



# MONASH University

## **The role of mobile technologies in the sustainability of women-led micro-enterprises and women's empowerment in rural Bangladesh**

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A thesis submitted for the degree of *Doctor of Philosophy* at  
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## ABSTRACT

In the face of rapid technology-led economic growth, the development scenario of Bangladesh is complex, with increasing inequality and uneven access to basic needs for all sections of the population. The consequences of this economic growth include greater disparities between urban and rural communities, unequal development outcomes for men and women, and gaps in access to presumed technological benefits for both rich and poor.

Without understanding the social, cultural dimensions and power dynamics, in a society like Bangladesh, it is hard to develop policies and programs to maximise the benefits of mobile technology interventions. In particular, rural women entrepreneurs are a distinct community who are currently unable to benefit from the mobile-based technologies due to factors, such as lack of formal education, limited digital infrastructure availability (bandwidth), the high price of mobile phone services and internet access.

This PhD research project observes, documents and analyses major trends in mobile technology-driven societal change processes in rural Bangladesh. This thesis particularly focuses on the role of mobile technologies in promoting the emergence, growth and sustainability of microenterprises led by women and how this socio-technical change process contributed to women's personal agency.

The specific aim of this research is to examine the role of mobile technologies in the lives of women micro-entrepreneurs in rural Bangladesh and provide critical insights about a) the social, cultural and economic change processes and b) relationships between mobile technologies, sustainable livelihood outcomes and women's empowerment. The research explored the relevance of the widely recognized Sustainable Livelihood Framework (SLF) from a Critical Realism perspective by examining two empirical cases from rural Bangladesh. Findings suggest that despite positive impact of mobile phones, women's access is limited because of patriarchal social norms causing a dilemma for them to choose between the image of a 'good woman' and a 'smart woman'. The research findings provide a reference point for other Information Communication Technology for Development (ICT4D) researchers, NGOs, and policymakers to design appropriate, bottom-up mobile based technological interventions for women involved in micro-enterprise in a rural setup.

**Keywords:** Mobile technology, SLF, micro-enterprise, rural Bangladesh, ICT4D, women's empowerment, sustainable development, Critical Realism

## **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.

Monisha Biswas  
22 December 2021

## PUBLICATIONS DURING ENROLMENT

Sarker, A., Biswas, M., Anwar, M., Stillman, L., & Oliver, G. (2021). When people come to me for suggestions, I feel like an expert” Empowering women through smartphones in rural Bangladesh. *In Lechman, E. (2021). Technology and Women’s Empowerment (1st Ed.)*, edited by Ewa Lechman, 1st ed., 181–99. London: Routledge. Retrieved from <https://doi.org/10.4324/9781003045946>.

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## **GLOSSARY**

### **List of Acronyms**

ADB	Asian Development Bank
A2I	Access to Information Programme of Bangladesh Government
A2I	Access to Innovation Programme of Bangladesh Government
BBS	Bangladesh Bureau of Statistics
CBO	Community Based Organization
DLS	Department of Livestock
FAO	Food and Agriculture Organization
FGD	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
IGA	Income Generating Activities
IS	Information System
KII	Key Informant Interview
LDC	Least Developed Countries
MDGs	Millennium Development Goals
ME	Micro-enterprise
MSME	Micro, Small and Medium Enterprise
NGO	Non-Governmental Organization
OBD	Outbound dialling
PROTIC	Participatory Research and Ownership with Technology, Information and Change
RD Milk	Rangpur Dairy Milk
RMG	Ready Made Garments
SIM	Subscriber Identity Module
SDGs	Sustainable Development Goals
SLF	Sustainable Livelihood Framework
3G	Third Generation

UISC	Union Information and Service Centres
UDC	Union Digital Centre
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WSIS	World Summit on the Information Society
WTDC	World Telecommunications Development Conference

## LIST OF BANGLA TERMS

Char	Riverine Island
Ved	Discrimination
Taka	Bangladeshi currency
Chatal	Rice processing
Balai nashok	Insect control
Bigha	Land
Pollisree	Rural Beauty, name of a local NGO in Dinajpur District
Bideshi	Foreign. Rural women used this word referring to a foreign or mixed breed of cow
Botam phone	Button Phone indicates a mobile phone with basic features
Deshi	Local or country origin. Rural women used this word referring to local breed of cow
Dorbesh	Saint (Muslim)
Heshkari	Reluctance
Vita	Indicates the land with house and homestead area
Uthan	Courtyard
Vutta	Bangla name of the maize crop
Union	Union is a local administrative setup, consists of several wards and villages under that structure
Upazilla	Upazilla is a local administrative setup, usually consists of several unions under that
Salish	Local dispute management process
Shashon	Rule
Shomaj	Society
Shomity	Community based organisation
Godown	Warehouse indicated a well-shaded place to store maize
Goala	Traditional milk producer and butter maker occupational group
Paikar	Wholesaler
Tathya Kallyani	Infolady, indicate a well-trained women group that provide information service to the community
Chula	Clay stoves, traditional cooking stoves commonly used in rural villages

# CHAPTER 1: INTRODUCTION

## 1.1. CHAPTER OVERVIEW

This chapter begins with an introduction and background to the research problem addressed in this PhD thesis. It then explains the significance of the research and specifies the thesis objectives and scope, followed by the research questions. This chapter also explains my motivation, contribution and research limitations as a researcher. It ends with an overview of the thesis structure and leads to the literature review in the next chapter.

## 1.2. INTRODUCTION TO THE STUDY AND ITS CONTEXT

This study focuses on mobile technology use in micro-enterprises and for women's empowerment in rural areas in Bangladesh. The Bangladesh Government's long-term national perspective plans, 'Vision 2021'<sup>1</sup> and 'Vision 2041'<sup>2</sup> emphasise innovative information, communication and accessible technology-driven economic growth as a major pathway to address development challenges and achieve the national goals. In order to enable informed decision making and implementation, further research on the policy implications for various excluded groups, the role of Information and Communication Technology for Development (ICT4D) and mobile technologies is required; and thus, makes this study relevant.

Bangladesh is a relatively small country encompassing 147,570 square kilometres, yet it is identified as the eighth most densely populated country on the planet, with an estimated 162 million residents by the Bangladesh Bureau of Statistics (BBS)<sup>3</sup> (BBS, 2017). Because of its geographic location, it is considered as one of the extremely vulnerable countries to the impact of climate change<sup>4</sup>. Consequently, the development challenges for Bangladesh are multiplied with poverty, inequality and gender-based discrimination. Despite these challenges, the country has made substantial progress in achieving the UN's Millennium Development Goals<sup>5</sup> (MDGs) (2015) and the Sustainable Development Goals<sup>6</sup> (SDGs) (2030), including poverty reduction, maternal and child health and women's empowerment targets. For example, the poverty ratio dropped from 31.5% in 2010 to 24.3% in 2016 (ADB, 2018).

As a rising developing country, Bangladesh has remained a centre of attention for development professionals and academia for a long time (Sawada, Mahmud & Kitano, 2017). Despite its poverty, the country now aims to be recognized as a middle-income country by 2021 (Vision 2021) and an upper-middle-income country by 2041 (Vision 2041). According to the World Bank (2019) assessment, Bangladesh has maintained a steady economic growth

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<sup>1</sup>[https://bangladesh.gov.bd/sites/default/files/files/bangladesh.gov.bd/page/6dca6a2a\\_9857\\_4656\\_bce6\\_139584b7f160/Perspective-Plan-of-Bangladesh.pdf](https://bangladesh.gov.bd/sites/default/files/files/bangladesh.gov.bd/page/6dca6a2a_9857_4656_bce6_139584b7f160/Perspective-Plan-of-Bangladesh.pdf)

<sup>2</sup>[http://www.plancomm.gov.bd/sites/default/files/files/plancomm.portal.gov.bd/files/10509d1f\\_aa05\\_4f93\\_9215\\_f81fcd233167/2020-08-31-16-08-8f1650eb12f9c273466583c165a315a4.pdf](http://www.plancomm.gov.bd/sites/default/files/files/plancomm.portal.gov.bd/files/10509d1f_aa05_4f93_9215_f81fcd233167/2020-08-31-16-08-8f1650eb12f9c273466583c165a315a4.pdf)

<sup>3</sup>BBS is the centralised national official bureau in Bangladesh for collecting statistics on demography, economy, and other facts about the country.

<sup>4</sup>[https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bangladesh%20First/NDC\\_submission\\_20210826revised.pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Bangladesh%20First/NDC_submission_20210826revised.pdf)

<sup>5</sup> <https://www.un.org/millenniumgoals/>

<sup>6</sup> <https://sdgs.un.org/goals>



and is well on track to graduate from the United Nations' (UN) list of the Least Developed Countries (LDCs)<sup>7</sup>.

Its national development agenda is driven by socio-economic-political processes, and inclusive digital development for the poor, rural communities, and women remains a challenging area. As in other developing countries, women's empowerment in Bangladesh is still challenged by social, economic, cultural and political factors, such as patriarchy and lack of access to higher education, economic opportunity, finance and modern technologies. There is a strong political commitment from the current ruling party in Bangladesh to fulfil the digital development vision aligning with the UN's global agenda to 'leave no one behind'<sup>8</sup> by 2030. However, despite the policy commitment, intersecting social challenges are not adequately addressed when designing socio-technical development interventions.

Thus, women's empowerment in Bangladesh is still challenged by social, economic, cultural and political factors such as patriarchy, lack of access to higher-level education, access to economic opportunity, finance and modern technologies. Research has shown that, in particular, the use of ICTs and mobile technologies have a positive impact on small and microenterprises and promote the agency of marginal communities, including women (Stillman et al., 2020; Biswas et al., 2022). There are ongoing debates about the nature and quality of positive impacts and negative effects; therefore, it is hard to draw firm conclusions (Sarker et al., 2021). Thus, there is scope for further research. My research offers an understanding of the situation in Bangladesh from the perspectives of mobile phone users and other key non-government actors. It also proposes a theoretical model to widen the policy and implementation understandings of inclusive mobile technology access.

### **1.3. RESEARCH PROBLEM**

Women's empowerment is a major goal of the development agenda for Bangladesh (Planning Commission, 2010). Consequently, the government particularly aims for a better investment, income generation, education and related improvements in the quality of life for women. But as a society influenced by traditional patriarchal ideas and practices, including at a policy level, women's contribution to the family and society in traditional settings is often unrecognised and undervalued (Laizu, Armarego, & Sudweeks, 2010). Furthermore, there is a limited understanding of gender and its relationship to micro-enterprise growth, sustainability and, more recently, ICTs. The use of these technologies, particularly mobile technologies, has thus been chosen as my key research focus. In fact, a central argument of my research is that rural women entrepreneurs in Bangladesh are unable to access the benefits of mobile technology due to such factors as the lack of education, cultural norms that inhibit ICT use, poor internet connectivity, the high price of mobile phone services and limited access to the internet. Moreover, the knowledge produced by academic researchers is intricate for practitioners and policymakers to access and understand. This limits its use in policy development and

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<sup>7</sup> <https://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/050/GeneralProfile050.pdf>

<sup>8</sup> <https://www.undp.org/publications/what-does-it-mean-leave-no-one-behind>

interventions. This, in turn, limits the application of research knowledge to serve the population's needs.

#### **1.4. SIGNIFICANCE OF THE RESEARCH**

My research observed the effect of social, cultural and economic change processes on women micro-entrepreneurs in rural Bangladesh. It focused on understanding the importance of mobile technologies to promote empowerment and ensure the sustainability of their enterprises.

Bangladesh is significantly reducing poverty and keeps up a steady growth rate in comparison to other developing countries (World Bank, 2019). However, growth alone cannot ensure livelihood opportunities for all. In fact, the gap between rich and poor in both rural and urban settings has been increasing. My argument is that mobile technology can be used to reduce that gap, and empirical data and insights from this research provide a set of recommendations for policymakers and others such as Non-Governmental Organisations (NGOs).

Rural women in Bangladesh are primarily involved in agriculture, personal health care and other informal business transactions but face challenges in availing themselves of public services because of structural and social challenges, such as mobility, the effects of patriarchy and uneven power relations. However, one barrier to understanding the problem is that no common definition of micro-enterprise has been established, even though there are about 250 types of micro-enterprises in Bangladesh (Industry Policy, 2016). This poses a challenge to understanding their contribution to the economy, and my research illuminates those dimensions of the economy, particularly in the area of micro-enterprise. In particular, my research has attempted to develop a standard definition of micro-enterprise, drawing upon common characteristics from the empirical findings reported in Chapters 5, 6 and 7.

My findings and recommendations are particularly relevant because the Government of Bangladesh's ICT Policy<sup>9</sup> 2009 and long-term development plan proposed an increased effort to promote ICT4D, including mobile technologies for micro-enterprises (Planning Commission, 2010). With this background, this study offers a relevant, timely contribution to policymakers and NGOs in addition to offering new research knowledge.

Measuring women's success is another challenge from a policy perspective, and my research has modified the Sustainable Livelihood Framework (SLF) to address that issue with an ICT component, given that ICTs are of policy interest. This is important because NGOs and aid agencies have widely used the SLF to assess vulnerability and measure capability. As a flexible logic model, the SLF has been widely used by development stakeholders and found effective in developing country contexts in Asia and Africa.

Particularly in the COVID-19 pandemic era, Bangladesh is experiencing an unpredictable growth halting situation, with previous achievements being challenged and demanding a solid theoretical framework for short-term remedy with an impactful long-term vision. My thesis findings suggest that government stakeholders may consider using the SLF model to explore

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<sup>9</sup> National ICT Policy of Bangladesh 2009 <http://www.bcs.org.bd/app/webroot/img/upload/page/11.pdf>

the use of mobile technology in reducing vulnerability and increasing the capabilities of marginalised communities.

## **1.5. SCOPE OF THE STUDY**

Based on the literature review, the following five research gaps were identified:

- I. One of the common research gaps identified from most of the ICT4D literature was that there is no clear theoretical framework, and, in some cases, research also lacks a credible methodology. This observation has also been made by ICT scholars, including Heeks (2014), Walsham (2017) and Williamson & Johanson (2018), to account for cultural subtleties that are not always easily observable. They found that most ICT4D research was unable to ensure the quality of research rigour because of weak methodology and the absence of clear theoretical analysis (Duncombe, 2012; Heeks, 2014a; Heeks & Wall, 2018; Walsham, 2000). They also argued that there is scope for further research using qualitative methods as most of the ICT4D research has been dominated by quantitative and positivist research approaches. As a counter to the criticism about the lack of solid theoretical frameworks, my PhD research explicitly uses a Critical Realism perspective for research rigour.
- II. A particular need for the theoretical development of the SLF approach has been identified from the literature review process (Duncombe, 2007; Small, 2011). Small (2011) argued for the relevance of the Complexity Theory, noting Long's work in 2001 derived from Giddens's structuration theory (Giddens, 1987). Small argued that the SLF could benefit from capturing the ICT4D aspect and using development theories in ICT4D research as suggested by Duncombe (2007). There was also scope for in-depth empirical analysis to make the argument even more substantial. The current study addressed this scope through Secondary Research Question 3.
- III. A deeper understanding of the impact of ICTs on development from a theory-based perspective has been recommended for ICT4D research (Gomez & Day, 2013; Heeks, 2007). This includes a call for development theories to support ICT research in developing country contexts (Avgerou, 2008). Additionally, Avgerou (2017) also argued that ICT4D research requires foundational and middle-range theories to understand broader social factors and particular phenomena related to technological processes. Moreover, the importance of interpretive research and interdisciplinary research using a qualitative approach such as interpretive case study has been emphasised for ICT4D research (Walsham, 2017; Walsham & Sahay, 2006). My research addresses that gap.
- IV. Mobile phone use, women, and micro-enterprises have been much discussed as research topics, mainly in the Information System (IS) literature. However, Heeks (2014a) and Walsham (2017) argue that women, gender, and ICT issues remain vital because they remain pivotal in the post-2015 international development scenario. They draw attention to the need for a better understanding of the dynamics of ICTs, systemic poverty and other inequality issues in the gendered development context. Consequently, there is a crucial need to discuss mobile technologies in particular

types of enterprise, such as micro-enterprises in the agriculture and food sector and e-agriculture innovation (Heeks, 2014b). The importance of understanding the strategic value of ICT and technological transformation from a holistic perspective that accounts for local cultural and institutional conditions (Arun, Heeks, & Morgan, 2004; Ramadani, Breidbach, & Kurnia, 2016; Walsham, 2017), has been incorporated into the main research question..

