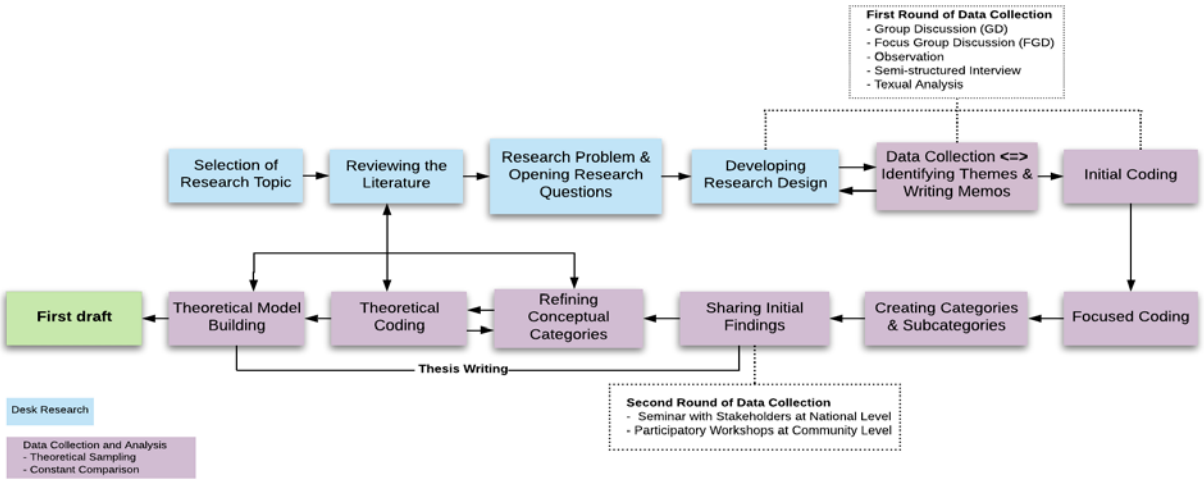

Figure 3- 2. Research design

3.9 SELECTION OF RESEARCH SITES AND PARTICIPANTS

To achieve the expected research outcome, the selection of the research sites and participants is critical because participants 'can best inform the research questions and enhance understanding of the phenomenon under study' (Sargeant, 2012, p. 1). In this section, the selection of research sites and participants is discussed.

3.9.1 Selection of Research Sites

The PROTIC project worked in very diverse areas, thus providing the scope to collect data from three different geographical locations within Bangladesh, and allowing me to obtain a diversified and comparative picture of women's access to and use of ICT based on different geographical and sociocultural backgrounds. Because of the ongoing collaboration between Oxfam and Monash University, Oxfam and the local partner NGOs of PROTIC agreed to extend their initial support for my field work. This was another reason to select PROTIC working areas as research sites, see Table 3-1.

Table 3- 1. Selection of research sites

Geographical location	Name of the Village	PROTIC/Non-PROTIC (P/nP)
Coastal area (Southern part of the country)	A	P
	D	nP
Sandy Island (Northern part of the country)	B	P
	E	nP
Haor or Wetland (North-eastern part of the country)	C	P
	F	nP
Total no. of villages	**6**	

PROTIC worked in the 'sandy islands' (north), 'coastal' (south) and 'wetland' or 'Haor' (north-eastern) regions of Bangladesh (see Figure 3-3). For this research, two villages were selected in each geographical location where PROTIC works. One PROTIC village and one non-PROTIC village were selected from each location. PROTIC villages are those where the PROTIC team implemented the project with direct project participants; non-PROTIC villages are those where the PROTIC team did not run any project activities. As part of the project support, the PROTIC team had handed out 100 smartphones to 100 women working in the agriculture sector in three different villages in three locations. Women received information support from the project to improve their agricultural production in poultry, livestock and pisciculture. Non-PROTIC villages were chosen from those near the PROTIC villages because they had a similar profile to the PROTIC villages and were thus suitable for comparison.

Participants were both ICT users and non-users from both PROTIC and non-PROTIC villages. PROTIC villages were selected to understand women's experience as part of the development projects. On the other hand, non-PROTIC villages helped me to understand women's experience with ICT from a more general background. Non-PROTIC villages could be in fact any village in Bangladesh, but in this research non-PROTIC villages were chosen to use time and resources effectively because there are range of similar factors between PROTIC villages and adjacent villages including geographic and economic situations and methods of developing livelihoods.

Figure 3- 3. Selected research sites. Adapted from (Hossain, Bhuyan, & Roy, 2016)

3.9.2 Selection of Research Participants

My research findings will contribute to current and future projects on ICT4D and ICT4WE in the context of rural Bangladesh, so I took the opportunity to work with both PROTIC project participants and women who were not involved with any development project (general participants). I wanted to understand women's experience of using ICTs both as part of a development initiative and not as part of a development initiative. PROTIC project participants were chosen under the criteria of women using ICTs as part of a development initiative because they had a consistent experience of using smartphones as part of the development project for over two years.

The primary participants were the rural women at the village level as this research emphasises understanding their in-depth experience with ICTs along with the challenges they face in case of their active engagement with ICTs. An initial list of participant groups was made to start the data collection (see Table 3-2) which was finalised based on the initial coding and observation. I gradually recruited the participants based on the categories and requirements identified in the theoretical sampling and initial observation. For example, adolescent girls and boys were not on my list of participants but in the initial data analysis, women reflected on the use of technology by young girls and boys and I found that young girls' experience and restrictions of technology use was very relevant to understanding women's experience of ICTs in a social context. I therefore recruited adolescent girls and boys and arranged FDGs with them.

Table 3- 2. Research participants and methods for data collection

Group ID	Participant Groups	Methods of Data Collection	Number of participants
1	**Rural Women**	▪ Group Discussion ▪ Interview and FGD ▪ Observation	258
2	**Spouses of the rural women**	▪ FGD ▪ Interview ▪ Observation	26
3	**Family members of the rural women**	▪ FGD ▪ Observation	8
4	**Adolescent girls and boys**	▪ FGD ▪ Observation	30
5	**Local leaders (religious and social)**	▪ Interview ▪ Observation	3
6	**Union Parishad Chairman and member**	▪ Interview ▪ Observation	3
7	**Union Digital Centre (UDC) entrepreneurs**	▪ Interview ▪ Observation ▪ FGD	9
8	**Local computer shop owners at village level**	▪ Interview ▪ Observation	2
9	**Representatives from government of Bangladesh's a2i project**	▪ Interview ▪ Observation	3
10	**NGO representatives**	▪ Interview ▪ FGD ▪ Observation	8

Group ID	Participant Groups	Methods of Data Collection	Number of participants
11	**Academics**	▪ Interview	5
12	**Practitioners of ICT4D and community and development informatics**	▪ Interview	7
13	**Women's rights activists**	▪ Interview	2
14	**Representatives from telecommunication companies**	▪ Interview	2
Total no of participants			**366**

The orange highlighted participant groups in Table 3-2 indicate additions to the initial list of participants. For some groups of participants, I used multiple data collection methods including group discussions and FGDs and intensive interviews, for example, rural women. Other participants only joined in a single method, either FGDs or interviews. For example, I conducted only FGDs with adolescent girls and boys and conducted only interviews with the local leaders, village computer shop owners, government representatives from a2i, NGO representatives, academics, practitioners, women's rights activists and the participants from telecommunication companies.

I collected data from 14 different groups of participants (see Table 3-2); rural women, spouses and family members of the rural women, adolescent girls and boys, local leaders, Union Parishad (local government) chairmen and members, UDC entrepreneurs, village computer shop owners, government representatives from access to information (a2i) program, NGO representatives, academics, practitioners, women's rights activists and the representative from a telecommunication company involved in PROTIC. A total of 366 participants took part in this research (see Table 3-2). Participants were chosen using purposive sampling where 'specific participants were selected having the characteristics relevant to the topic' (Williamson, 2013a). I conducted group discussions, FGDs and intensive interviews with the rural women. Group discussions provided the opportunity to get an overall idea about the participants, whereas FGDs and intensive interviews focused on understanding personal experiences with and without ICTs. Data collected from the other village level participants very useful to understand the role of the surrounding context influencing women's ownership and access and use of ICTs.

Apart from the village level, development actors including government and non-government organisations were found to be extremely important areas for this research. This discovery was important for understanding the existing support systems as well as gaps in ICT4D and ICT4WE initiatives. Development practitioners working in ICT4D from both government and NGOs were interviewed. Selected national and international academics and practitioners in community and development informatics and gender and development fields were also interviewed to understand the broader picture of ICT4D and ICT4WE in particular.

For selecting participants from the PROTIC project, this research relied on the advice of the PROTIC staff as the field work was organised with the support of Oxfam in Bangladesh and relevant partner NGOs. Reflexivity throughout the research process was documented including the important factors related to the data collection, field experience and analysis. Reflexive writing helps the reader to

understand the context of the research and the journey of the researcher better. My reflexivity throughout the data collection process will be discussed in Chapter 4.

3.10 DE-IDENTIFYING THE PARTICIPANTS

To ensure de-identification and confidentiality, identifiers were used to label de-identified participants in their village context and to link their quotes and words. The PROTIC villages were labelled village A, B, and C, and the non-PROTIC villages were labelled village D, E, and F. Villages A and D belong to the Coastal area, villages B and E belong to the sandy island area and villages C and F belong to the Haor or wetland area (see Table 3-1). The letters and numbers in the identifiers represent the following:

- The first letter of the identifier is the first letter of the category (e.g. women, spouses, family members),
- The second letter(s) is either the PROTIC or non-PROTIC status (for the rural women only) or the village.
- The number is the order they were listed in the data collection process.
- The age of the participants is given in brackets (). The age of the NGO staff is not mentioned to maintain the anonymity.

Table 3-3 represents the identifiers for different participant groups.

Table 3- 3. Identifiers for the participants

No.	Participants	Identifier	Example
1	**Rural women**	W+PROTIC/non-PROTIC+arbitrary participant number	WP1
2	**Spouses of the rural women**	S+village+arbitrary participant number	SA1
3	**Family members of the rural women**	F+village+arbitrary participant number	FA1
4	**Adolescent girls and boys**	A+village+arbitrary participant number	AGA1, ABA1
5	**Local leaders**	L+village+arbitrary participant number	LA1
6	**Local government (Union Parishad chairman and members)**	LG+geographical location+arbitrary participant number	LGX1
7	**UDC entrepreneurs**	U+geographical location+ arbitrary participant number	UX1
8	**Local computer shop owners**	CS+village+arbitrary participant number	CSA1
9	**NGO (local)**	NL+ arbitrary participant number	NL1
10	**NGO (international)**	NI+arbitrary participant number	NI1
11	**Government**	G+arbitrary participant number	G1
12	**Academics**	A+ arbitrary participant number	A1

3.11 METHODS OF DATA COLLECTION

There were two rounds of data collection. The first round was intensive data collection following the Constructivist Grounded Theory approach. The second round was designed based on the gaps identified in the initial data analysis. Four participatory workshops and two seminars were organised in the second round of data collection.

3.11.1 Data Collection: Round One

In the first round of data collection five techniques were used: group discussion, FDGs, intensive interviewing, observation and reviewing documents. Round one intensive data collection was started

in October 2017 and continued for six months. I began with field visits to the selected research sites in Bangladesh.

3.11.1.1 Ethics and Participants

Ethical requirements were explained to the participants through a written explanatory statement and consent form. The English versions of the approved consent forms and explanatory statements were translated into Bangla and shared with the participants. I briefed participants who could not read the explanatory statement and the consent form due to illiteracy or other reasons about the research project and their participation issues in Bangla. Where applicable, I tried to convey the written clauses and information mentioned in the explanatory statement and consent form in a more understandable way as I had a moderate understanding of the local dialects used by the participants in their daily lives. For this, I discussed the information in a more popular Bangla dialect rather than the Bangla used in the written version as I found it was difficult for many participants at village level to understand the written Bangla version by reading or by listening. Each of the participants agreed to the clauses mentioned in the consent form at the beginning of their participation. Most of the participants signed the consent form and a few agreed verbally, which was recorded on audio tape.

Confidentiality regarding participants' identities is vital and I made every effort to maintain confidentiality at each and every stage of my research. As mentioned in Section 2.3 of this chapter, no person is identified during presentation and discussion of results in this thesis or any other presentations. In addition, I oriented the participants and transcriptionists involved in this research about the importance of maintaining confidentiality and asked them to keep conversations and transcriptions confidential. I saved the electronic files of the transcriptions in my laptop and in the university-drive protected with a password. The signed copies of the consent forms and statements were kept in my personal storage. I took steps to ensure data contained in these files were de-identified. Working with PROTIC participants and staff further increased the need for anonymity as revealing their opinions with identification may push them to further vulnerable situations in the community or in the development programs. Participation in the research was voluntary, and participants could withdraw their participation before December 2018, when the final analysis and writing up began.

Ethics approval was obtained (project number 10999) from Monash University Human Research Ethics Committee on 11 October 2017, compliant with the National Statement on Ethical Conduct in Human Research (2007)-updated 2018. After the initial stage of data collection, adolescent girls and boys were found to be a potential group of participants. To apply this change in the research, Monash University Human Research Ethics committee approved the amended ethics application on 31 January 2018. Participants of this research will not be named or identified by any means without their consent.

3.11.1.2 Group Discussion

Group discussion is a qualitative method of data collection where data can be collected from several people or a group in one setting. Group discussion concentrates on people's shared meanings without a narrowly focused topic (Payne & Payne, 2004). This method is helpful to explore the research context at the beginning and as a researcher it was an opportunity for me to introduce myself to the participants and understand the context better.

A total of 12 group discussions with rural women were conducted in six villages. Each group contained 15 to 21 participants, and discussions took around 90 to 120 minutes. A total of 205 women participated in the group discussions. Women from different age groups (16 to 52 years), classes, religions, and occupations (students, day labourers, farmers, housewives, and other businesses

(tailoring, vermicompost making, paper box making) joined group discussions. Participants shared their opinions and discussed various issues including their family and social lives, experience with and without ICTs and women's social position. They also talked about the challenges they faced as women within the family and in society. Findings and observations from the group discussions helped in purposive sampling to identify participants and to develop a list of discussion topics for the focus group discussions and intensive interviews.

3.11.1.3 Focus Group Discussion

Focus Group Discussion (FGD) is a form of group interview that capitalises on communication between research participants discussing a focused topic to generate data. In qualitative research, group discussions are often used as a fast and convenient way to collect data but FDGs explicitly use group interaction as part of the method. Participants are encouraged to talk to one another: asking questions, exchanging stories, experiences and points of views instead of the researcher asking each person to respond to a question (Kitzinger, 1995). FGD is a useful way to collect topic focused in-depth data from a small group within a short period of time; it is therefore appropriate when research participants cannot allow long periods of time for participating in a research project (Liamputtong, 2011).

As per Table 3-2, FDGs were used for intensive discussion with a selective group of participants on relevant discussion topics. The groups were much, smaller than the general discussion groups. FGD was used with the different groups identified in the first discussion round and throughout the data collection phase based on need.

Eleven FGDs were conducted with different participant groups including rural women, adolescent girls and boys, spouses and family members of the rural women, NGO representatives, female and male entrepreneurs of UDCs (local government supported information centres). The FGDs lasted from 60 to 90 minutes.

3.11.1.4 Intensive Interviewing

In Grounded Theory, intensive interviewing is mostly used to gather rich data (Creswell, 2013a), as the nature of this technique stimulates participants' interpretation of their own experience. By using open-ended questions, the intensive interview technique encourages the emergence of unanticipated stories from the field. This technique also fosters the development of new topics or concepts (Charmaz, 2006). Intensive interviewing was the main data collection technique used in this study. The list of participants was developed and finalised according to the initial observation and findings. As mentioned in Table 3-2, intensive semi-structured interviews were conducted with the participants from different groups. In this Grounded Theory research, intensive interviewing and data collection continues until reaching theoretical saturation as this is the indicator that enough data has been generated about theoretical categories.

Two types of intensive interviews were conducted based on requirements: open-ended and focused. It needs to be noted that the interviews were constantly subject to the normal interactions of the everyday lives in the group setting of the village. This will be discussed further in Chapter 4 on reflections. The interviews conducted at village level with rural women and other participants were comparatively long and more open-ended, whereas the interviews with national and international academics and development professionals were more focused.

At the village level. a total of 41 open-ended interviews were conducted with the rural women. Along with that, a total of ten focused interviews were conducted at village or Union level with different participants including the Union Parishad Chairmen, female members of the Union Parishad, male entrepreneurs of the UDCs, religious and social leaders, a village computer shop owner and local NGO workers. These interviews explored relevant issues through listening to and understanding the in-depth experiences of the participants (Boyce & Neale, 2006). They allowed discovery and enriched the discussion based on the topics introduced by the participants. The time and place of the interviews were fixed in consultation with the participants. Most of the interviews were 100 to 120 minutes long.

A total of 19 focused interviews were conducted in this research. Five of them were conducted with national and international academics related to Community Informatics and Development Informatics. The remaining 14 interviews were with the development workers working with ICT4D projects or programmes including government and NGOs in Bangladesh; women's rights activists; and representatives from telecommunication companies. The interviews conducted with academics were from 60 to 90 minutes long. These interviews focused on the research questions, objectives and methodology of the research. Feedback and comments from these interviewees guided me to refine research questions, methodology and data analysis techniques. These interviews also helped me to decide to situate the study in the wider contexts of ICT4D and ICT4WE.

The focused interviews conducted with development professionals were from 30 to 45 minutes long. These interviews focused on the objectives of ICT4D and ICT4WE projects and programmes, participants' thoughts on development and women's empowerment, the impacts of ICT4D and ICT4WE initiatives, challenges and recommendations. These interviews were helpful for understanding development dynamics and the fate-deciding factors of the development projects. The idea of 'women's empowerment' and factors considered as empowerment indicators perceived by the development organisations in the context of Bangladesh were also discussed. Participants made self-reflexive comments on the projects they are involved with. These comments added to my understanding of the wider development context and priorities.

3.11.1.5 Observation

Observation is a qualitative research method in which the researcher observes participants in a natural setting or structured environment (Johnson & Turner, 2003). Observation allows a researcher to capture useful information from different sources as people do not always do what they say they do. Observation is exploratory and open ended with the researcher taking extensive field notes and using audio-visual recording devices to keep a record for later analysis of what happened at the research site (McKechnie, 2008).

I observed the research participants in their daily lives during my walks in the villages, in their courtyards during group discussions, FGDs, interviews, project meetings and other activities. In terms of observation, I was paying attention to the context and surroundings. Paying attention to the context means noting things like facial expressions, interaction with others, vocal tones and body language, which seemed important as new insights. I did not only listen to the discussions according to the topic or questions asked but observed and took notes of anything that happened beyond those organised discussions. I did not go into the observation with a set of criteria; rather, I learnt what sorts of things to look for and then, retrospectively, the sorts of things I was noting.

Observation was a very useful tool during the data collection process as it helped me to understand more and to make changes to the research questions and methods as per need. This was particularly the case in the village setting, where FGDs and interviews mostly take place in courtyards, or conversations take place along village paths, and one sees the daily activities of the extended family

or village members. The observed behaviour does not always match what people say in their interviews or in FGDs. Reflections related to observation will be discussed in Chapter 4.

3.11.1.6 Reviewing Documents

Part of qualitative research entails reviewing and analysing documents and texts as either primary or supplementary sources of data (Charmaz, 2006). Researchers may collect documents such as minutes of the meetings, official reports, newspaper articles, personal journals, diaries, letters, and emails during the process of research (Creswell, 2013b). Texts draw on particular discourses and provide accounts that record, explore, explain and justify the selected content with purpose (Charmaz, 2006). Document reviewing was a useful technique to understand the policy and project documents on ICT4D in the context of Bangladesh. In the course of the research, I collected and analysed documents such as project proposals, minutes of the meetings, official reports, brochures, presentations, newspaper articles, journals, diaries, and emails.

3.11.2 Data Collection: Round Two

The second round of data generation was designed to a) share the initial findings with the research participants and b) address the gaps identified in the initial data analysis. I revisited participants in the context to share the initial findings of my research. This sharing of initial findings was part of the original research design and had certain objectives. It was not only for validation but also to create an opportunity for the participants to actively engage with my research by having a say on whether I was doing them justice with my interpretation of their opinions and realities.

I not only shared my initial findings with the policy makers and stakeholders at the national level in Bangladesh, but also went back to my prime participants, the rural women. When discussing this approach with researchers and professionals, I received comments from most of them that revisiting communities to share findings is not a common practice in academia or in development. One of the academics said:

> *In most of the cases, researchers do not consider to go back to the communities to share and validate findings whereas sharing at national level is quite common where we want the comments and feedbacks from 'experts' and 'specialists' but not from the primary research participants. A2 (45)*

The significance of engaging the primary research participants in a later stage of the research was also raised by the women during the first phase of data collection. During FDGs and interviews, some of them expressed their interest in receiving further information about the findings and actions taken as part of this research.

In the second round of data collection, I organised a national level seminar with various stakeholders to share the initial research findings, and four participatory workshops with the primary participants at community level. Initial findings sharing workshops were important in refining the results and producing the practical and applied versions of the research outcomes which can be used to make ICT4D and ICT4WE initiatives more sustainable and appropriate. As a researcher, it was an opportunity for me to obtain the reflections and comments of the participants to cross-check and reinforce the initial findings.

3.11.2.1 Initial Findings Sharing Seminar at National Level

The national level initial findings sharing seminar was held in the Bangladesh office of Oxfam and attended by academics, researchers and development practitioners from both government and non-

government organisations. Most of the academics and practitioners who participated in the first round of data collection also attended. Bangla was used as the preferred language of communication with the participants, although the presentation slides were in English. The seminar resulted in comments and reflections from the participants which gave me useful directions and insights to finalise my research findings. This sharing and dissemination was also the result of Oxfam's request to make initial findings from PROTIC PhD students available during the PhD research period rather than post-submission.

3.11.2.2 Participatory Workshops at Community Level

Four participatory workshops were organised with the rural women from two areas who had participated in round one data collection. A total of 44 women participated, comprising a combination of both PROTIC and non-PROTIC participants. These workshops were useful for sharing initial findings and collecting further data on certain issues.

Three participatory exercises were designed based on the first-round field experience. These games prompted spontaneous and active discussion by the women. The workshops were day-long with 10 to 13 participants in each workshop. Each workshop group was mixed in regard to age, marital status, class, PROTIC-non-PROTIC, competent -not so competent ICT users.

Exercise 1: Contextual observation: Agree/Disagree/ Not sure?

After the introduction, I conducted an exercise to review and validate the initial research findings. It was also an opportunity to have a more detailed discussion on the underlying factors related to the initial findings. Observation throughout the process was useful for understanding participants' facial expressions, discussion and interaction with others.

At the beginning of this exercise, seven statements based on some quotes from the initial findings were shared. Three zones were labelled in the room as a) agree, b) disagree and c) don't know/not sure. One of the participants read out the statements and asked other participants what they thought about it. Then the participants took their positions in their desired zones independently without any consultation with others. Following are some of the statements used for this activity.

1. 'Mobile phone is not a good thing for the women.'
2. 'Men are technologically sounder than women.'
3. 'It is not good for the women to make new friends over phone or in Facebook.'
4. 'Using technology is in a way encouraging Muslim women to violate *parda* (seclusion)
5. 'Women should always share with their husbands what they are doing with their phones.'
6. 'Agricultural information is not the most useful and relevant information in our lives, we want to know other things as well.'
7. 'It is better not to involve husbands or other family members in any kind of project activities.'

Every statement was followed by a discussion including a) why women agreed, disagreed or were not sure; b) factors that influenced their decisions; and c) what could be done to change this situation (if relevant).

Exercise 2: Aspiration Vs Reality

This exercise was useful to understand the gap between the women's aspirations and their practical reality. Participants were formed into groups and asked different sets of questions including:

Set 1:

1. What is the thing you love to do most on your mobile phones?
2. What is the thing you don't like to do on your mobile phones?
3. What are you doing most with your mobile phones?

Set 2:

1. Mobile phones increased women's mobility and access to market. What do you think?
2. How has your mobility increased? Do you go to the market now?

Set 3:

1. PROTIC contributed great changes in the lives of the rural women farmers. What do you think?
2. What will you do after the withdrawal of the project support?

Exercise 3: Empowerment: Laddering Exercise

The objective of this activity was to understand and explore women's empowerment in general from the participants' point of view including challenges to their own empowerment or disempowerment related to ICT use.
Participants were asked to respond to the following questions:

1. What does empowerment/advancement mean to you?
2. What do you think is the most influential factor towards empowerment?
3. What is the most significant challenge you are facing in the case of empowerment?
4. How is the use of ICTs affecting your empowerment situation? (positive and negative)

This activity was designed to understand the information women hold related to the empowerment discussion in general and the factors they consider relevant to their personal lives, as the initial data showed a need for further exploration in this regard.

3.12 DATA TRANSCRIPTION

Transcription needs to be performed with a focus on the integrity of the data. There is a risk of losing or compromising important aspects of the data when new people who do not have a common understanding about important aspects of the research objectives and data are recruited for transcription work. Most of the data was collected in the Bangla language. Verbatim transcription of the data was undertaken by me and other transcriptionists who were recruited in Bangladesh. I selected four transcriptionists who had experience in conducting and managing qualitative research data. All of them had completed master's degrees in social science.
Audio files were shared with transcriptionists and anything that identified the participants was removed in the written transcripts.

All the discussions with participants during data collection were recorded as part of interviews or other group discussions. I used an Echo smart pen to record the interviews along with taking notes in a smart notebook. This device was very useful not only for recording but also for importing notes as live pdf files with the audio. To ensure accuracy, I subsequently checked the transcripts against the original audio files. Some parts of the audio were difficult for the transcriptionists to understand because of external noise. In these cases, I referred to my notes to complete those sections.

3.13 DATA ANALYSIS

As discussed earlier in this chapter, Grounded Theory requires simultaneous engagement with data collection and analysis, and it follows certain steps and guidelines for analysing the data and theory-generation (Charmaz, 2006; Creswell, 2013a; Strauss & Corbin, 1998). Analysis began with initial or

open coding followed by focused coding, axial coding and theoretical coding (see Section 7.1). Initial coding is useful for identifying the major categories of information from the initial data. The next step is focused coding which emerges when the researcher identifies one open coding category to focus on (Charmaz, 2006). Axial coding relates the categories and subcategories and reassembles the data to give coherence to the emerging analysis. This is also called the 'core' phenomenon (Matavire & Brown, 2013). The categories around the core phenomenon create the visual model called the axial coding paradigm (Creswell, 2013a). The final step is theoretical coding, which helps to develop the model that interrelates the categories and describes the interrelationship of categories in the model (Charmaz, 2006). This theory is then presented as a diagram or as a discussion.

The constant comparative method of data analysis was used to compare the information from data collection to emerging categories (Creswell, 2013a). Observation and memo writing played significant roles in this analysis during field work, as it provided ways to explore ideas about the codes (Charmaz, 2005). Theoretical sampling during the data collection helped me identify where and how I could find the data to fill gaps, make changes and reach saturation point.

After completion of the data collection, the verbatim transcription and open coding occurred simultaneously. I used NVivo 11 software in order to code the data and other documentation such as memos and policy documents to thematic nodes, child-nodes, and categories. I coded verbatim Bangla transcriptions by creating nodes in English. I made this decision to maintain the integrity of the data without losing any information. Open coding developed the initial insights from the data and also guided the next round of data collection. Examples of the open code are:

1. Restricted communication outside family.
2. Husband made the call on behalf of wife.
3. Son/husband chose what to download in the project phone.
4. Husband checks the call log of wife's phone.
5. Women do not use their phone for something bad (considered by their family or society).
6. Share everything done with the phone with husband.
7. Do not share everything with husband.
8. Prefer restricted phone use in public.

After finishing the open coding, I revisited the nodes and tried to group them to identify major themes emerging from the data. For example, the first three nodes reflect 'family restrictions/challenges over women's mobile phone use' while nodes 5 to 8 refer to 'women's strategies or performance against challenges'. Axial coding followed by the selective coding was performed to identify connections between emerging themes and codes. This way the coding process was progressed and led to the final categories. Theoretical coding is a sophisticated technique which allows the identification of underlying logics between categories to be integrated into a theory (Charmaz, 2006). I was consistent with the principles of Grounded Theory method and open to participants' natural responses in order to understand the small things important to understand the big picture. I relied more on participants' responses than any specific theoretical perspective.

3.14 MANAGING THE DATA

It was necessary to have a place to manage and process the data generated as part of this research. Initially, I uploaded all the transcripts into Nvivo 11 to code. The QSR Nvivo 11 application was very useful for coding and sorting data. I also kept regular back-ups of my data in the University drive and in my personal external hard drives. I used mind map software and manual techniques such as post-its, paper and coloured pens for drawings and flowcharts. These exercises helped me to internalise and visualise small parts of my data to develop in-depth understanding of identified themes. I saved

photos of those mind maps and exercises on my computer. I went back to my transcriptions and recordings at different stages of coding and analysis. This process always helped me to develop new insights and clarify my understanding of codes and categories identified throughout the research process.

Memo writing (see Section 3.74) was a useful technique for managing and sorting data throughout the process. I used a variety of memo styles including dot points, short notes, and full pages depending on the purpose and scope of the memo. At the initial research stage, I hand-recorded memos in a notebook while collecting data in the remote villages in Bangladesh where electricity and Internet services were interrupted and use of digital technology for writing was not viable. Writing a memo allowed me to record my thoughts and impressions at different stages of the research. This process helped me to identify initial patterns in data, and record ideas for possible changes in the data collection plan or add further explanations to earlier analyses. For example, I wrote memos on my observation as a researcher which I also coded as a source of data. At an advanced stage of the research data analysis, I started writing memos particularly for exploring certain categories identified in the data or in initial codes. These memos significantly contributed during the theory development stage.

3.15 CHAPTER SUMMARY

This chapter has presented a discussion of the methodological choices of this research. I adopted the Critical Theory paradigm in this study because it is particularly useful for exploring the study context and for identifying suggestions for positive transformations. The Critical Theory approach has two main stages: exploratory and transformative. The exploratory part was useful for gaining an understanding of how women are accessing and using ICTs in rural Bangladesh, and the factors either contributing to or restricting their active engagement with ICTs. The transformative aspect then helped me to critically analyse the data to finalise policy recommendations for different stakeholders to make ICT4WE initiatives more appropriate and sustainable.

As a research methodology, the study followed the Constructivist Grounded Theory for data collection, analysis and theory building because it is suitable for developing empirically valid theory and allows context-specific patterns in data (Glaser & Strauss, 1967; Urquhart, 2001).

It was used in this research to develop empirically valid theory. Constructivist Grounded Theory emphasises understanding the views, values, beliefs, and ideologies of research participants rather than methodological precision for generating theory (Charmaz, 2006). The procedures of institutional ethics approval were discussed including the measures taken to provide adequate information to the participants about the project in their preferred language Bangla to allow them to give their informed consent. Steps taken to maintain confidentiality of participants' identities are also discussed. The next chapter (Chapter 4) describes the practical experience of the data collection and analysis processes.

CHAPTER 4: RESEARCHER's OBSERVATIONs: PAYING ATTENTION TO THE CONTEXT

4.1 CHAPTER OVERVIEW

In Chapter 3, I discussed the research methodology and the formal process of data collection; in this chapter, I reflect on the informal process of data collection. I have discussed the field realities and their impacts on my research. In this chapter, I document my self-reflections on the process of research data collection and how it worked out in the field.

The setting required a multifaceted approach and, in this chapter, I discuss the dynamics of responses to the field realities. I also reflect upon my role as both insider and outsider which prepares the ground for understanding the methodological contribution of the research. Initially, I thought I had sufficiently planned the data collection with a list of potential participants and possible methods. However, in the field, the plan became more complex as I had to continuously pay attention to the context. I therefore introduced changes in respect to the local conditions.

Paying attention to the context means exploring both formal and informal expressions and interactions, along with internal and external influences and noting participants' facial expressions, tone, body language and, interactions with others. This helped me to obtain better quality data than sticking strictly to the plan I had developed in Australia. I have also documented my learning from the process and the measures taken in response to field realities.

This chapter will assist other researchers using a combination of both planned and responsive methods to achieve rich and authentic qualitative data. Although discussion in this chapter is based on my research in the context of rural Bangladesh, the learning from this process is also relevant in similar contexts or situations.

4.2 PAYING ATTENTION TO THE CONTEXT: RESPONDING TO THE DATA COLLECTION REALITIES

This section moves through the different stages of data collection and reflects upon the observation, learning, and changes that were made and the rationale particularly for those changes.

4.2.1 Introduction to the Research Context and Research Participants

The researcher's formal and informal introductions to the research participants and the participants' understanding of the research objectives are both vital for the researcher's acceptance into their community. In many cases, researchers obtain assistance from relevant organisations or others to get access to research sites and participants. However, it needs to be considered whether those organisations or others have any untoward influence that can affect the researcher's relationships with participants and data collection. After starting the data collection, I faced such challenges which affected my acceptance by the community and the quality of data. Because of this, I made some changes in my strategies during the data collection activities. These strategies include proactively sharing my research objectives with the villagers, and avoiding the participation of the NGO staff. This learning also made me aware about the potential for other influences throughout my research and the need to be on guard.

In Bangladesh, Oxfam was my first point of contact during the data collection. Before staring, I selected the research sites in consultation with Oxfam and local partners working with PROTIC. The local partner organisations assisted me in the selection of participants. They also introduced my research to the local community people or villagers and helped me to arrange venues and participants for group

discussions. During my data collection in three different research sites, three local organisations extended their necessary support including infrastructure, staff, resources, accommodation, food, and transport. I met the necessary costs. I was introduced to the research sites and participants by the local NGO staff and they accompanied me to the villages at least at the beginning with their project motorbikes. Motorbikes and in some areas manual or battery-operated rickshaws were the most convenient and available transportation as there were no proper roads for other vehicles.

I also used the research methods in a variety of ways. Before starting the actual data collection, I allowed adequate time to become oriented with the research context and participants. I paid attention to the informal, situated, and contextual factors rather than present agendas and formal question-answer sessions. To respond to the contextual requirements, I followed a combined approach with both formal and informal method of data collection. Friendly interaction and informal discussion with the rural women helped me earn their trust and receive authentic reflection about their personal experiences.

Entering the villages with the PROTIC staff was important, because community people trust and respect the local NGO staff who have been working for development in those areas for quite a long period of time. The introduction by the PROTIC staff was also useful for my safety and security as a woman while travelling to and working in those remote communities. Consequently, in most cases, community people were supportive and willing to participate in my research.

However, in the first research area, after a week of data collection, I realised that the staff had inadvertently not accurately presented my role to the villagers. Community people started introducing me to others as one of the 'high level' project staff from Australia. This cultural mischaracterisation of my status affected the participants' responses and quality of data in the villages. There were also community assumptions related to the history and culture of development projects working in rural Bangladesh. These assumptions resulted in obedience and acceptance by the community people. Community people responded positively as they had benefited from the support of development programs. That status-bound perception influenced PROTIC participants' responses to my questions in a particular way, with their focus on the positive impacts of PROTIC. During my first days in the village, I was accompanied by the local NGO staff and they were also present in the group discussions. It became clear that participants were convinced that I was also from the PROTIC project. They felt 'accountable' to answer my questions in a certain way. I realised this when I found my participants were repeatedly saying that:

> *We know that (from the project people) you came to know about PROTIC and how we are using our touch phones for our agriculture. This phone has improved our lives a lot ……. We can do many things that we could not do before. WPB5 (24)*

At the beginning, it was quite a challenge for me to make them understand that I was not there to hear about the project activities. The situation in the non-PROTIC villages was also quite similar. In the non-PROTIC villages, most of the participants thought that I was in their villages to do an assessment or survey for a future project like PROTIC. At the beginning, their responses were more about how touch phones could improve their lives if they could get any kind of project support.

After observing this situation for around a week in the first research site, I took some measures which helped me to address the above-mentioned challenges. Firstly, I explained this situation to the local NGO staff and requested them to introduce me to the local people as the only point of communication for my work. I also started managing all the communication by myself. Secondly, I started spending more time 'shadowing' people in the village—accompanying them in their everyday lives—and conducting informal discussions with the community people on my own. I also hired local transportation rather than going with the local NGO staff. Thirdly, whenever I met any community

people or conducted any data collection, I always introduced myself as an independent researcher and explained the objectives of my research. It should be noted that I found most of the PROTIC participants were quite familiar with the term 'research' as they had had the experience of participating in other research conducted by the project, but it was not the same for the non-PROTIC participants. Fourthly, I started conducting data collection more independently without the physical presence of the NGO people.