- V. Another contextual research gap has been observed in mapping the stakeholders into the ICT4D context and understanding their roles in the sustainable development management mechanism (Heeks, 2020; Heeks & Krishna, 2016). The roles of different stakeholders were identified as an important dimension in the literature review. Engagement with stakeholders is fundamental in addressing the poverty and inequality issues. There have been collaborations between various stakeholders, but it has been very directed and traditional (Foster & Heeks, 2010; Sambasivan et. al, 2019, Mim & Ahmed, 2020). Effective bottom-up collaboration is identified as a future research topic, and it is beyond the scope of this PhD research.

## **1.6. RESEARCH OBJECTIVES AND QUESTIONS**

My project theorises significant trends in gendered mobile technology-driven societal change processes by studying certain cases of rural micro-enterprises. It focuses on the role of mobile technologies in promoting the emergence, growth and sustainability of micro-enterprises led by women in rural Bangladesh.

### **1.6.1. Research objectives:**

The major research objective and three specific objectives are as follows:

#### **Major objective:**

To explore the role of mobile technologies in the lives of women micro-entrepreneurs in rural Bangladesh and provide critical insights concerning social, cultural and economic change processes through examining the relevance of the Sustainable Livelihood Framework (SLF) from a Critical Realism perspective.

#### **Specific objectives:**

- A. To explore the relationship between the usage of mobile technologies and women's empowerment for useful insights for the design of women-friendly socio-technical projects.
- B. To review how the Sustainable Livelihood Framework can be informed by and improved with empirical research and theoretical analysis.
- C. To observe and analyse the nature of transformative changes happening in the lives of rural women micro-entrepreneurs through the use of mobile technologies in order to provide recommendations for policy and advocacy.

### **1.6.2. Main research question:**

To achieve the research objectives, this study has one main research question and three subsequent secondary research questions which are given below:

**Main research question:**

What are the relationships between mobile technologies, women's empowerment and the sustainability of micro-enterprises?

**Secondary research questions:**

- A. What is the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs in Bangladesh?
- B. What kind of transformative changes are occurring in rural women micro-entrepreneurs' lives with the use of mobile technologies?
- C. How can the Sustainable Livelihood Framework be informed and improved with empirical research and theoretical analysis?

**1.7. RESEARCH MOTIVATION**

As a development professional in a developing country in Asia and with additional experience in Africa, I have observed the following challenges, which motivated me to take up this research project:

- A. Development intervention strategies applied by international NGOs, UN agencies and governments use development models and concepts to address poverty, inequality and women's empowerment issues. However, intervention sustainability remains challenging because of a lack of holistic and deeper theoretical understandings in many areas of international development (Sarker et al., 2021). Although operational models and frameworks such as the SLF and the MDGs contain elements of the theory, it was hard for me to align them with a clear and consistent theoretical base in my work as a manager with Oxfam. I consider my research an opportunity to use theoretical insights to explain and improve existing development practices.
- B. The collaborative efforts between different actors in society, including academia, policymakers, development professionals, the private sector, community, experts, and the mainstream media, have been limited in their effect because they lack overarching theory frames. Thus, while bringing different stakeholders' perspectives together can strengthen the rigour of academic research and analysis, implementing agencies and policymakers can also benefit from theory-based analysis and learning. This research has consequently studied three categories of research participants viewpoints and my reflections as a researcher and therefore offers a solid analysis based on data triangulation.
- C. Development organisations are in close contact with community members, and they conduct practical research and produce policy and advocacy documents. However, academic methods, processes and publication outcomes can be complex to understand or even locate and access for non-native speakers of English. Development professionals and local media have frequently criticised academic research because of its abstract nature, delays, and lack of collaboration with stakeholders (Harris, 2016, p. 179). The research appears disconnected from practical time-bound attempts to change people's lives, the focus of development.

Thus, building an ongoing connection between academia, development professionals and mainstream media from developed and developing countries is critical to overcoming this disconnect. This problem can be exacerbated by differences that exist between the normative picture of technology in the society presented in academic research and the hierarchical and cultural norms in Bangladesh, which are real, pervasive, and influential at all levels of society. My research utilised the opportunity to share primary research findings immediately after the fieldwork, which took into account these cultural differences with community groups, national NGOs and academia. This triangulation process helped to validate the research findings and develop a deeper reflective analysis.

- D. Creating economic opportunities for women has been a crucial factor for national growth in Bangladesh. Historically, 2019 was a transitional period in Bangladesh when the ICT 2009 policy ended and was replaced by a new one in 2020. Analysis of the ICT4D context provided an opportunity to review the lessons of ICT4D interventions and explore ground level executions, particularly from women's perspectives. Thus, the timing of my PhD research makes it especially relevant to a national audience such as academics, policymakers and ICT4D practitioners.
- E. There is a gap between policy and practice level intervention. Often the special needs of particular communities are not adequately considered in the design of socio-technical projects (Sarker et al., 2021). In addition, many mobile technology services are not women-friendly. This research project has created an inspiring opportunity to gather the insights of rural women entrepreneurs on the ground. These insights can help practitioners and policymakers to gain a better understanding of development project design.

## **1.8. LIMITATIONS OF THE STUDY**

As multidisciplinary research, my thesis tries to understand the interrelationship between mobile technology, the sustainability of rural micro-enterprises and women's empowerment. Thus, it tries to develop a particular definition of women's empowerment relevant to understanding two case studies of rural women micro-entrepreneurs. It refers to some dimensions of inequality and gender discrimination faced by rural women in Bangladesh. As a consequence, the thesis does not study gender and empowerment from an international gender studies perspective, though aspects of my research are relevant.

## **1.9. STRUCTURE OF THESIS**

This thesis is organised into three major parts as follows:

**Part One:** Part One provides an overview of the research project, highlights previous relevant work, and explains the conceptual framework and research design.

An introduction and background to the research project are provided in Chapter 1.

Chapter Two reviews relevant work in the literature and directs the reader to essential research concepts and research gaps. However, some ideas and concepts emerged during

the fieldwork (based on insights gained from interaction with research participants), and assisted in developing further clarity on the conceptual model for this study. Therefore, those additional concepts are discussed in Chapters 3 and 8.

Chapter 3 presents the conceptual model and justifies the relevance of using the SLF to understand mobile technology-led development experienced by rural micro-entrepreneurs in Bangladesh.

Chapter 4 explores the appropriate research design and methodologies, explains the sampling strategy, research steps, processes of the research design, data collection, analysis and storage of data according to the Monash University institutional policy.

**Part Two:** Part Two presents the research findings based on data collected in the field along with a review of a wide variety of secondary sources, followed by a discussion drawn upon two case studies of rural women entrepreneurs in Bangladesh, feeding into the development of the SLF modelling for ICT4D.

Findings and discussions are presented in three segments: i) Chapter 5 presents an understanding of the research context; ii) Chapters 6 and 7 present case studies on maize and dairy entrepreneurs' mobile technology use; iii) Chapter 8 presents a discussion feeding into an upgraded modelling of the SLF.

Chapter 5 provides an empirical contextual background to rural Bangladesh in terms of economic, social and cultural aspects. It connects Part One with Part Two by reviewing the contextual discussion, highlighting the gap between policy and reality related to women's empowerment, and the challenges of micro-enterprise sustainability and mobile technology development interventions in Bangladesh, with a particular focus on the digital exclusion faced by the rural women entrepreneurs. This chapter explores how the concept of digital Bangladesh is perceived from the macro perspective, and the execution of mobile technology-led development interventions happening on the ground.

In Chapters 6 and 7, case studies are presented to explore the patterns of rural micro-enterprises, usage of mobile technologies for those enterprises and its importance, challenges faced by rural women micro-entrepreneurs and the role of key stakeholders and institutions at the local and national levels.

Chapter 6 presents the case of women farmers and entrepreneurs involved in the maize value chain who use smartphones.

Chapter 7 presents the case of women entrepreneurs involved in a dairy cooperative where they use basic mobile phones.

Chapter 8 summarises the findings and explores the major points under discussion. This chapter also presents upgraded modelling of the SLF as a part of the theoretical contribution.

**Part three:** Finally, Part Three summarises the research project and highlights the significant findings in Chapter 9. This concluding chapter ends the thesis with a summary of the contribution to theory and practice, the implications of the findings and recommendations for future work.

## CHAPTER 2: LITERATURE REVIEW

### 2.1. CHAPTER OVERVIEW

This chapter maps out previous studies to provide an overview of the theoretical and methodological research concepts relevant to this study. It also sets a backdrop against which to explore research scopes and conceptualise the research design and conceptual framing presented in Chapters 3 and 4.

Section 2.2 contextualises existing knowledge and begins with providing an overview of the research trends in ICT4D. Sections 2.3 and 2.4 introduce prominent scholars, their works and relevant theories in relation to the key concepts for the study: ICT, ICT4D, digital divide, sustainable development, SLF, micro-enterprise and women's empowerment. Section 2.5 reviews structural and social challenges, such as gender, power, patriarchy and intersectionality in geographic vulnerabilities that have an impact on women's access to mobile technologies and other development interventions. Section 2.6 highlights ongoing global discussion agendas in ICT4D, including Sustainable Development Goals, challenges in inclusive ICT and mobile technology-based development, particularly for people who live in developing countries or rural areas and belong to marginal communities, including women. Subsequently, Section 2.7 focuses on relevant works on Bangladesh contexts that discuss poverty alleviation and economic and social development issues, including gender dimension and women's access issues. Finally, Section 2.8 summarises the discussions in the chapter.

### 2.2. ICTS AND ICTS FOR DEVELOPMENT

This study can be characterized as contributing to ICT4D research. There is a growing need for new, critically-oriented research understandings of socio-political contexts in the fast-changing technology-driven development scenario (Walsham, 2017; Dey & Ali, 2016; Heeks, 2014b; Thapa & Sæbø, 2014). This section provides background to the literature review connecting ICT4D with the broader knowledge stream of information ecology.

The impact of technologies on development varies between developed and developing countries, and it also varies from one user group or community to other communities. The main reason behind this is the different information ecologies in different contexts and communities. In general, information ecology can be defined as “[a] system of people, practices, values, and technologies in a particular local environment” (Nardi & O'Day, 1999, p. 49). The British sociologist Anthony Giddens argued that the dynamic between human agency and social structure depended on the reproduction of information and knowledge, and this varies in the particular or contextual conditions found in different communities (Giddens, 1984). Ideally, any technological innovation, information and knowledge needs to be introduced and practised in a way that nurtures the human capability and dignity of the community and promotes their economic, social, and cultural transformative change (Lubin, 2021). Therefore, ICT scholars have pointed out the importance of further ICT4D research



on how people in developing countries can take advantage of digital innovation as a part of a sustainable development agenda (Dey & Ali, 2016; Foster & Heeks, 2010; Heeks, 2014a; Soeftestad & Sein, 2000; Walsham, 2017).

Our understandings of human and sustainable development have changed over the years, and this has in turn affected our understanding of the role of ICTs. For example, the introduction of the MDGs greatly influenced global development agendas. Information technologies became available to promote development interventions, but mostly in the northern countries while southern issues were not well-considered. They were later introduced to the southern developing countries by donor NGOs with endorsement from national governments as a part of the modernisation process. Despite lack of planned successes in poverty eradication, education and women's empowerment, the SDGs replaced the MDGs in 2015 because of potential innovative use of inclusive ICT access for all people to address the challenge of sustainable development.

Richard Heeks (2020), a British scholar who is known as one of the foundational theorists of ICT4D, suggested considering three paradigms of ICTs and international development: i) pre-digital, ii) ICT4D (ICT4D 1.0 and 2.0), and iii) digital-for-development (ICT4D 3.0).

As shown in Table 2.1, the concept of ICT4D has remained a centre of debate and an academic field for practical intervention in both developed and developing contexts, and it is likely to shape future intervention and research in coming years (Heeks, 2010, 2014a, 2014c). While technology transfer was emphasised at the beginning of the 1960s, attention gradually shifted to inclusion, sustainable development and the impact of ICT from 2000 onward and particularly so in the last few years (Heeks, 2014c, 2014a). Given the rapid growth of mobile technology in the developing world, it is important to address the intersectionality of complex issues in development, such as women's empowerment and citizen rights perspectives (Walsham, 2017).

**Table 2.1: Discourse in ICT4D research (Heeks, 2020)**

<b>Issues/features</b>	<b>Pre-digital</b>	<b>ICT4D 1.0</b>	<b>ICT4D 2.0</b>	<b>ICT4D 3.0</b>
Period	1960 – 1990	1990 – 2000	2000 – 2014	2015 - 2030
Dominant discipline	Information system	Informatics, development studies	Tribrid of the computer system, information system and development studies	
Development paradigm	Modernisation	Human development	Inclusive development	Digital development
Technology	PC database	Telecentre	Mobile phone	
Innovation model	Northern	Pro-poor → para-poor	Para-poor → per-poor	
Attitude	Ignore → isolate	Idolise → integrate	Integrate → innovate	
Issues/features	Technology's potential	Readiness & availability	Uptake & impact	Integration & scale up

Key application	Data processing	Content, interaction	Services, production, innovation	
The poor	Unknown	Consumers of ICT	Innovators, ICT user producers	
Key roles	Government	Donors, NGOs	Private sectors	All sectors

## 2.3. MOBILE TECHNOLOGY FOR DEVELOPMENT

### 2.3.1. Mobile Technologies for Development and Affordances

Mobile Technology for Development (M4D) has emerged as one of the key aspects of contemporary ICT4D research. In this era, a mobile phone is an inseparable part of most people's lives. Therefore, the question of affordances is crucial. Both post phenomenology and Affordance Theory explore the use of technologies in people's lives. Post phenomenology, a philosophical theory of technology, suggests that we should study technology as a relationship between a user and an artefact to understand how technology shapes us and vice versa. Similarly, Affordance Theory, as developed by the philosopher Gertz (2016), suggests that we should review how technology exists in the world. However, post phenomenology fails to identify any moral difference between ethical and moral use of an artefact, ignoring the fact that the same artefact and technology may cause harm to others.

Thus, we can suggest that affordances are the manifestation of the designers' intentions, but users also create affordances because they may use an artefact differently to the designer's intended purpose. Gertz (2016) explains affordance by using an example of a fork that a child can use for play instead of using it for eating. He argued that the intended use of a fork for eating is a learned behaviour that grows over time, and the actual use by a user without prior knowledge or learnt skill is likely to be different. This example is similar to what can happen with a mobile phone user. Her adoption or adaptation of the phone for group use can be quite different to the designer's intentions for an individual. In the same way, the use of the mobile phone as a tool for harassment and subsequent violence by some users raises important moral and ethical questions about design decisions. Scholars have suggested that technology and people also have a mutually constitutive relationship (Orlikowski, 1992), and affordances describe aspects of this relationship (Gertz, 2016). For example, Davis and Chouinard (2016) outlined six kinds of affordances that have an impact on people in that they have agency by: i) requesting, ii) demanding, iii) allowing, iv) encouraging, v) discouraging and vi) refusing. Therefore, understanding the nature of affordances helps us to understand people's interactions with technology, particularly in a development setting.

### 2.3.2 Mobile Technologies, Livelihood and Micro-enterprise

With these notions of affordance in mind, multidisciplinary research has been conducted to understand the ICT4D change process, mainly in developing country contexts in Africa and Asia, with a particular focus on mobile technologies. Walsham (2017) has observed that since the mid-2000s, mobile-based technologies have become a prominent tool for technological development compared to other ICT devices such as desktops and laptops. Similarly, many studies have shown a positive correlation between ICT4D interventions, including mobile

technologies and, a) user awareness and e-learning, b) e-inclusion, c) enterprise growth, d) connection and social capital, and e) women's empowerment (Hoque, Mahiuddin, & Alam, 2015; Islam, Habes, & Alam, 2018; Mbogo, 2010; Botha et al., 2009). Research also demonstrates that mobile phones help people strengthen social networks in addition to their business networks (Duncombe & Heeks, 1999).

A study by Donner (2007) in the context of South and East Asia, and Africa shows that compared to old users, new users use mobile phones more frequently, and this has a direct positive impact on rapid business growth. Another study in Niger observed that mobile phones improved the welfare of consumers and traders in the grain market with reduced search costs (Aker, 2008). Similar findings were noted in a recent study in the Bangladesh context, showing the positive impact of mobile phones on business performance which is mediated via the social capital of micro-entrepreneurs (Islam, Habes & Alam, 2018).

The literature suggests how frequently mobile phones are connected with business growth, personal contact and social capital. Donner (2009) argues that "mobiles blur the lines between livelihoods and lives" (p.91), because mobile technology directly connects 'people' instead of 'places', blurring the necessity of contexts and purposes. Subsequently, the mobile phone provides affordance, it allows people *"to draw complex interactions between personal and productive activities"* (Donner, 2009, p. 94). Several different studies in different settings, such as Jamaica (Horst & Miller, 2006), the Philippines (Nagasaka, 2007; Paragas, 2005), and Senegal (Tall, 2004) show that blurred lines between personal and economic relationships were found in different kinds of livelihoods including micro-enterprises and other personal activities. Presumably, people's habits of using mobile phones and mobile internet in particular ways are driven by cultural and personal preferences (people end up being allowed, demanding, and encouraged to connect by mobile affordances in their cultural context), that can be diverted to mobile-based financial and production activities (Donner, 2009).

Some studies observe that the experiences of men and women users can be different. For example, an ethnographic study in India found that men's possession of mobile phones symbolises their freedom, independence and connections (Assa, 2012, p. 431). This experience may vary depending on region, class, age, gender and caste; therefore, the potentially emancipatory qualities of mobile phones might be totally different for a woman from the same society (Assa, 2012). Moreover, mobile phones may increase the domestic burden for women, and in some cases, it may even increase incidents of domestic violence (Komunte, 2014).

Another research study in Bangladesh found that there is a direct connection between the use of mobile phones in managing information flow and financial transaction processes such as mobile banking (namely Bkash) and improvement in the living standards of rural women (Islam & Slack, 2016). Research conducted on the Bangladesh Grameen Bank Mobile Phone Programme shows a positive correlation between mobile phones and improved income level, housing conditions, living standards, awareness about health and overall improvement in rural women's lives (Barua & Diacon, 2003; Uddin, 2014).

However, despite the volume of research, only a few studies have analysed the correlation between mobile technologies and micro-enterprises, and the results are inconsistent. Studies reveal that the operation of a micro-enterprise is a complex, interconnected, multidimensional process where investment, labour, technology, skills, connection, value chain, market, context - all dimensions are important (Tundui & Tundui, 2013; Donner, 2006; Anwar & Johanson, 2012). The nature of mobile technologies varied in research focus, definition and characterisation of micro-enterprises also varied from one researcher to another, making it difficult to conceptualise the issue. For example, as Donner (2010) explains in a review of mobile usage in 14 developing countries by micro and small entrepreneurs, it is challenging to find a standard definition of micro-enterprises, and roughly it may engage less than 50 employees (Donovan & Donner, 2010). A number of studies show the relevance of mobile money transfers such as M-Pesa in Kenya in the case of the success and growth of micro-enterprises (Lyytinen, 2010; Mbogo, 2010). Another survey by Komunte (2015), in Uganda shows how mobile phone usage can facilitate a positive change in the entrepreneurial ability of women by increasing their ability in handling emergency situations, reducing transactional and trading costs, as well as minimising risk factors. At the same time, a mobile phone may increase the domestic burden, and it may even increase domestic violence in some cases (Komunte, 2014).

One study in Bangladesh noted that the use of mobile phones brought some positive changes but did not increase women's mobility, which is an important factor for women's empowerment (Hultberg, 2008). The study demonstrated that, compared to men, women have less opportunity to use mobile phones, suggesting we should consider structural causes and barriers limiting women's access. Presumably, the usage of mobile phone technology can be considered merely as a technological option and not a panacea to address the social divisions, as observed in the case of women micro-entrepreneurs in Chennai, India (Chew, Levy, & Ilavarasan, 2011). This insight guides this study to explore the relationships between mobile phone usage and women's micro-enterprise related activities along with their personal and social communication, which are related for women's empowerment.

## **2.4. DIGITAL DIVIDE AND INCLUSIVE SUSTAINABLE DEVELOPMENT**

### **2.4.1. Digital Divide**

Inclusive digital development, digital divide and gender divide have emerged as important discussion and debate agendas in ICT4D research. However, because of the orientation of ICT scholars, it is difficult to develop a standard definition and characteristics of the digital divide, and priorities may be different. For example, while reviewing the trend of IS research in developing countries, Avgerou (2008) noted that the majority of papers consider the digital divide is important, mainly to explore the huge yet untapped market in developing countries. In contrast, only a few scholars like Walsham take an ethically based position on digital divide issues, concerned with improving lives of the poor who are denied access to technology (Avgerou, 2008; Walsham, 2017).

Consequently, while the digital divide in a developed country might address concerns like high-speed internet access, the concerns can be different in a developing country context,

such as ensuring physical access to or ownership of mobile phones (Heeks, 2017; Aziz, 2020; GSMA, 2020). Therefore, scholars suggest considering three aspects of the digital divide: i) access, ii) affordability, and iii) digital ability (Thomas et al., 2018). In particular, digital literacy and skills, which can be considered as the third aspect of digital ability, are crucial in both developed and developing country contexts. Furthermore, the experience of successful digital literacy and skill development might not be transferable knowledge, because of different social embedded factors, which are often 'unobservable' in conventional research and, therefore, currently less discussed. For example, 'mobile literacy' and access to mobile phones for a woman in Northern India (Assa, 2012) can be a huge concern for the community resulting in constraints on use because they can result in breaking social barriers. However, immaterial cultural barriers are not always easily observable, may be non-material tacit, and not captured with conventional materialist approaches to access (devices, bandwidth, cost) (Sarker et al., 2021). Despite the fact that they are empirically directly unobservable concepts as effects, they have agency, and can shape the woman's self-identity (Stillman et al., 2020; Biswas et al., 2022).

Another problem is that developing countries tend to engage in ICT4D projects for immediate results without a long-term vision. The United Nations Conference on Trade and Development (UNCTAD) reports observed the absence of policy strategies in many countries (UNCTAD, 2014). Without strong political commitment, vision and strategic planning, it is not possible to achieve a sustained impact and ensure benefits for all sections of the community. Studies indicate that only some countries included acceleration of broadband adoption and network connectivity in their national plans; a few have separate ICT policies (Duncan-Howell & Lee, 2008). This study considers both physical and social dimensions of the digital divide; therefore, it considers the perspectives of different segments of the population and explores gender-segregated data.

#### **2.4.2. Inclusive Sustainable Development**

In 2000 the UN endorsed the MDGs that aimed to halve the number of people in poverty, promote women's empowerment and address environmental vulnerability issues. With a deadline of 2015, the MDGs have now been replaced by the SDGs for UN member states targeting more precise national development agendas and actions by 2030. Consequently, this study considers SDGs, particularly goal 5, which aims to *"achieve gender equality and empower all women and girls' through the use of ICTs"*.

As a part of the SDGs, 'human capabilities' and 'informational capabilities' or 'digital abilities' are central to inclusive international development (Sen, 1993; Gigler, 2011; Donner, 2009) and much-discussed topics in different academic disciplines, including ICT4D (Crocker & Robyens, 2010). The use of human capabilities or freedom of choice and emancipation concepts have become particularly known through the Capability Approach, introduced by the Noble Laureate and Economist Amartya Sen (1993). Since then, it has been widely used in development studies, social policy, economics and political science in addition to ICT4D. In this study, the capability approach was found relevant as a concept to examine the individual and collective capabilities of rural women entrepreneurs, discrimination and challenges faced by them because of gender, class and patriarchal power relations (see Chapters 3 and 8).

### **2.4.3. Sustainable Livelihood Approach**

The 'Sustainable Livelihood' concept has been adopted in various academic disciplines. It is also known as the 'Rural Livelihood Approach', 'Sustainable Livelihood Approach' or 'Sustainable Livelihood Framework'. This development approach has been widely used in development interventions focusing on livelihoods in Africa, Asia, South America, and Central and Eastern Europe (Small, 2011). The approach was originally introduced by Robert Chambers, a leading development researcher and theorist from the UK, who advocated for the concept of the SLF as a practical development model. Later, the concept of SLF became popular when the UK Department for International Development (DFID) and other donors adopted the model for development projects and evidence-based research as a meaningful tool to address the vulnerability issues of poor people (Chambers & Conway, 1991; Duncombe, 2006; Small, 2011).

ICT scholars have used the SLF as a conceptual framework to examine the relationship between information and communication technologies in promoting social and cultural change and suggest it is relevant to further understand the ICT for development under ICT4D research trend (Duncombe, 2006; Small, 2011). However, at the same time, the SLF has been criticised for not paying enough attention to the broader macro-economic and political issues which may impact the local situations related to ICT4D (Parkinson & Ramirez, 2006). Furthermore, a major limitation of the SLF in explaining ICT4D was identified as its lack of theoretical alignment with any development or socio-technical theory (Small, 2011). As a consequence, Small argued for the relevance of Complexity Theory, while Duncombe emphasised the importance of using theories from development to explain the SLF with an ICT4D component (Duncombe, 2006; Small, 2011). Small and Parkinson also noted that SLF is used mainly to understand the causal linkage of ICT4D and livelihood, but suggested there is room for theory development (Parkinson & Ramirez, 2006; Small, 2011).

The SLF can consequently be considered foundational for this study because it is a basic development conceptual framing used by international, national and local NGOs in Bangladesh along with government institutions, UN Agencies and other bilateral donors, and it is also of interest to academics. Consequently, this thesis takes the position that it is useful to understand how the SLF can be informed with in-depth analysis from a) examining the role of mobile technologies in facilitating the sustainability of rural micro-enterprises and women's empowerment and b) exploring a consistent theoretical base to explain the socio-technical change process (see Chapter 3, Sections 3.4 and 3.5).

## **2.5. GENDER ISSUES IN ICT4D**

The concept of 'women's empowerment' is complex and has been interpreted differently in different contexts for decades; therefore, there is no one commonly accepted framework to measure the impact of ICT on women's empowerment. Therefore, this section reviews some prominent theories to understand the gender digital divide in technology, i.e. women's unequal access to technology, and explores relevant theoretical perspectives for this study.

The Indian researcher Gurumurthi has reviewed major approaches used in previous studies to understand the gender dimension in ICT. Her critique on different approaches guides this research to consider a robust conceptual framing to understand the relationship between gender and ICT.

**Table 2.5: Gender and technology (Gurumurthi, 2004)**

<b>Approach</b>	<b>Primary Thrust</b>	<b>Central Concepts</b>	<b>Critique/comment</b>
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 is 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 for the Third World.	Challenges western systems of knowledge and technology by asserting that these are colonising and displacing local knowledge and experience. Offers a new vision of technology	Puts too much emphasis on people-based knowledge systems, rejecting possible adaptation of modern technologies for progressive purposes.

		that is democratic, non-colonial, and non-patriarchal.	
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' (Gaijala 2002).	Based on the interactions between social power relations and the culture of technology.

Women's empowerment is often considered as a process rather than an end itself; it usually indicates how women's lives can be changed over time through active participation in different economic and social activities (Kabeer, 2017; Laizu, Armarego, & Sudweeks, 2010). *"Women are defined by their relationships in a collective environment; they thus lack both individual rights in material resources, and also bear an ever-present responsibility for the care of family members"* (White, 1992, p. 140). In other cases, women's empowerment is explained as a situation or contextual reality because of its complex nature. Therefore, some studies set indicators to measure women's empowerment and explore the correlation between empowerment and other factors, such as mobile technologies (Mahmud, Shah, & Becker, 2012).

Women's agency and their relationship with society and institutional structures has remained a much-discussed topic in many studies (Alsop & Heninsohon, 2005). Usually, empowerment indicates a power relation between the powerful and powerless in a society (Sam, 2017). Consequently, the concept of women's empowerment and agency has been interpreted in various ways by development organisations and donors, such as the World Bank. This conceptualisation assumes both formal and informal relationships between agency (women) and social structure or institutions that lead to maximum utilisation of productive resources and strengthened capabilities of the community (Alsop, 2005; Sam, 2017). However, that conceptualisation remains blind to the hidden and complex layers of patriarchy in many developing countries, which may direct a woman to act cautiously in accordance with the expectations of family, relatives and community (Moore, 2010; Sultana, 2018).

The sociologist Giele (1977), attempted to develop a framework to assess 'women's status', focusing on legal and social identity or position in society. This framework suggests



considering six aspects: i) political expression, ii) work and mobility, iii) family formation, duration and size, iv) education, v) health and sexual control, and vi) cultural expression. Exploring women's status from various aspects can be useful in observing and interpreting transformative changes in women's lives, and this is further discussed in Chapter 8.

Furthermore, the influential feminist economist and researcher Naila Kabeer (1999), considers empowerment as a process. According to her, women's 'ability to make choices' and make 'active decisions of their day-to-day life' are vital aspects of that empowerment process. She also suggested a conceptual framing to measure women's empowerment combining economic and social aspects on the one hand and showing the connection between individual agency with collective achievement leading to a transformative change process in a society on the other. Her conceptual framing has greatly influenced this study and is included in the conceptual design (see Chapter 3, Section 3.5).

## 2.6. MAJOR GLOBAL ISSUES IN ICT4D

ICT4D research emerged as a significant focus in the mid-1980s, but the research trend and issues continued to change. Globally as well as in developing contexts, focus on ICT4D research is growing with widespread ideas and debates as observed in IS conferences and journal publications (Avgerou, 2008). The importance of understanding contemporary development trends, transformational change processes and the role of ICT4D to address the development challenges is highlighted by a number of key articles (Avgerou, 2008; Heeks, 2014b; Thapa & Sæbø, 2014; Walsham, 2017). Based on a systematic review of literature, Thapa and Sæbø (2014) argued that social and cultural issues are not given adequate attention in ICT4D research and, therefore, there is still a lack of understanding about the strong relationship between information and communication technologies in a development context.

Other ICT4D scholars, such as Heeks (2014) and Walsham (2017) have analysed the major research trends in ICT4D research over the last decades, which repeatedly emphasised gender and women equality issues as priority future work.

**Table 2.6: Major issues in ICT4D research**

Issues in ICT4D research	Analytical lens/ theory	Author/source
Digital divide	Conceptual framework	Mansell (2002)
ICTs and health system		Braa et al. (2004)
Use of ICT by indigenous people in Venezuela	Case study	Gigler (2004)
E-governance assessment in India	Conceptual framework	Madon (2005)
ICTs for livelihood & microenterprise in Botswana	SLF	Duncombe (2006)
The conflict of interests in ICT infrastructure program	Actor-network theory	Gao (2007)
Social exclusion in e-society in Africa and China	Case Study	Zheng and Walsham (2008)

Systemic poverty		Heeks & Arun (2010)
Mobile phone use by farmers in Indonesia	Case study	Wahid and Furuholt (2011)
ICT initiative in remote areas in Nepal	Case study	Thapa, Sein, & Sæbø, (2012)
Internet crime, pornography, identity theft in western countries		Tarafdar et al. (2015)
Gender equality in a patriarchal structure		Oreglia & Srinivasan (2016)

While discussing the past and future agenda for ICT4D, Walsham (2017) identified the following social issues as potential future ICT4D research (p. 27). This study considered **a.** and **b.** below as having scope for research and elaborated these in the thesis research design, findings and discussion chapters.

- i More extensive research is required with an explicit focus on pro-poor ICT4D to address systemic poverty (Stillman et al, 2020; Walsham, 2017). This gap is addressed in my research.
- ii Despite significant previous work, equal access to ICT for women remains a challenge (Frings-Hessami et al., 2020; Sarker et al., 2021). Therefore, there is a wide scope for further research to understand the structural and social barriers to women's access to ICT (Heeks, 2020). This is one of the major focuses of this study.
- iii Some research has been conducted on the use of ICT in humanitarian crises, such as for logistics and supply chain. There is a clear need for further research, but this was not much relevant to my study.
- iv Some research has been undertaken on the use of ICTs to support activism and social justice (Ekine, 2010), and further research can be conducted on state surveillance, privacy and safety of citizens. This is relevant and partially addressed; however, the whole issue is beyond the scope of my study.

## **2.7. MOBILE PHONES, GENDER AND MICRO-ENTERPRISE IN BANGLADESH**

This section reviews previous studies related to the research topics, outlines the Bangladesh national policy context, including structures and actors.