It was also important to be aware of biases, and issues in the participant selection process. This could affect the quality of data collection. For example, at the beginning of the participant selection process, the staff of the local NGO assisted me with a list of possible participants. They initially selected women to participate in the group discussions, the first organised consultations in this research. However, I did not limit my selection of participants to that particular list. During my initial visits to the villages, I invited rural women to join the group discussions. The open invitation for participation allowed the inclusion of potential participants beyond the list in the group discussions and later in the purposive sampling for FGDs and interviewing.

Along with organising venue and participants, local NGO staff were also present during the group discussions at the first research site. Group discussion was conducted with a group of 15 to 21 women. Those groups were quite mixed in terms of their age, social class, religion, marital status, PROTIC and non-PROTIC status and other intersectional factors. It was challenging to ensure participation from as many people as possible. I took the role of the facilitator and allowed participants to run the discussions. I observed that a few PROTIC participants dominated the discussion and non-PROTIC women did not talk much. Those PROTIC women were also encouraged by the local NGO.

After observing the first two group discussions, I ask the local NGO staff not to speak or interfere when others were taking part to maintain the natural flow of the discussion. I was mindful not to hurt their feelings while discussing this point and making them understand about their role and form of engagement in my research. After conducting another two group discussions, I observed that the presence of the local NGO staff was still influential although they were hardly participating in the discussions. I found that still the PROTIC participants were discussing the project more and referring to how the NGO staff had helped them to have positive changes in their lives and livelihoods. I thus asked the NGO staff not to be present during discussions. An indirect influence still remained because the staff had provided an introductory brief to the participants.

Informed by this experience of conducting group discussions, I conducted purposive sampling independently without any kind of engagement with Oxfam in Bangladesh and PROTIC partner NGOs to avoid possible biases in the selection process. I followed the rigorous data collection techniques followed by the Grounded Theory principles (Charmaz, 2006).

My more independent approach, without the presence of the NGO staff, helped me to develop useful research insights which then guided me throughout the data collection process. The exercise also made me more independent in terms of roaming around the villages, communicating with the people, and selecting participants. I obtained a better understanding about the research areas and local contexts. I used this process of independent context-setting in the second and third research sites, and I was able to avoid local staff accompanying me to the villages within a short time. This strategy of avoiding the visible influence of the local staff helped me to directly communicate my identity and the purpose of my study in a more effective way.

A final observation. I could have undertaken more intensive observations if the data collection could have been conducted for a longer period of time by staying in the village. However, staying with the community in the village was not allowed due to safety and security issues.

4.2.2 Conducting Group Discussions and FGDs

Introductory discussions are useful as a general method of data collection. In my research, group discussions were conducted at the beginning of the data collection which was beneficial for the following reasons. First, as a researcher, I wanted to become oriented with the research participants in the natural setting; second, to explore and also refine potential interview topics and questions; and finally, to engender trust and become culturally adjusted to them as a Bangladeshi 'stranger' from the city who went to the village to conduct 'research'. Group discussions as introductory methods of data collection helped me to develop mutual respect and gave me the opportunity to talk about my role as a researcher. Group discussions significantly enabled me to take an independent role in the selection of participants, which helped to avoid biases from the local NGOs in the selection process.

During data collection, I always encouraged spontaneous and dynamic interactions which helped me to become responsive to the contextual realities with the women. For example, the FGDs initiated dynamic discussions and I explored participants' point of views on various issues including women's social position, the role of the family and society in their lives, the impact of ICTs on women's lives, socioculturally 'expected' and 'unexpected' use of ICTs by the women. The setting was also dynamic, with participants from different backgrounds. I played the role of a facilitator and observer during the discussions. FGDs were conducted in open courtyards where I tried to maintain the natural flow of the discussions despite the dynamic nature of the setting. In most cases, six to eight participants continued the FGDs from the beginning to the end. They were surrounded by other villagers who were occasionally joining or leaving the discussion. In the context of Bangladesh, it is quite common to have 'external' people in any kind of gathering or discussion happening in the open courtyards, especially if that is not a part of the regular life activities. I also found external people during the group discussions or even during individual interviews organised in the open courtyards and I could not turn them away. During this data collection process, I always encouraged spontaneous participation which sometimes did not allow me to run the FGDs according to the plan or following the initial agendas. As a facilitator, I observed external people participating in the discussion and in most cases, those discussions resulted in some interesting insights related to women's experiences of accessing and using ICTs.

FGDs were useful for collecting information from the particular group of participants on particular discussion points. For example, knowledge of how social hierarchy and the local power dynamics influence people's participation is important to understand women's behaviour. In my research, the influence of social power structures over women's participation was clearly observable. A space for observation was created through FGDs which had impacts on my perceptions and actions as a researcher. It also helped me to find suitable participants for intensive interviews. As a researcher, this was also an opportunity for me to observe the existing gender relations, ongoing power dynamics and sociocultural norms which influence people's roles as a man or as a woman or generally as a social being.

Interactions between different genders and age groups are dynamic and I needed to be aware of them. It is worth observing what is happening in those interactions. Figure 4-1 shows the FGDs with women and their spouses. The seating positions of the men and women reflected their roles in those discussions. Women were in the back seats while men led the discussions. For example, in the open forums, men usually talked first and women tended to agree with them. Men dominated those discussions and women could hardly get any chance to say something. In most cases, women's participation was discouraged by their spouses by overlapping their voices and sometimes by making angry facial expressions. Some women just left in the middle of the discussion.

Figure 4- 1. FGDs with women and their spouses (Photos by a villager with A. Sarker on the left)

I documented these informal observations in memos. I organised more informal discussions with the women alone to understand more about that dominance. This provided the basis for obtaining rich data relevant to gender relations and social power dynamics impacting women's access to and use of ICTs in their daily lives. Intensive interviews were useful for exclusively understanding women's experiences and stories related to their lives, achievements, aspirations and challenges.

Differences were also noted between elders and youngsters, where the youngsters usually do not talk over elders although they were not always in agreement. Parent-child interaction is also dynamic where parents were to be found more controlling over their children. Seeing these behaviours improved my understanding of social dynamics and informed my choice of how to select and apply informal techniques for searching out untold stories.

4.2.3 Conducting Intensive Interviewing

To ensure uninterrupted participation, I conducted intensive interviews in the preferred time and place as set by the participants. However, I also found that people do not always express the realities of their lives openly on such occasions. With regard to this, I organised interviews in natural settings and allowed for adequate time and a safe space to encourage them to reflect on their own stories.

However, for women, it was difficult to get free time from their busy daily schedule. Consequently, I consciously did not try to coerce the participants into research discussions, rather I became part of their lives, albeit briefly, in order to achieve their trust. I tried to be a part of their informal life setting rather than interview them in a formal setting. I joined the women during their daily activities including cooking, sweeping, washing, fishing, working in the homestead garden, or working as day labourer or enjoying leisure time (see Figure 4-2).

Figure 4- 2. Intensive interview (Photos by a family member of the participant with A. Sarker on the left)

I mostly followed the flow of the discussion and gave them the space to open up with their experiences and stories. I allowed enough time for these interviews and in almost every case I found that when women opened up with their stories, they wanted to talk more about their lives as most them said that they hardly got the opportunity of sharing their personal stories.

I was open to making on-the-spot changes based on the circumstances, such as the influence of external participants during intensive interviews. I first tried to exclude them, by saying that I would prefer to talk to the women individually, but they did not leave me alone with the selected interviewee. In some cases, I made an on-the-spot decision and conducted group interviews or FGDs. However, not every group interview worked well, as in some cases women were not very comfortable in sharing their personal experiences related to family or other sensitive issues in front of their neighbours or relatives.

In other cases, women who trusted each other shared their personal experiences more spontaneously during the group interviews. Figure 4-3 was taken after a group interview. I visited one of the women in her home but within a short amount of time, three of her neighbours came and were very keen to share their own experiences of accessing and using ICTs. I shifted to a group interview and the participation became very spontaneous. The photo was taken by one of the participants.

Figure 4- 3. Intensive interview turned into a group interview (Photo by one of the group members with A Sarker in the middle)

Figure 4-4 represents the situation when I started an interview but after 15 to 20 minutes, I had to conduct a focus group discussion. The photo captured the moment just five minutes after I started the FGD.

Figure 4- 4. Intensive interview turned into an FGD (Photo by a relative of the participant with A Sarker in the left)

This woman preferred to meet me at a relatives' house because she did not want to be interviewed at her home in front of her husband. She said:

> *He does not like me to be 'popular'. I do not know why he is like this. So, meeting outside is better. WPC2(32)*

After starting that interview, people including men and women started coming and joining the discussion and we could not continue the planned discussion. Participants were reflecting on various relevant issues related to women's technology use which were worth pursuing in an FGD.

4.2.4 Conducting Observations

As a Bangladeshi with a background in community development, I understood the dynamics of village life. Now, as a PhD research student with training in theory and advanced research methods, I had new skills in data collection, analysis and interpretation. I used observation or shadowing as a method throughout my data collection and analysis to capture unexpressed, tacit, and unanticipated research data.

Visiting participants in their own context and conducting data collection activities were the keys to discovering both told and untold dynamics of women's lives and experiences, which may not have been possible in an external context. For example, communal dynamics and situations that were important for this research were very contextual and related to other actors and the situations of women's daily lives. They could not have been adequately revealed from the situation.

I learned that I should not go into the observation with a clear set of criteria; rather I learnt what sorts of things to look for and how to effectively conduct an interview. I then retrospectively listed the sorts of things I was observing. While in the field, I listened to the recorded audios every day after returning from the field. However, after a week of data collection, I noted repetitions in the responses and some of them just echoed the same thing that I prompted to them. At first, I tried to explain the topic I wanted to know about from their experiences but later I realised that too much prompting negatively influenced the research data. I consequently tried to avoid prompting or explaining too much about the topic I wanted to explore, and let them talk. Being aware of the danger of prompting and avoiding it improved my skill in interviewing and helped me to more effectively collect rich data and authentic reflections from the participants.

During FGDs, interviews or other project activities, I tried to capture the untold stories through my observation activity. As stated above, based on my initial observations from FGDs and interviews, I found that people do not always do what they say they do. For example, in an FGD in the presence of the rural women, their spouses were talking on behalf of their wives and women hardly found the scope to speak. Women were not very spontaneous supporting their spouses when their spouses claimed that they always supported women's participation with ICTs and always shared domestic work with their wives. I also observed that in some cases women's or their spouses' facial expression or body language did not match with their words. In light of their perceived influence and the women's muted behaviour, I organised a different discussion session with only those women in a more informal setting. One afternoon, we sat by the riverside away from the eyes and ears of others. The stories I heard from the women were completely different to the stories I had heard during the FGD with their spouses. Based on such experiences, I arranged alternatives to support real participation. From the audio recordings of my data, I also picked up on important expressions and subtleties which I was able to document in my primary observation notes and memos.

4.2.5 Conducting Participatory Workshops

The following discussion provides some examples of the variant conductions under which the participatory workshops were conducted.

To encourage women's participation and conversation in the participatory workshops, I tried to avoid possible interruptions to women's active participation. The interruption could happen at village level

and at NGO level. Interruptions at village level were the presence of villagers, family members or relatives during the discussion. Rural women rarely had free time from household responsibilities. While conducting the FGDs or group discussions, many times women had to leave the discussion early because of their household responsibilities. Sometimes family members including a spouse, son, daughter and mother in had come to the discussions to call them back home. It was even worse if they were at home or any nearby place where their family members could inhibit them from participating in the research. Based on this learning, I avoided organising workshops at the village level. For similar reasons, I did not organise the workshops at partner NGO offices. I organised the workshops at a sub-district level (30 to 40 minutes travel with local transport from the village) in a locally hired venue. Local NGO staff assisted me with the logistics and arrangements but they were not present during the workshop. Some women were interested to participate in the workshops but could not manage their families as it was outside the village and for the whole day. I aimed for uninterrupted participation and that was why I organised it outside the village. So, the women who could manage to come for the workshop attended the whole workshop, although they had to attend to phone calls from their spouses and other family members.

Conducting participatory workshop in everyday Bangla language encouraged active and spontaneous participation. Conversation in local dialect or whatever language they used was also beneficial for the discussion without any language barrier. I had a fair understanding of the local dialects used in all three areas. In terms of face to face communication using those dialects, I sometimes looked to support from the women themselves. They explained and interpreted things in everyday Bangla. Conducting workshop in local dialects and avoiding possible interruptions by the NGO staff also helped the participants to be open with their sensitive life stories or experiences. For example, one of the senior members of the local NGO came to visit the workshops without any prior notice while participants were having a discussion on their experience related cyber bullying and how it negatively impacted their image of 'good women' in family and society. I observed that they immediately stopped talking about this issue when they saw that staff member. Most of the participants said that they were not comfortable sharing that very personal information with the senior staff member as they (women) might be judged.

Informal discussion mode during the participatory activities (see Chapter 3 section 3.11.2.2) also helped the women to be open to discussing various sensitive issues related to their lives and their access to and use of ICTs (e.g. cyber bulling, challenges, and restrictions from the family and community).

Additionally, I avoided selecting participants from the same families or neighbourhoods in one group because I had learnt that some of the women were not very comfortable talking about sensitive issues or sharing personal experiences in front of close or known networks like family members and neighbours. In the first workshop, I observed that one of the participants was very quiet most of the time but from her previous interview with me, I knew that she had been a very spontaneous person. In a one to one discussion, she said that her sisters-in-law were there as participants and she was not very comfortable taking about some of her personal experiences as she was afraid of being blamed by the family.

4.3 DATA TRANSCRIPTION AND INTEGRITY

I tried to maintain data integrity during both data collection and analysis. I recruited Bangladeshi transcriptionists to transcribe a major portion of my data. I was careful to a) choose persons who had experience of conducting qualitative research and doing verbatim transcription and b) create a common understanding about my research and about the requirements of the transcription work. I closely reviewed their work to ensure they met all the requirements of data integrity.

4.4 TIMELY APPROPRIATION OF RESEARCH FINDINGS

The research supported the timely communication of research findings with the relevant stakeholders. Appropriation of research findings while it is still 'fresh' by NGOs like Oxfam is necessary for such organisations which need information for policy and development purposes. This means sharing research before it is officially published as a thesis or research article. A delay in providing research findings is seen as hindering the timely appropriation of new knowledge. Timely communication also gives the NGO a sense of the field level realities which they can address in both their ongoing and future programs.

I shared my initial findings and reflections with Monash University, Oxfam, and other stakeholders. Some of my insights were used to design workshops and activities for the PROTIC women. For example, I shared my findings and insights for designing information literacy workshop activities to educate PROTIC women about safe access to and use of their smartphones. Based on my findings, PROTIC made an official recommendation for the participants on Facebook to log out from their accounts and secure their data before sending their phones for repair. I had discovered that women's lack of or limited understanding of 'safe use of ICTs' resulted in offline and online harassments for them. Some of my insights have also been considered in designing the second phase of PROTIC.

4.5 INSIDER-OUTSIDER: REFLEXIVITY AND PARTICIPANT-RESEARCHER INTERACTIONS

This section helps the reader to understand my role as a researcher and how my experience and perceptions influenced the research relationships throughout the research process including selection of participants, nature of data collected and subsequent analysis.

Adopting the Constructivist Grounded Theory approach with its relativist ontology and subjectivist epistemology redefines the connection between the researcher and participants (Mills, Bonner, & Francis, 2006). Researchers have the scope to be self-reflexive and share how they encounter the wider cultural, political, and social meanings and understandings. This helps the readers to understand the results and considering all the influential factors worked throughout the research. As a researcher, I tried to be reflexive about my role and identities as both insider and outsider as well as my engagements and interactions with the study participants. My consciousness of my position as 'insider' and 'outsider' allowed me to identify valuable context-specific ethnographic description analysis. This context-specific description is called 'thick description'. It helps us to explore multiple layers of meanings in the data by describing sociocultural behaviours, vents, processes, and institutions (Geertz, 1974).

A researcher as an 'insider' belongs to the group of the research participants based on a common identity including ethnicity, sex or gender, whereas an 'outsider' does not belong to the participants' group, due to class, education, and other differences (Gair, 2012). Thus, my research role was a mix of being 'insider' and 'outsider'. 'Insider' and 'outsider' perspectives can also be understood as 'experience-near' and 'experience-distant' where the 'experience- near' refers to the 'native' and 'experience-distant' refers to the specialist researcher (Geertz, 1974). An 'insider' or 'native' experience allows individuals to define and understand effortlessly what his or her fellow natives see, feel or think (Brooks & Alam, 2015; Geertz, 1974) .

Winning the trust and respect of the participants was directly influenced by my identities as a woman, a Bangladeshi, an educated middle-class person, a Hindu woman, a researcher, and as a former worker in an international NGO. However, these identities did not justify, in their eyes, my good intentions to contribute to the empowerment of rural women. Their concern was what benefit my research would bring into their lives because at first, the research project did not sound very useful or interesting to them. After realising this, I increased informal interactions with the research participants

and also helped the them better understood my good intentions. This better understanding of my research and intentions made me a 'friend from outside'.

But my identities as both 'insider' and 'outsider' were not static. These identities also developed in response to my growing consciousness of situational identities (Dwyer & Buckle, 2009). Even with the same person, I was perceived as both insider and outsider in different situations. For example, when women perceived me as a Bangladeshi woman like them, I became an 'insider'. On the other hand, when they prioritised the differences related to our backgrounds, I became more of an 'outsider'.

Being an outsider can sometimes be an advantage. In some cases, women were more comfortable sharing their personal experience with me as someone outside their community and networks. However, with most of the women, I felt I was a more trusted 'insider friend from a distance' to them, which allowed me to get to know them better.

Consequently, being a Bangladeshi woman, using Bangla as my first language (or adapting local dialects), and understanding Bangladeshi culture in general, I was in a better position than any other 'outsider' researcher to adapt to and observe the 'native' point of view. My identity as a Bangladeshi women and experience of working in development projects in Bangladesh helped me to commence in the field, though I gradually realised that my role as a researcher required a more open approach to explore and understand the field realities than in the past. My previous experience in the development of rural and urban Bangladesh had the different focus of achieving development agendas, whereas my PhD study required more openness to the field realities regardless of agendas. My academic training in anthropological and ethnographic research and training as a researcher also helped me to be open and respond to the field realities and thus to collect authentic research data.

My previous identity as 'Oxfam staff' also influenced my interaction with both Oxfam and partner NGO staff. When I interviewed Oxfam people, they mostly presented the success stories of their projects and two of the staff critically reflected on the project issues. On the other hand, the partner NGO staff mostly treated me as a 'former Oxfam staff'. I found there were trust issues that impeded their ability to share their open reflections about the PROTIC project and the overall situation. By clearly discussing my role as a researcher and the objectives of my study I tried to minimise this trust gap but I cannot say that I was able to minimise it completely.

I did not detect major differences between my three research villages in terms of how well I was accepted. My acceptance and interaction with the three communities was more or less the same and it did not have any significant impact on the data collection. I had to consider some issues related to my image and mobility in the village. In all the three areas, I mostly travelled alone with the local motorbike drivers who were all male. I faced some awkward comments by some of the villagers, particularly in the north-eastern villages as I did not follow the particular sitting style of the local women. Most of the time, I just ignored random comments but sometimes I tried to proactively address this issue if I heard it from any of my research participants. I believe this issue was not significant enough to impact the data collection.

4.6 CHAPTER SUMMARY

This chapter has discussed how field level dynamics and my identities as both insider and outsider influenced the data collection process. In my research, both formal and informal methods were equally useful to collect data for in-depth understanding of various issues relating to the research. I reflected on how I addressed the field realities and applied particular data collection techniques to collect better quality data, including strategies to become a trusted outsider, at least to some in the

community. Based on the issues identified during the data collection, I made necessary adjustments. I was open to making changes in the data collection process and did not limit it to the present agendas.

As a Bangladeshi woman, in some cases I obtained access and won trust, but in some cases I was still an 'outsider'. I tried to understand and respond to both the external and internal challenges related to the data collection, but I cannot claim that I managed to overcome those situations completely.

Sociocultural contexts are so diverse and at the same time very useful to capture the dynamics of people's engagements and interactions in a natural setting. Data collection is not only based on the written guidelines but also depends on the researcher's mapping and understanding of the research context. The researcher's self-reflexive approach allows required modifications of the qualitative research techniques and ensures rich and authentic data. The next two chapters discuss the research findings.

Part 2: STORIES FROM THE FIELD

This part of the thesis presents the stories from the field and reports on the findings of this empirical research. The core focus of the research has been to explore rural women's experiences of accessing and using ICTs by listening to the voices of the grassroots women and their communities, and understanding the role of available support systems. The support systems considered by my research include NGOs and government, sociocultural environment and infrastructural support systems including network and device support.

Along with documenting and discussing the research context, themes and ideas that emerged from the data, this part of the thesis establishes background information to support the theoretical model and the practical outcomes of the study presented in Chapter 7 and Chapter 8. The information documented in Part 2 is also helpful in situating the emerging theory of this research in its 'social, historical, local and international contexts' (Charmaz, 2006, p. 180) which strengths the theory and its adaptability to similar contexts.

The findings reported in this chapter are based on the data collected from the research participants through group discussions, FGDs, interviews, and observations. This part consists of two chapters. Chapter 5 sets the context and reports on the women's experiences with ICTs, while Chapter 6 develops a holistic understanding of the impacts of ICTs and women's empowerment.

CHAPTER 5: RURAL WOMEN'S ACCESS TO AND USE OF ICTs

5.1 CHAPTER OVERVIEW

This is the first of three chapters in which the findings of this empirical research are presented. The chapter provides an in-depth understanding of rural Bangladeshi women's access to and use of ICTs. The chapter starts with an introduction to the research sites and then reports on different factors and scenarios related to women's access to and use of ICTs.

Findings presented in this chapter include the types of ICTs accessed and used by the rural women (Section 5.3.2 and 5.3.3), their ownership of ICTs (Section 5.3.4), and frequency of ICT use (Section 5.3.5) which directly answer the RQ1a: What ICTs are women currently accessing and using?

Section 5.3.6.2: Offline Usage of ICTs and 5.3.6.3: Online usage of ICTs answer RQ1b: What are the main uses of ICTs in women's lives?

Women's ICT sharing practices (Section 5.4.5); socioculturally expected and approved ways of ICT use for the women (Section 5.4); gendered patterns of ICT access and use for women and girls (Section 5.5); and intersectional factors and women's experiences with ICTs (Section 5.6) are also discussed in this chapter which answer the RQ2: What factors influence women's active engagement with ICTs? Discussion related to RQ2 helps to understand how women's personal control and agency in relation on ICTs are compromised because of existing sociocultural, religious and intersectional influences.

All the findings and insights reported in this chapter are based on the qualitative data collected in this research. Some quantitative tables and figures are used to present the context of the research participants but not to generalise the findings.

5.2 INTRODUCTION TO THE RESEARCH SITES

This section presents introductory and demographic information related to the three geographical locations of the research. This information results in a better understanding of the research context and related findings presented in this chapter. This introduction includes background information on climate and climatic events, infrastructure and communication systems, participants' family and household settings, occupation, class, religion, and other relevant information. This section is mostly based on my field work with reference to other reports and the Bangladesh Government's official statistics.

5.2.1 Geographical Location and Disaster Vulnerabilities

Due to its geographical location, Bangladesh is highly vulnerable to natural disaster including tropical cyclones, floods, and droughts (Imam et al., 2017). The three locations of my research, southern coast, northern sand island and north-eastern wetland, are also extremely vulnerable to natural disasters which affects the livelihood and socioeconomic development of the communities.

The southern coastal villages are situated beside the UNESCO World Heritage mangrove forest, the Sundarbans. These villages are situated on the bank of a river which separates the villages from the Sundarbans. This coastal belt is very vulnerable to natural disasters including cyclones, tidal waves and heavy rainfall, which affect peoples' lives and damage their crops and belongings[14]. The sandy island

[14] http://burigoaliniup.satkhira.gov.bd/sites/default/files/files/burigoaliniup.satkhira.gov.bd/page/5c502747_1c4b_11e7_8f57_286ed488c766/Union%20Profile_Burigoalini_Shy%202014.pdf

villages are on riverine land which is locally called *'char'*. Sandy island is *'*a tract of land surrounded by the waters' (Tithi et al., 2020, p. 2) and these areas are vulnerable to flood and land erosion, and extreme weather[15]. The north-eastern wetland or *'haor'* is a 'bowl-shaped depression located between the natural levees of rivers' (Nishat, Huq, Barua, Reza, & Khan, 2002, p. 9). The wetland becomes a very extensive water body in the monsoon because it receives excess water from rivers and other water bodies. It dries up mostly in the post-monsoon period. Flash floods are the challenge in this area and almost every year people lose crops and belongings. Figure 5-1 is a photo taken during field work; it is a compilation by a local organisation in Bangladesh that shows the 2010 flash flood. It shows the severity and devastation of the flash floods in the north-eastern wetland area.

Figure 5- 1. Flash flood in north-eastern wetland in Bangladesh (Photo by A. Sarker)

5.2.2 Livelihood

Agriculture is the main source of livelihood in rural Bangladesh, but agricultural production across the research areas is quite diverse, depending on the different climates. In coastal villages salinity is an issue which impacts crop production significantly. Cyclone *'Aila'* struck in 2009. The village protection dam was collapsed in some areas and could not protect the villages and as a result their land was flooded with saline water. Both rural women and men in my research reported that they could only produce a limited amount and variety of crops because of salinity. However, salinity is good for prawn and crab culture which are also common sources of livelihood in coastal areas.

In northern villages, maize is the most cultivated crop along with vegetables including potatoes, pumpkins and onions, because these crops grow well in sandy soil. Figure 5-2 shows one of the PROTIC women growing onions and potatoes in this sandy *'char'* land. Farmers cultivate sandy islands in the dry season because most of these *chars* are completely drowned during the rainy season. These *char* lands are far from farmer's homes and sometimes they make temporary shelters in which to live. Most often, men stay there or women stay with their husbands or family members, but never alone. One of the women from a northern PROTIC village said:

> *I have a piece of land in the char that I got from my father where we (she and her mother) cultivate maize. It is almost three kilometres from our home and I have to walk there almost every day. During the harvesting season, one of my cousin brothers (male cousin) helps me to look after my*

[15] http://en.banglapedia.org/index.php?title=Char

crops at night as he lives there in a temporary hut and it is not safe for me as a woman. I have to pay him a small portion of my crops for that. WPB3 (28)

Figure 5- 2. Woman growing onions and potatoes in northern sandy island (Photo by A. Sarker)

Livelihood in wetland areas depends on single crop rice cultivation. Natural flooding also helps productive fisheries there. In the crop season people try to save to sustain their livelihood during non-crop seasons, which is almost half the year (Kamruzzaman & Shaw, 2018). In all three research areas, migration of the men for income generation is quite common and this is the result of the low agricultural productivity in the areas vulnerable to disaster (Bernzen, Jenkins, & Braun, 2019). In my research, most of the husbands work as migrant workers from three to nine months a year and women mostly lead the family and farming in their absence. According to the Government of Bangladesh's Climate Change and Gender Action Plan report 2013, male migration is leading to a systematic feminisation of agriculture[16] which was visible in all three research sites.

Traditionally in rural Bangladeshi society, women have played a key part in agriculture and in achieving food security. However, their efforts and hard work tend to be unacknowledged and underappreciated because of the dominant social view which does not recognise that women are involved in agricultural production (Agu, 2013; Kabeer, 1991; Rahman, 2000, 2010). Systematic feminisation of agriculture has made women more visible in family farming. Women farmers who participated in this research reflected that their efforts were acknowledged more when they started

[16] https://portals.iucn.org/union/sites/union/files/doc/bangladesh.pdf

managing the family farming in the absence of their husbands or other male family members. One of the women from the northern village said:

> *I have been working for the family maize farming with my husband. I work for both producing and processing maize and especially the after-harvest processing is fully done by me. But for last two years, my husband had to migrate to the divisional town and works there almost eight months in a year. He always tells me what to do over the phone but I feel that he also trusts and acknowledges me more than before because it is quite evident that family farming is happening without him and I am doing it …. And PROTIC also chose us as 'women farmers' to support our farming. WPB6(24)*

In spite of increased participation in family farming, most of the women said they had very limited participation in the major decisions related to family farming, including what to grow, to whom to sell crops, and how to spend the income. However, most of the women said they could decide what to grow and how to grow it in their smaller homestead vegetable gardens, and rear poultry or goats on a small scale in comparison to the large-scale family farming. They could also sell to vendors who came to their homes but they reported little control over spending the income. Most of the women said they borrowed money from local NGO microcredit programs to support various needs of their families including medical bills, farming costs, purchase or care of domestic animals, dowries for daughters' marriages, and husbands' businesses. In most cases, husbands decided when to take the loan, the amount to borrow and how to spend it, whereas women were the official receivers of those loans as NGOs preferred to lend money to women rather than men.

Both men and women worked as paid day labourers. They mostly worked in agricultural fields, or for fish farms. Sometimes they were hired for constructing soil embankments and platforms for houses. In all three research villages, women reported that they received less payment than men for similar working hours. This discrimination was socioculturally accepted and longstanding. It is commonly believed by the community people that women are not physically strong or capable enough to do a similar amount of work to men. Most of the women themselves also believed that they worked less than men and accepted less payment. Figure 5-3 shows both men and women working as agricultural day labours in the same field. After working for six to seven hours, women received Bangladeshi Taka (BDT) 150 as their payment, while men received BDT 250.

Figure 5- 3. Women and men working as day labourers in a rice field (Photo by A. Sarker)

5.2.3 Transportation and Communication

All three research sites are very remote and due to their vulnerability to disaster and lack of proper roads, communication is an issue in all three areas. The north-east wetland villages are the most remote. People use bicycles, motorcycles and vans as transport as there is no proper road for other vehicles. Village roads are mostly made of mud or sometimes of bricks and cement. In both southern and northern villages, the village protection embankments were used as connecting roads. In wetland areas there are some submersible roads and, in some areas, there is no proper road. During rainy season, the submersible roads are under water and people use boats for travel and communication for almost six months in a year. Figure 5-4 shows the road situation in coastal areas and wetlands. According to most of the participants in the wetland area, communication and transportation by boat during the rainy season, when water remains either stagnant or flooding, is easier than in the dry season.

Figure 5- 4. Village roads in coastal areas (left) and wetland in dry season (right) (Photo by A. Sarker)

5.2.4 Family and Household Settings

Extended families are the most commonly found family structure in rural Bangladeshi societies (Amin, 1998) and this was the case in all three research areas. In most households, three generations lived together. In this research, family members of the women mostly indicate their immediate family members. For married women, it includes husband, in-laws and children and for unmarried women it includes parents, siblings and grandparents. Sometimes, extended family members living in the same household is also referred extended family. Women traditionally live with the husband's family after marriage and men are the head of the family. In the absence of men, however, women can become the head of the family. For example, if the husband is dead and there is no other man available in the family, then the wife takes over the responsibility. As already noted, many women said that they managed their families as their husbands had gone somewhere else to earn money. Women said that their husbands send them money for household expenses and mobile phones make communication easier and more frequent. One of the women in a northern non-PROTIC village said:

My husband works in a brick field in Savar, Dhaka, for almost six months in a year but he sends money regularly through B-kash (mobile banking) to run the family and children's education. WnPE2 (26)

5.2.5 Education and Religion

According to the Government of Bangladesh Literacy Assessment Survey 2011[17], the literacy rate is higher in the southern coastal region than the sandy island or wetland regions, at around 53%, with women making up less than half of this number. Most of the women who participated in this research could sign only their names and very few were found who had completed their secondary education. Islam is the most practiced religion in Bangladesh, followed by around 90% of the total population; second is Hinduism with around 9%, and other religions are practiced by the remaining 1% of people[18]. During the fieldwork, it was found that more Hindu people live in the coastal villages than in the other two areas. This is also supported by the Government of Bangladesh District Statistics 2011[19].

5.3 RURAL WOMEN'S ENGAGEMENT WITH ICTs

5.3.1 Participation in this Research

As presented in Table 3-2, a total of 258 rural women participated in this research, including group discussions, FGDs, interviews and participatory workshops. In the first round of data collection 205 women participated in the group discussions; 12 participated in both group discussions and FDGs; 20 participated in both group discussions and in-depth interviews; and 21 women only participated in the in-depth interviews. In the second round, 44 women who had already participated either in the in-depth interviews or in the FDGs participated in the participatory workshops. Thus, the total number of participants remained the same after the second round of data collection.

In this thesis, participant-specific data, quotations and references are drawn from the in-depth interviews and the FDGs. A total of 53 women participated either in the in-depth interviews or in the focus group discussions, including 21 PROTIC and 32 non-PROTIC women. Among those 53 women, 23 were from coastal areas, 26 were from sandy island areas and four were from wetland areas.

As part of the Grounded Theory iterative cycle of data collection, constant comparison and analysis were conducted simultaneously. Emerging concepts and themes were also identified. The data collection in the wetland area was conducted with the insights and themes already identified from other two areas. After conducting group discussions and two intensive interviews with the women, no new findings were evident in the data. Then two more intensive interviews were conducted and it did not take long reach data saturation. Therefore, fewer interviews were conducted in the wetland areas than in the other two research areas.

No participant-specific data or quotations have been singled out from the group discussions because those discussions focussed on more general issues, rather than in-depth understanding of any particular issue. Quotes come from interviews or FGDs. Table 5-1 shows the number of rural women who participated in this research and the methods used to collect data from them. Quotes from other types of participants such as family and spouses of the rural women, NGO staff and government officials will also be used where applicable.

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[17] http://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/7b9bb713_5daa_48b6_bd3e_cf072e9be0ce/Literacy%20Assessment%20Survey%202011.pdf

[18] https://worldpopulationreview.com/countries/bangladesh-population

[19] http://203.112.218.65:8008/WebTestApplication/userfiles/Image/District%20Statistics/Satkhira.pdf

Table 5- 1. Participation of rural women in this research

Methods used to collect data from the rural women	Number of rural women participants	Coastal	Sandy island	Wetland
GDs (only)	205	68	66	71
In-depth interviews (only)	21	10	9	2
GDs and In-depth interviews (both)	20	10	8	2
GDs and FGDs (both)	12	3	9	0
Total (GDs, FGDs and interviews)	258	91	92	81
Total (FGDs or interviews)	**53** (21 PROTIC and 32 non-PROTIC)[20]	**23** (10 PROTIC and 13 non-PROTIC)	**26** (8 PRTIC and 18 non-PROTIC)	**4** (3 PROTIC and 1 non-PROTIC)

5.3.2 Types of ICTs Accessed and Used

This section answers RQ1a: What ICTs are women currently accessing and using?

Four different types of ICTs were used by the rural women including mobile phones, computers (laptop and desktop), television, and radio. Across the three research locations, mobile phones were the most commonly used technology. Forty-one rural women (PROTIC and non-PROTIC) were interviewed. Another 12 non-PROTIC women participated in only the FGDs. Among those 12 women, six were female family members of either PROTIC or non-PROTIC women including a mother, mother-in-law, sister and sister-in-law. The remaining women were female entrepreneurs who worked with the Government of Bangladesh's UDCs. In 2010 the government of Bangladesh established Union Digital Centres (UDCs) as one-stop shops serving rural citizens[21]. The UDCs use a micro-enterprise model and follow a public-private partnership modality. UDCs are run by two entrepreneurs, one male and one female, and officially the entrepreneurial role depends on their ability to provide services at a Union level at an affordable cost and to partner with different private-sector and public sector organisations (Mahiuddin & Hoque, 2013).

UDCs provide a wide range of services including birth registrations, citizenship certificates and mobile banking, as well as information about health, agriculture, weather and disasters, public examinations, employment and the social safety network (Faroqi & Siddiquee, 2017). Word processing, printing, scanning, photocopying, e-mailing, and vocational training are also provided. UDC entrepreneurs who participated in my research reported that all the above-mentioned services were provided regularly except vocational training.

Table 5-2 presents the technologies accessed and used by the rural women. All 53 women who participated in this research used mobile phones. Apart from mobile phones, 13 of the 53 had access to television. Ten of them had access to both national and international cable channels (mostly Indian) and three only had access to Bangladeshi national television channels. Forty women out of 53 had no access to any television.

[20] 44 out of 53 participated in the participatory workshops in the second round of data collection.
[21] https://a2i.gov.bd/publication/union-digital-centers/

Table 5- 2. Status of women's ICT access and usage

Area	Mobile phones	Television	Radio	Computer	Mobile phones only
Coastal (southern)	27	11	2	5 (1 laptop and 4 desktops)	9
Sandy island (northern)	22	2	3	3 (desktops)	14
Wetland (north-eastern)	4	0	0	0	4
Total	53	13	5	8	27

Five women said that they used radios and three of them used it on their phones. Eight women in total used computers. Seven of these were female entrepreneurs in the UDC and used desktops, and the woman who used a laptop was a bachelor honours student who had received an old laptop from her brother.

When considering the three research sites, the use of television was found to be significantly more common in coastal areas than the sandy islands or wetlands. From the group discussions it was also clear that use of mobile phones by rural women is more common in coastal PROTIC villages than the villages in other areas. Women in the coastal villages had good access to electricity whereas women from sandy island and wetland had poor or no access to electricity. Women in coastal PROTIC villages also reported fewer religious restrictions in the case of accessing and using ICTs as most of the women were Hindu. From both Hindu and Muslim women's experiences, it was found that Hindu women faced significantly less religious restriction than the Muslim women in accessing and using ICTs. One of the Muslim women from the sandy island area said:

> *My father-in-law or my husband do not support watching TV at all and they said watching naacha-gaana (dancing and singing) is no good for women and it is against Islamic regulation. That is why at the beginning they did not support my video phone from PROTIC. WPB2 (31)*

How religious issues impacted rural women's access to and use of ICTs will be discussed in Chapter 6, Section 6.2.2.3.

5.3.3 Types of Mobile Phones Accessed and Used

This section also answers RQ1a: What ICTs are women currently accessing and using?

Feature phones were found to be the most popular and common form of mobile phones used by the rural Bangladeshi women. Feature phones are called 'button phones' at the local level as they do not have the touch screen option and are operated by pressing physical buttons. Two types of feature phone were found to be used by the rural women in this research; the most common version did not support Internet use but the less common version did.

Most of the non-PROTIC feature phone users did not have the awareness of and skills to use Internet functionalities. A few of them had a limited understanding of some of the functionalities of the Internet especially video calling and Facebook. Among 23 non-PROTIC feature phone users, only two women, who were comparatively young, said that they occasionally used the Internet on their feature phones.

Smartphones were the second most used ICTs by the rural women. This is to be expected, given that the women in the PROTIC villages had received smartphones as part of their participation in PROTIC. Smartphones are operated by using the touch screen, which is why they were also called 'touch phones' at the local level. Smartphones are Internet and apps enabled. Among the 53 rural women, 22, including 13 PROTIC and 9 non-PROTIC women, used only smartphones. Twenty-three, all non-

PROTIC women, used only feature phones. Eight women, all from PROTIC, used both smartphones and feature phones but they did not access the Internet using feature phones.

Table 5-3 shows the status of smartphone and feature phone use by both PROTIC and non-PROTIC women. These figures are helpful to understand the context and the varieties of mobile phones accessed and used by the rural women in the study areas. Nevertheless, these figures do not represent women's ownership or their meaningful use of those devices which will be discussed in Section 5.3.4.

Table 5- 3. Types of mobile phones used by the rural women (PROTIC and non-PROTIC)

Area	Smartphones		Feature phones		Both	
	PROTIC	non-PROTIC	PROTIC	non-PROTIC	PROTIC	non-PROTIC
Coastal (southern)	6	7	0	10	4	0
Sandy island (northern)	5	2	0	12	3	0
Wetland (north-eastern)	2	0	0	1	1	0
Total	13	9	0	23	8	0
Total (PROTIC and non-PROTIC)	22		23		8	
Grand Total	53					

5.3.4 Ownership

Ownership refers to the fact of having rights and control over assets and resources including land, technologies, and intellectual property (Doss, Kovarik, Peterman, Quisumbing, & Van Den Bold, 2015). Rather than considering 'control' as a result of 'ownership', in this research 'ownership' and 'control' will be explored and discussed separately in order to understand how these components exist and influence women's practical experiences with ICTs. 'Ownership' indicates women's title over the technology or the device, while 'control' over that device indicates women's personal control over access to and use of their devices. From women's experiences, it was found that their ownership resulted in some kind of access to that device but it did not necessarily mean that women could control or make decisions about accessing and using their devices the way they want. Section 5.3.6: ICT sharing practices, Section 5.4: socioculturally expected and approved ways of ICTs for the women, and Section 5.5: gendered pattern of ICT access and use for girls and women help to understand how women's personal control over their own ICTs was restricted. Women actually had a low level of control or sometimes no control over their access and use of ICTs due to sociocultural factors which resulted in women's limited access and use of their ICTs.

Table 5-3 also shows the types of mobile phones used by the rural women. These numbers do not indicate that every woman used their own phone. Rather, they reflect women's access to different types of mobile phones. In this research, women reported that they used their own devices and also the devices of family members, relatives and neighbours. Five types of ownership over ICTs were found including:

- Self-supported ownership: Women bought the ICT devices themselves.
- Family or relative supported ownership: Women's immediate family members, or in some cases close relatives, bought the ICT devices for the women.
- PROTIC or government supported ownership: Women received the ICT devices from PROTIC or the government through their names being listed in the PROTIC project or government official records.
- No ownership but access: Women used others' phones including those belonging to family, relatives, friends and neighbours.
- No access: Women had no access to that particular type of ICT.

Figure 5-5 shows women's ownership over different devices, while Table 5-4 presents the area specific figures. It should be noted that these figures are based on the areas studied only.

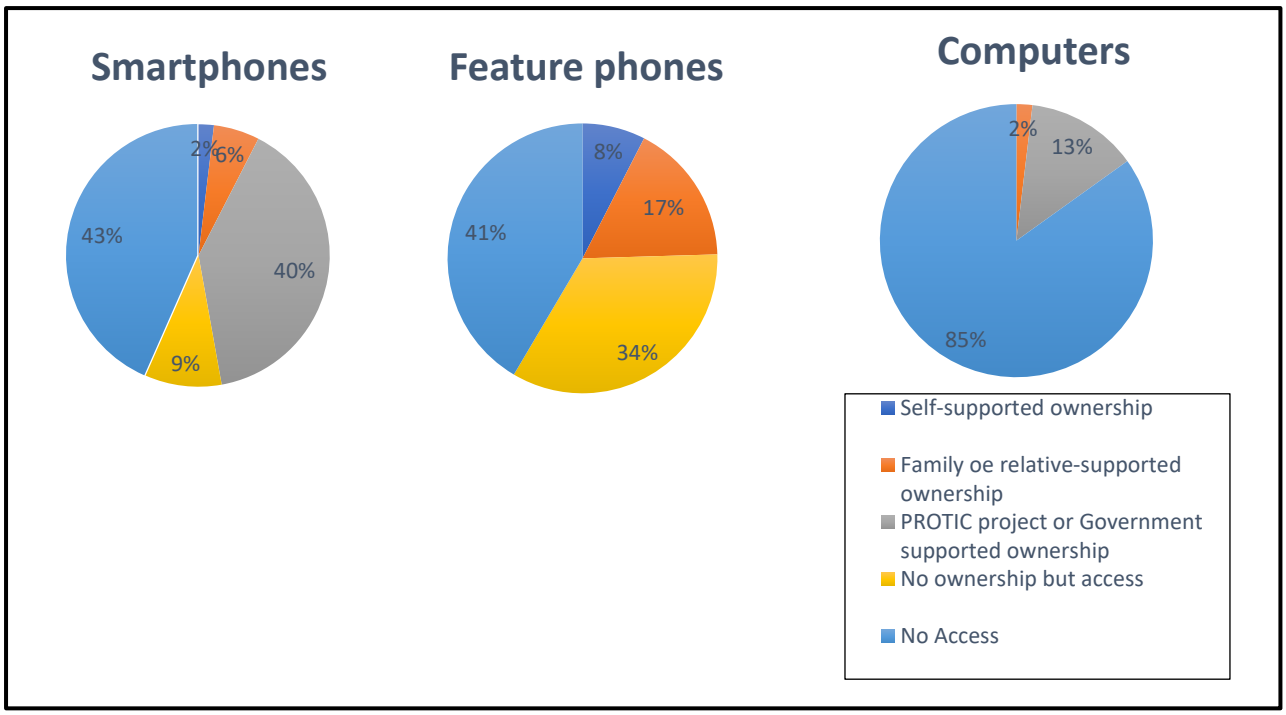

Figure 5- 5. Rural women's ownership over ICTs

Figure 5-5 shows that PROTIC project supported ownership is highest among smartphone users, and government supported ownership is highest among computer users, whereas no-ownership but access is highest among feature phone users. Eighty-five per cent of the women who were interviewed or participated in the FGDs had no access to computers. Figure 5-5 shows that, apart from PROTIC or government supported ownership, most of the women did not have ownership over the device they used, which represents the general scenarios related to women's ownership over ICTs in the villages studied in this research.

Table 5- 4. Status of rural women's ownership over the ICTs they accessed or used

Area	Technology	PROTIC women				Non-PROTIC women			
		Self-supported	Families or relatives supported	PROTIC or government supported	No ownership but access	Self-supported	Families or relatives supported	PROTIC or government supported	No ownership but access
Coastal	Smartphones	0	0	10	0	1	2	0	4
	Feature phones	1	1	0	2	1	4	0	5
	Computers	0	0	0	0	0	1	4	0
Sandy Island	Smartphones	0	0	8	0	0	1	0	1
	Feature phones	1	0	0	2	1	4	0	7
	Computers	0	0	0	0	0	0	3	0
Wetland	Smartphones	0	0	3	0	0	0	0	0
	Feature phones	0	0	0	1	0	0	0	1
	Computers	0	0	0	0	0	0	0	0
Total		2	1	21	5	3	12	7	18
Grand Total (number of ICT devices used by the rural women)		69							

Table 5-4 shows the 53 rural women's ownership status over the ICTs they used in this research in the three research areas. The total number of ICT devices represented here is 69 including eight women who used both smartphones and feature phones, and eight women who used both computers and mobile phones (either smartphones or feature phones). A combination of ownership structures was in place including self-ownership, husband-supplied, or other sources such as relatives or organisations.

In coastal areas, 17 women used smartphones, ten of whom received the phones from PROTIC. Among the seven non-PROTIC smartphone users, only one woman bought it for herself, two women's husbands bought smartphones for them and four women used someone else's phone: one woman used her husband's phone, two used their sons' phones and one used her neighbour's phone. In the case of feature phones, 14 women in coastal areas used feature phones but only two of them bought the feature phones for themselves. Five of the women received their phones from others; three from their husbands and two from their brothers. Seven women used someone else's phone: three used their husbands' phones, one used her mother's phone and two used their relatives' phones and one

used her father-in-law's phone. In case of computers, among the five women, four used government computers as they worked as UDC entrepreneurs and one had received it from her brother.

In the sandy island area, ten women used smartphones; eight had received their phones from the PROTIC project. Among the two non-PROTIC smartphone users, one woman's husband bought it for her and one woman had access to her son's smartphone. In the case of feature phones, 15 women used feature phones, of whom only two bought them for themselves. Four of the women obtained their feature phones from their family members, including three who got it from their husbands and one who got it from her brother. Nine women used someone else's feature phone; five used their husbands' phones, one used her father-in-law's phone, two used their son's phones and one used a neighbour's phone. A total of three women reported using government computers as they worked as UDC entrepreneurs.

In the wetland areas, three women used smartphones; all three received their phones from the PROTIC project. Two women used their husbands' feature phones. How women's ownership of ICTs is connected to their access to and use of ICTs will be discussed in Section 5.3.6.

5.3.5 Frequency of ICT Use

As mentioned in previous sections of this chapter, 100% of the PROTIC and non-PROTIC rural women who participated in this research had used mobile phones at least once in their lives. No women were found who had never used any form of ICTs in their lives, but there were significant differences in terms of frequency of use. 'Frequency of ICT use' refers to how regularly rural women accessed and used ICTs in their daily lives. Their preferred time of use for ICTs will also be reported in this section. Understanding the frequency of women's ICT use is helpful to identify factors that influenced the participant women's whole experience of ICT access and usage.

PROTIC women used their smartphones and feature phones more frequently than non-PROTIC women. Nineteen out of 21 PROTIC women reported that they used their phones every day while the other two said they used their smartphones once every two to three days. Among the PROTIC women who used their smartphones every day, five said they used their phones many times in a day. Eight used their smartphones two to four times in a day and the other four used it at least once a day. One of the PROTIC women from the wetland areas said:

> *This 'touch phone' (smartphone) has become my part as wherever I go or whatever I do, I take it with me. I used it 'hisab chhara' (countless) times in a day. WPC1 (28)*

Eight PROTIC women who used feature phones along with their smartphones reported that they used their smartphones at least once every day. Out of nine non-PROTIC women who used smartphones, only two of them used them two to four times in a day. Among 23 non-PROTIC feature phone users, only four women said they used feature phones two to four times every day, while six used feature phones at least once every day. The rest of the thirteen women used feature phones occasionally, only two to three times in a week. Eight non-PROTIC women used computers. Five used computers at least once every day whereas three used them once or twice a week. Women's ICT ownership patterns appear to have a significant influence on their frequency of ICT use, because non-owners or women who used others' ICTs reported less frequent or occasional access to and use of ICTs.

Both PROTIC and non-PROTIC women who used ICTs on a regular basis reported that they accessed or used their feature phones and smartphones during their free time, which was either in the evening or at night after finishing all the household work. Seven out of eight women who used government supported computers as UDC entrepreneurs reported that they used the computer during office hours only (9 am to 5 pm) and the one woman who used a laptop reported that she could use the device

whenever she wanted. Women who used ICTs owned by others mostly used them based on their needs and this did not totally depend on the women's free time.

5.3.6 ICT Sharing Practices

This section reports on women's shared access to and usage of ICTs including the nature of sharing and the actors involved. Understanding rural women's ICT sharing practices will help with exploring the contextual scenarios and influential factors related to women's access and usage which are key discussion points in this thesis. This section also reports on how rural women (both PROTIC and non-PROTIC) used ICTs in their daily lives in offline and online activities. Both the offline and online usage reported in this section do not represent usage solely by the women because women also reported shared usage with others including extended family and relatives, and this is also included in this section.

5.3.6.1 Shared Access to and Usage of ICTs

As reported in Table 5-4, 30 women out of 53 had some kind of ownership over the ICTs they used or accessed, whereas the remaining 23 women had access but no ownership. All the rural women participating in this research reported that they shared their ICT devices with others regardless of their ownership status. The word 'shared' indicates either giving access to or allowing use of their ICTs by others regularly or occasionally. During the field work, it was found that sharing ICTs was quite common and culturally expected in the societies of rural Bangladesh. From the women's experiences, it was found that a wide range of people had accessed and used their ICTs, including their close and extended family members, relatives, neighbours, colleagues and others.

Figure 5-6 represents rural women's ICT sharing experiences including the actors and the frequency of sharing. This network diagram has been developed based on my qualitative data. The dark arrow represents everyday sharing whereas light arrows indicate sharing that happened two to five times in a week or month, and dotted arrows show occasional sharing (once in a month or bimonthly or need based). As rural women mostly lived with extended families (see Section 5.2.4), they shared their ICTs with both close and extended family members. Every woman, both PROTIC and non-PROTIC, shared their phones with their family members living in the same household a couple of times every day. For the married women, husbands and sons were the persons with whom they shared their phones most; for most of the unmarried women it was either brothers or fathers. One of the non-PROTIC women said:

> *My brother bought me this mobile phone (feature phone) a year ago. Before that I used to use my husband's or sometimes neighbours' phones if my husband had been away from home for work. My phone is used by all the family members in our household. When my husband is around, he uses my phone. My brother-in-law's sons also use my phone to call or to listen to music. They regularly load (download) music in my card (phone memory card) from their friends or computer shops. WnPB2 (28)*

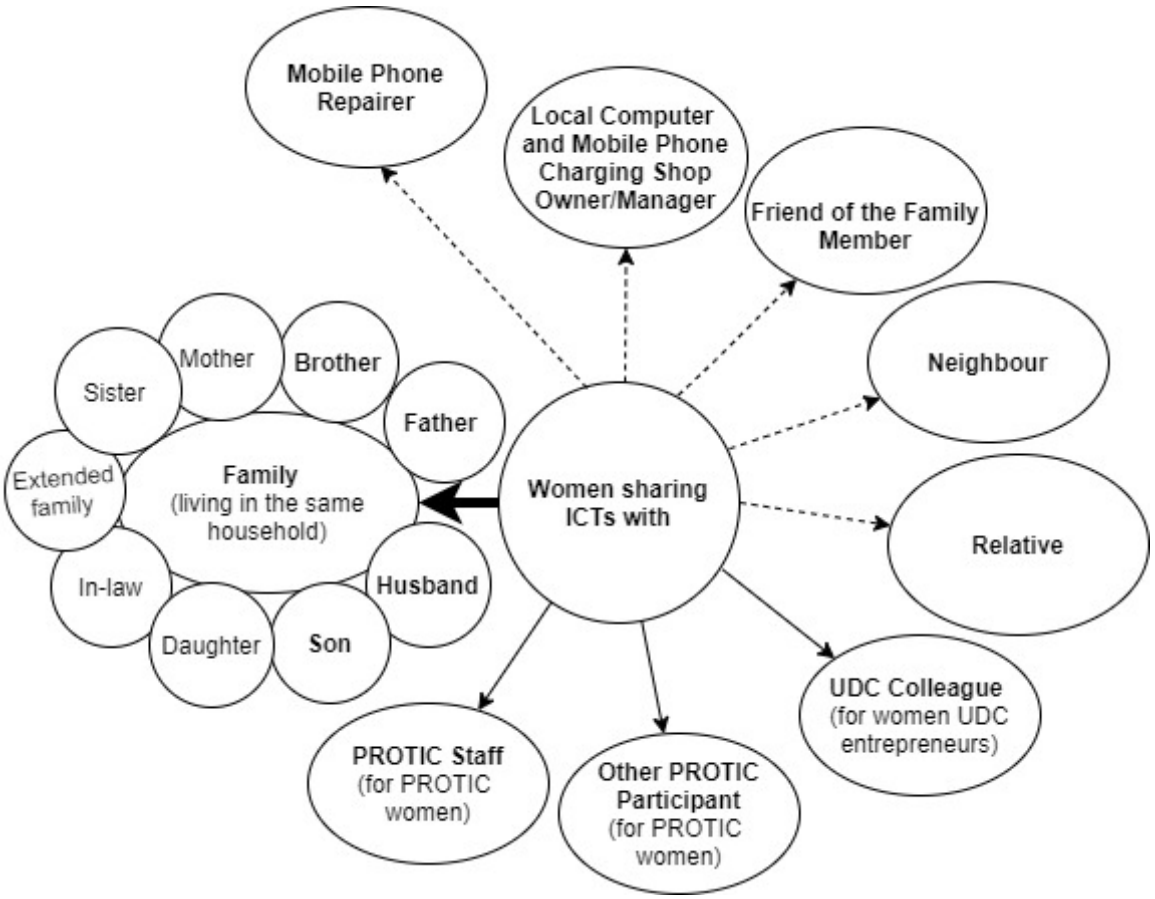

Figure 5- 6. Rural women's ICT sharing network

Most of the women reported that their relatives also accessed and used their mobile phones when they came to visit them or they go to visit their relatives. One of the PROTIC women said:

> *Whenever my cousins come to our place, they just glued themselves with my smartphone. They kind of use every function (apps) in my phone like take photos, use my Facebook, listen to music, watch Internet (videos). They enjoy using my phone. I never say no to them as they are our relatives not outsiders.* WPB3 (28)

Some of the women said that they occasionally shared their phones with the neighbours or other community people. Some of the women from both northern and southern villages said that they also kept their phones with their neighbours for charging as they did not have electricity in their houses. Allowing neighbours and community people to make calls from one's mobile phone is also a cultural practice as one of the PROTIC women said:

> *If I have balance (credit) in my phone, I always allow my neighbours to make urgent calls from my phone. It is quite common in our community to let others use our own mobile phones when they need that though not everyone in the community is always very cordial to others. WPA5 (29)*

Apart from family, relatives, and neighbours, most of the PROTIC women also reported that they shared their smartphones with the project staff quite often. Project staff made regular visits to the participants' households (a couple of times every month) when they checked the women's phones to learn how women had been using their smartphones. PROTIC women also reported that they sometimes shared their phones with their PROTIC peers, to share photos or apps or to seek support

to learn something from a more 'expert' group member. In the same way, female UDC entrepreneurs said that the male UDC entrepreneurs had access to their computers and most of them had to seek support from their male colleagues whenever they had any issues with their computers. Two of the UDC women reported that their male colleagues helped them if they had any issues with their phones as well. This kind of sharing happened a couple of times in a week.

Some women also reported that the friends and colleagues of their family members also had access to their phones when their family members, mostly husbands, brothers or sons, took their phone to work or out with friends. One of the PROTIC women said:

> *My husband sometimes takes my phone with him when he goes to the local market to meet his friends. Last month, I found many of my photos were deleted. Upon asking my husband, he said that maybe his friends mistakenly deleted those.* WPB8 (26)

Almost all the women with smartphones and some of the women with feature phones, particularly those who had music or video options on their phones, reported that they downloaded music or videos from the local computer shops. Mostly their male family members or neighbours took their phones to the local computer shops. The shop owner or manager accessed the phone to download or transfer files. Sometimes they left the phone with the shop owner or manager if it took longer. Most of the women from both northern and north-eastern villages had their phones charged at the local mobile charging shops at the closest village market, which could be three to five kilometres away from their homes. As they had no electricity connection in their households, they had to charge their phones every three to four days and leave their phones for a couple of hours in those shops. The charging shop people sometimes used their phones, looking at their photos or Facebook or making phone calls. One of the PROTIC women said:

> *My husband or son gets my phone charged from the market. Two or three times I lost my mobile balance (credit).* WPB7 (28)

Most occasional sharing of mobile phones happened with the phone repairers. Most of the women said they took a backup of their contents before sending the phone to the repairer. They neither deleted their personal contents from their phones nor logged out from their Facebook accounts. Based on some incidents, it was suspected that their contents and Facebook account might have been accessed by the repairer. One of the PROTIC women said:

> *Some days after repairing my phone, I got message from some new friends in my Facebook whom I did not add. I think, they were added when my phone was with the repairer. I asked the person who took my phone to the repairer but he said that he knew the repairer well and that person would not do this kind of activities.* WPA8 (26)

Sharing of ICTs happened for different purposes. Firstly, it was to support people who need to use the services, e.g. neighbours, relatives or family members, and secondly, to get assistance or maintenance support from others (e.g. NGO staff, peers, or phone repairers). In some cases, sharing for monitoring also overlapped with the provision of support or assistance which significantly compromised women's control and agency in relation to ICTs. For example, NGO staff and family members accessed and used women's phones and data for monitoring and controlling their phone use.

5.3.6.2 Offline Usage of ICTs

This section answers RQ1b: What are the main uses of ICTs in women's lives?

Most of the women participating in this research, both PROTIC and non-PROTIC, reported that their preferred way of communication through their mobile phones is making and receiving phone calls. Out of 53 women, only four women, two PROTIC and two non-PROTIC, reported that they preferred sending or receiving text messages to calling for communication. According to the women, making or receiving phone calls became the most preferred way of communication for several reasons. Firstly, because of the women's low literacy most of them were more comfortable with making or receiving phone calls rather than writing or reading text messages. According to the PROTIC baseline data, over 50% of the women were illiterate or could only sign their names. Among the 53 women who participated in this research, around two thirds either could sign only or had very minimal education (up to class five in primary school) and therefore were not very comfortable reading or writing text messages. Secondly, because of their oral culture, people share information through verbal communication, and use their memories. It is not so common to use written documents. Some of the women reported that they had learnt how to read or write in their childhoods but did not have the opportunity or scope to practice reading or writing in their daily lives. The dominant oral culture and low literacy levels were also applicable to the families and relatives with whom women communicated the most.

Apart from calling or, rarely texting, women reported other activities using their phones. Table 5-5 presents both online and offline usage of ICTs by the rural women. The activities are organised in the list based on frequency of use. The smartphone users reported a variety of activities including taking photos, using the clock for time management and setting alarms, listening to music, watching offline movies and videos stored in their smartphones, playing games, using the radio or calculator, sending and receiving photos via Bluetooth and recording sermons. Women reported that these activities were undertaken by them and also by their close and extended family members living in the same household. Smartphone users also used offline apps.

PROTIC also developed two offline apps for the participants. The first app was on maize cultivation, particularly to support the women maize farmers in the northern sandy island areas. The second app was for local government support systems, to educate women and raise their awareness of their eligibility for support from the local government offices. This information could also be used to support others in their communities

Apart from the apps developed by PROTIC, women with smartphones also reported using various offline apps and videos related to agriculture, poultry and livestock rearing, vegetable gardening, health information, religious lessons or holy books, and cooking on their smartphones. These apps were mostly collected from and shared with the other smartphone users in the community, both PROTIC and non-PROTIC, using the SHAREit app. Sometimes apps were also downloaded by their family members. One of the PROTIC women from the northern PROTIC village said:

> *Whenever I found any app on agriculture, health information or other important things like holy books in another's phone, I try to get it by sharing. My husband also collects videos, and owaz (Islamic lectures) from others or sometimes from the computer shop. We try to collect apps in my phone so that I can access it when needed.* WPB5 (24)

Both PROTIC and non-PROTIC feature phone users mostly carried out offline activities on their feature phones and, apart from phone calls and SMS, they also used the clock, alarm and calculator and played games.

Seven out of eight women who used computers worked as UDC entrepreneurs, so they used their computers for similar tasks as those mentioned in Section 5.3.2 including writing letters and filling in documents for job applications, birth and death certificates, citizenship certificates, and character certificates. Women UDC entrepreneurs did not share their official computers with the family or relatives but they regularly shared their computers with the male UDC entrepreneur. Apart from composing documents, three of the eight women also read documents occasionally in their computers and six listened to music and watched videos.

Table 5- 5. Online and offline usage of ICTs by the rural women

Offline Activities			Online Activities		
Smartphone users	**Feature phone users**	**Computer users**	**Smartphone users**	**Feature phone users**	**Computer users**
SMS	SMS	-	Social media (Facebook)	Social media (Facebook) [Limited]	Social media (Facebook)
Photos	-	-	YouTube	-	YouTube
Clock	Clock	-	Video calling (IMO, Viber)	-	Video calling (Skype)
Music	Music [Limited]	Music	Online apps	-	-
Movies/ videos	-	Movies/ videos	Agricultural information search	-	Agricultural information search
Voice recording	-	-	Health information search	-	Health information search
Offline apps	-	-	Google search	-	Google search
Calculator	Calculator	Calculator	Job search	-	Job search
Alarm	Alarm	-	Newspaper	-	Newspaper
Games	Games [Limited]	Games	Email	-	Email
Mobile banking	Mobile banking	-	-	-	-
-	-	Document writing	-	-	-
-	-	Print outs	-	-	-
-	-	Document reading	-	-	-

5.3.6.3 Online Usage of ICTs

This section answers RQ1b: What are the main uses of ICTs in women's lives?

Use of ICTs for online communication and activities was also reported by the rural women. From the field data, it was quite evident that PROTIC women were the more extensive Internet users among all the rural women participating in my research. PROTIC women used their smartphones for online activities including social media, particularly Facebook and YouTube, and video calling apps like IMO and Viber. Their family members also accessed and used the Internet on their phones for accessing YouTube, video calling, and downloading apps. Family members and other actors who had access to women's smartphones could access their social media accounts as well.

Women also used Google search for agricultural, health or other relevant information related to their businesses including tailoring, vermicomposting and paper box making. PROTIC women reported that project staff opened Facebook accounts for them to share agricultural information and to connect with PROTIC participants from other areas. PROTIC staff reported that they opened email accounts for all the participants so that they could download relevant apps on their phones, but only five

participants among 21 PROTIC women said that they knew how the email worked and only one woman reported that she sometimes checked her emails. One of the PROTIC women in the wetland area said:

> *Bhai (PROTIC staff) opened email in my phone but I did not need to use it. He showed me once but it was so complicated. WPC3 (30)*

Both PROTIC and non-PROTIC women also reported that they downloaded apps on their phones. Their family members also downloaded apps on their phones including newspapers and job search apps. Women with smartphones also reported that their children or other family members used their phones to search for study related information. Literacy apps and games were also used in their phones to teach their pre-school aged children letters and numbers.

Non-PROTIC smartphone users, particularly the women who had some kind of ownership of their smartphones, used Facebook, video calling apps and YouTube Among the nine non-PROTIC participants, only four had their own smartphones and most of them reported less extensive and less frequent usage compared to the PROTIC women. The feature phones used by both PROTIC and non-PROTIC women were very basic models and most of those did not support the Internet. As reported in Section 5.3.3, among 32 feature phone users, only two women said they very occasionally used the Internet on their feature phones to access Facebook.

Women as computer users reported that they used Facebook and YouTube on their computers. All eight women computer users had email accounts and four of them who were UDC entrepreneurs said that they used their email account regularly as part of their UDC job. UDC women also did various tasks online including visiting jobsites to support people applying for jobs and searching for admission test results, public service exam results, and agriculture and health information.

5.3.7 Use of Internet and Data Bundles

PROTIC women were given a data bundle every month. It included one gigabyte of data and 40 BDT of account credit (1 AUD = 60 BDT). Most of the women said that the data bundle provided by PROTIC was very helpful but not enough to use the Internet for a whole month, although very few reported that they topped up data after finishing the project data allowance. Some married PROTIC women reported that their spouses sometimes bought small internet packages to use the Internet. Only a very few women were found who also topped up their smartphone data sometimes. One of the women from the coastal PROTIC village said:

> *I like to watch recipes and videos on YouTube and also search for information related to my study. When the project MB (megabyte) finishes, sometimes I also buy small Internet packages but I cannot afford buying every month. WPA1 (19)*

Using the Internet was not common among the majority of non-PROTIC women. Among 32 non-PROTIC women only six used the Internet on their phones (four smartphones and two feature phones). Of those six women, only two reported that they bought a data bundle of either 256 or 512 megabytes, or sometimes more depending on the available Internet offers, every month. Four of them said that they very occasionally managed to buy data bundles for their mobile phones.

One non-PROTIC woman who used a laptop reported that she mostly used the Internet on her smartphone and sometimes on her laptop by using her phone as a hotspot. Seven women UDC entrepreneurs reported that they accessed the Internet on their computers via a modem in the UDC which is unlimited.

5.4 SOCIOCULTURALLY EXPECTED AND APPROVED WAYS OF ICT USE FOR THE WOMEN

This section helps to answer RQ2: What factors influence women's active engagement with ICTs?

As reported in Section 5.3.3, non-PROTIC women mostly used feature phones with no Internet for communication. Only a few of them had accessed or used smartphones, with limited use of the Internet. On the other hand, the PROTIC participants used the project smartphones and Internet support. PROTIC introduced both offline and online information sources and communication opportunities including a call centre, social media (e.g. Facebook), Google search and apps as mentioned in Sections 5.3.6.2 and 5.3.6.3. Among various information seeking and communication opportunities, it was found that certain types of information and ICT use and practices had been more supported by their families and communities than others.

5.4.1 Accessing Information on Agriculture and Farming

PROTIC women's use of smartphones was socially accepted because it concentrated on a livelihood issue such as agriculture. The information women had been seeking or receiving from the project was mostly related to their agricultural production, domestic animal and poultry rearing, fish and crab culture and vegetable gardening. Most of the women in their interviews highlighted this acceptance issue. This particular sociocultural acceptance helped women to have some kind of positive control over accessing and using their smartphones for agriculture and farming. One of the PROTIC women from the north-eastern village said:

> *During the first days, when I started using the PROTIC smartphone, my husband was not very supportive. He had not been convinced with the idea that my phone would be beneficial for our family. But, when I started supporting the family farming with the information I got in my phone, he started accepting my smartphone use. I was also able to make him understood that I use my smartphone for the betterment of our family. WPC2 (32)*

This was not just the case for women's families and relatives. The idea of using smartphones for increased agricultural production and income created greater acceptance in the community. During the discussion a local religious leader from the northern area said:

> *I heard about the project. It is contributing to the family agriculture, food security or income which is great. Women got the touch phone (smartphone) but if they are not using it for anything 'bad' that is the best case.* LB1 (44)

5.4.2 Accessing Information on Religious Practices and Lessons

Religious apps with religious lessons, recitation or discussion were also found to be very commonly used by the smartphone users, both PROTIC and non-PROTIC, and their family members. It was common among both Hindu and Muslim participants but, compared to Hindu women and their families, Muslim women and their families were more frequent and extensive users of religious apps. It was found that Muslim women's smartphones were also used for watching religious lectures locally known as '*owaz*' on YouTube by both women and their family members. Women's smartphones were also used to record religious lectures or discussions happening in their villages or nearest towns. Most of the Muslim women in the research, and particularly in both northern and north-eastern PROTIC villages, reported that their husbands, sons, brothers or sometimes relatives or neighbours also asked them to take their smartphones while attending religious lectures to record or take videos. One of the PROTIC women from the northern area said:

> *My husband likes to listen to owaz in my phone and whenever he goes to any owaz event, he always takes my phone with him to record. Last week, my neighbours' son took my phone to record an owaz session by a famous religious leader as he had some issues with his phone.* WPB7 (28)

Particularly for the PROTIC women and their families, using smartphones opened more options not only to listen to audios but also to record, collect and play videos. Sometimes women or their family members also collected those videos via sharing apps. Most of the Muslim women and their spouses and families thought that messages from the *owaz* helped to contribute to the betterment of their lives by knowing and practicing religion more *'sothikbhabe'* (accurately). Women's spouses also highlighted that religious lessons made them aware and helped them to understand their responsibilities towards Islam and their families. Most of the spouses of the Muslim women or male family members (fathers, brothers, sons, father and brothers-in-law) reflected that they encouraged their wives and female family members (mothers, sisters, daughters) to follow the religious and socially accepted ways. While talking about the positive changes which had happened through the use of mobile phones, one of the spouses from the northern area said:

> *Mobile phones can be used for good things. It helps us to access the experts' discussions (religious leaders) and follow the sahi tarika (the right way) of living according to Islam. Society and religion only accept the good things for us and the women and women should follow those. I and my wife watch owaz in the phone. I believe that it helps her to live a better life and I can guide her as well.* SB8(38)

Although accessing religious information is more common among the women using smartphones, some non-PROTIC women with feature phones and their families also reported that they listen to religious lectures and discussions on their phones. Increased access and use of religious information resulted in increased regulation and women's less control over their access and use of ICTs. How sermons, interpretations and discussion by religious leaders are impacting the lives of the rural women will be discussed in Chapter 6.

5.4.3 Communicating with Family and Relatives

Women also said that their families expected that they would mostly maintain communication with their family and relatives. PROTIC women said that their families had accepted some connections outside family and relatives including doctors, vets, their children's teachers, NGO staff and other members of the community-based organisations. Most of the women accepted this preference by their family and community. They also believed that communicating with an outsider, particularly with men outside the family, was not a good thing for women. Upon being asked, one of the PROTIC women said that:

> *If needed, sometimes I communicate with bhai (male project staff) and my husband is okay with that. He understands the project issues and requirements. Apart from that I think, I should not communicate with any man outside my family. Women in our village do not have male friends. My husband trusts me and he allowed me to use the phone, in return I should respect his trust. WPA9* (29)

Though women's communication and networking outside family and relatives were mostly restricted but sociocultural approval for maintaining communication with their family and relatives helped them to get more personal control of their devices for communicating with family and close relatives.

5.4.4 Offline Communication and Activities

It was evident that despite some limited online activities, use of multiple functions was not very common among the female smartphone users. Among 22 smartphone users, only six women (five PROTIC and one non-PROTIC) reported more regular and extensive online use of their smartphones than others, including searching for jobs and looking up information. Apart from that, most of the PROTIC and non-PROTIC smartphone users mostly used the smartphones for phone calls, similar to those using feature phones, with occasional use of Facebook and video calling with family and relatives. Most of the women with the smartphones reported that their offline activities are more accepted than their online activities, such as using social media and Facebook which lead to women's limited agency or control over their offline activities than online. This situation was also reflected in the interview with a social leader in the southern area. That person was a former local Government member and he reflected on his daughter's access to and use of the smartphone:

> *I think technology is not a bad thing for the women unless they use it in a 'wrong way' or the way they should not use it for. My daughter uses a touch phone but I strictly told her not to post photos online or use it for communicating with people outside family. LA1 (45)*

5.4.5 Accessing and Using Information for Improved Income and Wellbeing

Apart from agriculture, some of the PROTIC and non-PROTIC women who used their smartphones for other income earning opportunities like tailoring, vermicompost making, or paper box making received family support and acceptance. Sociocultural approval for women's ICT uses for income and family wellbeing helped them to exercise control over their ICTs while using it for supporting family income and wellbeing. For example, three rural women (two PROTIC and one non-PROTIC) who used their smartphones for improving their tailoring business reported that their families accepted their access to and use of smartphones more when they started contributing more to the family income. One of the PROTIC women from the northern area said:

> *My in-laws were not happy when I started using my smartphone. They discouraged me by saying that I should not waste time with my phone rather fulfil my household responsibilities. But, when I started contributing more to the family income with my tailoring business and I searched for relevant information in my smartphone to support my business, my in-laws started accepting my smartphone use. WPB9 (26)*

Using ICTs for communication outside family and relatives was also not usually accepted by women's families but there were some exceptions reported by the women. Communication with doctors to support family health and wellbeing or communication with the vet about their domestic animals was accepted by their family members. One of the PROTIC women from the southern village said:

> *Outside family, I now manage the communication with the doctor, vet and other relevant people like the teachers of my children. My husband never said 'no' to this kind of communication with outsiders as I am doing it for our family wellbeing. WPA8 (26)*

5.5 GENDERED PATTERN OF ICT ACCESS AND USE FOR GIRLS AND WOMEN

This section also helps to answer RQ2: What factors influence women's active engagement with ICTs? Social and cultural disapproval significantly impacts girls' access to and use of ICTs in rural Bangladesh and results in different control mechanisms for women and girls compared to men and boys. Women and girls reported very limited or sometimes no control over access and use of ICTs whereas men's and boys' control over ICTs was socioculturally approved.