As has already been observed in Section 2.3, research has shown that the use of ICTs and mobile technologies have a similar positive impact on rural microenterprises led by women in the Bangladesh context. We assume that there is a direct connection between the use of mobile phones in managing information flow and financial transaction processes, such as mobile banking (namely bKash); and the improvement in living standards of rural women (Islam & Slack, 2016). Similarly, a positive correlation between mobile phones and improvement in income level, housing conditions, living standards, awareness about health, and overall improvement in rural women's lives is also explained in the Grameen Bank Mobile Phone Programme case study (Barua and Diacon, 2003; Uddin, 2014).

However, there are ongoing debates about the nature of the positive impact that has occurred, and it is hard to draw firm conclusions, indicating the need for rigorous empirical and theory-based studies. Compared to the many positive stories, some studies showed that accessing ICT services remains a challenge for many because of geographic remoteness without adequate internet and mobile phone networks, lack of stable electricity and lack of awareness of available services (Ullah, 2016; Aziz, 2020). Despite political commitment to 'Digital Bangladesh' agenda and claims of success by the Government of Bangladesh (Election manifesto, 2018; Vision 2021; NIP, 2015), in reality, the women in Bangladesh are lagging behind compared to other countries like Brazil, the Philippines and other developing countries in availing the benefits of ICT because of gender discrimination (Rashid, 2016). Only a few studies have suggested that women in Bangladesh are suffering from digital exclusion, facing challenges in availing themselves of mobile technology services in comparison to men (Rashid, 2016; Aziz, 2020). Nevertheless, in the development sector we know that rural women are particularly unable to access the benefits of ICTs due to factors such as lower levels of functional literacy, poor bandwidth, the high price of mobile and internet usage, or barriers posed by inadequate and complex technical information services, staffed by men (Sultana et al., 2018; Stillman et al., 2018).

Additionally, very few studies have explored women's aspiration, willingness and interest in accessing technologies for their agricultural production, micro-enterprises and private lives. According to Qazi Kholiquzzaman Ahmed (2018), a prominent economist and national policy expert in Bangladesh, the use of information technology has emerged as an important contributing factor to small entrepreneurs (including rural women) being able to compete in national and global markets. A survey observed that about 80% of the small entrepreneurs felt the need for technological advancement to improve production processes used in their enterprises, indicating the positive aspiration of women entrepreneurs in accessing technologies (Ahmad, 2018).

Moreover, micro-enterprises in Bangladesh include about 250 types of manufacturing, repairing, trading, agricultural, and other activities across the country (Industry Policy, 2016). Rural women are mostly involved in agricultural and personal health-care trading ventures. Different reports and stakeholders interpret the present situation of microenterprises led by rural women differently (Stillman et al., 2020). It is, therefore, problematic to suggest that there is a common understanding of this issue. Thus, there is a scope for further analysis of the correlation between mobile phones and micro-enterprise growth.

Overall, women's empowerment in Bangladesh is still challenged by social, economic, cultural and political factors such as patriarchy, lack of access to higher-level education, and lack of access to economic opportunity, finance and modern technologies (Frings-Hessami et al., 2020). Furthermore, rural women also remain unrecognised for their economic and care work contribution at the family level (Nugroho & Chowdhury, 2015), indicating the need for further research. All these factors affect the affordances that occur with ICTs (see Section 2.3) and the importance of developing new research insights.

## **2.8. CHAPTER SUMMARY AND RESEARCH SCOPE**

The literature review suggests the following in relation to the research questions, conceptual framing and research design.

- I. One of the common research gaps identified from the ICT4D literature was that most of the ICT4D literature does not use a clear theoretical framework, and, in some cases, research also lacks a credible methodology (Heeks, 2014; Walsham, 2017; Williamson and Johanson, 2018). Some studies explicitly argue that because of weak methodology, most ICT4D research was unable to ensure research rigour (Duncombe, 2012; Heeks, 2014a; Heeks & Wall, 2018; Walsham, 2000). We may also argue that there is scope for further research using qualitative methods as there is a tendency for ICT4D research to be dominated by quantitative and empirical positivist research approaches (Ramadani et al., 2018). Therefore, this study addresses the issue of research rigour with a strong conceptual framework and research design that can account for the affordances offered by ICTs (see Chapters 3 and 4).
- II. A particular need for the theoretical development of the SLF approach has been identified from the literature review process (Duncombe, 2007; Small, 2011; Walsham, 2017). Both Duncombe (2007) and Small (2011) argue that the SLF could benefit from in-depth empirical analysis by examining the location specific vulnerabilities and community specific capabilities in relation to ICT4D, using development theories in ICT4D research to make the argument even more substantial. Consequently, the current study addresses this scope through the third secondary Research Question.
- III. A deeper understanding of the impact of ICTs on development from a theory-based perspective has been recommended for ICT4D research (Gomez & Day, 2013; Heeks, 2007). This includes a call for development theories to support ICT research in developing country contexts (Avgerou, 2008). Additionally, Avgerou (2017) also argued that ICT4D research requires foundational and middle-range theories to understand broader social factors and particular phenomena related to technological processes. Moreover, the importance of interpretive research and interdisciplinary research using a qualitative approach such as interpretive case studies has been emphasised for ICT4D research (Walsham, 2017; Walsham & Sahay, 2006). My research contributes to addressing that gap.
- IV. Mobile phone use, women, and micro-enterprises have been much discussed as research topics, mainly in the IS/ICT4D literature. However, Heeks (2014a) and Walsham (2017) argue that women, gender, and ICT issues remain vital because they remain pivotal in the post-2015 international development scenario. They draw attention to the need to better understand the dynamics of ICTs, systemic poverty, and other inequality issues in the gendered development context. Consequently, there is a crucial need to discuss mobile technologies in particular types of enterprise, such as micro-enterprise in the agriculture and food sector and e-agriculture innovation (Heeks, 2014b). The importance of understanding the strategic value of ICT and technological transformation from a holistic perspective that accounts for local cultural and institutional conditions (Arun, Heeks, & Morgan, 2004; Ramadani,

Breidbach, & Kurnia, 2016; Walsham, 2017), was incorporated into the main research question.

- V. Another contextual research gap has been observed in mapping the stakeholders into the ICT4D context and understanding their roles in the sustainable development management mechanism (Heeks, 2019; Heeks & Krishna, 2016). The roles of different stakeholders were identified as an important dimension in the literature review. Engagement with stakeholders is fundamental to addressing the poverty and inequality issues, but there has been little collaboration between academic researchers, practitioners, policymakers and other stakeholders (Foster & Heeks, 2010). This aspect is better for contextual understanding and addressed under the findings and discussion chapters, suggesting some implications for future research.

## **CHAPTER 3: SUSTAINABLE LIVELIHOOD APPROACH AS A CONCEPTUAL MODEL**

### **3.1. CHAPTER OVERVIEW**

The conceptual framing of the Sustainable Livelihood Framework, which guides the research design and analysis of findings of the study, is the central focus of this chapter. A modified version of SLF, named SLF-M4D, is used as a conceptual and analytical model for the study and informs the research design introduced in the following chapter. The SLF-M4D is informed by fieldwork findings, and further developed as a design and analytical model in Chapter 8 and discussed as a major theoretical contribution in Chapter 9.

There are four major parts of this chapter: a) the Critical Realism philosophical position of this study, b) an introduction to the SLF, c) the major concepts and definitions of the study, and d) the proposed SLF-M4D conceptual model. The chapter begins with an explanation of the philosophical assumptions and provides justification for using Critical Realism as a meta-theoretical lens (see Section 3.2). Section 3.3 introduces the major elements of the original SLF used by development practitioners and ICT4D researchers. Section 3.4 provides explanations of some of the associated concepts relevant to exploring the research questions in addition to elements included in the original SLF. Finally, the proposed conceptual SLF-M4D model is presented in Section 3.5. This model combines the original elements of SLF and introduces additional concepts based on the research objectives, such as women's empowerment, socio-materiality and sustainable development. Section 3.5 provides a solid basis upon which to understand the major conceptual elements and analytical framing of the study that guide the research design in Chapter 4 and support the organisation of research findings in Chapter 8.

### **3.2. CRITICAL REALISM AS A META-THEORETICAL PHILOSOPHY**

This section explains the philosophical paradigm and approach taken for this study. While choosing an appropriate philosophical position, I focused on producing a novel knowledge contribution by addressing my research questions. The elements of the research questions in this study primarily focused on rural women's agency, assuming a possible connection to their mobile technology use in a rural structure. Coming from a social science background, I have been keen to understand the social change process and the relationship between social structures and technological intervention (mobile technology). Hence, the factors of women's empowerment, mobile technology use in micro-enterprises, social structures and processes in rural Bangladeshi society remained crucial to exploring this study's research problem.

Before choosing a philosophical paradigm for this study, I explored a number of alternatives. I observed that Positivism is prominent in IS research. In positivist research, predefined hypotheses and the use of quantifiable dependent variables and independent variables are the basis of drawing results from representative samples. This philosophical stance was not

suitable for my study because of its overly structured assumptions about the nature of social reality and how to research it.

Another significant stance in IS research is Interpretivism. According to Klein & Myers (1999), interpretive research assumes that *“our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools, and other artifacts”* (p. 69). According to Walsham (1993), interpretive research methods are intended to develop an understanding of the complexity of a context where the information systems and processes influence the context and are influenced by the context simultaneously (pp. 4-5). Therefore, people’s understanding and interpretation of the phenomenon in the research context become the central focus in interpretive research (Orlikowski & Baroudi, 1991). In other words, unlike positivist research, instead of predefined dependent and independent variables, people’s understanding of the complex situation is explored (Kaplan & Maxwell, 1994 in Klein & Myers, 1999). I was heavily inspired by Walsham’s (2007) idea of interpretive research and adapted his idea of an interpretive case study as the research method. However, the overall interpretive research approach is not sufficient to capture complexity **over time**. This was important to me because, in this study, I aimed to explore the social change, women’s empowerment and sustainability of micro-enterprises where the time dimension and interrelationship between phenomena were crucial.

I also reviewed the possibility of using Structuration Theory by the British Sociologist Anthony Giddens (1984), who has influenced many researchers in their understanding of the role of social structures and transformation processes in society. But influenced by Critical Realism scholars, I felt that Giddens’s explanation of multidimensional social structures and processes was insufficient for my purposes of analysing social-technical change processes as they develop **over time** (Mingers et al., 2013, p.4).

I noted that Critical Theory was another possible option for my theory of knowledge. The German philosopher and sociologist Jürgen Habermas developed a Critical Theory position as exemplified in *Knowledge and Human Interests* (1968). Influenced by Weber, another key sociological thinker about modernity, Habermas combined idealism and practical realism while explaining social change in a post-modern society and the desire for social emancipation. Critical Theory takes a common stance with Interpretivism and Structuration Theory by considering the nature of social reality and its constitutive dimensions which Habermas says include issues of technical and administrative control (including their products), practical knowledge and understandings, and emancipation dimensions (Blaikie, 2009, p. 100; Pusey, pp. 24-25). However, Critical Theory is not suitable for this study because of its focus on the question of human emancipation from technical thinking and control rather than incorporating the significance of technology in its thinking. I needed a theoretical perspective that could take better account of the effects of technical systems and artefacts on the complex construction of reality.

Consequently, then I looked into the Critical Realism paradigm and found it relevant for this study. It is a comparatively new stream in IS and ICT4D research. It was developed in the 1970s as an alternative to Positivism and Interpretivism, allowing researchers to better perceive the contextual reality, in particular social and cultural situations along with time and

spaces (Archer, 2016). Scholars like Gorsky (2013) argued that there is no ontological distinction between natural and social entities in Positivism; both are considered 'phenomena' or 'objects of experience'. On the other hand, interpretivists *"draw a sharp line between the two domains; they argue that social reality is linguistically constructed"* (Gorsky, 2013, p. 660). In contrast to Positivism and Interpretivism, Critical Realism combines concepts from both and develops a deeper understanding of the relationship between social structure and mechanisms such as technology (Bhaskar, 1978; Gorsky, 2013).

Another scholar, Archer (2016), interprets Critical Realism in the following way, emphasising the researcher's reflexive philosophical stance while exploring empirical data:

*It is, rather, a meta-theoretical position: a reflexive philosophical stance concerned with providing a philosophically informed account of science and social science which can in turn inform our empirical investigations. We might think of this in terms of three layers: our empirical data, the theories that we draw upon to explain our empirical data, and our metatheories – the theory and the philosophy behind our theories (p. 2).*

According to the social research scholar Blaikie (2009), Critical Realism is *"a search for generative structures and mechanisms"* (p. 147). There are three major dimensions to reality in the Critical Realism philosophical position – a) the empirical, b) the actual, and c) the real (Bhaskar, 1978). The originator of Critical Realism, Bhaskar (1978) stressed the importance of paying attention to *"experiences, events and causal mechanisms"* to understand reality from a critical realist perspective. From a Critical Realism perspective, one accepts the reality of science and created objects (such as the materiality of technology) and the existence of real and influencing social structures (for example, patriarchy) that are not merely linguistically constructed. They are socially and materially enforced (for example, in the abuse of women). Furthermore, as a product of science, technology is not just an object of experience but, like social structures, has an objective agency as an 'event' that comes into play with social structures and their effects.

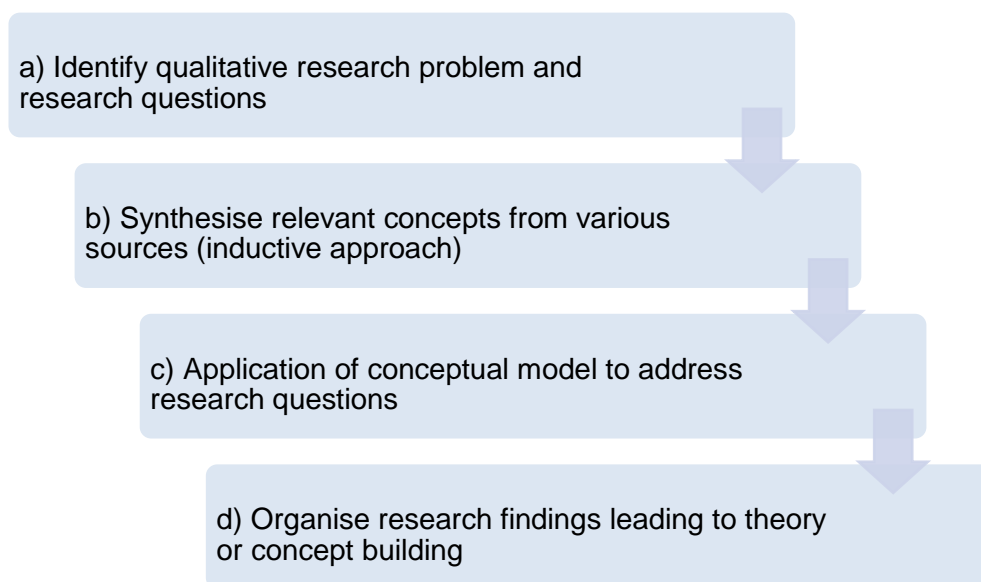
When using the Critical Realism methodology, a researcher starts by developing descriptions of empirical events and moves towards exploring the possible causal and generative mechanisms behind those events. Some of these events can be 'non-observable' in nature, but those may lead to other events or experiences which are 'observable'. For example, patriarchal social norms may limit the possibility of women's ownership of assets such as mobile phones. In such a case, whether a woman owns a mobile phone or not is observable, but the reason behind that (patriarchal social norms) might be non-observable or challenging to explore. Then the research may explore possible causal linkages between social norms and a woman's ownership of assets compared with other women in similar conditions and generate a pattern to understand the complexity in reality. Overall, I found that the Critical Realism approach could help me explore the research questions and guide me in reflecting on what is happening, why it is happening and how it is happening in the context of my study. For example, I had originally assumed that the difference between ICT4D policy and the implementation of ICT4D projects in Bangladesh could be explored through empirical data alone. However, with the Critical Realism perspective, the reason behind that alignment or differences between macro and micro context can be examined, and deeper insights into



factors, such as formal and informal power structures manifested through cultural practices, can be generated through this meta-theoretical perspective.

### 3.3. SLF AS A CONCEPTUAL MODEL

In qualitative research, it is challenging to identify a single theory that explains all of the dimensions of a research problem. While following an inductive approach, a researcher can generate novel insights from theoretical perspectives and empirical findings on the research problem by applying a conceptual model. A conceptual framework or model guides a researcher to observe the main variables and relevant concepts and exclude others that are not relevant to the study during data collection, interpretation, and analysis (Imenda, 2014). As theory and model can be used interchangeably or in combination (Blaikie, 2010), this section clarifies the interpretation of the study's conceptual model. According to Blaikie (2010, p. 21), a 'model' of a study offers "*a conceptual framework, a hypothesised set of relationships between concepts, a hypothetical explanatory mechanism, or a method for organising research results*". Figure 3.3 summarises the steps of how a conceptual model is developed and applied in qualitative research.



**Figure 3.3 Steps in Research (adapted from Imenda, 2014, p.192)**

This section introduces the SLF and major elements of the framework, which has been used as a tool to design rural livelihood interventions in different developing country contexts, including Bangladesh. The purposes of this section are to explain the relevance of SLF as a conceptual tool, propose a modified model of SLF which combines relevant concepts such as socio-materiality, mobile technology and women's empowerment through the Critical Realism meta-theoretical lens, and finally, to demonstrate how the proposed conceptual model SLF-M4D guides the research design outlined in Chapter 4. Section 3.3.1 reviews how different development organisations have analysed vulnerabilities, assets, institutional structures, processes, livelihood strategies and livelihood outcomes in their project planning. Sections 3.3.2 and 3.3.3 provide a definition of livelihood and other elements of SLF and present the

proposed conceptual model for this study which is helpful to understand the research findings and discussion in Chapters 7 and 8.

### 3.3.1. Relevance of SLF in understanding poverty and livelihood

The SLF has been widely adopted by international development agencies and NGOs as a strategic development approach in Africa, Asia, South America, Central and Eastern Europe (Small, 2011). For example, leading development actors such as Oxfam, Cooperative for Assistance and Relief Everywhere (CARE), UK Department for International Development (DFID), United Nations Development Programme (UNDP) and Canadian International Development Agency (CIDA) have been using SLF in Bangladesh for over two decades. Table 3.3.1 offers a comparative analysis of four international agencies' common and distinguishing features of using SLF in their development projects.

**Table 3.3.1: Use of SLF by International Development Agencies**

Agency	Oxfam	CARE	UNDP	DFID
When	1993	1994	1995	1998
Activity type	Strategic planning	Livelihood protection, promotion and provisioning	Conceptual and programming framework	Rights and sectoral approach, poverty elimination and other development targets
Relevance of SLF within the agency	1 of 5 strategic change objectives	Primary organisation wide framework for programming	Approach to achieve sustainable human development, 1 of 5 corporate mandates	An approach for achieving poverty eradication, associated with rural areas
Distinguishing feature of agency	Relatively loosely applied idea across a decentralised organisation	Distinguishes between private natural assets & common property assets, Stress on the household level, Personal and social empowerment emphasised	Starts with a strengths assessment instead of needs, Emphasis on technology, Emphasis on micro-macro links, Adaptive strategies as the entry point	Stress on underlying principles & a variety of SLF approaches, Analysis of strengths, Micro-macro links

Core ideas	People centred, Multilevel partnership, Various types of sustainability dynamic	Household livelihood security, People centred	Adaptive strategies, Conditioning factors (shocks and stresses that affect asset use)	People centred, Multilevel partnership, Various types of sustainability dynamics, Poverty focused
Asset categories	Human Social Natural Physical Financial	Human Social Economic	Human Social Natural Physical Economic Political	Human Social Natural Physical Economic

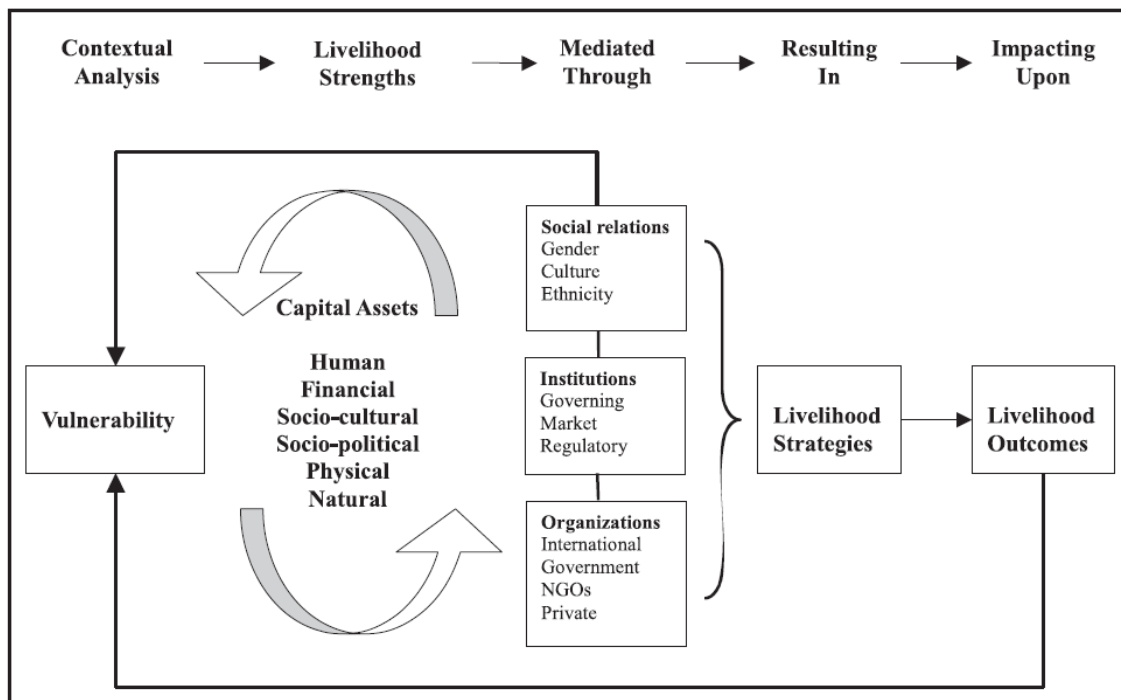
As discussed in Chapter 2, a deeper understanding of the impact of ICT4D from a theoretical perspective has been strongly recommended by ICT4D scholars like Heeks (Heeks and Wall, 2017). Hence, adopting the familiar SLF as a conceptual model in this study is a key theoretical and methodological contribution to understanding ICT4D issues in Bangladesh and beyond (see Chapter 9).

In fact, in line with Heeks and Walls' (2017) observations, the SLF has been identified as a potential conceptual model to explain ICT4D. For example, ICT scholars such as Duncombe (2006) argued that ICT4D research might use the SLF to examine the relationship between the vulnerability of the rural poor and the use of ICT with a theoretical development (Duncombe, 2006). However, the main limitation of the SLF was its lack of theoretical alignment to explain social change through ICT4D projects (Parkinson and Ramirez, 2006; Small, 2011). Moreover, the SLF has been criticised for being used too generally to explore the linkages between ICT4D and livelihoods; and not paying enough attention to the broader macro-economic and political issues which could impact the local situations related to ICT4D (Parkinson and Ramirez, 2006; Small, 2011). Consequently, Duncombe (2006) stressed that incorporating in-depth empirical analysis to the SLF conceptual model can explain the socio-technical changes and provide insights for theory development.

For example, SLF may become more relevant to academic research by explaining the impact of mobile technology via the Critical Realism lens on women micro-entrepreneurs' lives and the relationships between mobile phones, microenterprise growth and women's empowerment. This framework then may provide conceptual and theoretical insights into economic, social, cultural, and political barriers to women accessing mobile technologies for their enterprises.

### **3.3.2. Major concepts of the standard Sustainable Livelihood Framework**

The SLF was originally developed by Robert Chambers (1991), a leading development researcher and theorist. He advocated for the concept of the SLF as a practical development model for the 21st century and defined the concept by adapting the World Commission on Environment and Development (WCED) panel definition (Chambers and Conway, 1991).



**Figure 3.3.2: SLF Model (Duncombe, 2006, p. 84)**

**Figure 3.3.2** shows the major elements of SLF, including contextual vulnerabilities, five types of assets, institutional structures and processes, livelihood strategies and livelihood outcomes (Heeks & Molla, 2009, p. 41). As shown in **Figure 3.3.2**, the main elements of the SLF are vulnerabilities, assets, societal structures and processes, livelihood strategies and livelihood outcomes. These elements are briefly explained below:

- A. **Vulnerability:** contextual vulnerability refers to the external factors that may affect people's livelihood and well-being. These may include natural disasters (e.g. flood), trends (e.g. migration) or seasonality (e.g. food price hike).
- B. **Assets:** five types of assets are referred to: i) financial capital, ii) physical capital, iii) social capital, iv) human capital and v) natural capital. Remittances, wages, mobile banking, micro-finance savings and credit are examples of financial capital. Physical capital may include housing, infrastructural set-up, and transport. Social capital may include relationships within the community, collective effort and networking. Education, knowledge and skills, and health can be examples of human capital. Land, water and aquatic resources, forests, wildlife are examples of natural capital.
- C. **Structures:** different institutions and organizations from the public, private and NGO sectors, legal and financial mechanisms are examples.
- D. **Social Processes:** processes include decision making social and cultural norms.

- E. Livelihood Strategies: livelihood strategies refer to both long term and short-term strategies. These may include forming a micro-enterprise group and establishing networking with extension service providers.
- F. Livelihood Outcomes: livelihood outcomes refer to better well-being. This can be associated with more income, improved food security, better access to information and technology.

In particular, the definition of livelihood in the SLF explains contextual factors and individual or collective capabilities of people; it also draws a connection between immediate and long-term outcomes (Chambers & Conway, 1991, p. 6):

*A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.*

Another vital element of the SLF is the vulnerability dimension, which refers to the external and internal sides of stress, risks and shocks that challenge potential growth of human capabilities in a particular geographic location and time (Chambers, 1989, p. 1):

*Vulnerability is the exposure to contingencies and stress, and difficulty in coping with them. Vulnerability has thus two sides: an external side of risks, shocks, and stress to which an individual or household is subject; and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss.*

Researchers like Duncombe (2006) also emphasises the importance of in-depth empirical analysis to make the SLF a more robust tool. Consequently, I applied the SLF approach through a Critical Realism lens as a conceptual model for reviewing the nature of vulnerabilities faced by rural women and their possible connection with social and economic structures and gender relationships within the family and society to understand the role of mobile phones in promoting women's agency.

### **3.4. RELEVANT CONCEPTS FOR THE STUDY AND PROPOSED CONCEPTUAL MODEL**

The broader concepts that frame this thesis were introduced in Chapter 2, including ICT4D, sustainable development and sustainable livelihood, women's empowerment and agency. Building upon the literature review, this section explains associated concepts including ICT4D, sustainable development, sociomateriality, rural micro-enterprise and rural development, human and informational capabilities, and women's empowerment in Bangladesh. Therefore, this chapter focuses on particular concepts that are the foundation of understanding the proposed conceptual model of the study, SLF-M4D (see Section 3.5). Subsequently, these concepts are further explored with empirical findings in Chapters 5, 6 and 7. Along with Section

3.3, this section interprets and combines these relevant concepts to develop fine-grained understanding as a solid base for the research design and research methodology (see Chapter 4) and to organise the research results (see Chapter 7).

### **3.4.1. ICT4D and Mobile Technology**

ICT4D and mobile technology-related previous works were discussed in detail in the previous chapter. This section builds upon those explanations and provides an adopted working definition of mobile technology for this study and clarifies the scope of interpreting the research question element related to mobile phones and mobile technology.

A major concern in mobile technology and ICT4D innovation and research is making technology accessible for all. However, “*ICT does not necessarily result in development for all*” (Avgerou, 2010, pp. 11-12), and there are many aspects of the major ongoing debates in this regard. Therefore, ICT4D research requires review of ICT innovation and transfer of technology in a particular social context, and understanding of multidimensional complexity, such as power dynamics within society and global influences on the national context. As suggested in Section 3.2, research can be aided by developing descriptions of empirical events, activities and moves by exploring possible causal and generative mechanisms behind those events and transformations (see Figure 3.5). It is assumed that the ‘contextual analysis’ element of the proposed SLF-M4D model (see Section 3.5) acts as a guide to capture the technology transfer process in rural Bangladeshi society from both macro and micro perspectives.

Mobile technology in ICT4D considers different types of devices that use wireless technologies, including mobile phones, tablets, laptops, car radio systems and network-based wireless systems. Research literature shows that both basic standard mobile phones and smartphone devices are being used by rural women in Bangladesh. In general, there are four types of communication channels used: voice calls, SMS, outbound dialling (OBD) and mobile apps. All of these types are included in this study (see Chapters 5, 6 and 8). Furthermore, mobile technology mainly refers to the mobile-based operating system on cellular phones and use of the internet on those devices.

Although a 4G mobile communication network has been introduced in Bangladesh, the research literature assumes that internet connectivity in rural areas might be challenging in developing countries. Therefore, mobile users and mobile technology-based knowledge and service providers experience and policy were a point of empirical exploration.

### **3.4.2. Sustainable Development**

The concept of Sustainable Livelihood is associated with the larger concept of Sustainable Development, discussed in the previous chapter. Sustainable Development has long remained a consistent agenda for ICT4D research and projects; therefore, it is considered an important concept for academia and practitioners. This study adopts the globally acknowledged definition of ‘Sustainable Development’ as explained in the report *Our Common Future* by the World Commission on Environment and Development (WCED, 1987). This definition puts equal emphasis on the needs of the present population along with those of

future generations, inspiring consideration of the long-term impacts of development interventions:

*Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

### **3.4.3. Sociomateriality in the development context**

The social dimensions of development can be overshadowed by a technical focus in ICT4D projects. Academics, policymakers and NGOs tend to be caught up by a sense of 'technoptimism', based on a Western model of technology experience in an environment that tends to be more individualistic and freer of constraints than that found in development settings. This can lead to technological aspirations being put ahead of the on-the-ground reality of what people actually want and can actually achieve in many development settings. Such biased thinking can result in limited outcomes, and even failures in ICT4D projects, which is an issue that is well discussed in the ICT4D literature (Heeks, 2018; Heeks, 2016; Avgerou, 2008). A way around this problem, at least from a research perspective, is to look afresh at the relationship between people's social and material agency and the objects around them.

The US-based IS scholar and organisational theorist scholar Wanda J. Orlikowski (2008), introduced the concept of 'sociomateriality' to focus on relationships between organisation and technology. According to her definition, "*This is a relational ontology that presumes the social and the material are inherently inseparable*" (Orlikowski & Scott, 2008, p. 456). Another US-based IS scholar Paul M. Leonardi (2012), expands the concept of 'sociomateriality' to remind us to focus on people's social, cultural context in addition to the material aspects of technology in organisational space. He argued:

*Thus, whereas materiality might be a property of a technology, sociomateriality represents that enactment of a particular set of activities that meld materiality with institutions, norms, discourses, and all other phenomena we typically define as 'social' (Leonardi, 2012, p. 34).*

The idea of sociomateriality strongly influences my conceptual framing, and the research questions for this study thus result in a more robust SLF-M4D model for understanding the relationship between technology and people in particular contexts. Influenced by Leonardi (2012), my view is that understanding the sociomateriality of the research context is based on two major assumptions: i) Materiality of mobile technology is associated with social structures, processes and contexts; and ii) Social dimensions, such as social norms and individual behaviours under patriarchy, women's attitudes, skills, and economic status might influence women's mobile phone use in their micro-enterprise activities and day to day social lives. The conceptual SLF-M4D model in this thesis thus adopts the perspective of sociomateriality to develop critical insights about the relationship between mobile technology (and its material agency) and rural women users (human agency).

Consequently, rural women's use of mobile phones for communication in economic and social activities was critically examined to understand their livelihood assets, capabilities and outcomes from a Critical Realism perspective. It was assumed that, while women's ownership

and use of mobile phones would be observable and comprehensible by them, it might also be a challenge to observe and explore the challenges or barriers in local market and service delivery platforms. Moreover, social norms or attitudes of women users and their families or society would be immaterial things that are not easily observable or discovered by conventional empirical means. They are also unique from one woman to another. Thus, I assumed that recalling a changing trend from the beginning of mobile phone use until data collection time could be a strategy for me to create a dialogue with the research participants. Additionally, I hoped to produce new knowledge by comparing the experiences of different women users, such as confidence, and contrasting views of different categories of research participants on the same phenomenon or observable activity, such as the use of a mobile helpline.