My research has found that adolescents and young girls from the age of 12 to 19 are less likely to use a mobile phone or a personal computer than boys of the same age. While talking to adolescent girls and boys, it became clear that girls' use of and access to technology is a concern for their family and society more than that of boys. In this research, 30 adolescents participated (see Table 3-2) in four FDGs, including 17 girls and 13 boys. Social restrictions were more applicable to the girls than the boys. All the adolescent girls were accompanied by their mothers or aunts or fathers to the sessions, but most of the boys came alone without any family member or guardian. However, some adolescent boys attended the FGDs with their uncles or brothers or aunts.

Among the seventeen adolescent girls, only one girl had a smartphone which had been bought by her husband. The other sixteen girls used the phones of family members including five who used their mothers' PROTIC smartphones. Ten out of 13 adolescent boys had their own mobile phones including nine smartphones and two feature phones. All those mobile phones had been bought by their families. Among the other three boys, one used his father's feature phone and two used their mothers' smartphones provided by the PROTIC project. Only one of the adolescent girls reported occasional access to a laptop owned by her brother, whereas eight boys reported access to and use of either a laptop or desktop and two had their own desktops bought by their fathers.

Compared to adolescent boys, adolescent girls had fewer occasions to use ICTs and shorter access times. Boy said they had regular access to mobile phones. Even the boys who did not have their own mobile phones said that they used mobile phones at least two to three times in a day, whereas most of the girls reported using mobile phones two to three times in a week or in a month. The married adolescent girl who owned a smartphone said:

> *My husband said that he has given me the phone just to talk to him as he lives abroad. It is mostly used by my brother and I only use it when my husband gives me video calls every other day. Neither my in-laws nor my husband like me to use the phone except talking to them. My parents and brother are also very strict. AGA3 (16)*

Most of the parents, guardians, and family members who participated in the FGDs were concerned about and protective of their young daughters' use of ICTs. They thought that using the technology has additional risks for the girls and young women which can impact their social reputations. It can place the girls and women in a vulnerable situation. One of the fathers who was concerned about the incidence of cyber bullying against women and girls said:

> *Using Internet is particularly risky for young women and girls. A few months ago, one of our community women's 'bad photo' (with very minimum clothing) was found on the Internet. That was so shameful for the husband and family. I do not want to buy this risk for my daughter or my wife. SC2 (40)*

Parents were also concerned about 'wrong decisions' made by their girls and young women. By 'wrong decisions' they mostly referred to girls and young women making love relationships over the phone and sometimes getting married to that person or having a sexual relationship or being cheated by that person. In an FGD with spouses and family members, one of the spouses, the father of a young girl said:

> *I think use of technology can put the girl's reputation or even the risk to family reputation. Nowadays, such incidents happen a lot where girls get connected with unknown boys. One of my neighbours' girls fled away and got married to a boy whom she came to know over phone. After six months she came back pregnant to the family. Often girls make this kind of wrong decisions which can result in huge shame for the family.* SB2 (36)

Some of the parents also stated that to protect their girls from making wrong relationships, they sometimes prefer to marry them early. Some examples were shared by the parents where girls were married as teenagers because they used the family phone in secret and were having affairs. One of the mothers of a young girl said:

> *My elder daughter fled away from home and got married at the age of 15 with a boy from a very poor family. She used her elder brother's phone to make that relationship. We sometimes regret why we did not organise her marriage after knowing about that incident. I already made it clear to my younger daughter that if she does something like her sister, we will marry her immediately. FB2 (38)*

Parents were found more to be interested and comfortable in buying phones for their sons instead of their daughters. Most of them saw that as a kind of investment for the boys for their future careers. Parents also mentioned that boys were more insistent about asking for a mobile phone whereas the girls were more silent in this regard. Some of the parents also said that they preferred not to let girls own or use mobile phones to protect them from making wrong choices because of their young age, but the adolescent girls reflected that age was not the main issue as some of their younger brothers got phones from their parents. One of the girls said:

> *My younger brother got his phone when he was in class eight. But I am now in 12th standard but my parents never agreed to buy me one. I used to use my mother's phone sometimes to talk to my friends regarding study but for the last three months, I am not allowed to do that. One of my cousins had a love relationship over the phone and after that incident my mother said that I cannot have a personal phone until I get married. I also see people do not say good words for the girls who use mobile phones.* AGB2 (17)

Most of the girls sounded as though they accepted that situation. Upon being asked if they wanted to have a mobile phone of their own, most of them answered that they did not want one because it was not accepted by their families, relatives, and society. Some of the girls said that they did not want a phone because they might make wrong choices in using the device as they were not used to handling those devices. Girls also highlighted some of the stories where girls' photos were altered and shared in social media with a bad motive.

> *I think it is better not to have a personal phone because I may do something wrong that is neither good for me nor for my family.* AGE5 (16)

Somewhat in contrast, some of the adolescent girls and boys emphasised that learning a new technology like smartphones or computers can contribute to both girls' and boys' lives, but the practical scenario was different. Eight of the boys shared that they were already learning computers from their relatives and friends and three of them were taking classes from a computer shop in the nearest village market. On the other hand, no girls were taking or planning to take computer lessons. Learning computer skills or taking classes was not a choice for the girls as the parents did not allow them to go to the computer shop or learn from somewhere else. Some of the parents agreed that computer training was essential for both boys and girls as they can apply this technical skill in their future job or business, but later most of them ended up by saying that learning computers is more suitable for boys than girls. This is a common scenario found across the three research areas.

Compared to the overall situation of the adolescent girls, five adolescent daughters of the PROTIC women reported more regular use of their mother's smartphones. In family surroundings, they were allowed to use their mothers' smartphones. As they were more advanced in learning the new technology than their mothers, PROTIC staff also had encouraged them to learn to use smartphones so that they could help their mothers to learn how to use the device. This was an opportunity for

some of the adolescent girls to access and use smartphones but this does not mean that their open access to and use of ICTs were supported unconditionally. One of the PROTIC women said:

> *My daughter started going to college this year. She sometimes uses my phone. At the beginning of the project, I struggled a lot to learn how to operate this phone, then apa (NGO staff) showed some of the functions to my daughter and she helped me gradually as the young brain works better than my old brain!... … But I never allow my daughter to take my phone with her or use it alone. WPA3 (36)*

PROTIC staff also reported that, as a support strategy for the PROTIC participants with no or low literacy and skills, they encouraged adolescent girls to learn to use their mothers' smartphones and help their mothers learn the device. One of the local NGO staff said:

> *We encouraged and trained some of the young and adolescent daughters of the project women, so that they could help their mothers to learn how to use their devices. NL3*

Both PROTIC and non-PROTIC women said that they always consider their reputation and family pride while doing online and offline activities on their phones. They also think the same for their adolescent and young unmarried girls.

This gendered pattern of smartphone use was evident in the discussion with the women's spouses. The communication networks of the spouses are very diverse and, apart from the family, they regularly communicate with friends and other persons related to their work. In contrast, the women's calls are mostly limited to close kin and family members. This gendered pattern of mobile phone use is influenced by socially constructed gender roles and expectations.

5.6 INTERSECTIONAL FACTORS AND WOMEN'S EXPERIENCES WITH ICTs

This section helps to answer RQ2: What factors influence women's active engagement with ICTs?

It was quite evident from the women's experiences that not only gender but also other sociocultural identities based on age, marital status, occupation, literacy, religion, region, household income, and engagement with development programs impacted women's access to and use of ICTs. These factors were identified from the qualitative data produced during this research. Based on the women's experiences, it can be said that every woman cannot experience technology in the same way. Women's different sociocultural identities and their intersections help us understand women's experiences as a dynamic cultural process (Crenshaw, 1989). Some of these factors such as age, marital status, income and religion appeared be directly related to their experiences but there were also less measurable sociocultural and religious factors. How intersectional factors determined women's access to and use of ICTs will be discussed in Chapter 7.

Table 5-6 presents women's ICT use according to their age group. Women from 26 to 32 had the highest rate of smartphone use with age group 17 to 25 and age group 33 to 40 the second highest. Young women under 25 reported that they face more sociocultural restrictions in using ICTs compared to the older women.

Table 5- 6. Rural women's ICT use based on age

Age group	No. of women	PROTIC	Non-PROTIC	Smartphones	Feature phones	Both	Computers
17-25	13	5	8	8	4	1	4
26-32	28	13	15	10	12	6	2
33-40	9	3	6	4	4	1	2
Above 40	3	0	3	0	3	0	0
Total	53	21	32	22	23	8	8

Considering marital status, unmarried, divorced or separated women and widows reported facing more sociocultural restrictions compared to married women. If the married woman is young and does not have any children, she faces more restrictions than married women over the age of 35 and who have children. One of the spouses from the northern village said:

> *Young married women still can make mistakes by using technology and they may cross the boundary they should not cross, they can cheat their husbands very easily. I know some of the incidents that happened in our village but after having children, women become more settled in their families and think more about the reputation of their families. Other men also show less interests in married older women with children. SB3 (35)*

Table 5-7 shows women's ICT use according to their marital status. Married women's participation is the highest. Women who were separated, divorced or widowed faced more restrictions from their families. Five women who were divorced or separated and two widows participated in this research. Five of them said that they faced more restrictions and monitoring from their birth families, husbands' families (for widows) and societies. One of the PROTIC women from the north-eastern village said:

> *When I got divorced, my family and possibilities became more concerned about where I go and what I do. My husband divorced me after his second marriage, and I came back to my parents. Since then, I always listen to my brothers as my father is no more and they always remind me that I need to be careful so that no one can say anything bad about me. When I got the phone from the project, my family warned me to use it carefully and not to do anything so that people can gossip about me. I always keep it in mind. My divorce had already impacted my family and their reputation, so they always remind me of that WPC3 (27)*

Table 5- 7. Rural women's ICT use based on marital status

Marital Status	No. of women	PROTIC	Non-PROTIC	Smartphones	Feature phones	Both	Computers
Unmarried	8	3	5	6	2	0	4
Married	38	17	21	15	16	7	4
Divorced/separated	5	1	4	1	3	1	0
Widowed	2	0	2	0	2	0	0
Total	53	21	32	22	23	8	8

Women's experiences of accessing and using ICTs also differ based on their literacy status. Table 5-8 shows Rural women's ICT use based on their who participated in this research. Twenty out of 53 women could sign only their names and some of them had very minimal reading and no writing. Nine women studied up to higher secondary school and use of computers was limited to that group.

Table 5- 8. Rural women's ICT use based on literacy

Literacy Status	No. of women	PROTIC	Non-PROTIC	Smartphones	Feature phones	Both	Computers
Higher secondary	9	1	8	5	4	0	8
Secondary	3	3	0	3	0	0	0
6th to 10th standard	5	4	1	3	1	1	0
1st to 5th standard	16	9	7	7	5	4	0
Can sign only names	20	4	16	4	13	3	0
Total	53	21	32	22	23	8	8

Most of the women with low literacy said that they were more comfortable using feature phones than the smartphones. Women who could sign only used their smartphones in a very limited way, similar to feature phones. Two among four PROTIC women shared how they tried to overcome the literacy barriers to use their smartphones. One of the PROTIC women from the southern village who could sign only said:

> *Whenever I swap the pages quickly to find contacts or other applications in my phone, my husband asked how could I do this without any literacy! Who will tell him that it needs not only literacy but also 'a brain'. I saved photos against all the numbers. Don't need to read. WPA9 (29)*

Women's economic status influences their access to and use of ICTs. Table 5-9 shows the household income of the women participated in this research ($USD 12 is approximately 1,000 *Taka*). Women's ability to afford devices is directly connected to their income. The table shows that most of women participating in this research belong to middle-income and upper middle-income groups. If we consider the overall scenarios in the villages, it is also the same; very few women from the lower income and lower middle-income families have their own phones.

Table 5- 9. Rural women's ICT use based on income

Income (Bangladeshi Taka)	No. of women	PROTIC	Non-PROTIC	Smartphones	Feature phones	Both	Computers
Below 20K (lower income	1	0	1	0	1	0	0
20-50K (lower-middle income)	9	3	6	6	2	1	0
50-80K (middle income)	22	8	14	2	14	6	2
80-100K (upper-middle income)	16	7	9	12	4	0	5
Over 100K (higher income)	5	3	2	2	2	1	1
Total	53	21	32	22	23	8	8

Women's social status also impacts their ICT access and usage. It was found that women from higher income and socially more respected families face more restrictions from their families to maintain the socially accepted ways of ICT use. There is also a social pressure to maintain the 'respectable' image of women. One of the non-PROTIC women who belongs to a socially respected family in the northern area said:

> *Our family is the idol for all and everyone respects my father-in-law and his sons. As the daughter-in-law of this household, I also maintain that. I think mobile phone is risky and it can defame women very easily. I use my mobile phone only to contact with my husband, in-laws and relatives. I never post any photos online. WnPE1 (28)*

Women's family structures and the presence of technologically skilled family members or relatives also have roles in developing their experience with ICTs. Women who live in big extended families needed to share their ICTs with more people as mentioned in Section 5.3.6.1. Most of the women who lived with someone with literacy and skills in technology use reported that they had faced more frequent physical inspections of their devices, whereas women living with people who do not have those skills can avoid physical inspection of their devices. Young women who study outside can exercise some freedom using their devices outside the home.

Rural women, as development program participants and non-participants, experienced access to and use of ICTs very differently. In the research villages, PROTIC participants were in advanced positions compared to the women in general. Device and training support from the project and regular support from the local NGO staff helped them learn to use their devices; this was not available for the non-PROTIC women. So, it was quite evident that PROTIC women with low or no literacy learnt to use the

smartphones better than most of the non-PROTIC women with the same level of literacy. Use of smartphones by rural women was not common in Bangladesh, but PROTIC women got that opportunity which contributed to enriching their skills and experiences of using ICTs. PROTIC women were found to be doing better but it is not as if all 300 PROTIC participants were able to interact with technology in the same way, or that they were all advanced smartphone users. There were different challenges relating to women's contexts that shaped their experiences and these is reported in Chapter 6.

From the field data, it was evident that religious beliefs and rules had influenced and, in some cases, had determined how women interacted with technologies. Muslim women reported more restrictions from their families and communities compared to the Hindu women. Visibility in social media is more restricted for the Muslim women; the ideology and practice of *parda* was mentioned by both the women and their families and social leaders. *Parda* is a Bangla word which literally means curtail or veil but in Islamic values and practices, it refers to the isolation of women from men. Table 5-10 shows rural women's ICT use based on their religion. Although the total number of Muslim women was the highest in this research, in the southern villages, where there are fewer Muslim women, more Hindu women participated.

Table 5- 10. Rural women's ICT use based on religion

Religion	South	North	North-east	Total
Muslim	8	23	2	33
Hindu	18	0	2	20
Total	26	23	4	53

Muslim religious leaders and community people also showed more restrictions from the religious point of view regarding women's visibility both offline and online. Potential risks of women's technology use and how it could lead women to violate religious rules and *parda* was repeatedly mentioned by them. On the other hand, Hindu religious leaders and community members mostly highlighted the patriarchal sociocultural issues, women's gender roles and their safety and security as concerns and emphasised these to support their argument for restricted or limited use of technology by the women and girls, which applied equally to the Muslim women as well.

Muslim women belonging to higher income households reported less mobility and more mandatory following of religious rules and regulation in their daily lives than the Hindu women, which also impacted their online and offline visibility. For these women, earning money to support the family is not considered as appropriate as it is for Muslim women belonging to lower income households. Most of the Muslim women from the higher income households also reported more monitoring of their online and offline ICT use based on religious regulation. In the higher income households, men were found to be more educated and skilled in technology use, which resulted in frequent monitoring of both online and offline activities.

Upon being asked about their occupations, most of the PROTIC women identified themselves as farmers, whereas most of the non-PROTIC women identified themselves as housewives, although both groups do farm and household activities. Apart from that, women with other occupations, such as student, day labourer, tailor, vermicompost maker or paper box maker, also participated in this research. Although there was no particular trend found in the occupation groups, most of the PROTIC women farmers used their smartphones for agriculture more than the non-PROTIC women. Students reported than they had knowledge and skill in using ICTs but most also reported non-cooperation by their families and communities. Four PROTIC women who were involved in tailoring, compost making and paper box making reported that they used their phones to search for information related to their

business and marketing, e.g. contemporary designs of Bangladeshi women's clothing and also the market price for the designs they made.

5.7 CHAPTER SUMMARY

In this chapter, detailed findings related to rural Bangladeshi women's access to and use of ICTs were presented. Findings include types of ICTs and mobile phone; women's ownership over ICTs; women's frequency of ICT use; ICT sharing practice; and socioculturally accepted use of ICTs for the women which answers RQ1a, RQ1b and RQ2.

In this research, mobile phones and more specifically feature phones were found to be the most frequently used ICTs by the rural women. Women's ownership over ICTs were also diverse; five different types of ownership over ICTs were found, including self-supported, family or relative supported, PROTIC or government supported, no ownership but access, and no access. Shared access and ICTs owned by the women were very common and the network of sharing was also diverse including immediate family and relatives, peers, neighbours, NGO staff, and phone repairers. PROTIC women reported more skilled, frequent and extensive use of the Internet compared to non-PROTIC women as they were supported by the project. Gendered and socioculturally expected patterned of ICT use for the women were also reported in this chapter. Intersectional factors of women's identities including age, class, literacy, marital status, religion, and occupation shaped women's personal control and experiences with ICTs as sociocultural expectations over women were heavily influenced by those factors.

Findings documented in this chapter show that women's ownership does not ensure women's personal control over their access and use of ICTs because in societies like rural Bangladesh sociocultural regulation and intersectional disadvantages significantly influence women's personal control and agency in relation to ICTs. Sometimes, sociocultural and religious restrictions could allow women's limited control over their ICTs for using it in socioculturally recommended ways but existing restrictions mostly compromised women's agency and personal control of accessing and using their devices in the ways they want.

As the first chapter on findings, this chapter also reported on the contextual factors and participation. In line with the discussion in this chapter, the next chapter (Chapter 6) reports on the impacts of ICTs on women's lives and women's empowerment.

CHAPTER 6: UNDERSTANDING THE IMPACTS OF ICTS AND WOMEN'S EMPOWERMENT

6.1 CHAPTER OVERVIEW

This is the second of two chapters in which the findings of this empirical research are presented. The chapter provides an in-depth understanding of both the positive and negative impacts of ICTs on the lives of the rural women whish answers RQ1c: What impacts (both positive and negative) have ICTs introduced into women's lives?

This chapter also reports on the various understandings of women's empowerment present among the participants including rural women, their spouses and family members and NGO staff. Findings related to the challenges faced by the women in accessing and using ICTs are also reported in this chapter which answers RQ 2: What factors influence women's active engagement with ICTs? Findings reported in this chapter are based on the qualitative data and insights gained during this research.

6.2 IMPACTS OF ICTs on WOMEN'S LIVES

This particular section answers both RQ1C: What impacts (both positive and negative) have ICTs introduced into women's lives? and RQ2: What factors influence women's active engagement with ICTs?

From the experiences of the participants of this research, both positive and negative impacts or changes were found. Table 6-1 summarizes both positive and negative impacts of ICTs reported by the women.

Table 6- 1. Positive and negative impacts as a result of women's access to and use of ICTs

Positive Impacts			Negative Impacts		
Improved skills in ICT use	• Smartphones • Feature phones (few)	• Feature phones • Smartphones (few) • Computers (few)	**Offline and online harassment**	Mentioned	Mentioned (mostly offline)
Increased access to information	• Online • Offline	Mostly offline	**Incidents of domestic violence related to women's ICT use**	Mentioned	Mentioned
Increased knowledge and learning opportunities	• Farming techniques • Livestock and poultry	Not mentioned	**Increased sociocultural and religious restrictions and monitoring**	Mentioned	Mentioned
Increased participation in livelihood activities	Direct influence of ICT use is frequently mentioned	Occasionally mentioned	**Increased surveillance and monitoring**	• In Family • In the Community • NGO • Online • Offline	• In Family • In the Community • Offline • Online (few)
Increased communication	• Family and relatives • Project people • Relevant Stakeholders	Family and relatives			
Networking	• Online • Offline	Offline (very limited)			
Increased respect and improved social position	Increased	Not mentioned			

6.2.1 Positive Impacts of ICTs on Women's Lives

6.2.1.1 Skills in ICT Use

Accessing and using ICTs improved women's skills in ICT use. Women who used ICTs on a regular basis showed more improvement than women who accessed and used ICTs occasionally. In light of this, PROTIC women had more improved skills in using smartphones, whereas non-PROTIC women mostly had skills in using feature phones. Very few of the non-PROTIC women had skills in using smartphones and computers.

6.2.1.2 Access to Information

Access to and use of ICTs increased access to information for both PROTIC and non-PROTIC women. PROTIC women had more access to both offline and online information, whereas non-PROTIC women had mostly access to offline information.

6.2.1.3 Knowledge and Learning Opportunities

PROTIC women also said that engagement with ICTs had created more learning opportunities for them. For them, smartphones and training support from the project contributed to their knowledge and understanding of using that particular technology for agriculture and livelihood opportunities. This included cultivating various crops, rearing poultry and livestock, and culturing fish and crab. They also learnt about new techniques for farming; preparation and use of organic pesticides; preservation of seeds and crops, vaccination of poultry and livestock; and interpretation of natural disaster situations and early warnings. PROTIC women said they could better select the right type and amount of pesticide instead of making assumptions. One of the PROTIC women said:

> *I have learnt new techniques of farming for quality production. I now understand the weather better and can take care of the plants with the support of the information that we got from PROTIC. My relatives and neighbours also come to me for the information support for their crops. If needed, I also call the call centre to find a solution for their problems. WPA6 (29)*

6.2.1.4 Participation in Livelihood Activities

Women said that they could participate in livelihood activities using ICTs. This change was more discussed by the PROTIC women than non-PROTIC women. As discussed in Chapter 5, systematic feminisation in agriculture has resulted in women's increased participation in family farming including crop, fish, crab, poultry, and livestock rearing. PROTIC women particularly mentioned that access to and use of agricultural information helped them to run the family farming more efficiently. They could also use their smartphones to improve their small-scale vegetable gardening and poultry and livestock rearing. They could take timely care of their diseased crops, poultry, and livestock, which helped them to avoid financial losses. Their engagement with PROTIC resulted in more acceptance and participation in the family farming as they could support family with the required information.

PROTIC women said that using different apps related to agriculture, poultry and livestock rearing was also beneficial for improvements in farming. PROTIC women from the northern area particularly talked about the usefulness of the maize app developed by PROTIC. It was an offline app that included each and every step of maize cultivation including taking better care, controlling pests, harvesting and storing mechanisms. One of the PROTIC women said:

> *Bhutta (maize) app is very useful for us. We can use it anytime and we do not need Internet. Whenever I see any pest, I go back to the app to find out what should I do. The app is based on lots of photos, so I do not face any difficulties understanding the information though I cannot read properly. WPB7 (28)*

In the southern coast, crop and vegetable production was significantly affected because of salinity intrusion in the soil. With information from PROTIC women were able to apply innovative techniques to cultivate varieties of crops in a small piece of land all year round. For example, to avoid salinity, they started cultivating vegetables in plastic bags and watered them with rainwater. Crabs, shrimps, fish, and ducks were also commonly produced in coastal villages.

Apart from using mobile phones to seek agricultural information, some of the women also used their mobile phones for their small businesses including tailoring, paper box making and vermicompost making. Firstly, they could access both online (mostly for PROTIC women) and offline information more easily and secondly, they could communicate more easily with people related to their business. One of the PROTIC women who did tailoring from home said:

I can now search the Internet to find latest dress designs. Sometimes for my customers, I use my mobile as a catalogue and show the designs to my customers to choose their preferred one. This technique helped me to increase the number of customers. WPA7 (25)

Figure 6- 1. Women's tailoring business in the village (Photo A. Sarker)

One of the non-PROTIC women said that using the feature phone made communication and access to raw materials easier for her. As shown in Figure 6-1, some women also started selling cloth, thread and other sewing materials in their shops. These shops were located in one corner of their households. One of the non-PROTIC women said:

Earlier I had to request my husband to take me to the market to buy the necessary materials from the local village shop for my tailoring business. The market is around 10 kilometres from my home. When I started using my mobile phone (feature phone, I collected the number of the shop owner. Whenever I need anything from his shop, I call him. He delivers the items and I pay the money through bKash (mobile banking). This is a lot easier and saves my money and time. WnPA4 (30)

As in discussed in Chapter 5 (Section 5.3.2), women's access to and use of ICTs also made them able to work at the UDCs.

6.2.1.5 Communication and Networking

Accessing and using ICTs resulted in increased communication and networking by both PROTIC and non-PROTIC women. Women who had their own phones and had access to the Internet had more opportunities for networking and communication. In this regard, PROTIC women had more opportunities for networking and communication compared to non-PROTIC women, except for some of the non-PROTIC women who were educated and had access to the Internet.

PROTIC and non-PROTIC women who owned a mobile phone could communicate with their family members and close relatives more frequently. One of the PROTIC women said:

I mostly communicate with my husband and parents. I am also connected with both of our relatives more than before. Earlier my husband more maintained the communication with family and

relatives. Now with my phone, he relies on me to maintain the communication with family and relatives. I also use video calling to communicate with my cousin who lives abroad. WPA2 (38).

As discussed in Chapter 5, communication outside family and close relatives was mostly managed by husbands or male members of the family. In spite of such sociocultural norms and practices, both PROTIC and non-PROTIC women had some communication and networking outside family and relatives, including NGO staff, doctors, schoolteachers of their children, local government extension officers for agriculture, veterinary and fisheries, market vendors, Union Parishad chairmen and members, and researchers. Not every PROTIC woman had communication with every actor listed above but the most common communication outside home was with the local NGO staff.

Communication with stakeholders was not mentioned by the non-PROTIC women, where communication outside family was limited to doctors, schoolteachers or market vendors. Market vendors refers to the people doing business at the market including retail and wholesale shop owners. A very few PROTIC and non-PROTIC women said that before selling any crop, fish, goat, and poultry from home, they sometimes made calls to their known market vendors for the market price. Women never preferred to go to the market to sell their products by themselves because it was not accepted by their family and society and they also were not comfortable in doing so. One of the PROTIC women said:

Whenever I sell any goat, I always check the price with the market. Vendors come to my house to buy goats or sometimes my husband sells them to the market. Information about the market price helps me to ask the right price of my products while selling those to the homecoming vendors or at the market. WPA8 (26)

PROTIC women shared their experiences of peer learning when they asked for help from their comparatively more skilled PROTIC peers, family members, relatives and neighbours whenever they needed to improve their ICT use skills.

6.2.1.6 Online Communication and Networking

Apart from offline communication, using smartphones introduced online communication and networking opportunities for women. Through Facebook, women in PROTIC were connected to PROTIC peers from other villages situated in different geographical locations. Sometimes they also made new friends in Facebook whom they did not know face to face. They mostly preferred to make female friends as it is more accepted by their families and communities. One of the PROTIC women said:

Because of Facebook we are connected with all PROTIC sisters from other areas whom we never meet face to face. We can share our experiences of farming and can learn from each other. Apart from PROTIC or previously known persons, I also made some new friends in Facebook. I accepted only the requests from girls and I think it is not appropriate to make friendship with unknown men. WPA7 (25)

Online calls were much cheaper than offline calls. Women who owned smartphones and used the Internet reported increased communication with family and relatives living abroad. Women also innovatively used video calling for different purposes including buying clothes for tailoring business and following up with doctors. One of the PROTIC women shared:

Around a year ago, my husband got very sick and we had to go to India for treatment. After the first visit, we now communicate with the doctor via video calling and I did that arrangements with the help of my brother who lives in India. WPA6 (29)

6.2.1.7 Respect, Confidence and Social Position

Most of the women, whether PROTIC or non-PROTIC, said that more frequent and increased communication with family and relatives contributed to their increased respect and trust in the family and among the relatives. Communication is usually the domain of the men, maintained more through physically visiting extended family and relatives living at geographical distances. Before using the mobile phones, women had very limited access to communication. For example, one of the non-PROTIC feature phone users said that she was now included in important family event discussions which would have been difficult prior without a phone:

> *This phone has given me the scope to talk my extended family members and relatives whom I hardly talked to before. A couple of days ago, my sister-in-law's husband called me to discuss about the marriage preparations of their son and asked me to talk to my husband. With more regular communication for about two years, I feel like they respect me more. WPB1 (35)*

Some women also highlighted the fact that they could make decisions in regard to their children's education as they became the key person in the family who maintained the communication with their children's teachers. Some of the PROTIC women also said that their families valued their contributions when they proactively communicated with the doctor to support their family members in need. Apart from increased respect at family level, non-PROTIC women did not talk about any particular situation where their use of mobile phones contributed to their respect or social position in the family or community. Consequently, the following paragraphs are mostly based on PROTIC women's experiences of using smartphones.

Women's visible and positive contribution to the family farming also resulted in more respect for them in the in the family and also in the community. Some of the PROTIC women were also able to participate more in family farming decisions as they were able to support the farming with the awareness and information they got from the project and their husbands also supported their role in the family farming which had not previously been possible. In spite of this, most of the women said that they preferred not to make any decision without the consent of their husband or in-laws as their families do not accept their independent decision making.

Owning smartphones gave the rural women a positive status in the community. Each and every PROTIC woman said that having the smartphone 'in their hand' gave them more respect in the community. One of the PROTIC women said:

> *People see me with respect when I take this expensive touch phone with me while roaming in the village. Touch phone is not very common in our village not even among the men.* WPB8 (26)

Most of the PROTIC women shared agricultural, fisheries, and livestock related information with their communities which also resulted in social respect and inclusion of the women. With their proactive support to the community some of the PROTIC women became active information agents in the village and community people, both men and women, started coming to the women and seeking their help. One of the women in the southern PROTIC village was called 'the doctor of goats' by the community as she became efficient at treating goat diseases.

Along with offline communities, PROTIC women also talked about increased respect in online social media or Facebook. Some of the women who were regularly using Facebook said that they got likes and appreciation from their PROTIC peers from other areas. A few women also received messages from unknown people asking for farming tips. One of the women said:

One day I got a message in my Facebook where someone was asking what pesticide he could use to save his eggplants. I did not know him before. He seemed to be a nice person and asked me with respect by calling me 'apa' (sister). I shared the message that I got from the project. I felt like an expert that unknown people also asked me for support. WPA3 (36)

As discussed in Section 6.2.1.5, women's increased networking and communication made them more confident. They could communicate with the agriculture or fisheries officer or with the Union Parishad chairman and members. PROTIC developed an application with information related to local government support services which informed the women to check their eligibilities to seek support from the Union Parishad. They were also able to support their communities with that information. To support women networking with stakeholders, PROTIC also had engaged local level stakeholders in the project activities, although women reported that the stakeholders were not very accountable to the women in absence of the project staff. Women could hardly communicate with the stakeholders without the support from the PROTIC staff.

At different stages of the project, PROTIC women participated in different research projects and events organised by different NGOs, universities, and research organisations. PROTIC participants also reflected that sharing experiences with wider audiences helped to improve their confidence.

6.2.2 Negative Impacts of ICTs on Women's Lives

6.2.2.1 Online and Offline Harassment

Most of the women, both PROTIC and non-PROTIC, reported offline abuse or harassment at least once in their lives. Women who used smartphones on a regular basis also reported online harassment incidents. Offline harassments include unwanted calls and messages with abusive words. Sometimes, annoying calls and messages were also received by the women with love proposals. One of the non-PROTIC women said:

When I started using the phone (feature phone), I used to get a call from a person who asked me to marry him. I told him that I am not interested. But he did not leave me alone. Continued calling me from different numbers. My brother also believed that I knew that person. I stopped using my phone for some days and then changed my number. WnpE3 (23)

Some of the young girls said that they were exposed to '*bad*' things (nude photos or pornography) either online or offline. In some cases, their friends (male) or classmates intentionally did that to them. Most of the women and girls preferred not to share or make any complaints to anyone as it might socially defame them. From the experience of the young women and girls, their families were not supportive. Rather they faced non-cooperation and even violent behaviour from their families. One of the PROTIC women shared her experience:

When I was in class eight, one of my classmates showed me a 'bad' (nude) picture in his phone during a private tuition class. I was shocked and shared that incident with my mother. My mother thought that I might have done something wrong and she scolded me a lot. After that incident she did not allow me to go to school or tuitions for months. She even asked my uncle to find a groom for me. WPA1 (19)

Some particular incidents of online abuse were discussed by the participants. For example, one fake ID was created using one woman's name. The photo for that fake ID was created using that woman's face over a women's body with very minimum clothes. The woman who was victimized said:

It was a very difficult situation for me. I had no idea who did that and why but people started making all kind of stories of my extramarital affair with that unknown person. WPB7 (28)

Talking about the same incident, another PROTIC woman said:

That particular incident not only affected 'apa' (sister) but also many of us. It seems like our families became more cautious about our movements. My husband used to trust me blindly if I asked him to allow me staying outside home for joining project training. Now, he asked me every little detail and made sure that I am going for the project event. WPB8 (26)

Online harassment also happened through other people accessing Facebook accounts and using them to defame women. For example, one of the young women shared her experience where one of her relatives accessed her Facebook account and deliberately sent some abusive photos to some of her friends. She said:

My cousin sent those abusive photos to my contacts to defame me. My cousin wanted to marry me but I refused and that's why he did that though he never admitted that he did that crime. I shared this with my uncle (my cousin's father) but he did not trust me. Then I made a post in Facebook with an apology and made it clear that I did not send those abusive photos.

A similar incident occurred with another woman where her smartphone was accessed by a member of her husband's staff. That person sent abusive photos to her contacts and also made an abusive post about the local NGO female staff. In regard to this incident, one of the local NGO staff said:

Some of the community people did not like our work with the women as they think we are bringing women outside home which should not be happened. I think that person was that kind and utilised the opportunity to defame the staff. NL4

Both online and offline scams were also reported by both PROTIC and non-PROTIC participants where they got fake calls and messages about winning prizes or money or someone asked for their personal information. Some women also lost their money in response to those scams. While participating in this research, most of them said that they did not respond anymore to that kind of scam.

6.2.2.2 Domestic Violence

Incidents of domestic violence were reported by both PROTIC and non-PROTIC women. Some of the young girls spoke of incidents of beating and scolding by their parents or brothers or sisters when they used their family phones secretly or failed to comply with family restrictions related to mobile phone use. Sometimes facing online and offline abuse also became the cause of domestic violence where their families blamed them for those incidents.

For married women, domestic violence incidents were mostly related to mistrust or misunderstanding by the spouses and in-laws. In those cases, spouses and family members thought that women did not use their mobile phones in a culturally and socially expected way. One of the non-PROTIC women talked about her story where the husband had suspected her of having an extramarital affair over the phone, and he beat her so badly that she was hospitalised. She said:

My husband saw an unknown number on my call list and I explained to him that it was a wrong number call. Another day I called another wrong number and my husband thought that I am talking with the same person. I tried to convince him but he was so angry and without listening to me he started hitting me. WnPE4 (22)

One of the non-PROTIC women termed the mobile phone a *'suspect machine'* for women. It is not always necessary that women do something 'wrong' or 'unethical' with their phone. Rather, it is mostly the spouse, family and the society who think negatively. This woman talked about an incident that happened with the neighbour's young girl (17). She said:

> *The girl's husband himself bought her the button phone to communicate with him while he is away. But after a couple of months, he started to suspect her and became violent. This girl came to her parents several times after facing violence. This time he was so brutal he pushed her in the wall and she had a head injury. I feel very scared when I think of my own daughter at her place. WnPD6 (30)*

One of the PROTIC women also said that a similar thing happened with her. She was hospitalised after that incident. Her sister tried to seek support from the local NGO but they did not get adequate support from the NGO. A complaint was made to the local Union Parishad chairman by the sister. Then the chairman along with the elected Union Parishad member from their area organised a meeting to settle that incident. In that meeting the husband committed that he would never do such kind of violence again. The woman also committed that she would not do anything bad with her phone and would use it the way her husband permitted.

A few married women also talked about incidents of sexual abuse by their husbands. Those husbands either used their own smartphones or women's smartphones to watch pornography and forced women to have sex in different positions the women were not comfortable with. While talking to the village computer shop owner it was found that pornography or adult movies were very popular in the village. He said that increased use of smartphones made those videos or movies easily accessible by the rural people.

6.2.2.3 Sociocultural and Religious Restrictions and Monitoring

Access to and use of technology by the women made them comply more with sociocultural and religious restrictions or mores. In Chapter 5 (Section 5.4), socioculturally and religiously expected ways of using ICTs for the women have been discussed. From women's experiences, it was understood that they are regularly monitored by the family and community whether they complied with those restriction or not. Smartphones were extensively used to listen to religious lessons not only by the women but also their husbands, families, and the communities (see Chapter 5, Section 5.4.2). Using smartphones for accessing religious videos has become very popular among the Muslim people at rural level. Increased use of smartphones and Internet has made those videos more accessible where women and their families and communities blindly trusted all the information from those videos.
Many of those videos were about women's lives and how the husbands should control their wives in certain ways which were labelled as the right ways according to the religion. For example, some of the women showed or talked about the videos where the religious leader said that women should not use mobile phones, and should not work outside home as these will lead them to disobeying Islam and '*parda' (seclusion). These videos and discussions* by the religious leaders were found to be very influential in the lives of women and their families. One of the PROTIC women said,

> *A couple of months after I started using the smartphone, my husband asked me to give the phone back to the project people. He said that using smartphones and Internet is not good for women as I may have to compromise my parda (seclusion). He learnt it from the huzur (religious leader). I then made him understand that I will not use my phone in such way that compromises parda. WPB2 (31)*

Some of the videos and discussions directly supported domestic violence against women by their spouses. One of the women said,

My husband said that if I fail to take care of his parents properly or disobey them, he will never forgive me. 'Huzur' (religious leader) also said that husbands have every right to punish their wives if wives fail to undertake their responsibilities, even husbands can get new wives. WnPE2 (26)

In some of those videos, *'huzurs'* (religious leader) also talked about teasing of girls by boys. They tried to justify that teasing incidents happened because of girls' *'beporoya cholafera'* (desperate behaviour) without maintaining the *'parda'* (seclusion). In those videos. they directly recommended that girls should be punished for teasing not boys.

The above-mentioned discussion shows that increased access to smartphones and Internet helped women and their families to have easy and frequent access to religious discussions. Religious is a very sensitive issue in the context of Bangladesh and most of the people blindly trust any information that is presented by any religious leader. Most of the cases, those religious videos were negatively impacting women's position in their families and in the society.

6.2.2.4 Surveillance and Monitoring

As discussed in Chapter 5 (Section 5.3.6.1), women and girls participating in this research either used a shared family phone or had to share their own phone with others. Their activities using the phones were monitored by their husbands or family members including fathers or brothers on a regular basis. Very few women mentioned it as 'monitoring'; rather most of the women believed that their husbands or families did it for their betterment and others considered it as the prerequisite for accessing and using their mobile phones.

This monitoring happened either by accessing their devices or by monitoring their activities offline and online. Non-PROTIC feature phone users faced offline monitoring while smartphone users faced both offline and online monitoring. It was evident from the interviews and FGDs with PROTIC women and their spouses that most of their smartphones were checked regularly by their spouses to see if their wives were doing anything socioculturally or religiously 'unexpected' or 'wrong'. The husbands also said that they checked their wives' call history, SMS and Facebook activities including what posts they shared or were tagged in, and Messenger chat history.

After coming back from work I checked my wife's phone every night. I must check it and keep her in the right way. NGO has given the phone but they will not take any responsibility if anything bad happened or if they respond to a trap. My respect my family will be affected. SA3 (38)

Most of the PROTIC women did not use a security lock or password to access their smartphones. Some of them used a password supported lock though they shared that password with their husbands and family members (sons, daughters, brothers) so that they could also access and use the smartphone. In the same way, spouses and family members or whoever had physical access to a woman's smartphone could access the woman's Facebook account as well. In terms of sharing Facebook passwords, most of the PROTIC women said:

We do not share our password with anyone……The husband will definitely know because they are our husband and they have the right to know what we do. NGO apa and bhai (local NGO staff) are our teachers as they taught us everything. So, they know our password. WPA6 (29)

Most of the PROTIC women did not change the password set by the NGO staff after opening their accounts. Non-POTIC smartphone users also shared their passwords with their husbands and close family members like sons, daughters, and brothers.

Some of the women, both PROTIC and non-PROTIC, who used smartphones said that their social media activities were also monitored by the family or even extended family members by following them online. One of the PROTIC women said:

> *In the beginning, I set my photo as a Facebook profile picture but it has created lots of problems in my life. My relatives started calling my husband to remove my photo. They did not accept it and considered it as violation of 'parda'. I immediately removed my photo and set a photo of a flower as my profile photo. Later, I posted my photo with 'parda' (covering head and some parts of the face) as staff (NGO staff) requested me to do that. WPC2 (32)*

Women also had to report their activities and family financial expenditures to their migrant husbands over the phone. Some of them said they took notes of every financial expenditure including food, stationary, children's books, NGO loan repayment instalments, family farming costs, and loans to other family members so that they could report to their husbands whenever the husbands wanted.

Women also reported regular monitoring by the NGO staff and expectations that they complete some of the regular activities required by the project. Women said that sometimes those requirements clashed with their priorities and practicalities and created tensions in their lives. For example, NGO staff mostly encouraged women to use their phones by themselves but the women's reality did not always let that happen.

> *Project staff always encouraged us to use the phone by ourselves. I could not use it much at the beginning as my husband mostly used it. Project staff discovered it and told me if I do not use the phone more, they will take it back. At that stage it was very difficult for me to make my husband understand or take the phone from him. WPB8 (26)*

6.3 FURTHER CHALLENGES TO WOMEN'S ACTIVE ENGAGEMENT WITH ICTs

This section particularly answers RQ2: What factors influence women's active engagement with ICTs?

6.3.1 Literacy, Skills and Infrastructural Issues

Women talked about various challenges which impact their access to and use of ICTs. As mentioned in earlier Sections in this chapter, their low literacy and lack of skills or experience in accessing and using ICTs were the most commonly identified challenges by the women.

Use of both feature phones and smartphones was related to their convenience and skills. Some of the PROTIC women said that they were more comfortable using feature phones as they had been using them before getting the smartphones from the PROTIC project. Consequently, they continued using their old feature phones with their PROTIC phones.

As part of their technological skill development, PROTIC women received training and assistance from the staff to learn how to operate their smartphones. Most of this training was introductory such as introductions to the smartphone functionalities, Facebook or PROTIC apps and were organised only once or twice throughout the project cycle. However, most of the PROTIC women participating in this research reflected that regular training and refreshers activities would be helpful for them to learn to use their devices more efficiently.

Lack of skill to extensively use the functions available in a smartphone was also highlighted as a challenge by the non-PROTIC smartphone users. One of the non-PROTIC women from the southern PROTIC village said:

> *I bought my touch phone with my savings. My younger brother is an expert user and he sometimes shows me how to use that. My brother opened a Facebook account for me but I do not understand most of the things in Facebook yet. I need to learn the things to operate my phone but my brother explains things so fast, sometimes I cannot quite figure out what he refers to. I like to watch Indian Bangla TV serials in my phone and I have to pay money for buying (downloading) those videos from the computer shop and buying mb (Megabyte) WnPA3 (23)*

Otherwise, there was not much support available for women's technological skill development. UDC had vocational training in their list of services but in practice only one training session was reported, organised by one of the male UDC entrepreneurs in the southern area. He also reported that only one girl enrolled for that training. Boys were also encouraged more than girls to learn to use technologies such as computers. As a result, women faced more difficulties while doing ICT related jobs e.g., UDC entrepreneurs. Out of seven female UDC entrepreneurs participating in this research, only one had received computer training before she started working as an entrepreneur. The other six women mostly learnt using computers through on-the-job training or from their brothers or relatives. According to them, it was a challenge to perform better and work more independently in their roles. Most of them worked under their supervision of the male UDC entrepreneur although officially both of them were partners at the same level. While reporting on her role, one of the female UDC entrepreneur said:

> *I mostly type documents in word for birth, death or citizen certificates and job applications and then take the printouts. Usually, bhai (the male entrepreneur) allocates tasks for me based on the requirements and I try to manage accordingly. UY1 (22)*

Women also reported infrastructural challenges including poor network connectivity and electricity issues. Most of the women who used both smartphones and feature phones (see Figure 6-2), said that they used feature phones because they were more power efficient than smartphones. One of the women from the north-eastern PROTIC village said:

> *With full charge I could use my feature phone for two to three days but the smartphones needed charging at least once a day, sometimes two times depending on the usage. WPC2(32)*

Figure 6- 2. A woman with her smartphone and feature phone (Photo by A. Sarker)

Charging phones was an issue in both northern and north-eastern villages because mains electricity is not widely available in those areas. Some women had access to rural electricity supplies but still they experienced regular power outages. As a result, many women had to take their phones to the local markets to get charged and they had to pay for that service. Local village markets are not very close to most of the communities of this research. This could mean having to travel 3-5 km and more for the north-eastern wetland villages where local transportation and communication is very limited because of the ecological issues reported in Chapter 5. One of the women interviewed in a northern village PROTIC village said:

> *It is difficult to charge the touch phone (smartphone) as I usually do not go the market, I had to request someone (husband or sometimes neighbours) to take my phone to the market and every time I have to pay 10 taka (BDT). Sometimes I ask my neighbours who have electricity at their homes, but most of the time they refuse. So, I use the 'button phone' (feature phone) to make and receive calls and 'touch phone' for using Facebook which saves charge. WPB1 (35)*

6.3.2 Issues Related to Information Quality

Most of the women showed blind trust regarding any information available online either as written form or as videos. When they searched for something online in Bangla, most of the time they trusted the information they had received without further assessing the quality of the information. Almost always, they chose the first option from the search result. While discussing menstrual cycle, hygiene and management issues, one of the women said, she had stopped eating protein during her menstruation as she found from someone's post in Facebook that eating protein while menstruating was not good for women. Women also believed in different posts in Facebook including religious posts and support or donation seeking posts without further assessing the quality of those information.

6.3.3 Financial Issues

Women also highlighted the challenges of managing expenses related to ICT usage. As discussed in Chapter 5 (Section 5.2.2), most of the rural women who participated in this research had very limited, or in some cases no say in the financial decision making of the family. For PROTIC women, certain costs related to their smartphone usage were supported by the project including a data bundle and a free call centre service. However, most of the PROTIC women said that their spouses or families did not allow them to spend money on their smartphone usage which resulted in limited use of their smartphones and access to the Internet. One of the women from the southern village said that her husband got angry and scolded her when she spent money to buy Internet access with the money from poultry farming. For that reason, she had stopped spending money on her smartphone as she did not want any conflict in the family.

Financial issue was also one of the main reasons for not using the Internet by non-PROTIC women regardless of using smartphones or feature phones. In most cases, either the husband or the father or the brother in the family decides the family expenses and they do not consider it is worthy to spend money on using the Internet in women's phones. One of the spouses of the women from the northern village said:

> *We have to lead our lives with my limited income. Sometimes I struggle to recharge my phone as well and if you calculate, it is a couple of hundreds of Bangladeshi taka in every month. That is why I asked my wife to use the phone to communicate with me whenever they really need it. The Internet is not needed for regular communication. SE4 (36)*

6.3.4 Self, Family and Sociocultural Restrictions

Almost every woman who participated in this research talked about the role of their families where families did not accept their access to and use of ICTs unconditionally. Most family members of the rural women considered that ICTs and the Internet were more appropriate for their boys than girls, for their study and job-related information. They also believed that men were more efficient users of ICTs than women. A good number of PROTIC and non-PROTIC women also counted themselves as less efficient mobile phone users, and more specifically the smartphone users, compared to their husbands or other members of the family, e.g., sons, brothers, brothers-in -aw, and sometimes daughters. One of the PROTIC women said:

> *My husband is an expert in using touch phone. He better understands Internet and Facebook than me. He can also use other difficult Internet functions. He runs my Facebook sometimes as he understands it better. WPA4 (32)*

Both male and female UDC entrepreneurs also highlighted the challenges that female entrepreneurs face from their families to continue their jobs as UDC entrepreneurs. One of the women UDC entrepreneurs who would have to quit her job after her marriage said:

> *I have been working here in the UDC for almost a year. My family was very concerned if it could negatively impact my character as a potential bride. My father and younger brother kind of accepted my job as I was able to support them financially. While setting my marriage, my in-laws and husband did not accept my job outside home and my father had to commit that I will leave my job soon. They said women of their family were never allowed to work in 'bazar' (market) and my job was a threat to their family reputation. UX3 (24)*

Women also faced challenges at community and social level. Using ICTs was not considered a good thing and particularly young unmarried girls' use of ICTs was not widely encouraged by the rural community. As discussed in Section 6.2.2.3, religious restrictions also influence women's access to and use of ICTs. Apart from that there was also a common misconception that women were not capable or skilled enough to use ICTs efficiently like men. Women UDC entrepreneurs shared that community people did not widely accept their jobs at the UDCs. Most of the villagers also did not believe in their efficiency in accessing and using ICTs. One of the women UDC entrepreneurs said:

> *I hardly get clients as most of them prefer to be served by my male colleague. We face various technical difficulties including power cuts, low speed Internet etc. here in the UDC. Sometimes, it takes more time because of these technical issues but people most of the time think that I am not efficient enough whereas they never question the efficiency of my male colleague. UX5(26)*

6.3.5 The Heavy Burden of Household Responsibilities

Women also mentioned their heavy burden of household responsibilities which did not allow for adequate free time to learn and use new technology. Women started their day before everyone else in the family and went to bed after everyone else. Most of the PROTIC women said they used their phones and social media at night after finishing all the household responsibilities. With few exceptions, most of the spouses and families were not very cooperative in sharing women's household responsibilities. Apart from regular household activities, some of the women also worked as day labourers and actively participated in the family farming. Apart from that they collected drinking water from miles away on a daily basis (in the southern area), collected young shrimp from the river during ebb and flow tide two times in a day (in the south), cut and carried grass for livestock from miles away riverine islands (in the northern area). Therefore, managing time was a real issue for them. At the same time, most of the families did not accept their use of technology before finishing their household

responsibilities. This issue was mentioned by the mothers-in-law in the FGD organised with the family members of the women.

6.3.6 Expectations and Priorities of the NGOs

PROTIC women said that they were mostly encouraged to post more about their farming of crops, fish, crabs, poultry and livestock. PROTIC staff expected them to share the positive changes related to their farming and increased agricultural production as part of PROTIC.

> *If I do not have time during the day I try to post something on Facebook at night as the staff always encouraged us to do that. I regularly post the SMS that I get from the project on my phone and sometimes some photos of my vegetable garden. It makes them (project staff) happy. WPB4 (24)*

As part of certain expectations from the NGOs, women posted mostly agricultural, rather than personal, posts. In some cases, the NGO workers talked about particular institutional monitoring over them to set those expectations. One of the project staff said:

> *We always encourage to make agriculture-related posts rather than personal something as it is directly linked to the project objective and outcome. We also get monthly feedback from Oxfam on our Facebook posts and calls made by our participants. If the progress is not up to the mark then it seems like we have not played our part. Both our organisation and Oxfam considered it as result of our performance. NL2*

Both PROTIC women and the NGO staff said that physical access to women's smartphones by the local NGO staff occurred on every month. Sometimes it happened when women faced difficulties with their phones and other times it happened as part of their regular activities. One of the project staff said:

> *Though women say that their husbands do not use their phone but this is not completely true. Almost 90% of their phones are used by their spouses regularly and members of the family at least occasionally. While checking we also find porn sites in their search and watch history. We always encourage women to try to use their phones more than sharing with the family members. NL5*

Most of the PROTIC women said PROTIC staff did not ask them about the challenges and violence they faced in their lives. In response to this issue, the project staff said there was not much scope and time in the project activities if women faced any kind of personal challenges related their accessing and using smartphones. Project staff conducted both monthly doorstep visits and monthly meetings with the participants. In both cases, they focused on understanding how women accessed and used the information to support their increased agricultural production. While attending I observed that the monthly project meetings were conducted based on set agendas to discuss:

- all the SMSs women received from the project in a month
- how they used the information from the SMSs and OBDs
- how many calls they made to the call centre
- with whom they shared their learning
- changes made to their agricultural production.

The project staff played the key role to control the discussion of the meetings and sometimes it limited the spontaneous participation of the participants. The meetings followed a set of agendas and sometimes it did not allow participants to have open discussion which might not be in the agendas but important. For example, Participants were expressing the challenges of marketing their crops and not getting proper prices where the facilitator was only interested to listen to that project participants

got increased agricultural production as they are getting information support and guidance from the project.

Based on my understanding of Bangladeshi culture and from the interviews with local NGO staff, it was clear to me that the NGO staff and the working culture of the local organisations are influenced by the traditional patriarchal norms and beliefs. NGO staff also mentioned that their organisations did not quite support or encourage the staff to directly deal with any violence or sensitive issues happening in the field. Most of the time they avoid dealing with the local power structure and let the local authority and community to deal with that.

From the interviews with both Oxfam and local NGO staff, it was quite evident that the written objectives, indicators, and activities of the project dominated the whole process of implementation. From the selection of participants to the evaluation of the project, those indicators were the key to monitoring the success of the project. In the case of selecting rural women as participants, staff had some unwritten preferences, for example, prioritising women who had some literacy or prioritising women aged under 35 years. One of the NGO staff said:

> *At the beginning of the participant selection process, we did not consider the literacy status as one of the main factors for selection. After handing over the smartphones, we saw that women with no literacy and women aged over around 40 or 45 had struggling to learn and use their smartphones. For the effective running of the project, we had to do some re-selection and replacements of some of the existing participants with younger women and women with minimum literacy. NL4*

Project staff said they had to prepare reports based on the indicators mentioned in the project proposal and success stories. Because of this, they sometimes missed some of the issues. Oxfam staff also mentioned donor reporting priorities and funding requirements. One of the senior managers of Oxfam said:

> *Addressing sociocultural issues for empowering women is vital but managing donor funding for that is difficult. Visible and quantifiable impacts are preferred by most of the donors and bringing visible sociocultural changes within three years is not realistic. So, in most of the cases the main objective is economic empowerment with sociocultural issues 'on the side'. This way sociocultural issues never become the main issue to address. NI1*

6.4 RESPONSES TO THE CHALLENGES

Most of the adolescent and young girls who participated in this research said that they had secretly or covertly used devices belonging to friends, brothers or parents. Girls aged between 13 to 18 mostly shared that they knew about social media and sometimes covertly used the Internet and social media on their friend's or siblings' phones but they usually did not share this experience with their parents. One of the adolescent girls said:

> *Most of our parents think that the mobile phone is not good for us as if we will always end up having love relations with boys or unwanted pregnancies. I believe it can also be used in many positive ways for a better life but we do not know much about that. We also feel uncomfortable and shaky when we try to use something unknown on anyone else's phone. AGA2 (17).*

A number of women, particularly the young women, said that they preferred not to use their phones in public to avoid being judged by the community. One of the young women who is a school teacher in a kindergarten said:

I try to avoid using mobile phone when I am outside home. If I need to talk, I try to finish as early as possible. By seeing me talking over phone, one of my neighbours thought I had a boyfriend. That was so embarrassing for me and my family. It took a while to make people understand that it was a rumour. I now prefer to talk over phone while at home. If I have to talk I usually communicate with people when I am at home. WPA1 (19)

Young girls who lived outside of the village for study purposes commonly reported a different experience of dealing with social stigma and family non-cooperation. One of the young girls from the southern village said:

After admission into college, my father bought me a smartphone and I am now using it. I frequently use my phone when I stay in the hostel but when I come to visit my family in the village, I use my phone in a limited way for making urgent calls or SMS only. My family always discourage me not to use phone much and I do not want to have unnecessary concerns. WnPA1 (19)

Most of the women and girls who participated in this research said that they proactively share their phones with their husband and family members. They believed it was helpful to avoid any kind of misunderstanding. In Section 5.3.6.1, women's shared access to and usage of ICTs was reported. Most of the women said they always cooperate with their spouses or family members if they want to check their call log, Facebook account or other activities on the phone. As discussed in Section 5.4, women said they always tried to make their family, relatives and community believe that they did not use their phones for anything that is not accepted by their families. One of the PROTIC women said:

If I do not share my phone with my husband, he will think that I am hiding something. Sometimes I ask him to use my phone which helps him to trust that I am not using the phone for anything bad. WPB5 (24)

Avoiding using their mobile phones while doing household tasks was also discussed by the women. In the FGDs, spouses and family members also raised the issue that women's access to and use of mobile phones made them less responsible for their household duties. Women also addressed this issue; as one of the PROTIC women said:

I use my touch phone after finishing all my household work. I do not give any reason to my mother-in-law or my husband to say something against my phone use. WPB4 (24)

Some of the women who are more advanced level users of smartphones said that they sometimes delete their activities including call logs and SMS to avoid unwanted concerns by their family members. One of the women said:

If I get any call or SMS from unknown numbers my husband gets very concerned. He also does not like me to talk to my cousin brother who lives overseas. So, whenever I talk to my brother or got any unknown call, I simply delete those histories. Otherwise I have to explain the same thing a hundred times and still he will not be convinced. WPB4 (24)

As discussed in Section 6.3.5, NGO staff accessed women's phones to check what they used in their phones. Some of the advanced level PROTIC smartphone users said that they regularly deleted the Internet browsing and watch histories in their phones. One of the women said:

My husband uses my phone sometimes. Whenever he uses my phone, I clear the history so that the staff cannot find that he used the phone. I do not want any unnecessary tension in my life. WPA7 (25)

6.5 UNDERSTANDING EMPOWERMENT

From the field data, it is quite evident that empowerment was understood in various ways among different groups of participants including rural women, their spouses and family members, and NGOs. Even participants from the same groups did not necessarily perceive empowerment in the same way. In this section, the perspectives and factors of empowerment are reported.

6.5.1 Perspectives of the Women

As a concept 'empowerment' was complex to explain to the rural women. While conducting the interviews or FGDs, it was difficult to use the Bangla word for 'empowerment' which is '*khomotayon'* as it was hardly making sense to the women. That Bangla word was not used in their regular life activities at village level. Some of the PROTIC women who were connected with development projects for a long time had heard this word *'khomotayon'* from the NGO staff, but they could not relate it much to their practical experiences.

Considering the situation, I tried to explore similar words or expressions from the discussion with the women to understand how they describe their sense of empowerment. I gradually explored and incorporated those expressions into the FGD and interview discussions for my Grounded Theory research.

It was thought-provoking to understand how women conceptualised 'empowerment' and how they related it to their practical lives. Some of the women used the Bangla terms for 'women's development' and 'women's advancement' to express their understanding. Some women expressed empowerment with some scenarios like 'women leading a happy life', 'can do whatever they want', or 'getting support from the family'.

Some of them identified the factors for empowerment or advancement more easily, whereas others had to struggle to think about them. The factors identified by the women were also diverse. The following stories will help to explain the various understandings of empowerment perceived by the women in this research. They also indicate their thoughts on empowerment and the influential factors that they thought foster the empowerment process. These stories were collected during the interviews, FGDs and the initial findings sharing workshop.

Story 1

One of the PROTIC women who was 34 years old, had studied up to class nine, and had also been involved in development projects for more than six years said:

> *I think I know what is 'khomotayon' (empowerment). Someone discussed it in our project training. Project staff also talk about this sometimes in project meetings. I think empowerment is advancement and stepping forward. For women, it is very important to step forward in our lives. I think, earning money is the most important factor that can lead to women's empowerment. If women are able to contribute to family expenses, they will have a say in the family…. We have different challenges that restrict our ways towards empowerment and I think we do not get the required support from our families to be empowered or to do something independently.*

Story 2

One of the non-PROTIC women who was 33 years old and studied up to class eight and had previously been involved with development projects for three years said:

I believe empowerment means something like development like the NGO project does. I think, education is important for development. It will be better if we can have our own job and earn money for ourselves and family. If I could complete my studies, I could join a job. I got married when I was in class eight. After my marriage, my in-laws decided not to continue my study. Then I got pregnant as they wanted me to have babies. I wanted my daughter to continue her studies but my husband decided to get her married at the age of 16. As a mother I had no say in the decision making of her marriage.

Story 3

One of the PROTIC women, aged 28 years, who had studied up to higher secondary said:

Women's empowerment will be achieved when we will be able to do something independently. I am using a mobile phone for the last four years. With this phone I can communicate with my parents whenever I want. Earlier I had to ask my husband to make a call to my parents and I could never share my feelings with my mother in private but now I can do that with my phone. I now manage most communications with extended family and relatives and I think that is a step to empowerment though my husband has not supported my use of smartphone unconditionally.

Story 4

One of the non-PROTIC women who could sign her name only and had never been involved with any development project said:

I never heard this word 'khomotayon' (empowerment) but I heard the word 'unnoyon' (development). I think 'unnoyon' is happening good things with us. Leading a good and happy life is 'unnoyon'. If we get a good husband who is caring and has a good income, we will be able to lead a happy life. It is also important to be a 'good woman' to lead a happy and developed life. Using mobile phones can contribute to have a happy life but we should not hide anything from our husband.

Story 5

One of the non-PROTIC women, aged 18 years, who was an honours student and had never been involved with any development project said:

I do not know about empowerment, but I think girls need to be treated equally in the family and society. We had to think a lot of things before doing anything but boys do not need to think much. For example, my parents were never willing to give me a mobile phone when I used to stay at home but my younger brother started using a phone before me. I have to ask for permission for everything that I do but it is not applicable for my brothers. Even now, when I am staying outside home for study, I still have to bear these things with me as a girl. It is good or bad I do not know but sometimes it is very stressful to comply with those requirements.

Women's understandings of empowerment mentioned in these stories are diverse. Their words also reflect what they considered as challenges towards their empowerment or advancement. The most common understanding of empowerment was considering 'earning money' or 'being involved with economic activities'. Most of the women thought that if a woman could contribute to her family expenses, she would have a say in the family.

During the initial learning sharing sessions, women reflected (wrote down or told anyone else to write down) on the criteria they think important for women's advancement or empowerment. They also

reflected on the challenges (only one) they faced towards their advancement or empowerment. The following aspects came out as most important factors from that workshop activity.

Aspects of empowerment:

- Own income
- Cooperation and support from the family
- Education
- Freedom of decision making
- Respect in the family and society
- Being a 'good woman' (maintaining good character)
- Equality (equal wages)

Challenges to empowerment:

- Unequal treatment in the family and society
- Family restrictions to women's independent mobility
- Lack of education
- Low wages
- Physically weaker than men
- No access or limited access to decision making

It was clear from the discussion sessions that women mostly reflected on individual aspects of empowerment or personal empowerment rather than collective empowerment. A debate started during the findings sharing sessions. The women who worked as day labourers said that they did not get any support from their more affluent peers in PROTIC to protest against the women's low wages.

> *We are in a group but our group leaders never raised the issue of women's low wage in the society. We only get 150 BDT per day where men get 250 BDT though we work for the same hours. Even when we work for our rich peers, they pay us less than men. WPA5 (29)*

In response to that point, women who were economically more solvent and could recruit day labourers in their fields said that:

> *This low wage is a social system, we cannot change it. We know we are in the same group but we cannot go against the social system. It is true that women cannot complete similar amount of work in the same time like the men do. They are also not suitable for hard work like 'preparing agricultural land and carrying heavy weights' which is a high payment work and men are only suitable for that. WPA3 (36)*

6.5.2 Empowerment Perceived by the Family

While exploring the understanding of empowerment among the rural women participants in this research, it was also important to understand the perspectives and thoughts of their family members and close relatives on women's empowerment and advancement. It was important because in most of the discussions with women, they talked about the family support and cooperation issue, and most of the women identified non-cooperation by the family as a challenge towards their advancement and empowerment.

During the data collection I first tried to identify the important actors among family and close relatives who play a significant role in the lives of the women in terms of their access to and use of ICTs, along with other important decision making and control in their lives. It was found that the family members

play the most significant role. For married women, the husband and in-laws play an important role. For unmarried women and girls, mostly their father, mother and elder brother, and in some cases even the younger brother, influence their access to and use of ICT.

After identifying the above-mentioned actors, I conducted focus group discussions with the spouses of the women and with the family members including brothers, mothers, mothers-in-law, sisters and other close relatives. It was very interesting to explore how they perceive the word 'empowerment'. Like many of the women, most of the spouses and the family members were not familiar with the Bangla word for empowerment *khomotayon'* except for a few. They were more comfortable understanding Bangla words such as 'advancement' or 'development', rather than 'empowerment'. In most of the discussions, spouses and family members agreed that education is an important factor for women's advancement as it introduces possible empowerment opportunities. Some of them also talked about the unequal social system which does not give equal status to women compared to men. Several debates occurred during the discussions among spouses and family members because most of them did not consider that social inequality is a problem. They thought women's position in society was exactly where it should be. One of the spouses said:

> *Women and men cannot be treated as equals because they are different. Women are good at doing household activities while men are capable of earning money or working outside. SB3 (29)*

Although some of the spouses and family members acknowledged that the unequal social system is a challenge for women's advancement, in later discussions no practical evidence was provided to support their statements. In some cases, their practical life situations contradicted their awareness of social inequality. For example, one of the spouses was a teacher in a college and his wife was also a teacher in a local school. While reflecting on women's education as an important aspect of empowerment, he said:

> *Education is a must for women to lead a better life. It is not only just for jobs but also for managing responsibilities more efficiently. My wife used to work in a school but when our first child was born, it became difficult for her to manage the household work and job. Then she left her job for our family. But sometimes women do not understand family situation which is not good for family. SA4(38)*

While talking about the benefits of ICTs, it became clear that the spouses' and family members' understanding of online activities and the uses of smartphones was not very clear. They only had a very general idea and some misconceptions. While the discussion initially focussed on the positive aspects of women's access to and use of ICTs, they later emphasised that women's access should be limited to family members or close relatives to avoid potential risks.

While talking about empowerment, spouses and the family members of the women talked about their 'family culture'. This does not mean any particular culture, rather it is a culture of normalising gender and sociocultural inequalities in conservative environments. For example, one of the family members of the women said that:

> *The mobile phone nowadays dragging women outside home which I do not think always good, depends on the family. In our family, we do not have any history of women or girls working outside. Men always took that responsibility for outside work and women managed the home. Even when my father-in-law died suddenly and my husband was not earning money, my mother-in-law still did not allow me to work outside. This is the rule of our family (she used the Bangla word 'niyom' for the English word 'rule') and I try to maintain that. FB3(40)*

6.5.3 Empowerment Perceived by the NGOs

Both Oxfam and local NGO staff expressed their understanding of empowerment mostly in terms of the way it was included and prioritised in the project documents. In the case of PROTIC project, it was about economic empowerment of women in agriculture. The project staff emphasised the following issues to achieve women's empowerment as part of PROTIC:

- Increased skills of technology use
- Increased agricultural knowledge.
- Increased income
- Increased mobility
- Participation in the market
- Participation in the family decision making
- Improved social position in the family and society

Some of them also shared their personal understanding about empowerment. As discussed in section 6.3.5, some of them highlighted the sociocultural aspects of empowerment whereas others thought that economic empowerment was the key to women's empowerment, with social empowerment being an outcome of that. For example, one of the local NGO staff said,

> *Earning money is the most important for the women to say something in their families. Otherwise, no one will listen to them and we cannot do much to make their families understand. When families see the visible outcomes (financial) happened through women's use of technology, they somehow accept it. NL3*

Some of the local NGO and Oxfam staff also reflected on the implementation of project activities, commenting that project activities were more focused on increased agricultural production and income by the women, and that no specific activities were designed to address their participation in decision-making and improving their social positions. However, improved social position is not due sole to economic empowerment, rather it need be addressed and achieved through particular activities.

6.5.4 Similar Context and Different Perceptions

From the data, it was quite evident that the idea of empowerment depends on the context and persons' point of views. In some cases, the same incident was marked as 'empowerment' by some people whereas others marked as 'shame'. For example, a number of incidents were revealed where married women were able to leave an abusive relationship after findings a new love over their phones. During FGDs, those incidents were repeatedly referred by the spouses, family members, community people and sometimes women themselves as negative impacts of women's access and use of ICTs. On the other hand, while talking to one of those women said,

> *Only because of my mobile phone, I could escape from that abusive relationship. My ex-husband had another wife in the town and he very occasionally came to me. He was very bad with me. I tried to end that relationship but no one supported me not even my parents. Then I got to know my current husband over phone. We became friends and after sometime we got married. This is my new life. WnPE7 (28)*

Some of the NGO staff also talked about those incidents and referred those as challenges for them to work and implement the project activities in the villages. One of the staff said,

When this kind of negative incident happens, we have to answer a lot of questions why we are supporting women's use of smartphones. Keeping the trust that we are supporting only good things for the women and community is difficult to be maintain. Even if any negative incidents (extra marital affair) happened with the non-PROTIC women, families of the PROTIC women become concerned and we have to make them understand that we do not support those decisions at all. NL4

6.6 COORDINATION, INFORMATION MANAGEMENT AND INFORMATION SHARING PRACTICES

During this research, different forms of information and interactions were found across different levels of PROTIC including community level, local level, national level and international level. The community level represents the village level, and the local level is the Union/ Upazila/ District level. From the experiences shared by the women, it was quite evident that they collected, preserved and shared different forms of information with different actors at the community level as well as with local NGOs. Women had very limited or no scope to directly interact and share information with actors across national and international levels. Sharing of information directly by the women had only happened when national and international stakeholders organised meetings or workshops or visited them in their villages which happened very occasionally. Otherwise, the rural women mainly worked with local NGOs, who then communicated findings related to project interventions and women's experiences with the stakeholders across local, and national levels and then national level stakeholder and in this case Oxfam in Bangladesh communicate that information with other national and international stakeholders.

Table 6- 2. ***Information collection, management and sharing practices among different stakeholders involved in PROTIC***

Different levels	Forms of information
International Level (International partners including universities, research org., donor org.)	• Project Reports • Event reports • Field visit reports
National Level (Govt., INGO, national partners including universities, telecoms, research org.)	• Project Reports • Event reports • Field visit reports
Local Level (Union/Upazila/District)	• Day to day visit reports • Notes • Project reports • Event reports (meeting/training) • Observation (not written)
Community Level (village)	• Individual stories (not written) • Group meetings (not written) • Project meetings (documented by NGOs) • Notebooks (only maintained by some PROTIC women)

Table 6-2 Information collection, management and sharing practices among different stakeholders involved in PROTIC. Overwhelmingly at a community level, information and knowledge are based on oral culture in the village setting in Bangladesh. Correspondingly, in this research, community people

and particularly women were found most comfortable in sharing their stories orally including PROTIC and non-PROTIC, literate or semi-literate or illiterate women. Most of the women who learned how to read and write in their childhood or completed primary education said that they are not that comfortable in writing as they did not write for a long time after childhood and the degree to which they continue to be active readers beyond a basic level is also variable. Thus, reading an SMS a medicine label can be too difficult for many women.

At partner NGO/union/upazila/district level, written information was generally required as part of PROTIC and organisational management for NGO work. Field visit reports by the staff, event reports, monthly or annual project reports documented by the local NGO staff and among those, project reports were the most common written document that was shared among partners. There are other forms of information which was collected by field project staff from the community during their regular visits and monitoring including observation notes but it was found that most of their observations were kept as personal and obviously fallible memory. Sometimes they took notes for themselves but they did not share this data or observations with other stakeholders and partners.

In Table 6-2, different forms of information are presented but only the highlighted forms were preferred by different stakeholders and decision makers. Sharing those particular forms was designed to support achieving planned goal of the project. This process impacts the information flow between different partners involved in PROTIC as it did not support ways to include reflective qualitative documentation of project activities and outcomes. As well as this, as noted, the production of knowledge and information at the community level may not even be accounted for.

During the discussion with field staff and also with the national and international partners, it was also said that the required skill that was necessary for the field level and national level staff was interpretive writing in Bangla and English. However, field staff said that they were not very confident writing reports (in English/Bangla) and they needed more training on writing qualitative reports. They also expressed that they were more comfortable in case of sharing their findings verbally. Another issue was the prescribed format where project staff said that sometimes they were not sure what to write in the report or if they could write anything beyond the required information as per the format. As a result, they did not use their daily field observation from their notes or their memories in the reports to OXFAM.