#### **3.4.4. Human and informational capabilities**

The capabilities of rural women entrepreneurs were consequently another critical element of this study. Taking into account the social and economic thinking of Sen (1993), Gigler (2011) and Bebington (1999), my research argues that human capabilities are essential for sustainable development. While the intention in this study was to explore individual capabilities, I also took into consideration the role of social and political structures and institutions in influencing individual choice and capabilities because people, particularly in more traditional environments, are strongly linked to and influenced by dominant social and other structures (Sen, 1993). Gigler's (2011) concept of 'information capabilities' concerning ICT use is relevant for understanding the broader overview of women's access to mobile technology. As he explained, the informational capital and ability of rural women are linked to their agency, and their material agency exists within a larger matrix of relationships and structures:

*... 'informational capabilities' refers to the combination between a person's existing livelihood resources in terms of information (informational capital) and his/her agency (ability) to strengthen these assets and to use them in such a way that the use of information can help a person to transform his/her options in life in order to achieve the 'beings' and 'doings' a person would like to achieve (Gigler, 2011, p. 8).*

#### **3.4.5. Micro-enterprise, livelihood and development in rural set-up**

The literature review reveals the lack of a standard definition of micro-enterprise (see Chapter 2). Therefore, I developed a working definition suggesting common characteristics in the findings part of the thesis (see Chapters 5 and 8). To do so in the context of this study, I explored whether rural micro-enterprises could improve the well-being of households, particularly for women-led enterprises. This study focuses on rural micro-enterprises from the agricultural sectors, informal in nature, led by rural women who use mobile phones for their enterprises, similar to Heeks' (2005) 'livelihood enterprise' concept. According to Heeks (2005), micro-enterprises can be categorised into two different types: a) livelihood enterprises delivering livelihood assets mostly in rural areas and b) growth enterprises delivering long-term broader benefits from manufacturing and trade mostly in urban areas. He also stressed that 'livelihood enterprises' have the potential to reduce poverty at a large scale by contributing to rural household income and expenditure (Heeks, 2005, p. 11).



### 3.4.6. Women's empowerment

Women's empowerment is a central element of this study. Feminist research argues that a critical discussion on the 'feminisation of poverty' is relevant to understanding essential elements of international development such as livelihood capability, social exclusion, class, patriarchy and power (Chant, 2011).

However, the concept of women's empowerment is complex and has been interpreted differently in different contexts and times. There is, therefore, no one commonly accepted framework to measure the impact of ICT on women's empowerment. However, for some writers, women's empowerment is often considered as a process rather than an end in itself. This usually indicates how women's lives can be changed over time through active participation in different economic and social activities (Kabeer, 2017; Laizu, Armarego, & Sudweeks, 2010). On the other hand, women's empowerment is explained as a situation or contextual reality of women's lives.

Due to these complexities and the difficulties involved in measuring social processes in the field in particular, my research used some standard indicators to understand the nature of empowerment and its correlation with other issues such as mobile technologies (Mahmud, Shah, & Becker, 2012). Overemphasis on economic impact in comparison to other crucial immaterial social and power dimensions in previous research has been a challenge. Therefore, my conceptual framing focuses on capturing the multidimensional aspects of women's empowerment from **both** economic advancement and social power perspectives.

After reviewing different definitions and characterisations of (women's) empowerment, the definition offered by a feminist economist, Naila Kabeer (1999), is adopted for the study. Because of her extensive research in developing country contexts, including Bangladesh, her definition and the reasoning behind it capture the complexity of women's empowerment issues in the present ICT4D trends. Moreover, her definition pays attention to the economic, social and political aspects of women's empowerment simultaneously, which has been addressed by only a few researchers. She argues that a woman's ability to make decisions and choose between options is vital, leading to her individual growth and finally contributing to a greater power shift within a family and in society (Kabeer, 2017, p. 651):

*Empowerment then refers to the expansion in the capacity to make strategic and meaningful choices by those who have previously been denied this capacity but in ways that do not merely reproduce, and may indeed actively challenge, the structures of inequality in their society. It touches on many different aspects of change in women's lives, each important in itself but also in its interrelationships with other aspects. It touches on women's sense of self-worth and social identity; on their capacity to question the subordinate status assigned to them; on their ability to exercise strategic control over their own lives and to renegotiate their relationships with others who matter to them; and finally, on their ability to participate on equal terms with men in reshaping their societies in ways that expand the options available to all women and that contribute to a more democratic distribution of power and possibilities.*

According to Kabeer's (1999) conceptualisation, women's empowerment can be measured from three interconnected dimensions, and these fit well in the conceptual and analytical framing of this study. While measuring women's empowerment, she considers it a changing process and, in her framework, she suggests three dimensions of empowerment. These dimensions include different changes from individual to society level, which are as follows:

**Women's access to resources:** Kabeer described women's access to resources as access to capital resources, opportunities for employment and livelihood, and the freedom and power to spend her income and to own assets and property.

**Enabling women's agency:** Kabeer explained agency as women's ability to participate in various activities, including decision-making processes, and to play different roles within the household and the broader community and societal structure.

**Women's achievement:** Kabeer emphasised achievement as an outcome of the other two dimensions, which can improve women's status from a holistic perspective, including economic, social and cultural aspects.

These interconnected dimensions of women's empowerment are included in the conceptual model (see Section 3.5). Conceptualisation of women's empowerment in the SLF model is further discussed in Chapter 8, showing the relationship between mobile technologies and women's empowerment.

### 3.5. PROPOSED CONCEPTUAL AND ANALYTICAL MODEL OF THE STUDY

A variety of social and cultural factors, such as communication and information culture and practice, power, class and social capital, are important to consider while designing socio-technical projects focusing on women's empowerment and other mobile-based development interventions in Bangladesh. The research questions in this study address these critical factors using a modified modelling of the SLF. This section provides an overview of my proposed model and explains how it aligns with the Critical Realism meta-theoretical lens.

My proposed conceptual and analytical model, SLF-M4D, includes all major elements of the SLF (as explained in Section 3.3) and combines other relevant research concepts from Section 3.4. Considering 'active reflexivity' as a critical feature of qualitative research and an essential dimension of Critical Realism (Heeks & Wall, 2017), the conceptual model SLF-M4D explores underlying questions while capturing the views of different stakeholders involved in mobile technology-led interventions in rural Bangladesh.

As shown in Figure 3.5, the SLF-M4D model was used as a conceptual model to understand the broader ICT4D scenario, and the socio-technical transformative change processes in rural Bangladesh. This modelling exercise was informed by empirical analysis of the phenomenon and of the relationships between mobile technologies, sustainable development, women's empowerment and the sustainability of microenterprises. Consequently, I developed the model further incorporating the research findings, presented in Chapter 8.

For example, while addressing the research question related to the role of mobile technologies in improving rural women's livelihood outcomes and empowerment, the concept of socio-materiality and the Critical Realism perspective guided my investigation of the phenomena. In particular, Critical Realism as an overarching theoretical perspective allows for an understanding of the interconnection of influencing, correlative and generative relationships of empirical events, activities and non-observable or non-material events. Here non-observable events may include social customs, attitudes, religious norms and cultural influences.

The SLF-M4D conceptual model consequently examines the relationship between mobile technology, micro-enterprise growth and women's empowerment by examining the following dimensions of relationships:

- I. How the technological artefact, i.e., mobile phones are being used by rural women entrepreneurs?
- II. What kind of attitude, behaviour, knowledge, skills constitute the 'technology-in-practice'?
- III. Whether there is any difference in mobile phone use in economic activities, i.e., micro-enterprise operation and social activities, compared to personal communication?
- IV. Whether social relations, such as the relationship between husband and wife, play any role in mobile phone ownership, access to mobile technologies and the use of mobile phones?
- V. What kind of roles is being played by organisations and structures (such as government, NGOs, banks) in rural women's access to mobile technologies?
- VI. Whether there are any gaps between the macro and micro level realities; for example, variance between national ICT policies and their implementation?
- VII. Whether there is any variation amongst similar women users and other service providers such as public service providers and wholesalers in the market?

By examining these issues, the proposed conceptual SLF-M4D model resulted in a reflexive exploration process and helped to build and structure my research findings.

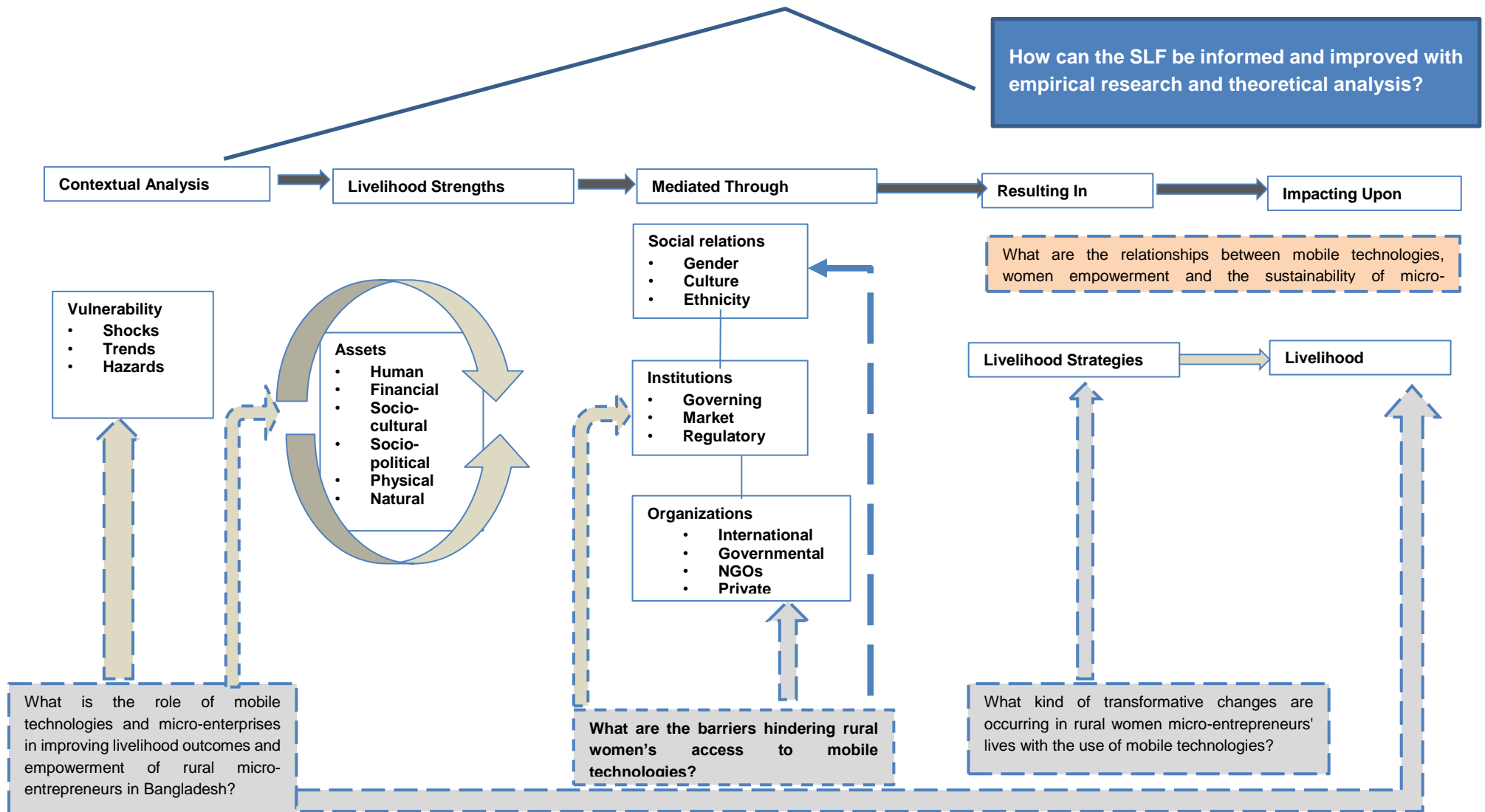


Figure 3.5 SLF-M4D Model

### **3.6. CHAPTER SUMMARY**

The main focus of this chapter is to provide a justification and explanation of the relevance of using the SLF to inform my proposed SLF-M4D model from a Critical Realism lens to address the research questions of this study. Therefore, Sections 3.3 and 3.4 combine relevant concepts associated with Critical Realism and SLF, clarify those concepts with explanations, and suggest some working definitions adopted for the study. Sections 3.2 and 3.5 explain why and how the conceptual model and Critical Realism as a meta-theoretical perspective are pertinent for the study. In Figure 3.5 of Section 3.5, the proposed conceptual SLF-M4D model shows links between major elements of the model and research questions. This chapter also explains how the chosen conceptual model and philosophical position was helpful in generating a novel contribution of knowledge to understand the relationship between mobile technology, women's empowerment and the sustainability of rural micro-enterprises. Finally, this chapter sets a basis for developing the research design and methodology, explained in the next chapter and organising the empirical findings presented in Chapters 5, 6 and 7.

## CHAPTER 4: RESEARCH DESIGN AND METHODOLOGIES

### 4.1. CHAPTER OVERVIEW

The conceptual framing of this thesis is a qualitative research approach that applies a theoretical lens of the interpretive paradigm and application of Critical Realism, and uses a conceptual and analytical model of the Sustainable Livelihood Framework. These broader conceptual framings are explained in Chapter 3, and this current chapter links these conceptual framings to the research design adopted by this study. Furthermore, it explains the ontological and epistemological positions taken for the research design and justifies the use of the case study as a qualitative research method (see Section 4.2.2). Finally, this chapter provides a detailed overview of the research process and steps (see Section 4.3.1), from developing the research proposal and formulating research questions to the data collection and analysis phases.

### 4.2. RESEARCH APPROACH AND METHODOLOGY

#### 4.2.1. Research Paradigm

It is important to situate the research in an appropriate paradigm to understand the development process, its systematic nature and the role of ICT4D (Sein et al., 2018). The interpretive research paradigm directs us to set ontological questions. As mentioned previously, Critical Realism, a meta-theory, has been chosen for this research (see Chapter 3, Section 3.3). This theoretical lens helps us address the *why* and *how* questions of the phenomenon being studied (Heeks & Wall, 2018; Sein et al., 2018; Thapa & Omland, 2018).

Critical Realism works with the assumption that knowledge comes from observation of structures, mechanisms, regularities, and understanding of causal connections (Blaikie, 2009). While using the Critical Realism perspective in conducting case studies, ICT scholars like Thapa (2018), have argued that social, economic, and other socio-technical mechanisms and structures are essential elements of international development. However, these elements are challenging to identify, observe, analyse and understand. For example, social norms and power structures exist and influence our day-to-day lives, but are not explicitly visible. While we can observe activities and events, we need to explore the meaning of why and how those events occur (i.e., a manifestation of those mechanisms), and the linkages between them. Therefore, as a researcher, I explored the meaning of the reality of research context from three dimensions of Critical Realism: experiences, events and mechanisms (Archer et al., 2013), as explained in Chapter 3, Section 3.3. Consequently, I observed *“the interplay between three entities: structures, mechanisms and events”* during fieldwork (Thapa & Omland, 2018, p.3).

As shown in **Table 4.2.1**, my research used a Critical Realism meta-theory perspective and applied the SLF as a conceptual model. It followed a qualitative research approach and used case studies as a research method. Purposive sampling was found most appropriate to collect data using focus groups and interviews with key informants from three categories of research participants. Observation techniques were also used to develop a ‘thick description’ to

understand the complex socio-technical change process in rural women's lives in relation to their access to mobile technologies (Geertz, 1973; Walsham, 1995).

In addition to the primary source of data collected from the research participants, I used many secondary sources of data and grey literature, such as documents produced by the government, NGOs and media. Data analysis was guided by using NVivo 12 plus software for primary categorisation and data cleaning. Then thematic and content analysis (Braun & Clarke, 2006) was used to develop information-rich case studies.