6.7 CHAPTER SUMMARY

In this chapter, an in-depth understanding about the impacts of ICTs in the lives of rural Bangladeshi women including both positive and negative was presented, answering RQ1c: What impacts (both positive and negative) have ICTs introduced into women's lives? as well as RQ2: What factors influence women's active engagement with ICTs? Positive impacts include their increased access to information; knowledge; learning opportunities; livelihood activities; and respect in families and in communities whereas negative impacts include online and offline harassments; increased sociocultural and religious restrictions; surveillance and monitoring; and domestic violence. Along with the negative impacts, further challenges including lack of literacy and skills; inadequate infrastructural support; financial issues; and the expectations of the NGOs were also reported. These challenges contributed to limit women's active engagement with ICTs which particularly answers RQ2 What factors influence women's active engagement with ICTs?

This chapter also presented a comparative understanding of empowerment among different groups of participants including the rural women; their spouses and families; and NGO staff. Women's empowerment was mostly understood as women's advancement or development at the village level. Women mostly highlighted having own income as empowerment whereas their spouses and family

members thought being a 'good woman' is important for women to lead a developed and happy life. On the other hand, NGO staff mostly perceived empowerment as economic empowerment as economic aspects of empowerment was prioritised in the development project design and implementation. Some of the NGO staff also expressed the importance of sociocultural aspects of empowerment and highlighted the issue of less prioritisations of social aspects of empowerment in the development programs. Coordination, information collection, management and information sharing practices as part of an ICT4WE or ICT4D initiative was also discussed based on the experience with PROTIC. It was found that existing practices of information sharing and management did not consider the communication of information sharing across different levels including community, local, national, and international involved in an ICT4WE initiative. This could result in a lack of in-depth understanding of the experiences of the participants and other stakeholders. Existing information sharing mostly happened from local project staff to national stakeholders to international donor where there were no the direct participation opportunities available for the women or the community people to communicate their vices across different levels involved in the project. Local NGOs were in-charge of collecting and sharing information from the communities and most of the cases it was limited to the set agendas related to the formal reporting requirements. The discussion of these findings of Chapter 5 and 6 will be presented in Chapter 7.

PART 3: THE MODEL AND CONTRIBUTIONS

This part of the thesis consists of two chapters, Chapter 7 and Chapter 8, which include the discussion of the findings, development of a substantive model, and summary of the key findings and contributions of this research.

In Chapter 7, I answer Research Question (RQ) 3: How can the use of ICTs contribute to the empowerment of rural women? I do this by identifying all the elements that need to be considered in enabling women's empowerment and presenting the substantive grounded theory model of ICT4WE. This model has been developed using the lens of Critical Research and will enrich the theoretical and methodological landscape of ICT4WE, ICT4D, and IS research by focusing on context-based information and process-oriented description and explanation.

New knowledge generated by the research clarifies how women's experiences with ICTs are influenced by various contextual and intersectional factors will assist development organisations, policy makers, government bodies and other relevant stakeholders to co-design more appropriate and sustainable ICT4D programmes by adequately reflecting the needs, challenges and priorities of the rural women.

In Chapter 8, I present a summary of the key research findings by answering RQ1: How do ICTs impact rural women's lives? RQ2: What factors influence women's active engagement with ICTs? And RQ3: How can the use of ICTs contribute to the empowerment of rural women? I also present the summary on contributions, and future research agendas. Chapter 8 also frames the practical and methodological contributions of the research. The practical contribution includes a set of recommendations for stakeholders to facilitate context-specific ICT design and implementation support for rural women's empowerment. These recommendations will also contribute to localising United Nations SDGs, particularly SDG5: to 'achieve gender equality and empower all women and girls' through the use of ICTs. The methodological contribution of this research will guide future researchers to be responsive to the sociocultural requirements which will result in more effective application of qualitative research methods to collect intensive data.

CHAPTER 7: DISCUSSION OF THE FINDINGS, DEVELOPMENT OF THE MODEL

7.1 CHAPTER OVERVIEW

This chapter presents the theoretical model and practical considerations of the results presented in Chapters 5 and 6. Consistent with Constructivist Grounded Theory Methodology, these concepts are my constructions from data gathered during first and second rounds of data collection. Discussions on research findings have been organised according to the dimensions and facets of the model and in doing so I answer RQ3: How can the use of ICTs contribute to the empowerment of rural women? Where relevant, the discussion also highlights how my research findings are similar or different to the findings of existing research on ICT4D and ICT4WE in similar contexts. This comparison helps to situate the findings into a wider context by comparing similarities with existing theories and concepts as well as the uniqueness of this particular research context.

7.2 THE ICT4WE MODEL

The ICT4WE model (Figure 7-1) represents a complex process of interconnected dimensions and facets within each dimension to support appropriate design and implementation of ICTs and ICT-supported women's empowerment interventions. This multidimensional model shows how ICTs and ICT-based initiatives can effectively contribute to women's empowerment by addressing context-specific needs, challenges and priorities.

This model is supported by a table (Table 7-1). The overarching model represents a process and the table provides an explanation of the dimensions and facets of the model and their interconnections. The table also presents considerations for designing and implementing ICT4WE and ICT4D initiatives related to the dimensions and facets. The model, along with the table, is the theoretical contribution of my research and is also the basis of the practical considerations and recommendations for the researchers, practitioners and stakeholders involved in ICT4D and ICT4WE.

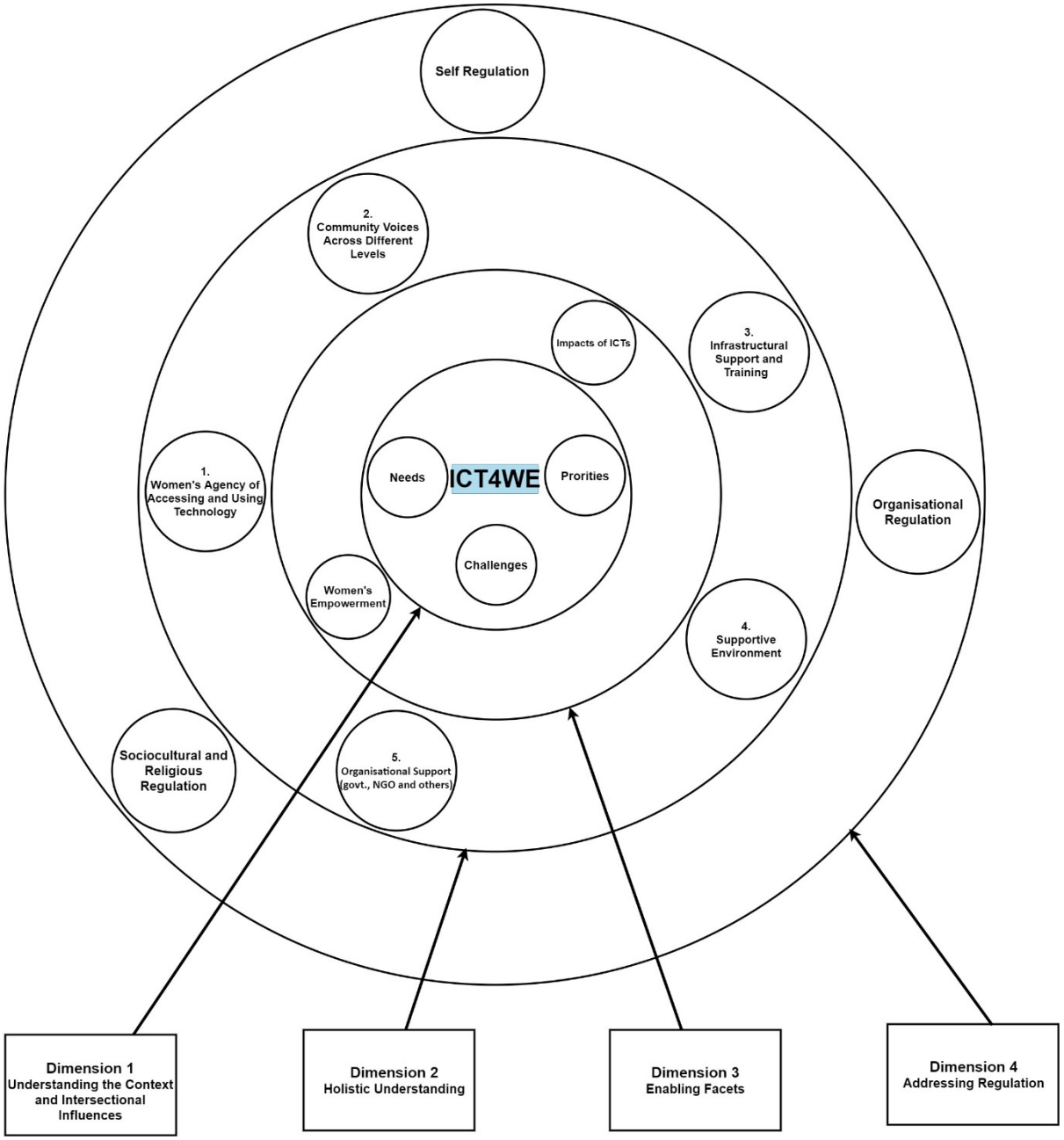

Figure 7- 1. ICT4WE Model

Figure 7-1 presents a multi-dimensional view of the ICT4WE model. The dimensional arrangement of this model has been inspired by Upward's records continuum model (Upward, 1996).

The multi-dimensional view of this ICT4WE model contains the context-specific insights and comprehensive understanding of the contextual nuances derived from this research. The model consists of four dimensions, each of which is a foundational construct of the model. The dimensions are represented through four circles, from the inner circle representing Dimension 1 to the outer circle representing Dimension 4. These dimensions identify considerations which will enable researchers and practitioners to undertake a more valid and rigorous investigation of the understanding, design and implementation of ICT4WE initiatives. Dimensions 1 and 2 reflect the need to understand the context, whereas Dimension 3 and 4 suggest actions and represent ways of addressing the context-specific issues of Dimensions 1 and 2.

- **Dimension 1: Understanding the context and intersectional influences** emphasises the understanding of context-specific needs, challenges, and priorities.
- **Dimension 2: Holistic understanding** highlights a holistic understanding of both women's empowerment and the impacts of ICTs.
- **Dimension 3: Enabling factors** identifies the enabling factors for designing and implementing ICT4WE and ICT4D initiatives.
- **Dimension 4: Addressing regulation** is about considering challenges and regulation at different levels of those initiatives including self, sociocultural and organisational.

Dimensions are not independent but interconnected. Following the dimensions chronologically from 1 to 4 is not mandatory as the model is not presenting any pre-determined process. Rather, all the dimensions need to be considered iteratively for better understanding of the contextual requirements and in addressing those requirements as part of a complex process. Overall, the model emphasises the need to understand the context while designing and implementing any ICT-supported development or empowerment initiatives for the women.

Interconnections among different facets within the dimensions are also reflected. In Dimensions 1, 2, 3 and 4 smaller circles have been used to represent facets within that particular dimension. Using smaller circles to represent facets within each dimension has been particularly helpful for better organisation of the information. Table 7-1 further explains the dimensions and facets of the ICT4WE model. It also presents the considerations and interconnections between different facets within the particular dimension to better understand the model and its functionalities.

Table 7- 1. Considerations to implement the ICT4WE model

Dimensions	Facets	Considerations	Interconnections
Dimension 1 *Understanding the context and intersectional influences*	**Facet 1** Needs **Facet 2** Priorities **Facet 3** Challenges	The following considerations are important for understanding the context and intersectional influences including needs, priorities and challenges faced by the women: • Studying women in their own contexts • Allowing adequate time to collect quality data that truly represents the situation on the ground in both formal and informal settings • Understanding women's experiences based on various	All three facets are interconnected (see Section 7.3.1.

Dimensions	Facets	Considerations	Interconnections
		intersectional dimensions and identities including class, age, religion, ethnicity, marital status, literacy and skills • Understanding women's context-specific needs, priorities and challenges	
Dimension 2 *Holistic understanding* Dimension 2 emphasises holistic understanding of the impacts of both ICTs and women's empowerment rather than understanding them partially or in isolation.	**Facet 1** Impacts of ICTs	Considerations related to holistic understanding of impacts of ICTs are: • Understanding the positive impacts • Understanding the negative impacts • Considering both the success stories and the stories of failure as part of ICT4WE and ICT4D initiatives	Both women's empowerment and impacts of ICTs are interconnected and influence each other. (see Section 7.3.2)
	Facet 2 Women's Empowerment	Considerations related to holistic understanding of women's empowerment are: • Understanding women's empowerment in theory • Understanding women's empowerment in practice - Perspectives of women - Perspectives of their families	

Dimensions	Facets	Considerations	Interconnections
		and communities - Perspectives of government and NGO • Understanding the interconnections between theory and practices by women and other stakeholders • Applying the above to contribute to the holistic design of ICT4WE and ICT4D	
Dimension 3 *Enabling facets* Dimension 3 represents the major areas of consideration for designing and implementing ICT4WE initiatives along with their interconnectedness. Five facets are identified as part of this dimension.	**Facet 1** Women's agency in accessing and using technology	Women's agency in technology use and access to information is important for their empowerment. The following considerations support women's agency in technology use: • Ownership of ICTs • Literacy and skills to support active engagement • Control over access to and use of ICTs	All five facets are interconnected and can influence each other (see Section 7.3.2).
	Facet 2 Community voices across different levels	Understanding and communicating women's and community voices from the local to the global level is vital to ensure the incorporation of women's needs and priorities in the design, implementation and advocacy of ICT4D and ICT4WE programs. • Understanding an effective and authentic community voice free of domination and filtering	

Dimensions	Facets	Considerations	Interconnections
		• Ensuring proper arrangements to encourage direct participation of the women, their families and communities to reflect on the ongoing ICT4WE and ICT4D initiatives • Collecting and managing the different forms of information available at different levels of the ICT4WE and ICT4D • Maintaining regular documentation of community voices as part of the project initiatives • Supporting convenient forms of documentation (including written, verbal or visual presentations) by the women and other stakeholders • Communicating information to different stakeholders using both bottom-up and top-down approaches	
	Facet 3 Infrastructural support and training	Infrastructural support and training are the most important prerequisites to the access and use of any technology. Infrastructural support and training include: • Device support	

Dimensions	Facets	Considerations	Interconnections
		• Technology use training • Economic support • Network support • Appropriate technology design • Appropriate apps development	
	Facet 4 Supportive environment	A supportive enabling environment is mandatory for the empowerment of rural women through ICTs. The following considerations are vital for creating an enabling environment to support rural women's active engagement with ICTs: • Creating mass awareness to support women's active engagement with ICTs at both local and national levels • Engaging immediate family (living in the same household) in the process of project design and implementation • Engaging community and incorporating their voices in the process of project design and implementation • Supporting social innovation to support community engagement and leadership to meet	

Dimensions	Facets	Considerations	Interconnections
		social needs in a sustainable way	
	Facet 5 Organisational support *(govt., NGO and others)*	Support by government and non-government organisations and other relevant organisations including telecommunication companies, research organisations and universities can significantly contribute to women's empowerment by using ICTs. The following considerations are important for supporting women's active engagement with ICTs: • Encouraging women's assertiveness in technology use • Executing open implementation beyond project-driven requirements only • Addressing local social power relations and structures • Applying a holistic understanding of women's positive and negative experiences with ICTs • Documenting and communicating both success stories and stories of failure as part of ICT4D and ICT4WE programs • Co-designing technology and interventions	

Dimensions	Facets	Considerations	Interconnections
Dimension 4 *Addressing regulation* Dimension 4 indicates three types of regulation that control women's active engagement with ICTs and women's responses to regulation. Regulation and related challenges are important to understand the context as well as women's responses to regulation which need to be considered in the design and implementation of ICTs and ICT-supported development interventions.	**Facet 1** Self-regulation	The following considerations are important to understand and address women's self-regulation: • How self-regulation functions • How women respond to self-regulation • How self-regulation impacts women's active engagement with ICTs	All three facets of regulation are influenced by each other where: • Sociocultural and religious regulation (Facet 2) strongly influence both self (Facet 1) and organisational (Facet 3) regulation whereas self (Facet 1) and organisational (Facet 3) have very minimum influence over sociocultural and religious regulation (Facet 2). • Both self and organisational regulation strongly influence each other.
	Facet 2 Sociocultural and religious regulation	The following considerations are important to understand and address sociocultural and religious regulation: • How sociocultural and religious regulation functions • How women respond to sociocultural and religious regulation • How sociocultural and religious regulation impact women's active engagement with ICTs	
	Facet 3 Organisational regulation	The following considerations are important to understand and address organisational regulation: • How the organisational regulation functions • How women respond to organisational regulation • How organisational regulation impacts women's active engagement with ICTs	

The model does not prescribe the actual steps to follow when addressing context-specific needs and priorities in ICT4WE and ICT4D. Instead, it provides guidelines to be used on a case-by-case basis depending on the particular circumstances. The actual steps or actions can vary depending on the contextual requirements and may vary in the same context over time. For example, the impacts of ICTs and women's empowerment can be different in diverse situations; therefore, Dimension 2 recommends a holistic understanding of these facets based on the context of the study.

The model specifically represents an attempt to communicate the findings of my research. My findings are context-specific and other aspects may arise in different contexts. Context-specific requirements and changes are addressed in this model by:

- emphasising the changing nature of context-specific needs, challenges and priorities
- identifying the influences and interconnections across dimensions
- emphasising the dynamic nature of the process through four different dimensions which need to be considered together

Considering the dimensions as a continuous process will support the appropriate design and implementation of ICTs and ICT-supported development and women's empowerment initiatives. By prioritising the active involvement of the participants throughout development programs, organisations including government, NGOs and the commercial sector will also be able to understand and address the challenges related to women's active engagement with ICTs. Development organisations are working to empower women but they need to consider sociocultural and infrastructural issues, government policies, and donor requirements. This context-specific understanding will be helpful to those conducting evidence-based advocacy and making policy recommendations at local, national and global levels to empower women by addressing their context-specific needs, challenges and priorities.

7.3 DISCUSSION OF THE FINDINGS

The results discussed in this section are organised according to the dimensions of the ICT4WE model. The ICT4WE model has provided a useful framework for analysing, understanding, mapping and discussing the current situation and practices related to ICT4D and ICT4WE in rural Bangladesh. It has also guided my framing of the practical and methodological recommendations of this research.

7.3.1 Dimension 1: Understanding the Context and Intersectional Influences

The findings of my research show that technology is not context-neutral but strongly influenced by context-specific needs, priorities and challenges. This finding supports the work of Gurumurthy (2004), who presents the idea that the mainstream views of technology often take it for granted that technology is useful, but do not consider how the interpretation and use of technology is itself influenced by society. From the women's experiences in my research, it became evident that their access to and use of ICTs not only depends on technical issues but is shaped by sociocultural and contextual factors. Therefore, both the social and the technical, and in particular, the subtleties of their conditional intertwining, need to be considered in ICT4WE initiatives.

The lens of sociomateriality is important for the consideration of both the social and material aspects of technology use in a particular context; these are considered as inseparable by Orlikowski and Scott (2008b). My findings related to the PROTIC project show that similar types of digital interventions and information support did not have the same results in every location. The introduction of material technology had to contend with different contextual issues including literacy and skill levels, and economic, infrastructural, sociocultural and religious factors which ultimately determined women's experiences with ICTs in those locations.

Western ideas oriented to individualistic use and ownership of ICTs by a single person were not helpful in understanding access to and use of ICTs by rural women in this research because sharing ICT devices was quite common and culturally expected in my research. Women shared their ICT devices with a wide range of people including their immediate and extended family members, relatives, neighbours and colleagues (see Figure 5-6), and more regular and frequent sharing occurred with their spouses

and immediate family members. Prior studies have also noted this different sense of ownership and sharing of artefacts (including ICTs) between communally oriented societies and more individualistic western contexts (Hofstede, 1984; Sambasivan et al., 2019). Consequently, I have found that the dominant western understanding of digital privacy as an individualistic value is not applicable to societies like Bangladesh. Existing studies have also shown that women's mobile phones are often considered as family devices and men frequently violate women's digital privacy by inspecting their devices (Ahmed et al., 2017). My research findings also confirm that women's ICT devices are also purposely accessed and used to monitor and control their activities; this is further discussed under Section 7.3.4.1

Existing research shows that understanding and addressing context-specific information needs when designing information services can result in the effective transmission of information to women. Tithi et al. (2020) showed how location specific crop or livestock related information services and apps were successful for supporting women farmers in PROTIC. However, my findings further show that effective transmission of information to women is not enough to support women's empowerment with ICTs, and that women's practical challenges in accessing and using information also need to be considered. Consideration of the key factors related to women's challenges in accessing and using ICTs and information, including women's restricted mobility, lack of literacy and skills, lack of financial control over family expenses, social positions, and lack of contextual and infrastructural support, will assist the design of more context-specific and comprehensive ICT4WE and ICT4D initiatives. Otherwise, women may end up having access to information but very limited ability to use it. This can limit their empowerment.

From my research data, it was also found that women spend less time accessing and using ICTs compared to men. This finding is consistent with that of Huyer et al. (2005) who found that women in developing countries, particularly those in rural areas, have less time to spend using ICTs than women from developed countries. As the product of underlying gender-specific effects, women's lower degree of economic control, fewer learning opportunities and heavy burden of household priorities, including their children's education, household chores, and care responsibilities, only allow them limited access to and use of ICTs.

Apprehension about girls' access to and use of ICTs also creates a gap between girls and boys in terms of developing technical skills and safe ICT use practices. Along with the gap in technical skills, this conservatism in using ICTs in the family results in more hidden impacts. Limited access to technology does not mean that girls are not using technology at all; rather, girls reported that they used their family phones or friend's phones in secret. Most of the adolescent girls participating in this research commented that they had secretly or covertly used devices from friends, brothers or parents which added more risks and vulnerabilities as they were unaware of the basics of safe ICT practices.

My research found noticeable differences in the way boys and girls use mobile technology. For instance, boys tended to use phones for a more sophisticated range of activities, from spending time on social media to searching the Internet for news, study-related or other information. Girls in these locations were more likely to be restricted to simple tasks like calling their parents and friends or using the calculator for their studies. Girls aged between 15 to 18 mostly said that they knew about social media and sometimes covertly used the Internet and social media on their friends' or siblings' phones but they usually did not share this with their parents. This gap between boys' and girls' access to and use of ICTs also creates a disparity between men and women in the longer term, in the case of engaging in technical work.

Findings of my research also show that women's access to and use of ICTs is not only gendered but also intersectional, with women from different sections of society experiencing their journey with ICT

in different, but interlinked ways. Sociocultural and religious restrictions were not the same for women from different sections of society. Intersectional influences are also considered by Crenshaw (1989) in her work where she also emphasises the compounding experiences of marginalisation though it is not universally the same for each person in a group. As reported in Chapter 5 of this thesis, women's access to and use of ICTs were very diverse based on their age, marital status, occupation, literacy, religion, region, household income, and engagement with development. Young girls and women faced more restriction from their families and communities compared to women over 35 years of age. Unmarried, divorced or separated young women faced more sociocultural restrictions compared to married women. Young married women without children faced more restrictions compared to women with children. Similarly, Muslim women faced more religious restrictions when accessing and using ICTs compared to Hindu women, because Muslim women's online and offline visibility was considered as a potential threat to the custom of *parda* (seclusion).

The intersectional approach was also helpful in understanding the social power dynamics that exist within and between women from different sociocultural backgrounds. 'Visible' and 'invisible' power dynamics were explored by obtaining an in-depth understanding of women's experiences. In this regard, the discussion on forms of power by VeneKlasen and Miller (2002) was useful in understanding visible and invisible power dynamics. VeneKlasen and Miller (2002) defined visible power as policy and formal rules, but I relate it to exploring the local sociocultural dynamics of visible and invisible forms of power. Sociocultural rules are not as formal as institutional policy, but in the same way they may be even more influential in shaping women's experiences. Visible outcomes of restrictive power relations were clearly observed as forms of established sociocultural and religious restrictions, but I found it more important to explore the less visible power dynamic that was shaping women's understanding and making them accept the restrictive situations they were in.

Furthermore, narrower gendered approaches to the problem only consider a subset of a more complex scenario related to women's experiences with ICTs. As mentioned by Bailur and Masiero (2017), existing research does not adequately address the intersectional aspect of gender and access to and use of ICTs. Race, class, caste, religion, and other relevant dimensions need to be considered. In the context of rural Bangladesh, no studies were found that integrate the contextual and intersectional dynamics to understand women's access to and use of ICTs. My study shows that understanding women's experience with ICTs is a dynamic sociocultural process in relation to the technology environment and over-generalised addressing of gender imbalances needs to be avoided.

To understand the contextual and intersectional influences, women's experiences need to be considered in their own contexts. My reflections and experiences as a researcher and NGO practitioner have also made me conclude that allowing adequate time and a combination of both formal and informal methods of data collection are mandatory for collecting authentic data. Consequently, observation is another important tool for the in-depth exploration of both visible and invisible forms of power and their influences over women's experiences with ICTs. Conducting qualitative research by visiting participants in their own contexts and using a combination of qualitative data collection techniques is a common approach to data gathering (Moser & Korstjens, 2018) but the methods adopted need to be able to respond to contextual realities. The methodological contribution of this research will be articulated at the end of this chapter. This can act as a guide for researchers to be responsive to the contextual requirements while conducting qualitative studies.

7.3.2 Dimension 2: Holistic Understanding

The results of my study show that the impacts of ICTs on women's lives vary and result in both positive and negative outcomes. As mentioned in Chapter 2, existing ICT4D literature mostly considers the positive impacts of ICTs (Ahmed et al., 2006; Laizu et al., 2010b; Yusuf & Alam, 2011). However, my

research shows that ICTs can also contribute to women's disempowerment and marginalisation by creating negative impacts in their lives.

Similarly, women's empowerment was perceived in various ways by different participants including rural women, their spouses and family members, and development practitioners. Most of the participants at village level understood women's 'empowerment' as women's 'advancement' or 'development'. There are also some similarities and dissimilarities in understanding among different participants where their contexts, including sociocultural, religious, and professional positions, had a great influence in shaping their understanding of women's empowerment. A holistic and localised understanding of the impacts of ICTs on women's empowerment is needed for more appropriate design and implementation of empowerment initiatives, otherwise such initiatives can contribute to further disempowerment of women.

7.3.2.1 Impacts of ICTs

My research data shows that the effects of both positive and negative impacts of ICTs are proportional to the use of ICTs by the women. Women who had used smartphones or computers for both online and offline activities were able to achieve more positive impacts in their lives compared to women who had used feature phones or computers for offline activities. More shared access to and use of women's ICTs led to more negative impacts or incidents where women had little or no personal control over their ICTs.

7.3.2.1.1 Positive Impacts of ICTs

The results of my study show that access to and use of ICTs enhance women's skill related to that particular technology. Women who could access particular information on a regular basis, for example, agricultural information, became more knowledgeable in areas such as quality crop cultivation, rotation, and preservation.

Positive impacts of ICTs were more visible among PROTIC women as a result of the continuous technical and information support provided by the project compared to the non-PROTIC women. Moreover, positive impacts of ICTs were more evident in the southern and northern areas because a pilot phase was conducted in those areas and women had more extensive experience in using ICTs than women from wetland areas. These results prove that ICTs can make positive contributions to women's lives but to maximise that opportunity careful consideration of the challenges and negative impacts needs to be made. This is discussed in Section 7.3.2.1.2.

PROTIC women's increased knowledge of farming helped them to contribute to increased agricultural production for the family. This contributed to an improvement in their positions in the families when families started acknowledging some of their contributions to the family farming which had not happened before using their smartphones for agriculture.

Previously, because of restricted mobility, women had very limited communication opportunities but using mobile phones resulted in increased communications and networking for both PROTIC and non-PROTIC women. Figure 7-2 presents a holistic understanding of women's communication and networking through their smartphones in PROTIC. Before PROTIC, women's communication and networking were mostly limited to very occasional communication with immediate family and close relatives and community. Very limited communication with market contacts had taken place and women's restricted mobility and lack of participation in economic decision making hindered that connection. Communication with the local government and extension services, NGOs, universities, research organisations, and online communities started as part of PROTIC.

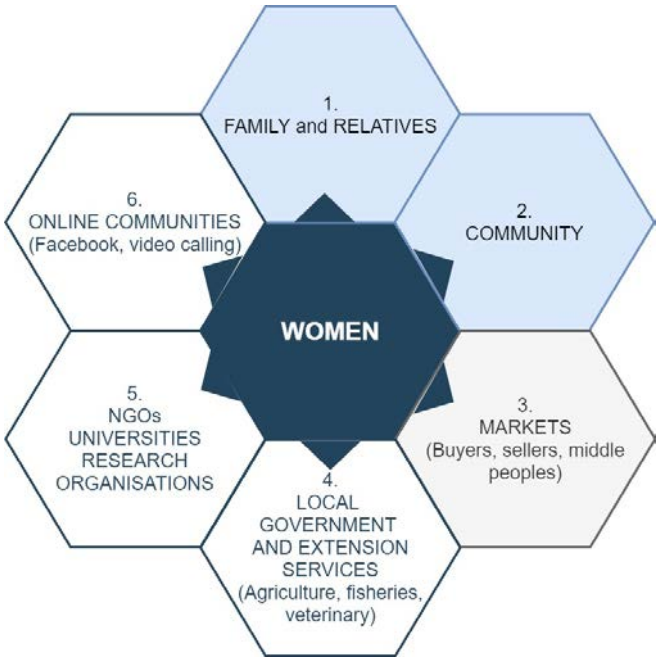

Figure 7- 2. Holistic understanding of women's communication and networking with ICTs in PROTIC22

When given the opportunity by PROTIC, most of the women became the 'communicator in-charge' for maintaining communication with immediate and extended families and close relatives. This had previously been managed by the men when communication happened mainly through physical visits to relatives' homes. Despite restrictions over communication and networking outside families and relatives, women's experiences with PROTIC surprisingly show a degree of acceptance by families and communities regarding women's communications outside the family including communication with NGO staff, PROTIC peers, local government representatives, and market retailers or mobile vendors. However, there was also resistance to this new communication role outside the family as discussed under Dimension 4, Section 7.3.2.1.

PROTIC women were able to support the community with required information through their smartphones which resulted in increased social respect, status, social inclusion and leadership at the community level. From a sustainability and networking point of view, PROTIC also worked to engage local level stakeholders in the project activities, which also helped the women to be connected with the local government and stakeholders. This increased communication and networking significantly contributed to the PROTIC women's improved confidence and agency.

7.3.2.1.2 Negative Impacts of ICTs

My research findings indicate that access to and use of ICTs could have some negative impact on women's lives, related to both online and offline use of ICTs. Smartphone users who mostly used their phones for regular offline and online activities reported more incidents of online harassment. Incidents of offline and online harassment included receiving abusive SMS, photos, videos, and phone calls. Forced exposure to pornography by their male relatives or classmates was also reported by some of the adolescent and young girls.

[22] Figure 7-2 by Anindita Sarker modifies a model by Larry Stillman which was presented in various discussions and seminars on ICT and development in 2019-2020 at Monash University.

My findings show that incidents of fake social media (Facebook) accounts using women's identities and posting altered photos and abusive texts were used to defame their image of 'good woman'. In a society like Bangladesh the idea of 'good woman' is dominant. The notion of 'good' women refers to the socioculturally accepted image and has a strong influence on expected use of ICTs by the women. Women have to follow sociocultural conventions including restrictions on communication and mobility to be 'good women' and to live peacefully in their personal family lives. Offline and online harassment incidents were threats to their image of 'good woman'.

Shared use of women's devices by a variety of actors within and outside the family increased the risks of unwanted access to and misuse of women's mobile phones, especially smartphones and social media accounts. The misuse of women's Facebook accounts by other people was also conducted with the aim of controlling or shaming them. The persons who did this did not accept women's increased engagement with ICTs, online visibility, and improved social position.

For both offline and online harassment, women and girls mostly preferred not to make it known or make any complaints to anyone either family or authorities, including Union Parishad member or Chairman or police as it might result in defamation them and their families. The culture of 'blaming the victim' also deters women from asking for support from their families or communities as in most cases they faced either non-cooperation or even more violent behaviour from their families. There was also a social pressure to not report violence against women and related issues to authorities including local government and police. According to a 2015 survey conducted by Bangladesh Bureau of Statistics and United Nations Population Fund (UNFPA), more than72 percent of women and girls who faced violence never told anyone and nearly half of them did not think it was necessary (Bangladesh Bureau of Statistics, 2016). Violence and social pressure can result in victimization, shock and shame for the women. In this environment, some women felt discouraged with regard to accessing and using their mobile phones.

The impact of online and offline harassment was not only limited to the particular woman who directly faced the harassment. Women's families and communities who had very limited or no awareness of offline and online harassment also tended to believe that the women had done something wrong. For example, when one of the PROTIC women's fake Facebook ID with a tampered photo was used to defame her, most of the community people believed that she was responsible, which resulted in further restrictions for other women who used smartphones. Incidents of offline and online harassment also resulted in increased restrictions on women's mobility and communication.

Apart from offline and online harassment, incidents of domestic violence including verbal and physical abuse were also reported by both PROTIC and non-PROTIC women. Mistrust or misunderstanding by the spouses or immediate family, when they thought that women did not use their mobile phones in culturally and socially expected ways, resulted in domestic violence. Some of the women said that increased use of mobile phones by the women resulted in increased risks of being 'suspected' of doing something 'wrong' or 'unethical'. Sexual abuse within marriage was also reported by some of the women as a direct outcome of their husbands using smartphones to watch pornography.

Surprisingly, my research also found that access to and use of technology by the women made them comply more with sociocultural and religious restrictions, rather than feeling 'liberated'. Mobile phones, particularly smartphones, supported increased access to online and offline *owaz* (religious discussions by Islamic religious leaders) which negatively impacted women's positions in their families and society and resulted in further restrictions.

My research data also indicates that women's access to and use of ICTs resulted in increased monitoring and surveillance of their offline and online activities with their ICTs. Women's mobility

and activities were also monitored by their spouses and immediate family by contacting them through their mobile phones.

Consequently, empowerment through ICTs is not unproblematic. Other recent studies have also shown that new technologies or ICT interventions for empowering marginalised women can contribute to existing unequal gender relations and result in negative impacts in women's lives (Masika & Bailur, 2015; Pei & Chib, 2020). Some studies have discussed the challenges and barriers related to women's ICT use (Buskens & Webb, 2009; Hilbert, 2011; Mehta & Mehta, 2014; Tacchi et al., 2012) but a close examination of both positive and negative impacts and their interrelations in a specific sociocultural context is missing. The findings of my research indicate that, in the context of rural Bangladesh, both positive and negative impacts of ICTs, or the success stories and the stories of failure co-exist like sides of a coin which need to be considered in designing and implementing ICT4WE and ICT4D initiatives.

7.3.2.2 Women's Empowerment

The understanding of empowerment in this research was derived from a direct discussion of empowerment issues with the participants and by closely observing women's experiences of accessing and using ICTs. My data shows that there were gaps between women's understanding of empowerment and their lived experience related to empowerment which resulted in a 'negative consciousness'. Women found it difficult and abstract to articulate the concept of empowerment, although they had strong practical knowledge of what it could mean. Among some of the PROTIC women, an understanding of empowerment was more evident as they could identify different forms of empowerment. They said they heard about empowerment while attending project supported training and workshops but could hardly apply it in their real lives. These gaps related to women's knowledge and practice either resulted in more frustration or an incomplete understanding of empowerment, which also worked to sustain disempowerment. For example, women understood that domestic violence was negative to their empowerment, but when they faced domestic violence in their lives, they considered it as negative to their *image* as advanced or progressive or empowered women. To maintain their image as empowered women, they hid incidents of violence from the outside world and did not seek support from others. Gaps between knowledge and practice were also found among the families and the communities, who always tried to insist that violence against women does not happen nowadays; however in-depth discussions with the women revealed the realities of their empowerment and disempowerment.

From a theoretical level, Figure 7-3 summarizes the key forms of women's empowerment (WE) based on my research data and observations. The WE model relates to Dimension 1, Facet 2 of the ICT4WE model. The organisation of different forms and features of WE model was inspired by the 'model of rural women's empowerment' by Lennie (2001).