**Table 4.2.1 Research Methodology Overview**

Research Methodology	
Theoretical lens	Critical Realism
Conceptual and analytical framing	Sustainable Livelihood Framework
Research Approach	Qualitative
Research Paradigm	Interpretive research
Research Method	Case study
Sampling Strategy	Purposive sampling
Data Collection Technique	Focus group, semi-structured interview, observation, desk review
Data Coding and Analysis	NVIVO 12 plus, thematic analysis and content analysis

#### 4.2.2. Case Study as a Method

My research questions required *“an extensive and ‘in-depth’ description of some social phenomenon”* (Yin, 2018, p.4); therefore, I found that the case study method was most relevant to address those research questions. I have been influenced by Walsham's (2017) argument of the relevance of using interpretive case study methods in ICT4D research to explore unique and in-depth qualitative insights based on empirical data. I also noted Yin's (2018) suggestion on taking a methodological decision, that the case study method could be more relevant when the research explained contemporary circumstances by addressing the *how* or *why* categories of research questions. Consequently, to test the conceptual and theoretical models and tools (Ponelis, 2015) of SLF-M4D from the Critical Realism perspective, I collected empirical data from Bangladesh, generated comparative analysis from

two cases and offered critical insight on the role of mobile technology on women's empowerment and micro-enterprise.

The case study method is widely used in qualitative research. The selection of cases must be undertaken carefully, and emphasis needs to be given to the selection of significant and special cases to make a credible contribution to knowledge and practice (Walsham, 1995a, 1995b; Yin, 2018; Creswell & Poth, 2018). Defining theory using case studies has been proven a useful technique (Thomas, 2011, p. 179). I followed the theory-building structure approach suggested by Yin (2018, p. 231) to present my data. Chapters 6 and 7 follow a logical flow drawing upon SLF while presenting the cases of mobile technology use by rural women in maize and dairy enterprises. The case study method guided me to apply the SLF model as an analytical lens and explore causal linkages between mobile technology, women's empowerment and microenterprise sustainability.

Another case study methodology expert and educational psychologist, Gary Thomas (2011), defined case studies as drawing upon a broad and flexible scope of use. In his definition, he emphasises the in-depth inquiry of persons, events, systems or processes:

*Case studies are analyses of persons, events, decisions, periods, projects, policies, institutions or other systems which are studied holistically by one or more methods. The case that is the subject of the inquiry will illuminate and explicate some analytical theme or object.* (Thomas, 2011, p. 23).

Scholars from various fields have found that many types of case studies have contributed to developing valuable insights. However, it can be challenging to define a single set of common characteristics of a case study. For example, Yin (2018), widely referenced in case study methodology, argues that case studies offer an 'in-depth' and 'real-world context'; however, boundaries between phenomenon and context are challenging (p.15) because of close influences and connections among people, events, institutions and geographic contexts. According to Yin (2018), the case study has the following methodological characteristics:

- It copes with the technically distinctive situation in which there will be many more variables of interest than data points and as one result.
- It benefits from the prior development of theoretical propositions to guide design, data collection, and analysis, and as another result.
- It relies on multiple sources of evidence, with data needing to converge in a triangulating fashion.

I found that the exploratory case study was relevant for this study. As argued by Thomas, an exploratory case study is relevant when the researcher has to explore an issue that needs to examine and test potential explanations (Thomas, 2011). It is also necessary to decide upon the unit of analysis. A unit of analysis is defined as *"the phenomenon that is being studied, for example, a group, organisation, project or supply chain"* (Williamson & Johanson, 2018). This definition emphasises the need to develop an understanding of the phenomenon, which can be drawn from interacting with individuals or groups or organisations and observing their actions. In this research, a focus on mobile phone use and associated activities was the unit



of analysis for understanding a pattern comparing the different perspectives of the women entrepreneurs, local service providers and national experts.

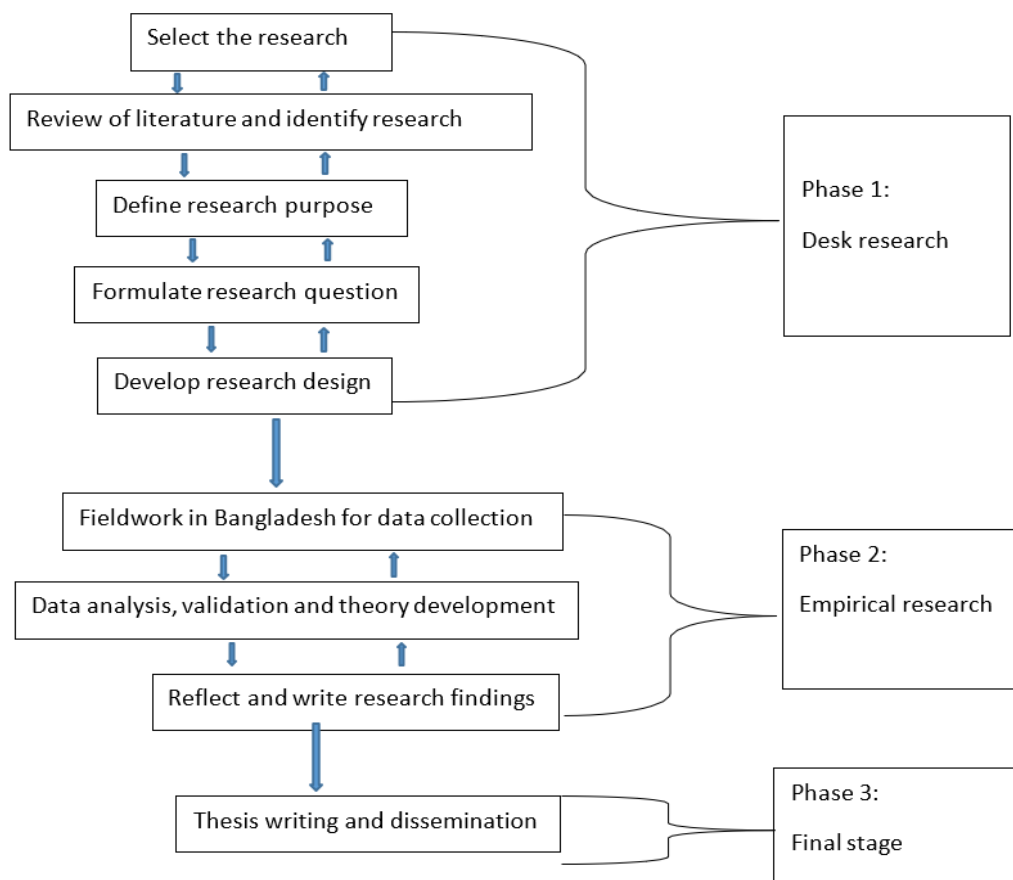
I present two cases of rural women micro-entrepreneurs in Bangladesh and examine the causal relationships between mobile technology, women's empowerment and micro-enterprise sustainability in the case of maize and dairy value chains. These two cases were chosen because they provide a comparative scenario of rural women's mobile phone use, i.e., basic features of mobile phones (in dairy micro-enterprise) and advanced features of smartphones (in maize enterprise) and their impact on women's empowerment and sustainability of micro-enterprises (see Chapters 6 and 7).

Analysing 'thick description' drawn from any qualitative research is a challenging and complex exercise, and an appropriate technique of data analysis is a significant consideration in research design (Geertz, 1973; Walsham, 1995a, 2006). In Chapters 6 and 7, the 'logic model technique' (Yin, 2018, p. 187) was used following the SLF logical flow for the data analysis and case study development of two groups of rural women entrepreneurs.

### 4.3. RESEARCH DESIGN

#### 4.3.1. Research Process

As shown in Figure 4.3.1, there were three phases to my PhD research.



**Figure 4.3.1: Various Stages of PhD Study**

In the first phase, I started to conceptualise each component of the research topic, i.e., mobile technology, rural women's empowerment, rural micro-enterprises in Bangladesh. Then I developed a detailed research proposal by reviewing the literature and identifying the possible scope of the study. Defining research questions and developing an understanding of possible knowledge contributions was a continuously evolving process, particularly in the first year of my PhD.

During the second phase, I finalised the research methodology, developed data collection tools, and collected empirical data from Bangladesh. Ethics approval was obtained based on a detailed plan and indicative questions. This phase also included sharing primary research findings and data validation with research participants and relevant research stakeholders, including NGOs and academic audiences and was a significant step in creating research rigour.

The third phase of research comprised transcription, translation, coding, organising of raw data followed by data analysis and thesis writing.

#### **4.3.2. Desk review**

I conducted a thorough review of literature by building and then continually revising my database of references to reflect the refinement of my ideas and research project development. I used the following strategies and processes to conduct a desk review:

- I. In the beginning, I started reading about relevant concepts, theories and contexts of ICT for the conceptualisation of my research project and developed the research proposal.
- II. In the first year of my PhD, I created a personal online database using the Mendeley software. I conducted a thorough literature review using keywords and key authors through Monash Library electronic database and Google Scholar search engine. The focus was given to journal articles published in the last ten years to cover the contemporary body of knowledge. However, in the case of prominent authors and books, I went beyond this period.
- III. Following the snowball effect of references identified in the articles, I kept updating the database throughout my PhD project. Based on discussions with supervisors and other PhD colleagues, I identified credible online sources to locate relevant authors and articles on my study topic.
- IV. In the second year of my PhD, I updated the literature review based on discussions with academic domain specialists who provided feedback on refining research questions. During and after my field data collection stage, I conducted additional desk research to enrich my database and knowledge and understanding of the macro and micro research contexts, national policies and implementation status and achievement/impact-related documents from various sources.
- V. In my third year and final stage of the thesis writing phase, I restructured and updated my database and the literature review chapter of my thesis to make it consistent and current.

### **4.3.3. Sampling Strategy**

This research required a non-probability sampling technique, and I found purposive sampling to be the best option for this qualitative type of research as it can ensure an information-rich description of the phenomenon (Patton, 2015, p. 266-272, Punch, 2006, p. 51). At the beginning of the data collection stage, consultations with national NGOs were planned assuming that they had direct working relationships with the rural community, including women entrepreneurs. I developed a set of generic criteria to identify relevant information-rich participants. I planned to conduct a group discussion to develop a general understanding of the research context and community perception of the research questions. A criteria-based purposive sampling strategy (Patton, 2015) was followed to identify potential research participants for this study; this is discussed in detail in Section 4.3.9.

‘Snowball’ or ‘chain sampling’ (Patton, 2015, p. 298; Yin, 2018) was considered most relevant to interview national experts who could provide information-rich perspectives on the research topics. At the research design stage, I assumed that analysing a few exceptional or challenging examples of the role of public service providers and local service providers would enrich my understanding of the mainstream roles played by different stakeholders. I was also keen to locate unusual or unique representative cases (Yin, 2018) of rural women entrepreneurs, such as entrepreneurs from religious and ethnic minority groups, to understand the exceptional dimension of the phenomenon of mobile technology used for rural micro-enterprises.

However, I was aware that the selection of snowball and later sampling might depend on the outcomes of the focus group discussion and key informant interviews from the purposive sampling. I was also open to looking into some opportunistic sampling of rural women entrepreneurs.

### **4.3.4. Ethics, reflexivity, identity and positionality as a researcher**

Reflexivity, identity, and positionality of a researcher are considered important aspects of qualitative research because they generate more profound and critical insight from observing social conditions and analysing qualitative data (Heeks & Wall, 2017). Moreover, unlike the positivistic conceptualisation of objectivity, positionality and reflexivity of a researcher in qualitative research refer to a situation where the researcher is a part of the entire research process and environment (Holmes, 2020). Earlier, Giddens (1984) also stressed the importance of reflexivity in monitoring the ongoing social life trend and argued that it is more than self-consciousness.

I agree that social researchers need to be ‘reflexive’ as ‘active reflexivity’ is a key feature of qualitative research (Mason, 2002 cited in Blaike, 2009, p.). This study was conducted with the assumption that my previous experience as a development practitioner in rural Bangladesh and training on Social Anthropology from a national university, and Advanced Research Methodology from a western university would impact my observation and interpretation of research context and contents. For example, the reflection of my insider and outsider position was a valuable insight drawn from this process. Holmes (2020) argues that ‘researchers should acknowledge and disclose themselves in their work, aiming to understand their

influence on and in the research process' (p. 3). Hence, this is included in the research design (see Chapter 4), and the reflection during the research process is reported in findings (see Chapter 5).

Ethics approval and informed consent taking process was an important and essential part of my PhD research project. Informed consent was required from rural women entrepreneurs, organisations providing technical and financial support, public service providers, policymakers, and technical experts in Bangladesh to use their information as a major empirical base of analysis. I incorporated both the formal and community aspects of ethical consent and behaviour in my research design.

The ethics application was submitted to the Monash University Human Research Ethics Committee after finalising the research proposal in February 2019. As a result, I received ethics approval against Project ID 18821 from the Monash University Human Research Ethics Committee on 2 May 2019. I initiated my fieldwork soon after receiving approval from the committee.

Besides the formal ethical and legal issues, I was also aware of the dependent and unequal power relationship between NGOs and rural women in a village setting. In my experience, this means that the villagers are unlikely to refuse consent to a project that is bringing resources to them. In the same way, in the village association, people usually accept the leadership and authority of the community leader (often endorsed by the implementing local NGO) to give consent to a project. These are important concerns, but it is beyond the scope of this thesis other than to note the ethical and political aspects of this situation.

These issues highlight the need to explore the notion of informed consent processes in the village and gendered environment in other research, and this is discussed in detail in Chapter 5 under the study findings. All of these experiences have affected my perspective on a researcher's role and ethical responsibilities. Consequently, this has also made me aware of my changing positionality as a Bangladeshi researcher from the development sector to someone engaged in doctoral research in a western university with a traditional Bangladeshi community (Holmes, 2020).

#### **4.3.5. Data Collection Tools**

A variety of tools were used to collect data. I developed interview questions and conducted the Key Informant Interviews (KII) and focus groups in the Bangla language with the local service providers and rural women entrepreneurs. Occasionally I needed help with local dialects from local NGO officials and community leaders. Interviews with key informants can provide deeper insights to understand the core dimensions of the research topic, identify the root causes of problems and develop a 'thick description'. Therefore, in-depth interviews with key informants were the main source of data collection for this study.

However, the interview questions for the national experts were developed and delivered in English, even though two participants preferred to respond in Bangla. I used the Otter and Voice Recorder apps on my mobile device to record the interviews. I also captured photos and videos to document contextual information, non-verbal signals and facial expressions from the

research participants. In addition to that, I used notebooks to write down changes in fieldwork activities, daily observation points and daily reflection as I felt relevant.

Inspired by Patton (2015), I remained open and adaptive to consider taking a new direction in research, incorporating any unexpected new dimensions and information at the design and data collection stage.

### **A. Empirical data collection in Bangladesh**

I collected empirical data from four geographic locations in Bangladesh: Nilphamari, Rangpur, Jessore and Dhaka. The empirical data collection process, which was undertaken in four phases, is summarised in the following pages:

### **B. Selection of research site**

The quality of data and research rigour is dependent on the field researcher carefully considering the vital characteristics of research site selection, identification of research participants, and access to and rapport building with participants. Being a Bangladeshi woman with previous exposure to rural Bangladesh and understanding the complexity of the development context at the national level was useful in defining the characteristics of the research site and participants. Furthermore, my native Bangla language communication ability, rapport building skills and existing connections with the relevant ICT4D stakeholders were added advantages. These advantages enabled me to select the most suitable research site and identify appropriate gatekeepers to save time and cost without compromising the quality of the data. However, I was careful to avoid any possible bias by the local NGOs in the selection and data analysis phases. Therefore, following a Critical Realism philosophical position, I undertook a continuous reflective process throughout the data collection process. This included reflection and validation workshops with research stakeholders at the data analysis level.

The following criteria were considered for research site selection for the case studies:

- i Research sites representative of rural areas in terms of poverty and the overall economic condition of the population, degree of remoteness and vulnerability to natural disasters because of geographic location were considered.
- ii Ongoing micro-enterprise programs facilitated by NGOs and Micro Finance Institutions which use mobile technology in the greater northern and southern regions of Bangladesh were required to obtain geographic and cultural diversity.

### **C. Criteria for potential research participants**

Three categories of research participants were relevant for the case studies: i) rural women entrepreneurs, ii) local service providers, and iii) national experts. First, I developed a set of characteristics of potential research participants as detailed below while designing the research methodology. I then made necessary modifications and adjustments in consultation with local NGOs to identify the most appropriate and available research participants. Selection criteria for the three categories of research participants are presented below. Please refer to the findings section in Chapter 5 for details of the selected research sites and profiles of the research participants.