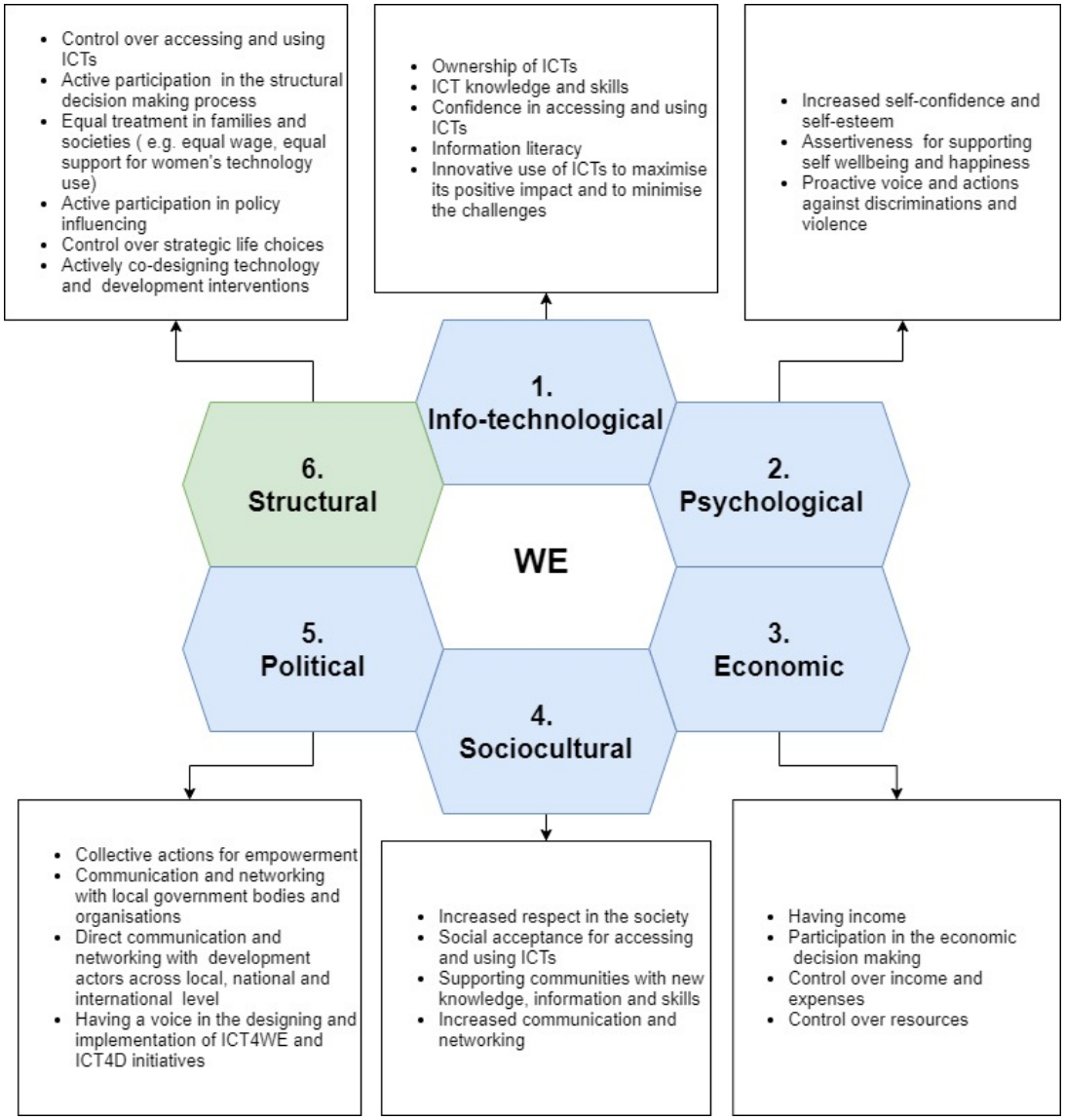

Figure 7- 3. Key forms and features of women's empowerment

The WE model represents a processual and context-specific understanding of women's empowerment where its six forms are interconnected and influence each other. The forms and features of empowerment reflected in the WE model were identified from discussions with three different groups of participants including rural women, their spouses and family members, and NGO staff. Although women and NGO staff discussed various forms of empowerment, women mostly highlighted economic empowerment, whereas NGO staff highlighted both technological and economic empowerment. On the other hand, most of the spouses and family members of the rural women said that being a good woman is important for women to lead a developed and happy life but my other relevant findings found that the potions of 'good woman' and related influences resulted in increased challenges to women's empowerment with ICTs.

My findings indicate that, for safe use of technology and information, women's knowledge about information quality is important along with their technical advancement. Therefore, the first form of empowerment in the WE model is info-technological empowerment. Furthermore, I found that existing ICT4WE and ICT4D interventions mostly emphasise technological skill development issues with little or no emphasis on information quality or safe information practices.

Women's psychological empowerment refers to their increased confidence and assertiveness for supporting self-wellbeing and happiness which will result in their proactive actions against discrimination.

The third form of empowerment in the WE model emphasises women's active participation in economic decision making, which is not only limited to them having incomes but also control over their income and expenditures. My data shows that women had very limited or no control over their incomes. Existing ICT4WE and ICT4D initiatives mostly understand economic empowerment as women's increased participation in economic activities or increased income but my research shows that income does not ensure women's control over their income so, the control aspects also need to be considered importantly to support women's economic empowerment.

The fourth from of empowerment in the WE model, sociocultural empowerment indicates women's improved social position and increased respect and increased acceptance in family as well as in society whereas women's political empowerment which is included as the fourth form in the model directs women having their voices in the formal and organisational power structure.

However, it should be observed that the sixth form, structural empowerment, represents a more long-term outcome of empowerment, whereas other forms of empowerment work as either preconditions or processes to achieve those structural outcomes. This processual understanding is inspired by Naila Kabeer's comprehensive view of empowerment, in which a person's ability to choose is central to that discussion (Kabeer, 1999, 2012).

Kabeer (1999, p. 461) emphasises the understanding of both the 'conditions of choice' and 'consequences of choice' which are helpful to explore if the choices made are challenging or destabilising social inequalities or reproducing existing inequalities. From my research findings, it was evident that rural Bangladeshi women had very limited or no control over their strategic life choices as those choices were mostly controlled and shaped by the existing patriarchal power structure. Some forms of choice were more socioculturally accepted for the women, whereas a deviation from those choices might lead to negative impacts on their social positioning. This discussion is also relevant to understanding women's choices related to their access to and use of ICTs in general, although in my research only certain types of access to and use of ICTs were socioculturally accepted and women had to comply with them. Sewell Jr (1992) referred to these circumstances as the forced improvisation of choices in structurally constrained ways. The concept of agency is fundamental in my research in understanding how women's empowerment can be achieved despite structural constraints. The findings of this research particularly related to the agency-structure in the context of rural women's access to and use of ICTs will be discussed in Sections 7.3.3 and 7.3.4.

Based on the women's practical knowledge and experience, my holistic and theorized understanding of empowerment considers all six forms of empowerment together. This helps to identify the empowerment features which have been achieved as well as those features that remain to be achieved. My findings strongly suggest that critical sociocultural and structural influences need to be understood for better conceptualisation of women's empowerment. A holistic understanding of empowerment also helps to better understand how ICTs and supported interventions can effectively contribute to empowerment. It also assists in exploring the existing gaps between theoretical understanding of empowerment and practices, including any negative impacts resulting in further disempowerment for the women. Holistic conceptualisations of empowerment are also helpful in understanding the interdependence and influence of the individual and the structural in the process of empowerment.

7.3.3 Dimension 3: Enabling Facets

The enabling facets that can support women's agency in relation to ICTs are discussed here (See Figure 7-1). Six key areas or facets were identified in my research that need to be considered for ICT4WE and ICT4D initiatives to support women's agency. The findings from my research recommend mandatory considerations of all six facets for designing and implementing ICT4WE and ICT4D because all of them are interconnected and can influence each other. In this section I discuss the current practices related to each facet as well as the insights from my data that need to be incorporated to address the women's contexts. Facet 1, women's agency in accessing and using ICTs, directly discusses the current situation of women's agency in relation to ICTs, whereas the other facets primarily discuss the supportive facets which contribute to their agency.

7.3.3.1 Dimension 3 Facet 1: Women's Agency of Accessing and Using ICTs

As presented in Figure 7-1 Facet 1, my data shows that women's lack of agency in accessing and using ICTs is an issue in the context of rural Bangladesh that limits their active engagement with ICTs as well as neutralising the positive impacts of ICTs on their lives. Women's lack of agency in accessing and using ICTs depends on various factors including ownership of devices, costs, literacy limitations, lack of skill, lack of easy access to mobile infrastructure and development support, sociocultural and religious factors and gender relations.

Five types of ownership over ICTs were found in my research including *self-supported ownership* where women bought the ICT devices themselves; *family or relative supported ownership* where women's immediate family members, or in some cases close relatives, bought the ICT devices for them; *PROTIC or government supported ownership* where women received the ICT devices from PROTIC or the government through their names being listed in the PROTIC project or government official records; *no ownership but access* where women used others' phones including those belonging to family, relatives, friends and neighbours; and *no access* where women had no access to that particular type of ICT. Among the non-PROTIC women, ownership of smartphones was very low.

As discussed in Section 7.3.2.2, women's low or non-literacy and lack of skills in using ICT devices and the Internet also limit their access to and use of ICTs. Issues related to infrastructure including poor network connectivity and unavailability of electricity also resulted in less frequent access to and use of ICTs by the women. Similarly, costs related to buying and maintaining ICT devices were found to be issues that impacted women's agency in accessing and using ICTs.

Apart from technical, economic, and infrastructural issues, sociocultural and religious issues also restrict women's agency in relation to ICTs. The findings of my research (see Chapters 5 and 6) show that sociocultural and religious restrictions limit women's control over access to and use of ICTs. As a result, women's ownership and use of ICTs itself could neither ensure their control over those devices nor result in their independent access to and use of ICTs. Pei and Chib (2020) found that women's access to and use of particular ICTs enabled the forces related to both structure and agency where women face the struggle between obedience to traditional patriarchal orders and their pursuit of individual autonomy and freedom. My findings support their findings.

However, there is a gap between the literature exploring the influence of social power dynamics on women's agency and that addressing it in the context of ICT for women's empowerment research in rural Bangladesh. An understanding of women's encounters with the traditional social power structures and existing regulation is needed to support women's agency in accessing and using ICTs. My research develops some meaningful insights and recommendations for stakeholders for

appropriate design and implementation of ICT4WE and ICT4D initiatives by supporting women's agency in the context of rural Bangladesh.

7.3.3.2 Dimension 3 Facet 2: Community Voices Across Different Levels

As shown in Figure 7-1 Facet 2, the findings of my research suggest that gaps in coordination, information management and sharing exist in current ICT4WE and ICT4D initiatives in terms of vertical communication between the various partners, from local to national to international levels, and horizontally, within the organisations. These gaps work as a significant challenge to connecting and communicating community voices across different levels. These coordination and collaboration gaps also limit opportunities to ensure women's active engagement from the grassroots and to address their needs and priorities in ICT4D and ICT4WE initiatives.

From my research data and particularly studying PROTIC as a case study, it was evident that the existing standard practices of information and knowledge management in the NGOs in Bangladesh do not adequately support the creation of an information infrastructure that is more open than that usually required for monitoring and accountability purposes. Project monitoring and evaluation reporting can be prescriptive, focussing on pre-determined outputs that may not include community data. Program activities, reporting and monitoring emphasise particular forms of information which in many cases make the community voices unheard and their own forms of documentation unrecognised. In PROTIC, there was also difficulty in obtaining an effective and authentic community voice free of domination and filtering, as the voice from the grassroots is often only available orally or in very limited written documents.

An analysis of my research data suggests that creating spaces for rural women, their families and communities to reflect on the ongoing ICT4WE and ICT4D initiatives will encourage their voices to be actively considered and incorporated in designing and implementing ICTs and ICT supported empowerment and development initiatives I found that collecting and analysing various forms of information available at community and local levels of ICT4WE and ICT4D is absolutely necessary for understanding community voices as well as for communicating across and within local, national and global levels to be reflected in program design and implementation

Maintaining regular documentation of the participants' experiences with the project is also important and those findings or insights based on that need to be communicated to the various project stakeholders. In PROTIC, local level staff said that they maintained notes from their daily field visits but no communication or use of that information was mentioned by the staff. What was lost was useful real-time documentation of women's experiences with ICTs which could not be saved because of poor management and communication of information across stakeholders.

From my data, it was also found that different stakeholder organisations had different priorities which impact the information management and sharing mechanisms. Identifying and prioritising information is very much linked to organisational priorities. For example, organisations working on disaster risk reduction, climate change adaptation, food security or poverty reduction tried to collect and present the information relevant to their organisational strategies, targets and priorities.

In some cases, different organisations involved in the same project understand and conceptualise what appear to be the same concepts or ideas differently. For example, in PROTIC, the way Monash and Oxfam understood research and data differed. Monash mostly focused on the participatory action research (PAR) approach and the ICTs and learning related to the ongoing project, whereas Oxfam focused on regular implementation more than research and innovation.

The integration of a new project within an existing project, program or organisational framework sometimes compromised the objectives and influenced the implementation of the new project. It also affected the coordination and attitude of the staff and the priorities of the organisation, with small scale projects being neglected under the umbrella of big budget or scale programs. This was also applicable to information management when the framework program becomes the priority which does not necessarily cover the priorities of the integrated project.

Supporting convenient forms of documentation (including written, verbal, or visual presentations) by the women and local staff was identified as a need where the local communication was mostly verbal. On the other hand, local NGO staff were required to write reports in English, which made it difficult for them to include their daily observations in the reports.

As part of any ICT4WE and ICT4D initiatives, the communication of information to different stakeholders, whether top-down or bottom-up, is necessary to engage community voices in the major decision making of the project. Project documents should encourage narrative prose writing rather than a summary or bullet-point style as the former is always more helpful to form a clear understanding of any issue.

It was also found that it was quite common to engage consultants or researchers from outside the organisation to conduct project evaluations and other studies or to analyse research data. This practice creates gaps in information management and analysis skills within the organisation as well as gaps in institutional memory of particular learnings. Organisations should take the lead in hiring skilled people and orient them with the objectives of the project as well as the task.

My findings also show fear or reluctance to discuss issues and findings that challenge existing practices and relationships, particularly among local NGO staff who are in dependent situations in the more conservative NGOs that depend on donor support. They might be very unsure of what to do and so, instead of an innovative project, little or no innovation occurs.

7.3.3.3 Dimension 3 Facet 3: Infrastructural Support and Training

As shown in Figure 7-1 Facet 3, the findings of my research emphasise that rural Bangladeshi women's experiences of ICT use can be compromised due to lack of infrastructural support including device support, network connectivity, electricity supply, economic situation, and inappropriate technology. In my research, in villages in rural Bangladesh, mobile phones and particularly feature phones were the ICTs most used by the women. Feature phones were more affordable than smartphones and computers and also did not need frequent or constant charging with electricity. They also did not need much technical knowledge or skills to operate, so women with low or even no literacy could use them to make and receive phone calls. The above-mentioned scenario illustrates how lack of infrastructural support promotes particular types of ICTs for the rural Bangladeshi women. Without support from government and NGOs, women are not able to overcome these situations.

PROTIC as a development intervention was a pilot to understand how device, training and information support can encourage women to access and use ICTs for their empowerment. Support from PROTIC was meant to help women to be able to innovate to overcome their literacy and skill related issues. Some of the PROTIC women became knowledge hubs at the village level.

Training on ICT operations resulted in improved use of their smartphones by the PROTIC women compared to the non-PROTIC women, but this skill development did not equally happen for all the participants. My research findings suggest that more needs-based training is needed for the rural women to support their agency in ICT use. Training and workshops for the rural women need to be

more communication-friendly, participatory and practical activity-based as most of the women said that the discussion was difficult to understand sometimes but hands-on training was more useful. Language was also an issue for the women where training and workshops were mostly conducted in formal Bangla language, but women were more used to the local dialects. This sometimes limited their participation and understanding.

It would also be helpful for the rural women if they could access and use more need-based and understandable versions of relevant information such as how to operate their devices as well as safe use of technology and information. This convenient access would support women's agency in technology use.

Limited or no availability of electricity in households resulted in less regular use of smartphones by the women in both northern and north-eastern villages compared to those in the southern villages where electricity was more readily available. Issues related to wider infrastructural problems including lack of electricity and poor network connectivity need to be communicated at government level. Policy influencing needs to be initiated to address and solve these issues.

7.3.3.4 Dimension 3 Facet 4: Supportive Environment

As presented in Figure 7-1 Facet 4, women's access to and use of ICTs are very gendered in rural Bangladeshi society which supports the arguments of a gender digital divide discussed by Hilbert (2011); Warschauer (2002). As discussed in Section 7.3.1, to understand women's and girls' gendered patterns of ICT use, the complex realities of people's divergent access to and usage of digital technologies needs to be prioritised instead of limiting the discussion to what Cisler (2000) and Warschauer (2003) refer to as the binary divides of haves and have- nots. In rural Bangladeshi communities, sociocultural disapproval significantly impacts girls' access to and use of ICTs, with adolescent girls likely to use personal ICTs including mobile phones and computers than boys. Girls face more restrictions and challenges than boys, resulting in limited access to ICTs.

My findings show that lack of acceptance from family and society for women's and girls' access to and use of ICTs was one of the strongest challenges for developing women's agency. Socioculturally in rural Bangladesh, women's and girls' access to and use of technology is assumed as a potential threat to their personal, family and social reputation. These assumptions result in more restrictions for women's and girls' technology use by their family and society. This lack of support from family and society was also identified by some of the women as a direct challenge for their empowerment and freedom in accessing and using ICTs.

The findings of my research also show that ICT4WE and ICT4D initiatives need to actively engage women's spouses and family members as well as communities at various stages of the project to support women's agency in accessing and using technology. I found that involving women in the development initiatives without considering their sociocultural and religious contexts may create more tensions and challenges to developing agency and might result in more difficulties in getting support from their families and communities.

A supportive enabling environment is mandatory to the empowerment of rural women through ICTs. My data reveals that there is a lack of awareness among women's families and communities about the potential benefits of ICTs for women and girls and those benefits will not be realised without active support. To address this issue, creating mass awareness is mandatory at both local and national levels. Consultations need to be organised with women's immediate families (living in the same household) and communities in the process of project design and implementation which may help to understand

their views and priorities. For the sustainable implementation of ICT4WE and ICT4D initiatives, social innovations need to be supported by engaging community voices and leadership.

7.3.3.5 Dimension 3 Facet 5: Organisational Support (govt., NGO and others)

As presented in Figure 7-1 Facet 5, my findings show that in development programs, NGOs mostly focus on short-term success stories rather than stories of failure or challenges. By focusing mostly on the short-term success stories and project-driven requirements, the sustainable impacts of the project are compromised.

I also found that the workings of local organisations are influenced by traditional patriarchal norms and beliefs, while government or NGO interventions do not address the sociocultural and religious power structures and influences in their interventions. NGOs mostly perceive ICTs as a tool for bringing positive changes to women's lives but they miss context-specific information as this is not in their agendas. NGO monitoring and regulation only support suggested use of ICTs to achieve project goals which may result in gaps between women's and NGOs' agendas for empowerment. Similarly, the UDC intervention by the Bangladesh government was an example of creating institutional job opportunities for women but without addressing the women's contextual challenges and regulation, women face difficulties in their jobs as UDC entrepreneurs.

An assertive use of technology needs to be encouraged to support women's agency. However, to achieve this, a holistic understanding of women's empowerment and both the positive and negative impacts of ICTs is needed. In the research data, the strong influence of NGO staff is also clearly visible, but this needs to be corrected. Through their regular activities and follow up visits, NGO staff recommended required activities that need to be done by the women and they also monitored the progress of those activities. For example, a Facebook post on agricultural activities was considered one of the most important tasks. Making calls to the call centres and reading agricultural SMS were also considered important. This resulted in a focus on agriculture-related posts on Facebook, to the exclusion of much else. Independence in other matters was not part of the training activity of the NGOs. The women, as dependent beneficiaries, did not (openly at least) question the authority of the NGOs.

Any project should be participatory and inclusive from the planning stage, and the selection of participants is an important step. For example, my findings show that in PROTIC, the selection of participants was influenced by some of the indicators for achieving project goals. Comparatively young women and women with literacy were prioritised as participants as staff believed that young and literate women would be able to learn and use their smartphones better. This type of preferential selection may contribute to existing intersectional inequalities and marginalisation.
Awareness building and active involvement by project staff and stakeholders are needed to ensure active community participation throughout the development project. For example, PROTIC theoretically followed a PAR approach whereas practically, it was implemented more as traditional development project where participants had very limited or no participation in the designing and implementation process of the project.

7.3.4 Dimension 4: Addressing Regulation

As presented in Figure 7-1 Dimension 4, women's access to and use of ICTs are subject to different forms of restriction and regulation which suppress women's agency in accessing and using ICTs. I noticed three different forms of regulation including self-regulation (SR), sociocultural and religious regulation (SCRR) and organisational regulation (OR).

Self-regulation refers to the regulation imposed by the women themselves and is an outcome of women's lack of personal control and self-agency when women are dominated under patriarchy and comply with sociocultural and organisational regulation. In some case it was found that women's preferred use of ICTs was not always directly regulated by a third party, rather many women themselves believe and act according to the sociocultural, religious and NGO regulation into which they have been socialized. The concept of invisible power has been helpful to understand how women internalise the feelings of subordination and perform existing regulation without any direct influence of coercive power. The invisible and hegemonizing dimensions of power exercised by patriarchal societies and development organizations justify women's subordinate performance as a 'good woman'. My research shows that sociocultural norms, practices and customs shaped women's understanding in such a way that both PROTIC and non-PROTIC women made adaptations to patriarchal domination. Similarly, for PROTIC women, it was also evident that they had consented to the preferences and regulation introduced by the NGOs.

Sociocultural and religious regulation refers to the influences of social, cultural and religious restrictions. Sociocultural and religious regulation plays a very influential role in setting 'expected' and 'unexpected' ways of using ICTs for the rural Bangladeshi women. For example, in rural Bangladesh it is mostly expected that women will use the mobile phone to communicate with family and relatives only. This expected use of ICTs is influenced by various relevant factors including social and cultural norms, religious beliefs, social power structures, gender norms and relations, and women's social positions. Sociocultural and religious regulation related to women's ICT use are not limited to their use of ICTs but regulate their lives.

As discussed earlier, in a society like Bangladesh the idea of 'good woman' is dominant with women having to follow sociocultural and religious conventions including restrictions on communication and mobility and to live peacefully in their personal family lives. Consequently, it is also expected that women will prove to their families and society that they are using ICTs in the 'right' or 'expected' way identified or set by the family and society. Religious regulation was found to be more applicable for the Muslim women.

Organisational regulation refers to regulation by organisations including the government, NGOs, and commercial sectors, which suppress women's agency in technology use. In the context of this research, organisational regulation occurred as outcomes of NGO interventions. My data shows that NGO interventions were so focused on promoting project-guided use of technology in order to achieve the project goals that most of the innovations introduced by the participants were ignored.

There were different relationships between different types of regulation depending on the circumstances. From the women's behaviour and experiences, it was quite evident that sociocultural and religious regulation strongly influenced and shaped both self-regulation and NGO regulation. For example, in PROTIC, women were asked by the project staff not to make any unknown friends on Facebook which in a way reemphasises the sociocultural and religious regulation limiting women's communication to their family and relatives.

However, PROTIC women sometimes complied with the NGO requirements and sometimes did not when it contradicted with their self-regulation. For example, most of the women did not prefer to post their individual photo as their Facebook profile due to restrictions from their families. For the Muslim women, it was also a religious issue as it was seen as violation of *parda* (seclusion). Culturally, it was considered not safe to post individual photos of the women as they might be subjected to harassment by the men. In response to the NGO's requirement to use individual photos as profile photos, some women used their photos with a veil covering their head because with a veil they could get more acceptance when in public places. On the other hand, instead of using their individual photos, most of

the women made different choices regarding their profile photos including photos of nature, random photos from the Internet, photos their husbands or photos of their children.

Thus, findings show that women did not always passively accept regulatory situations; rather they responded to regulation in various ways. The taxonomy of mobile practices by Pei and Chib (2020) also supports these arguments where they talk about both the structural oppression and agentic resistance of the women. (Pei & Chib, 2020) emphasise only the gendered social structural constraints, whereas I found three forms of regulation as influential. In terms of women's responses, (Pei & Chib, 2020) considered them strategic responses. In this section, I discuss how regulation works and how women respond to regulation in the context of my research. Figure 7-4 presents the regulation and responses influencing women's agency in ICT use in my research.

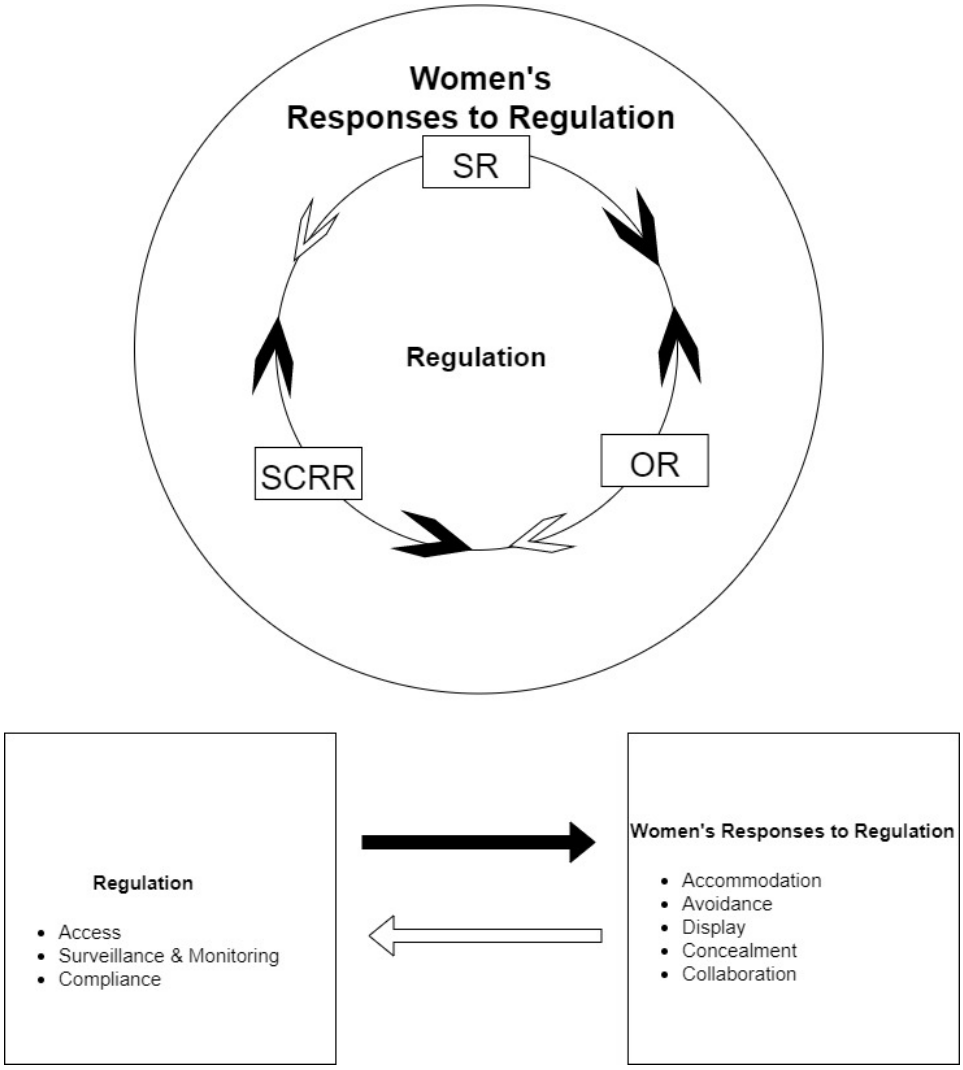

Figure 7- 4. Regulation and responses influencing women's agency in ICT use

7.3.4.1 Regulation

My data shows that regulation progressed in three ways; access, surveillance and monitoring, and compliance.

Access

My data shows that access firstly happened by physically accessing the ICT devices women owned or used, and secondly through their mobile phones or online accounts. Mobile phones as a portable ICT device enabled women to be identified and monitored 'while on the move' (Wei & Lo, 2006, p. 53). In the case of smartphones, physical access also occurred through accessing both the women's online and offline activities. Sociocultural acceptance of shared access to and use of women's ICTs facilitated physical access. Figure 5-6 shows the scale and frequency of women's shared use of ICTs. This sharing network helps to understand how access to women's ICTs happens in the context of rural Bangladesh. It was found that access to women's ICTs was conducted to control them and to establish patriarchal and hierarchical power in mobile spaces. Mobile phones and the Internet also enabled virtual access by reaching them on their phones or by tracking their online accounts. Access is the way to collect information which results in surveillance and compliance imposition over the women.

Access did not always happen as a result of sociocultural and religious regulation or organisational regulation. Women themselves also report to their spouses and families of their activities in a regular basis. Some of them said that they accepted the situation and thought it was their duty to let their husband know about their moves. Some women said they did that to avoid unnecessary tension and to lead a peaceful life.

Surveillance and Monitoring

Access paves the way for surveillance and constant monitoring. My data shows that surveillance and monitoring was conducted in many ways and by different actors including their spouses, immediate families, relatives, communities and NGO staff. Surveillance happened both offline and online including physical access, virtual monitoring, calling women on their phones, and observing women accessing and using their mobile phones.

Women's mobile phones were checked by their spouses on a regular basis. Spouses and families checked women's call logs, SMS and Messenger to check if women had used their mobile phones in the 'right way' (socioculturally expected way). Sometimes spouses and families forced women to talk over their phones with the loudspeaker in front of them. If they suspected any calls, husbands received their calls or even took away women's phones for random hours or days to check if women told them the truth or tampered with their phone record before showing it to their husbands.

However, surveillance was not a homogenous exercise as it varied based on the device used by the women and also on the objectives and skills of the actors who did the monitoring. In this regard women with smartphones had to comply with more monitoring. For example, video calling options were used by women's husbands or parents of young girls to cross check the verbal information provided by the women. Voice calls and video calls were used for real-time monitoring whereas tracking women's online activities was more a post-activity surveillance or monitoring. Online access made women subject to extensive monitoring and surveillance where various actors were involved including the women's spouses, families, relatives, communities and NGO staff.

PROTIC women were subject to regular monitoring by the NGO staff to check that they were using their smartphones according to the project guidelines. This monitoring happened both online and offline. By physically accessing women's smartphones, NGO staff regularly checked their call and

browsing histories to see if they visited any unwanted sites. Staff also called them to check if someone else was using their phones. PROTIC women's Facebook accounts were also monitored by the staff to check that they posted the positive impacts of the project on their lives as they were requested by the project.

Surveillance was also conducted by observing the women using mobile phones. Whom they talked to, what they talked about, and how long they talked on their mobile phones were subject to constant monitoring inside and outside home.

Women hardly questioned this activity as most of them did not consider it surveillance or monitoring. Checking their phone activities by their families and NGO staff was accepted by the women as most of them believed that their family and NGO staff did this for their betterment. Most of them blindly trusted their spouses and immediate family and shared their passwords to allow them to physically access their phones and their Facebook accounts. PROTC women also believed that NGO staff had the right to check their smartphones as they handed over the devices and provided training to support their use. Women were more concerned about managing their relationships in peace than the privacy of their information. The western idea of individual privacy did not apply in the communities I studied and women in my research did not show much concern related to their data or information privacy. In terms of data and information safety and security, they understood it as 'saving a copy for self' rather unwanted sharing or keeping it private.

Compliance

Compliance can be considered the final outcome of surveillance and monitoring. It is the final stage when regulation is established to control women's access to and use of ICTs or to promote sociocultural, religious and NGO promoted use of technology.

From my findings, it can be said that access and surveillance were used as strategies to set compliance and to regulate women's mobile practices. For example, adolescent girls were allowed to have their own phones even though they were not expected to use the family phone unattended. Similarly, young unmarried girls' access to and use of ICTs were also very restricted compared to the married women aged over 35 years. Families and communities were afraid of losing control over girls and women and suspected that they might exposed to things they were not supposed to and might deviate from the notion of 'good woman'.

Findings of my research also indicates that women's and girls' failure to be compliant could result in violence. Girls were also forced into early marriage if their families suspected they were having romantic relationship over mobile phones. Married women faced violent behaviours from their husbands when they were suspected of talking to unknown men over their mobile phones. In some cases, women's mobile phones were seized to stop them from having concealed romantic relationships.

It was also found that access and surveillance sometimes resulted in false accusations. In those cases, women were suspected of social offences they did not commit but failed to prove otherwise, which resulted in negative consequences in their lives.

In summary, the process of regulation is accompanied by visible and invisible power dimensions. In this process, women's agency including their control over their access to and use of ICTs is also compromised. Regulation and related practices reinforce patriarchal and gendered power structures in societies like rural Bangladesh and negatively impact women's autonomy and control over their lives.

7.3.4.2 Responses to Regulation

My research data showed women's responses to regulation occurred in various ways. In my research, five different kinds of response were reported by the women: accommodation, avoidance display, concealment, and collaboration.

Accommodation

Accommodation indicates the situations when women accept regulation. My findings show that accommodation not only happened as a result of face-to-face coercive power exercised over women, but also where women found little or no room to avoid or address that power.

Accommodation was also found to be an outcome of the influences of invisible power when women and girls accepted the situation without the influence of any visible coercive power. Masika and Bailur (2015, p. 43) define this kind of acceptance as an 'adaptive preference' where women and girls make their choices by downgrading and re-contextualising their desires for what cannot be accessed. For example, it was found that adolescent girls were not insistent about asking for a mobile phone as they accepted the situation that their families and society did not accept their access to and use of ICTs.

Avoidance

Avoidance indicates the response where women avoid online and offline visibility. By avoiding visibility, they comply with different forms of regulation as well as reduce the chances of being monitored or suspected. They also avoid sharing their detailed experiences or challenges in relations to ICT use with their families to avoid further restrictions.

Most of the girls and women said that their families became more restrictive when they came to know about online and offline harassment incidents, whether they happened to the women of their families or any other women in their village. In my research, most of the young women and girls said that they avoid using their phones outside the home for a long time to avoid unnecessary suspicions among the community people as young girls' access to and use of mobile phones was not widely accepted. Similarly, young girls and women who lived outside home for study used their mobile phones and computer in a limited way to avoid raising concerns among their family members as their families did not like extensive and frequent use of their mobile phones, particularly smartphones with the Internet. According to women, avoidance is undertaken so as not to create unnecessary problems or monitoring. It was not hiding something wrong from their families or communities.

Display

Display indicates the women's proactive performances according to the 'good woman' schema. It was believed that good women always prioritised their family and household responsibilities. In the case of accessing and using ICTs, 'good women' were expected to limit their communication to family and close relatives. For any other communication and activities, including communication with professional connections, good women should not proceed without the approval of their spouses and families.

The findings of my research show that women's physical use of phones is compliant when people can 'see' that they are using technology in accordance with the 'good woman' schema. Display was performed in different ways including not using mobile phones in public; young women who lived away from home using phones much less when they visited home (display that they are not using the phone 'much'); the proactive sharing of the phone with their husband (display that they have nothing

to hide); or when women talked about their phone use generally in relation to agriculture and business matters (display that they are using it for good things). Other instances included using mobile phones after finishing all the household and family responsibilities (display that they prioritise family more than spending time on their mobile phones), or not using individual photos in Facebook profiles (display that they comply with sociocultural and religious requirements). Women performed display also for the NGO staff including proactive sharing of the project-supported SMS in their Facebook profile (display that they are performing according to NGO requirements) or preventing their spouses and family members from using their phones when NGO staff visit them in their homes (display that they mostly use the smartphone themselves).

Concealment

Concealment refers to the activities when women intentionally conceal or cover up their online and offline use of ICTs from their families or communities or from NGOs. Limited access to technology did not indicate that girls were not using technologies at all; rather girls reported that they used their family phones or friends' phones in secret. Concealed use of ICTs might add more risks and vulnerabilities for the girls who were unaware of the basics of safe ICT practices. Sharing phones covertly can leave them more vulnerable to adult content on the Internet and social media because of their relative inexperience online. Covert use of mobile phones by the young people and associated risks were also reported by Tenhunen (2018) in the context of rural India.

Concealed use of technology also included women's cautious attempts to erase their call log or browsing histories or sometime SMS. Not many women reported this as only women with advanced ICT skills could attempt those activities. Women participating in my research said that sometimes they preferred to delete the call log or SMS if they received any calls from an unknown number. As women's communication with outsiders was not accepted by their families and communities, findings those numbers while conducting the regular checks by their spouses or families may raise more distrust.

In some cases, married women's husbands did not allow them to communicate with their parents and siblings. In those situations, women sometimes communicated with their parents and siblings in absence of their spouses and later deleted those call logs to avoid unrest in the family. Some of the parents of the adolescent girls and young women also said that their daughters used family phones secretly to develop romantic relationships and deleted the call log immediately after every communication, although this was not said by the young women and girls themselves.

Some of the PROTIC women said that they deleted browsing histories in Google search and YouTube in their smartphones to avoid NGO regulation.

Collaboration

Collaboration indicates women's collaborative use of ICTs and information. My findings show that collaborative use of women's ICTs and related knowledge and information created greater acceptance for women's access to and use of ICTs. In my research, collaborative use was more evident in the experiences of PROTIC women who shared their information and knowledge of localised farming with their family, relatives and communities which resulted in increased social connection and respect.

Pei and Chib (2020) also discussed collaboration and social connections in their taxonomy of mobile practices. They have discussed collaboration firstly as a result of information sharing and social support practices and secondly as a direct challenge to structural constraints as a manifestation of accumulated feminist power (Pei & Chib, 2020). However, in my research I mostly found collaboration to be a form of information sharing and networking. In the areas included in this research,

collaboration mostly happened at an individual level and with a purpose. In most cases it was agricultural, livestock, and fish culture related information because PROTIC women had access to localised agricultural information as part of the project and many of them became knowledge hubs in their areas and supported community people with farming and weather-related information.

My research data indicates that patriarchal and intersectional power relations were very influential among the women. Women could support and collaborate with each other at an individual level but these collaborations could not result in any collective movement to challenge the structural oppressions against them. For example, in the participatory workshops, some of the women who worked as day labourers raised the issue of women's low wages compared to men's, whereas most of the women believed that this system would never change as women were not physically strong enough to finish a similar amount of work to men in the same time. Most of the women belonging to higher income families justified the women's low wages as appropriate and they also paid less when they hired women for harvesting their crops or preparing the field for farming.
Women's lack of awareness resulted in a lack of agency for collaboration which prevented women from raising their voices against localised power structures. My data shows that agency was not a direct outcome of women's economic or technological advancements. To support women's empowerment, issues related to women's agency need to be directly addressed in ICT4WE and ICT4D initiatives.

Overall, women's responses reinforce their particular forms of limited agency within the structural constraints of their lives. Most of the women in my research explained their responses as necessary for the better management of their images as 'good women' and also for a peaceful life with their spouse and family members. They emphasised that they did not hide or conceal anything unethical, but it was more to avoid misunderstanding as sometimes their spouses and families failed to understand their situations, which could result in negative consequences in their lives. To avoid these chances of negativity they responded in the above-mentioned ways. Women's responses of avoidance, display, concealment and collaboration can be considered as part of their 'patriarchal bargain'. The term 'patriarchal bargain' was used by Masika and Bailur (2015, p. 43) and can be described as the various ways in which women respond within a set of real constraints. My data also shows that women's responses sometimes influenced the degree of regulation they faced. For example, women who could maintain their image of the 'good woman' and convinced their family may face less regulation.

Understanding the different types of regulation as well as women's responses to regulation is important for the appropriate design and implementation of ICTs and ICT support for women's empowerment and development initiatives. Projects and interventions in every stage including planning, monitoring or evaluating need to consider these types of regulation and responses.

My research findings strongly indicate the need for culturally sensitive solutions to address existing regulation, whereas most of the existing studies on shared use of ICTs and privacy prioritise technical solutions including creating and using secret accounts to support privacy. For example, the 'tiered privacy model' proposed by Ahmed et al. (2019, p. 1) suggests the technical approach of maintaining two accounts for the women; a shared one and a secret one. However, culturally, the women are largely unable to preserve such a secret as it may endanger them. Thus, my data argues that design solutions need to address existing cultural regulation and support women within that system of regulated cultural practices, otherwise they may reinforce the existing situation that could result in further challenges and disempowerment for the women.

7.4 CHAPTER SUMMARY

In this Chapter, I have answered Research Question (RQ) 3: How can the use of ICTs contribute to the empowerment of rural women? By discussing my substantive grounded theory model of ICT4WE, presented both theoretical and practical considerations to support context-specific designing and implementation of ICTs and ICT supported women's empowerment and development initiatives.

The multi-dimensional ICT4WE model (Figure 7.1) and the table (Table 7.1) present how women's experiences with ICTs are influenced by various contextual and intersectional factors, and not considering context-specific issues may neutralise the positive impacts of ICTs in women's empowerment or even can result in further disempowerment for the women. The considerations documented in Table 7.1 will assist development organisations, policy makers, government bodies and other relevant stakeholders to co-design more appropriate and sustainable ICT4WE and ICT4D programmes by adequately reflecting on existing regulation as well as women's responses to those regulation.

The next Chapter (Chapter 8) will present a summary of the key research findings and contributions of this study as well as limitations and recommendations for future research.

CHAPTER 8: CONCLUSION

8.1 CHAPTER OVERVIEW

This chapter presents a summary of my key research findings. I also discuss the theoretical, practical and methodological contributions of my thesis.

- The theoretical contribution of this research is the substantive grounded theory model ICT for women's empowerment (ICT4WE) on how ICTs and ICT based development interventions can effectively contribute to the empowerment of rural Bangladeshi women.

- The practical contribution contains a set of recommendations for different stakeholders to facilitate context-specific design and implementation of ICTs and ICT supported women's empowerment initiatives.

- The methodological contribution of this research will guide future researchers to be responsive to the sociocultural requirements for effective application of qualitative research methods to collect quality data.

Finally, I discuss the limitations of my research and suggestions for future research.

8.2 RESEARCH OBJECTIVES AND METHODOLOGY

The aim of my research was to explore, understand and communicate the holistic and context-specific dimensions of women's empowerment and the impacts of ICTs in women's lives in rural Bangladesh. In this study I have addressed the four primary research objectives, which were to:

1. Explore the main uses and impacts of ICTs on women's lives.

2. Identify the challenges and barriers women face in accessing and using ICTs in the context of rural Bangladesh.

3. Develop a gender sensitive model, concepts and theories to identify the intersectional and context-specific information needs and challenges for ICT4WE and ICT4D.

4. Develop meaningful recommendations for policy makers and NGOs working in the context of Bangladesh.

Developing theory grounded in the participants' worlds, their experience, their achievements and challenges in accessing and using ICTs was central in this research. Grounded Theory methodology was applied to develop the theory, by exploring rural women's context-specific and intersectional needs, challenges and priorities.

I conducted research data collection in six villages from three geographical locations: Coastal in the south, Sandy Island in the north, and Wetland or Haor Basin in the north-east of Bangladesh. In each location, two villages were selected including one PROTIC village and one non-PROTIC village. The PROTIC project was taken as a case study in my research as I aimed to explore and present a comparative understanding of women's experiences with ICTs with and without the support from development initiatives.

8.3 SUMMARY OF THE MAIN EMPIRICAL FINDINGS

This section presents the key findings of the study.

RQ 1: How do ICTs impact rural women's lives?

To understand the impact of ICTs in rural women's lives, this study explored which ICTs women were accessing and using in the context of rural Bangladesh including frequency and main uses of ICTs and both positive and negative impacts of ICTs in women's lives.

RQ1a: What ICTs are women currently accessing and using?

Across the three research locations, Mobile phones and more specifically feature phones were found as the most popular and common form of ICT used by the rural women in Bangladesh. The non-PROTIC women mostly used feature phones and some of the PROTIC women also used feature phones along with their PROTIC smartphones. The second most used form of ICT by the rural women was the smartphone. PROTIC women had received smartphones as part of their participation in PROTIC but outside PROTIC women's use of smartphones is not common. Smartphones are Internet and apps enabled. No PROTIC women used computers or laptops whereas women UDC entrepreneurs, who were not involved in PROTIC, said they used computers in their job.

The question of access is complicated, as culturally in rural Bangladesh, a mobile phone is not considered as a women's personal device, and shared access and use is the norm. Almost every woman, whether involved in PROTIC or not, shared their phones with a variety of actors within and outside family on a regular basis (see Figure 5-6 Rural women's ICT sharing network). Sometimes, women also used a family phone owned by any other family member. The western idea of privacy and individualistic ownership and use of technology does not reflect the expectation of women's shared and collaborative use of mobile phones in rural Bangladesh.

Five types of ownership over ICTs were found in this research including:

1. Self-supported ownership: women bought the ICT devices themselves.

2. Family or relative supported ownership: women's immediate family members, or in some cases close relatives, bought the ICT devices for the women.

3. PROTIC or government supported ownership: women received the ICT devices from PROTIC or the government through their names being part of PROTIC project or government projects/work

4. No ownership but access: women used others' phones including those belonging to family, relatives, friends and neighbours.

5. No access: women had no access to that particular type of ICT.

Although, ownership refers to the fact of having rights and control over assets and resources, my research indicates that women's ownership did not necessarily ensure their control over accessing and using those devices. The influence of different factors which limit women's control over their own devices will be discussed under RQ2.

RQ1b: What are the main uses of ICTs in women's lives?

Compared to the non-PROTIC women, PROTIC women were more skilled and frequent users of smartphones as they received training and regular guidance from the project staff to learn how to use their smartphones. PROTIC women also had more opportunities for accessing and using agricultural and weather-related information recommended by the project both online and offline. On the other hand, most of the non-PROTIC women who used feature phones, had very limited use of their phones, mostly limited to making and receiving phone calls within family and close relatives. There were some similarities and differences in terms of rural women's access and use of feature phones or smartphones. Both PROTIC and non-PROTIC women used their phones during their free time which was either in the evening or at night after finishing all the household work.

Most of the PROTIC women reported both offline and online use of ICTs, whereas most of the non-PROTIC women's use of ICTs were limited to offline activities. Making and receiving phone calls with family members and close relatives were found to be the most common uses of women's mobile phones in both PROTIC and non-PROTIC villages. SMS was not found as a preferred way of communication, firstly because of the women's low literacy and secondly, because of their oral culture where people mostly share information through verbal communication, and use their memory.

Apart from making and receiving phone calls and very rarely texting, most of the feature phone users used their phones for using the clock, calculator, or alarm, whereas the smartphone users used their phones for a variety of activities including taking photos, using the clock for time management and setting alarms, listening to music, watching offline movies and videos stored in their smartphones, playing games, using the radio or calculator, sending and receiving photos via Bluetooth and recording sermons. Women with smartphones also used various offline apps related to agriculture, poultry and livestock rearing, vegetable gardening, health information, religious lessons or holy books, and cooking.

Women UDC entrepreneurs used their computers for some set services including writing letters and filling in documents for job applications, birth and death certificates, citizenship certificates, and character certificates.

PROTIC women were the more extensive Internet users compared to the non-PROTIC women. PROTIC women used their smartphones for using social media and other online activities including using Facebook, YouTube, video calling apps like IMO. Some of the women also used Google search for agricultural, health or other need-based information. Both PROTIC and non-PROTIC smartphone users also downloaded apps on their phones. Women who had access to computers reported that they used Facebook and YouTube on their computers.

RQ1c: What impacts (both positive and negative) have ICTs introduced into women's lives?

Positive Impacts of ICTs on Women's Lives

Accessing and using ICTs allowed women to learn new ICTs and develop skills of using ICTs. PROTIC women had more improved skills in using smartphones compared to non-PROTIC women because non-PROTIC women mostly accessed and used feature phones.

For both PROTIC and non-PROTIC women, access to and use of ICTs also resulted in increased access to information. Similarly, increased opportunities of accessing and using information supported more learning opportunities for women. For PROTIC women, it was more evident as smartphones and training support from the project contributed to their knowledge and understanding of farming

including cultivating various crops, rearing poultry and livestock, and culturing fish and crab. They learnt about new techniques for farming; the preparation and use of organic pesticides; the preservation of seeds and crops, the vaccination of poultry and livestock; and the interpretation of natural disaster situations and early warnings.

Women's participation in livelihood activities also increased and it was particularly relevant for PROTIC women as they could make visible contributions in family farming and livelihood activities. Their visible contribution was reflected in increased agricultural production. It also resulted in acknowledgement of the women's contribution to agricultural production by their families and community which ultimately contributed to their position in family and society. By accessing information on localised agriculture, some of the PROTIC women also became the local knowledge hub where community people started seeking agricultural information support from the women. Some of the PROTIC women also used their mobile phones to run their small businesses including tailoring, paper box making and vermicompost making.

Use of ICTs lead to increased communication and networking by both PROTIC and non-PROTIC women. PROTIC and non-PROTIC women who owned a mobile phone could communicate with their family members and close relatives more frequently. Communication and networking were mostly a men's domain before but women's access and use of mobile phones helped most of them becoming the communication in charge in the family for maintaining communication with family and close relatives. Communication outside family and close relatives was mostly managed by husbands or male members of the family but despite such practices, however, the use of mobile phones for a limited range of specific purposes was accepted. These include contacting doctors, schoolteachers of their children, local government extension officers for agriculture, veterinary and fisheries, market vendors, Union Parishad chairmen and members, and NGO staff.

Owning smartphones, as expensive ICT devices, gave the rural women a positive status in the community. Women's more frequent and increased communication with family and relatives resulted in their increased respect and trust in the family and among the relatives. Some women could make decisions for their children's education as they maintained the communication with their children's teachers. Along with offline communities, PROTIC women also received appreciations from their PROTIC peers and even sometimes from unknown people for their agricultural knowledge. Increased networking and communication made women more confident. Women in PROTIC were also introduced to different stakeholders including the agriculture or fisheries officer or the Union Parishad chairman, and members of the project.

Using smartphones introduced online communication and networking opportunities for women. PROTIC women were connected to their peers from other locations. They could also made new friends in Facebook. Making calls through Internet enabled them to communicate with relatives and family staying abroad at minimum cost. Apart from communication with relatives and family living abroad, some women also used video calling in innovative ways for minimising their efforts and costs. These innovations include consulting doctor in another country or ordering preferred materials for a tailoring business.

Negative Impacts of ICTs on Women's Lives

Offline abuse or harassment was reported by both PROTIC and non-PROTIC women, and women who used smartphones on a regular basis also faced online harassments. Offline harassment included unwanted calls and messages with abusive words, exposure to nude photos or pornography. Online abuse occurred in various ways, including creating fake ID with women's persona information, and tampering women's photo to defame them. Families and communities were not very cooperative in

understanding women's or girls' situations, and women and girls were often blamed for the incidents of harassment, which discouraged them from reporting incidents or asking for support to combat such harassment.

Some domestic and intimate partner violence also occurred as a result of non-cooperation, mistrust, and misunderstanding by women's spouse and immediate family. For young unmarried girls, it was mostly initiated their parents or elder siblings whereas for the married women it was mostly their husbands and sometimes in-laws. Sexual abuse within marriage was also reported by the women as a direct outcome of women's husbands watching pornography and forcing them to have sex in different positions the women were not comfortable with. Use of mobile phones particularly smartphones made pornography more accessible in the remote villages.

Women's access to and use of ICTs made them comply more with sociocultural and religious restrictions. There were socioculturally and religiously expected ways of using ICTs for the women and women were regularly monitored by the family and community if they were complying with those requirements. Smartphones were extensively used to access sermons by the women and their husbands, families, and the communities

Women and girls participated in this research reported increased surveillance and monitoring by their families and communities. Most women didn't question this monitoring as they typically believed that their families did it for own their betterment. Monitoring of women's ICTs happened either by directly accessing their devices or by monitoring their activities both offline and online. Access and use of women's ICTs in private were not culturally accepted where women's spouse and family monitored women's use of ICTs in a regular basis. PROTIC women also reported regular monitoring by the NGO staff where they were expected to perform according to the NGO's interpretation of the requirements of the project.

RQ 2: What factors influence women's active engagement with ICTs?

Different factors influence women's active engagement with ICTs in the context of rural Bangladesh including sociocultural, religious, economic, technical, and infrastructural. Most of the existing research discusses the influence of explicit technical, economic and infrastructural factors, however my research also explored the influence of the implicit sociocultural and contextual factors shaping women's experience with ICTs as well.

Some underlying sociocultural and religious factors and conventions that strongly influence women's access and use of ICTs were identified. These sociocultural and religious factors are not always obvious, articulated and thus discernible to someone from outside that environment. Because of psychological internationalization of particular group norms, women behaviourally comply with these influences.

Social and cultural norms that affect family and community attitudes and individual behaviour restrict girls' access and use of ICTs. This research has found that adolescent and young girls from the age of 12 to 19 are less likely to use a mobile or a personal computer than boys. While talking to adolescent girls and boys it came out quite clearly that girls' use of technology is more a concern for their family. Parents are more interested and comfortable in buying phones for sons instead of daughters. While talking to the girls, I found that girls sometimes passively accept this situation and self-regulate their choices to comply with the sociocultural requirements.

Sociocultural factors affect both Muslim and Hindu girls and women in rural Bangladesh in similar ways but for the Muslim women and girls, religious restrictions are more influential. Religious norms

and restrictions determine and control women's mobility, connection with the outside world, and visibility in many ways. For example, many of the Muslim women explicitly mentioned the religious restriction of posting their own photos or setting as a profile picture in Facebook.

In a society like Bangladesh the idea of 'good woman' is dominant. The notion of 'good' women refers to the socioculturally accepted image and has a strong influence on expected use of ICTs by the women. In another way complying with the image of a 'good woman' in a way allow women to access and use ICTs in certain other and acceptable ways. To maintain the image of 'good women', women comply to keep their access and use of ICTs. As discussed in RQ1c, women's access and use of ICTs is under consistence surveillance and monitoring which restricts their active engagement with ICTs.

At a broader level, ICT4WE and ICT4D initiatives focus more on providing material and skills support, and sometimes overlook the creation of an enabling environment for women's active and independent engagement with ICTs. However, the challenges women face when accessing and using technology are not only related to skills and economic conditions but also to the lack of support from the family, society and also Government and NGOs in promoting women's active engagement with ICTs.

My study indicates that government and NGO support systems are frequently too focused on their service delivery which includes meeting defined project objectives and goals. Innovation and self-reflection are downplayed. Existing ICT for development initiatives mostly consider simplified ideas about economic development or empowerment as the prime indicator of women's empowerment. This limits ICTs' ability to be designed and used for empowering women holistically and also misses the gaps and factors that may negatively impact women's empowerment.

Information management and coordination gaps limit opportunities of active engagement with grass-roots people and the ability to address their needs. In some cases, the project activity design and project information management system do not adequately support information gathering, management and sharing processes across the different actors involved. It is important to ensure that information and knowledge flows including those of the community flow through to local, national and international levels, otherwise community voices will be compromised, bottom-up participation will not be ensured and positive change will be harder to achieve.

RQ 3: How can the use of ICTs contribute to the empowerment of rural women?

ICTs have the potential to empower women through access to and use of information, by overcoming physical boundaries and restrictions. From the PROTIC project it was quite evident how the use of smartphones has contributed to rural women's lives in many ways. It was evident from the research findings that use of ICTs can contribute to women's empowerment, however if sociocultural challenges and context-specific needs are not addressed, ICT uptake may be limited or have a negative impact on women's lives. In particular, existing ICT design is very much influenced by the western ideas of individual technology use, but in the traditional, hierarchical and collectivist environment of rural Bangladesh, ICT devices are shared among family members irrespective of particular ownership. Culturally this kind of sharing is expected and from a gender and intersectional perspective there are some specific considerations. In rural Bangladesh women's use of ICTs are influenced by self-regulation, sociocultural regulation and NGO regulation. These influence and forms of regulation need to be considered to make technology and interventions more appropriate for the women in rural Bangladesh. The ICT4WE model (see Figure 7-1) presents the dimensions that need to be considered to support the contribution of ICTs for empowering rural women in Bangladesh.

8.4 SUMMARY OF RESEARCH CONTRIBUTIONS

The outcome of the study contributes to new knowledge, with theoretical, methodological, and practical outcomes. It is hoped that contributions of my research will be the basis for future research, policies and practices to support women's active participation in ICT4WE and ICT4D policy and interventions.

8.4.1 Theoretical Contribution

Development of ICT4WE model and table to support context-specific designs and implementations of ICTs and ICT4WE and ICT4D initiatives.

Based on the foundation concepts emerged from my data, I have developed the multidimensional ICT4WE model. The multi-dimensional view of this ICT4WE model comprises the context-specific insights and wide-ranging understanding of the contextual nuances resulting from my research.

The ICT4WE model (see Figure 7-1) represents a complex process of four interconnected dimensions and facets within each dimension to support appropriate design and implementation of ICTs and ICT-supported women's empowerment and development interventions. It addresses context-specific needs, challenges and priorities by identifying them and their relationships. This model will enrich the theoretical and methodological landscape of ICT4WE, ICT4D and Information Systems (IS) research by focusing on context-based information and process-oriented description.

The model contains four dimensions, each of which is a foundational construct of the model. Dimensions 1 and 2 reflect the need to understand the context, whereas dimensions 3 and 4 suggest actions and represent ways of addressing the context-specific issues of dimensions 1 and 2.

- **Dimension 1: Understanding the context and intersectional influences** emphasises the understanding of context-specific needs, challenges, and priorities.

- **Dimension 2: Holistic understanding** highlights a holistic understanding of both women's empowerment and the impacts of ICTs.

- **Dimension 3: Enabling factors** identifies the enabling factors for designing and implementing ICT4WE and ICT4D initiatives.

- **Dimension 4: Addressing regulation** relates to the consideration of challenges and regulation at different levels of those initiatives including self, sociocultural and organisational.

This model is supported by a table (see Table 7-1) which offers a detailed explanation of the dimensions and facets of the model and their interconnections. The table also presents considerations for designing and implementing ICTs and ICT4WE and ICT4D initiatives. The ICT4WE model, along with the table, is the theoretical contribution of my research and it is also the basis of the practical contribution of my research.

8.4.2 Contribution to Methodology:

Considerations for future researchers to be responsive to the context-specific requirements for collecting quality data.

The methodological contribution of my research will guide future researchers to paying attention to the context and responding to the data collection requirements. Paying attention to the context is important as it helps to explore internal and external influences, by noting participants' non-verbal language including facial expressions, tone, body language and interactions with others. Responding to the data collection requirements will lead to the collection of quality data through effective application of qualitative research methods. Adopting a Grounded Theory approach, my study explored participants' experiences and context-specific realities rather than designing the study and analysing the data based on exiting theories or hypothesis. Collecting data by visiting participants in their situated locations was instrumental in achieving more authentic reflections from them. Data was collected from a number of perspectives, namely those of rural women, their families and spouses, community, development professionals from both government and NGOs, academics and researchers. My research approach was sensitive to the participation patterns. Along with in-depth interviews and focus group discussions (FGD), observation or shadowing was also used as an influential technique to understand the participants' world beyond their words. In Chapter 4, I discussed how observation or shadowing was undertaken in this research and how it contributed to collecting authentic stories of the participants. Following considerations are important to be attentive and responsive to data collection realities:

i. Understanding the research context, informal discussion with participants in natural settings needs to be done before starting data collection as this process helps researchers to avoid possible biases, and possibly to be more independent of intermediaries.

ii. Using a combination of both planned and responsive methods is important to achieve rich and authentic qualitative data.

iii. Researchers should visit participants in their situated context rather than inviting them for an isolated and formal interview or discussion. Isolated arrangements can be completely foreign or unnatural to their way of talking and describing their world.

iv. Observation and informal interaction should be used as an important technique of data collection to explore the untold stories of the marginalised groups of participants like women.

v. Researchers should ensure enough time and a safer and comfortable place for the women participants so that they can freely share their experiences without any influence.

8.4.3 Practical Contribution

Practical considerations for design and Implementation of ICTs and ICT4WE and ICT4D initiatives

The findings of my study demonstrate the need for addressing context-specific needs, challenges and priorities to support women's agency in relation to ICTs. My study has offered a holistic understanding of women's empowerment and the impacts of ICTs in women's lives. This holistic understanding will guide relevant stakeholders including researchers, ICT designer, development practitioners, and policy makers to examine the contribution of ICTs for women's empowerment. The findings of my study have identified that women's context-specific challenges of accessing and using ICTs can neutralise the

positive impacts of ICTs in their lives. The following considerations, resulting from my study, will contribute to localising the SDGs, and in particular SDG5, to help achieve gender equality and empower women and girls through appropriate design and Implementation of ICTs and ICT supported empowerment and development initiatives:

i. Co-design based on context specific requirements

Technology and development interventions should be actively co-designed with the rural women themselves by ensuring their participation in each and every phase of design, implementation and evaluation rather than only for on-paper validation. It will help to address context specific requirements to make technology and interventions more appropriate, applicable and sustainable.

ii. Support women's agency in relation to ICTs

ICT4D and ICT4WE initiatives should allow more independent and innovative use of technologies by the women to improve women's agency in relation to accessing and using ICTs.

iii. Active involvement of spouses and family members as a support system

Along with creating opportunities and supporting women's ownership of ICTs, their spouses and family members should be actively involved in the development programs as support systems.

iv. Supportive infrastructure, skills and training support

More needs-based and regular training need to be organised to support women's learning of new technologies and their safe use, including how they search and choose trustworthy information. Rural women's convenient access and use of need-based and understandable versions of information will support their agency in technology use.

To support rural women to become active and aware ICT users, training on online and offline safety of technology use and information literacy should be conducted before handing over any device to the participants and to lessen dependency on project staff and others. It will also contribute to the other training and learning activities related to technology use.

v. Communicate the stories of failures along with success

Development initiatives should recognise the stories of project implementation 'failures' or challenges because focusing only on success stories does not allow to understand and communicate the reasons of failures to achieve long-term positive changes.

vi. Project Information sharing and management across different levels

In ICT4D and ICT4WE initiatives, it is important to collect, share, and manage various forms of project related information from the community through to local, national and international levels, otherwise community voices will be compromised and bottom- up participation will not be ensured.

vii. Convenient reporting and information sharing for better participation and information management

Convenient reporting and project information sharing need to be organised for better information and knowledge management.

viii. Effective collaboration and shared ownership between partners

Collaboration between development organisations and research organisations needs to be done by developing an atmosphere of trust and shared ownership rather than working in conscious isolation.

ix. Addressing existing regulation and responses

Understanding and addressing existing regulation as well as women's responses to regulation need to be considered in every stage of ICT4WE and ICT4D interventions.

8.5 LIMITATIONS OF RESEARCH

This research is based on the context of rural Bangladesh and the findings of the research may not be generalizable beyond that specific context. The research also had some limitations in terms of access to participants, observation, timeline, and generalizability of research outcomes issues. It would be preferable if this type of field work could be conducted over a longer period of time by staying in the village because it could have resulted in deeper observations and interview work with participants. However, more time was not allowed due to safety and security concerns and PhD timeline issues.

8.6 RECOMMENDATIONS FOR FURTHER RESEARCH

The results of my research show that sociocultural and religious regulation of women's technology use sometimes lead to intimate partner violence, domestic violence and other abuses. This area should be explored sensitively in the future. Findings of my study also indicate that mobile phones and especially the smartphones had enabled increased access to *owaz* (religious discussions) by the rural communities which resulting in further regulation for women in their daily lives. Future research should explore this particular scenario related to use of mobile phones and religious *mores* and how these issues can be addressed by government and NGO initiatives.

In this context, supporting women's active engagement with ICTs, awareness needs to be raised about the potential and opportunity for productive ICTs uptake with positive cultural, social and economic effects among rural populations including women's families and communities at large.

Along with this, future research should study how ICT4D initiatives can be more inclusive regardless age, literacy, gender, disability and other challenges. This could also result in more positive attitudes about ICT uptake. Current practices have some bias because in most cases young and middle aged, literate people are prioritised as ICT4D project participants.

Furthermore, while it was not a key area of my research, it became apparent that while the Bangladesh government's UDC initiative for 5292 union digital centres[23] employing women is currently quite limited, even though it is meant to reach every corner of the country. If the vision of a Digital Bangladesh is to be fulfilled, the UDCs should by properly staffed by women and safely function for rural women. They have a key role to play in connecting with other ICT initiatives in the country, such as those implemented by NGOs, including those specifically directed at women, young and older. The findings of my research show that women who were employed by the centres could not undertake this role because of personal and sociocultural challenges in how the UDCs are set up, resourced, and managed. This gender-inequality and sociocultural regulation need to be addressed.

Further research could explore this situation and support policy developing and evidence-based advocacy for equitable consideration of women's roles and functions in government-supported ICT initiatives in rural areas.

Finally, future research can explore how information and knowledge can be better created, shared and managed in ICT for women's empowerment and ICT for development initiatives to address context-specific needs in bottom-up ways.

[23] https://a2i.gov.bd/publication/union-digital-centres/

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APPENDICES

Appendix 1: Topics for Interviews

Group 1: Rural Women

CONTEXT:

- Personal information
    - Name
    - Address
    - Age,
    - Marital status,
    - Educational qualification,
    - Occupation, religion,
    - ICT user/nonuser,
    - Participant of DP (development programme)/ not)
- Demographic information of the area
    - Climate and disaster vulnerabilities
    - Livelihood options
    - LIFE
- What is communication? / What does communication mean to you?
- What is information? What does information mean to you? What kind of information you think important for you?
- What are the characteristics that are required or important 'to be a woman'?
- How do you experience your journey 'as a woman?'
  How do you found yourself situated in this community (tell me about your mobility) [van diagram may be drawn?]
- How do you communicate to your family members, friends and others?
    - Whom do you communicate?
    - What are the reasons for communication?
    - What kind of information do you get from them?

DEVICES

- Meaning of technology? What do you think?
- What types of information and communication technologies (ICTs) do you use or used before?
- How are you accessing and using information and communication technologies? (PROBING THEM WITH DIFFERENT TECHNOLOGY)
- Impact of using ICTs in your life.

CONTENTS

- What are the functions that you usually use in your device?
- What are the contents you think is useful for you?
- What are the apps that you download by yourself in your mobile phone?
- What kind of information can be trusted?

- How do you rate the service that you are getting from the call centres and UDC?

EMPOWERMENT (Power, Control over resources, being empowered, Process/space/time, Agency) [Try to conduct this section more in story telling approach]

- Areas/role/ space of life you feel empowered, happy or disempowered. Why?
- Do you think that as a woman you can do whatever you like?
- Reactions to their roles 'as a woman' defined by the family and society.
- Ownership of ICT and independence of use.
- How empowerment occurs in the ground in relation to the technology
- Process of individual woman's journey in different stages (women with radio, first time got the phone and phone for 2 years experiences etc.)
- Challenges and barriers, they face of using ICTs at various levels including family, society national and global. / Reactions from the family members, community people and others on using ICT 'as a woman'.

PEOPLE AND NETWORK

- What are the networks you are now connected with? (formal, informal, women network, social network, local Govt, NGOs etc. [Van diagram may useful in this regard]
- Does ICT play any role to be connected with these groups? If yes then what kind of role?
- Is it useful to be connected with these networks?

ASPIRATIONS

- What is the best possible life that you want to achieve?
    - Where are you now?
    - Where you want to see yourself in next 5 years?
- How the voice of the women can be reflected in the national policies?
    - Is it really necessary?
    - Do you think that your opinions (views, needs etc.) can play any role at wider level? (society, national, global)

Group 2: Spouse and family members of the rural women

- Personal information of the participants
- Women's regular life in the village
- Social position of women and men
- Role of family and society in case of decision making in women's lives (Overall and personal experience)
- How women are using ICT in this village/ gross picture of women engagement with ICT (Household and in general)
- Impact of ICTs in women's lives (positive and negative)

- Importance/ potential of ICTs to bring changes in women's lives
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for empowerment

Group 3: Local leaders

- Personal information of the participants
- Women's regular life in the village
- Social position of women and men
- Role of family and society in case of decision making in women's lives
- How women are using ICT in this village/ gross picture of women engagement with ICT
- Impact of ICT in women's lives (positive and negative)
- Importance/ potential of ICTs to bring change in women's lives
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for empowerment (Power and customs related to Women/men roles)

Group 4: Government and NGO stakeholders

- Personal information (e.g. name, educational qualifications,
- Role of ICT for development / women's empowerment
- Projects for ICT for development and ICT for Women's empowerment (Existing and future panning)
- Implementation strategies / how the projects identify the needs for designing implementation plan?
- Impacts of ICT for development and ICT for Women's empowerment projects (positive and negative AND UNINTENDED)
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for women's empowerment in the context of rural Bangladesh
- How can the rural women evaluate the USEFULNESS of the interactive communication tools?
- How do we encourage and engage the voice of women with national policy issues?
- Is there any impact on women's social position?

- Challenges in case of implementing ICT4WE project?
- Monitoring system of the projects?
- What can be done differently or better in ICT4WE/a2i project?
- Participants selection criteria

  Particularly applicable FOR WECAN Campaign:

- Experience with the change makers
- Suggestions on ICT for WE initiatives
- ICT: blessing for WE or not!

Group 5: Academics and Practitioners in Gender, ICT and Development sectors

- Personal information (e.g. name, educational qualifications, experience in Gender/CT / development sectors
- What is empowerment? key factors and indicators for women's empowerment/ measuring women's empowerment
- Theories of international development and empowerment
- Role of ICT for development / women's empowerment
- Impacts of ICT for development and ICT for Women's empowerment projects (positive and negative)
- Comments/ views about the role of the development project including addressing needs from the grass-roots community
- Active participation from the grass-roots in the development process/ How can the rural women evaluate the success of the interactive communication tools?
- How do we encourage and engage the voice of women with national policy issues? / Evidence based advocacy strategies

Group 6: Staff of Telecom Organisations

- Personal information
- Activities of the organisation/ about the organisation
- History of the partnership with dev sector
- Perception of dev
- Perception of Women Empowerment or women in development
- PROTIC
- Impact
- Challenges
- What can be included as part of ICT for WE

Appendix 2: Topics for Focus Groups

Group 1: Rural women

- Personal information of the participants (e.g. name, age, marital status, educational qualification, occupation)
- Women's regular life in the village
- Social position of women and men
- Role of family and society in case of decision making in women's lives
- How women are using ICTs in this village/ gross picture of women engagement with ICTs
- Impact of ICTs in women's lives (positive and negative)
- Importance/ potential of ICTs to bring change in women's lives
- Major challenges to empowering women's voices
- Specific challenges related to using ICT independently by the women
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for empowerment
- Do the women need to be empowered? Why?

Group 2: Spouse and family members of the rural women and Local leaders

- Personal information of the participants (e.g. name, age, educational qualification, occupation)
- Women's regular life in the village
- Social position of women and men
- Role of family and society in case of decision making in women's lives
- How women are using ICTs in this village/ gross picture of women engagement with ICTs
- Impact of ICT in women's lives (positive and negative)
- Importance/ potential of ICTs to bring change in women's lives
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for empowerment
- Do the women need to be empowered? Why?

Group 3: Local Government and Local Leaders

- Personal information of the participants
- Women's regular life in the village
- Social position of women and men
- Role of family and society in case of decision making in women's lives
- How women are using ICT in this village/ gross picture of women engagement with ICT
- Impact of ICT in women's lives (positive and negative)
- Importance/ potential of ICTs to bring change in women's lives
- Comments/ views about the role of the development project including addressing needs from the community
- What is empowerment? key factors and indicators for empowerment

Group 4: Adolescent Girls and Boys

- Personal information of the participants (e.g. name, age, educational qualification, occupation)
- Girls' and boy's regular life in the village
- Social position of girls and boys
- Role of the family and society in case of decision making in girl's lives
- How girls and boys are using ICT in this village/ gross picture of women and girls' engagement with ICTs
- Impact of ICT in women's and girls' lives (positive and negative)
- Importance/ potential of ICTs to bring change in women's and girls' lives
- Challenges for girls and boys to engage with ICTs?
- Existing gender discrimination and social inequalities

Appendix 3: Consent Form

MONASH University

CONSENT FORM

(To be translated in Bangla)

Project: 'ICT for women's empowerment in rural Bangladesh'

Chief Investigator: Dr Larry Stillman

PhD Student: Anindita Sarker

I agree to take part in the Monash University research project specified above. I have had the project explained to me, and I have read (or have been read) the Explanatory Statement, which I will keep for my records. I understand the research project and agreeing to take part in this project:

Consent to the following:	**Yes**	**No**
I consent to take part in 1 interview/ 1focus group	☐	☐
I consent for audio recording during the interview/focus group	☐	☐
I consent for photos during the interview/focus group	☐	☐
I consent for the photos of myself to be used in the reports to the stakeholders and in the thesis	☐	☐
I understand that data will be held in secure storage at Monash and accessible only to the researchers during the life of the project	☐	☐
I understand that no reports will contain my name	☐	☐
I understand that research data and findings will be published and presented in journal articles and conferences	☐	☐
I understand that my participation is voluntary and that I can withdraw from the project up to the time that names are removed and the data analysed	☐	☐
I understand that I can request to see the research reports, or the photos and videos that the project makes, and the project will them available to upon request	☐	☐
I consent to use my data for future projects on ICT for development and ICT for women's empowerment	☐	☐

Name of Participant _____

_____

Participant Signature _____ **Date** _____

_____