The study was confined to rural micro-enterprises set up between one to ten years ago in order to represent a mixed feature of emergence, growth, sustainability, success and challenging aspects. The following criteria were used to identify potential rural women entrepreneurs:

- i Rural women who were associated with informal agricultural enterprises, ICT and mobile-based enterprises (such as mobile money transfer and mobile information sharing and trading).
- ii Rural women entrepreneurs who utilised financial support or loans from formal and semi-formal sectors such as banks, microfinance institutions and NGOs.
- iii Rural women entrepreneurs who were running micro-enterprises and using mobile technologies for their entrepreneurial activities.
- iv Rural women entrepreneurs who belonged to different age, class, societal and cultural identity groups to understand the internal power dynamics variation within a society.
- v The following criteria were considered for local service providers:
- vi Public service providers and duty bearers providing services to the women entrepreneurs, such as the officials of Union Digital Centres and agricultural extension officials.
- vii Local government representatives from selected research sites who play vital roles in the local power structure, such as handling local disputes and welfare support for rural communities.
- viii Local and national NGO professionals who worked directly with the rural women entrepreneurs through their development projects and acted as links between rural women entrepreneurs, market actors and public service providers.
- ix Local service providers are associated with rural micro-enterprises, such as wholesalers and businessmen at the local market, preferably from agricultural production and processing sectors (such as poultry and livestock production, milk processing, food processing), and financial support providers.
- x Other local actors suggested as relevant by rural women entrepreneurs.

Selection criteria for national experts were as follows:

- i Experts with an in-depth understanding of the ICT4D scenario in Bangladesh, including officials of the Access to Information (A2I) project of UNDP Bangladesh, economists and gender experts associated with university and research institutions.
- ii Policy makers and leaders who were responsible for providing policy direction on mobile technology usage, enterprise growth and women empowerment issues, such as an elected Member of Parliament.
- iii Senior and mid-level officials of major international NGOs (such as Oxfam), national NGOs (such as W Foundation) and MFIs (such as P) that have ongoing microenterprise and livelihood programs with rural women.
- iv Organisations that have referred to SLF, MDGs, SDGs and Right Based Approach in their development program planning and implementation with rural women.

#### **4.3.6. Data Creation and Transcription**

All focus groups and interviews were recorded using Otter, a mobile software application on the researcher's mobile phone. All recordings were made with the prior permission of the research participants, obtained before starting the interviews and focus groups. While conducting interviews, I took detailed notes in my notebook which were later used as memos to interpret interview and focus group content and explain additional relevant observations.

A Nokia model smartphone was used for recording purposes, which kept the research participants, particularly the rural women, at ease as it is a familiar device in their day-to-day lives. Moreover, the Nokia phone set was a cautious choice because, unlike other smartphone models, it can operate for many hours without needing to be recharged. However, the standard of recording was not as good as that found with a standard recording device, which I only realised during the data cleaning stage. In a village set-up, finding a noise-free location was not possible most of the time. Moreover, as a common cultural practice, villagers in Bangladesh are cordial, welcoming and curious in nature, resulting in some unavoidable noise and comments during recording with an individual respondent. In those cases, my field notes were useful for recalling the environment, context, and content of interviews and discussions.

Except for some interviews with national experts, all other interviews and focus groups with rural women entrepreneurs and local service providers were conducted in the Bangla language. For interviews and focus groups conducted in Bangla, transcription was done in the same language. Additional time was spent on manual coding in English from Bangla transcriptions, and selected quotes were translated into English to make them usable for NVivo. In the case of interviews conducted with national experts in English, transcription was done in English.

Sometimes the process of transcribing and data creation process was challenging because some expressions in Bangla are not found in English. Similarly, some English words and ways of explaining are not found in Bangla. This has impacted on the estimated time of data creation and data cleaning process.

#### **4.3.7. Data Analysis**

Scholars suggest following several principles while conducting interpretive research. These principles, listed below, are important to justify a researcher's approach, ensure research rigour and construct a novel contribution (Klein & Myers, 1999; Walsham, 2005). However, Walsham (2005) stresses the importance of research outcome over following research principles and processes rigidly (p. 326). Hence, I was keen to explore new knowledge while keeping the following principles in mind, as suggested by Klein and Myers (1999, p.72):

- i The fundamental principle of the hermeneutic circle
- ii The principle of contextualisation
- iii The principle of interaction between the researchers and the subjects
- iv The principle of abstraction and generalisation
- v The principle of dialogical reasoning
- vi The principle of multiple interpretations

## vii The principle of suspicion

The steps in Critical Realist data analysis vary from one research project to the other, and the sequence of steps can also vary. Inspired by scholars like Thapa, Easton, I decided to follow six steps in the study which are summarised in Table 4.3.8 (Thapa & Omland, 2018; Bygstad, Munkvold & Volkoff, 2016; Easton, 2010). Thapa & Omland (2018) stressed that abduction and retroduction were the most important methodological steps, offering a deeper level of understanding of causal structures and events in the case (Step 3), followed by an investigation of mechanisms and conditions influencing those events and activities (Step 4). For example, after noting down the nature of vulnerability and asset ownership of rural women entrepreneurs (Step 1), observing their relationship with local public service providers and market actors (Step 2), I explored the relationships between mobile phones and rural women's access to market and public services (Step 3). At Step 4, I further investigated the influencing mechanism and condition of mobile technology, such as ownership of mobile phones and their use in micro-enterprises and other purposes, the positive and negative factors of using mobile phones and women's limited physical access to the local market, leading to an informed assumption based on my empirical data and the literature. At Step 5, I continued conceptualisation and analysis of the relationships between the listed phenomena above to draw a link between the mobile technology and transformative changes in women's lives to address research questions. At the final stage, analyses of the women entrepreneurs' cases were fed into the SLF-M4D model. Eventually, a theoretical proposition for socio-technical change through mobile technology led development projects was developed and the revised SLF-M4D model was presented (see Chapter 8).

**Table 4.3.8: Critical Realist Data Analysis Steps (Thapa & Omland 2018; Easton, 2010)**

Steps	Steps in Critical Realist data analysis	Application in research design
Step 1:	Description of events and issues	Description of vulnerability, asset
Step 2:	Identification of key entities and associations	Identify structures and processes
Step 3:	Abduction or theoretical re-description	Exploring mobile phone as asset
Step 4:	Retroduction: Identification and selection of candidate mechanisms	Explore role of mobile technology in improving rural women's livelihood outcomes and empowerment
Step 5:	Analysis of the set of affordances and associated mechanism	Analysis of mobile technology affordances and access
Step 6:	Assessment of explanatory power	Assessment of mobile technology led socio-technical change and role of different actors at micro and macro levels

At the beginning of the analysis, I explored key words from the transcriptions of the interviews and focus groups. It was a useful exercise to discover the multidimensional aspects of responses given by the different categories of research participants. Some research



participants responded to interview questions in detail which represented the community perspectives as well. While conducting this micro-analysis of interview texts, I developed a deeper understanding by considering the possible inner meanings and perspectives behind their responses.

#### **A. Data Coding and Conceptualisation using NVivo**

I developed an NVivo design framework for data processing and analysis using Nvivo 12 Plus software. I attended basic and advanced training courses to equip myself with the ability to use this new software. I used NVivo to organise, categorise and preserve the large volume of data collected through fieldwork. In addition to NVivo, I used Post-It notes and mind mapping on paper to conceptualise and develop a thematic categorisation of data. I started with initial coding without predetermined categories in mind. After coding several interview transcripts, I started developing initial themes and continued reviewing thematic codes using NVivo. Following the conceptual framing and keywords from the research questions, I focused on ‘theoretical’ thematic coding and analysis (Braun & Clarke, 2008). I defined each theme with a short explanation, then grouped them in broader and specific categories as a part of the conceptualisation process.

Table 4.3.8.A. presents a primary level of design framework at the beginning of the data organisation stage.

**Table 4.3.8. A. Primary emergent themes**

<b>Data type</b>	<b>Unit(s)</b>	<b>Variables</b>	<b>Emergent themes</b>
KII with rural women entrepreneurs	Individual	<ul style="list-style-type: none"> <li>• Gender – M / F</li> <li>• Class</li> <li>• Age</li> <li>• Location</li> <li>• Education</li> <li>• User-level of mobile technologies</li> </ul>	1. The mobile technology as a ‘material agency’ for change (call, SMS, calculator, mobile apps, social media)
FGD with rural women entrepreneurs	Group		2. The mobile phone as a ‘physical’ and ‘virtual asset’
KII with local service providers	Individual		3. Positive and negative impacts of mobile technologies on rural women
KII with national experts	Individual		4. Security concerns and possible solutions for mobile technologies
Observation notes	Both		5. Future of mobile technology as key to ICT4D
			6. Rural women as a ‘human change agency’
			7. Digital divide – rural vs. urban, literacy, class, age, button phone vs. smartphone
			8. Characteristics of rural micro-enterprises in Bangladesh
			9. Perception of ‘Digital Bangladesh’
			10. Perception of women empowerment
			11. Difference between ICT policy and reality

			12. Role of national and local mobile technologies related service providers
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## **B. Data Triangulation and Validation**

Data triangulation and validation are important to ensure research rigour in qualitative research. Scholars suggest several strategies to address the rigour concern; data triangulation from multiple sources is one of them. Therefore, I included three categories of research participants to compare their perspectives and triangulate data. Case study methodology experts also argue that multiple tactics should be used to validate qualitative data (Yin, 2018, p. 43). I used multiple sources of data, including primary data collection from three categories of research participants, review of government policy documents and official macro statistics and review of NGO and community reports to construct validity based on solid pieces of evidence. Following the logical flow drawn from the SLF as a conceptual and analytical model, a pattern emerged from data. I compared different responses received against the same interview questions and interpreted those with field observation notes. This way, a comprehensive explanation building process was followed to address each research question. Finally, based on multiple cases, a chain of evidence was developed, ensuring the validity and reliability of data.

## **4.4. CHAPTER SUMMARY**

This chapter summarises the methodological landscapes and presents the detailed steps of research methodology followed in this study. The next chapter explains the research contexts, research participants and researcher's positionality and reflexivity to set a context in which to introduce the empirical findings of the study.

## **CHAPTER 5: REFLECTION ON THE RESEARCH CONTEXT AND PARTICIPANTS**

### **5.1. CHAPTER OVERVIEW**

This chapter begins with a reflection of my experience as a researcher collecting, analysing, and organising empirical data. It is then followed by an overview of specific research contexts and research participants. This chapter has three major sections:

Section 5.2 positions the research findings from my point of view as a researcher. This section contains my observations, reflections and realisation of the research context from an 'outsider and insider' perspective. In addition, it summarises documentation of memos (prepared by me) throughout the data collection and analysis process.

Section 5.3 presents a mapping of the macro policy context dimension, that connects to the micro-enterprise ecosystem and ground realities in rural Bangladesh. The main purpose of this section is to connect with the broader landscape and contextual challenges related to the research objectives. It summarises relevant national public policies, discusses schemes of government and NGOs related to ICT4D, rural micro-enterprise and women's empowerment related interventions. This way, this section directs to specific examples drawn from the ground reality in Chapters 6 and 7, by narrowing a macro-Bangladesh context to specific women's entrepreneurs' case studies.

Section 5.4 provides an overview of three categories of research stakeholders and their perspectives of research concepts. This section reflects on the participant recruitment process and justifies the research design and methodologies. Here I present local service providers' and national experts' perspectives, generating a broader idea of research concepts, such as 'Digital Bangladesh', women's empowerment, and characteristics of rural micro-enterprises. Therefore, this section sets a background for case studies in the following chapters directing to rural women's perspectives. It also offers a solid base for Chapter 8, where the research questions are addressed through triangulation of information using the SLF-M4D conceptual model.

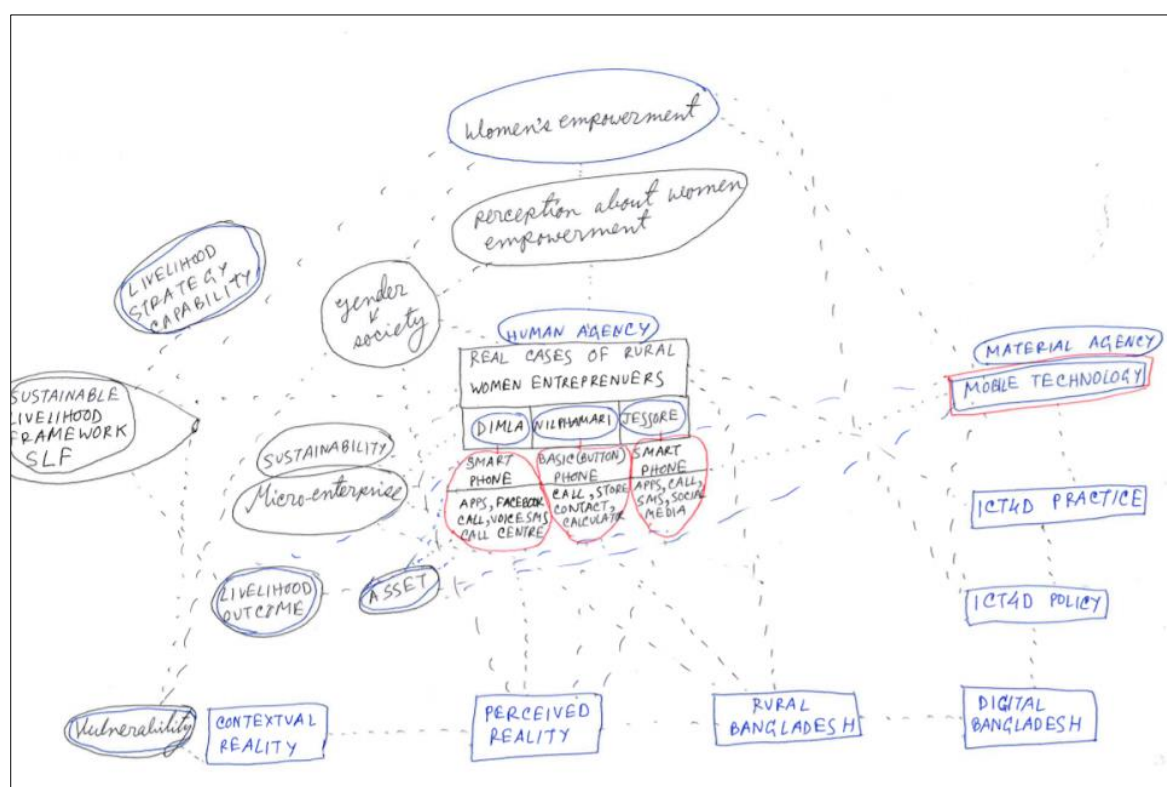
### **5.2. RESEARCHER'S REFLECTION BEING AN 'OUTSIDER AND INSIDER'**

This section is a reflection and connecting link between the research methodology and the research findings. I discuss the informal process based on my fieldwork diary and memos created throughout this research project's data analysis and interpretation phases. As Walsham (2006) said, that *"we are all biased by our own background, knowledge and prejudices to see things in certain ways and not others"* (p. 321). Inspired by Walsham, my

reflection as an 'involved researcher' is offered here to help the reader clarify my positionality and perspective.

### 5.2.1. A holistic approach to observe and interpret data in a contextual setting

Exploring phenomena and their relationship in a broader context are essential for data collection and analysis in qualitative research. The linkage between macro and micro context at a specific time can define research scope while taking a holistic research approach. For example, I observed that 'Digital Bangladesh by 2021' is more of a political vision for rebranding a positive image of Bangladesh than an economic growth strategy. This vision has emerged as a unique approach to leverage ICT in delivering social goods for underserved communities. One of my key motivations behind this study was to theorise women's agency in a digital development context, explain the social challenges and suggest policy recommendations based on empirical data contrasting with policies.



**Figure 5.2.1: Mind Map to Visualise Data Collection and Conceptualisation**

I developed a mind map to conceptualise the phenomenon at various levels of research context while designing interview questions for three categories of research participants. After reviewing policy documents, statistics by government and donors, academic articles, news reports and practitioner reports, my conceptual clarity gradually improved. Furthermore, after data collection, I modified the mind map again to organise and present my data. This process reminded me to be open to hearing the 'inner voice' of the data, relating to the broader context, and making a meaningful connection with my observation note to grasp the nuance of interviews.

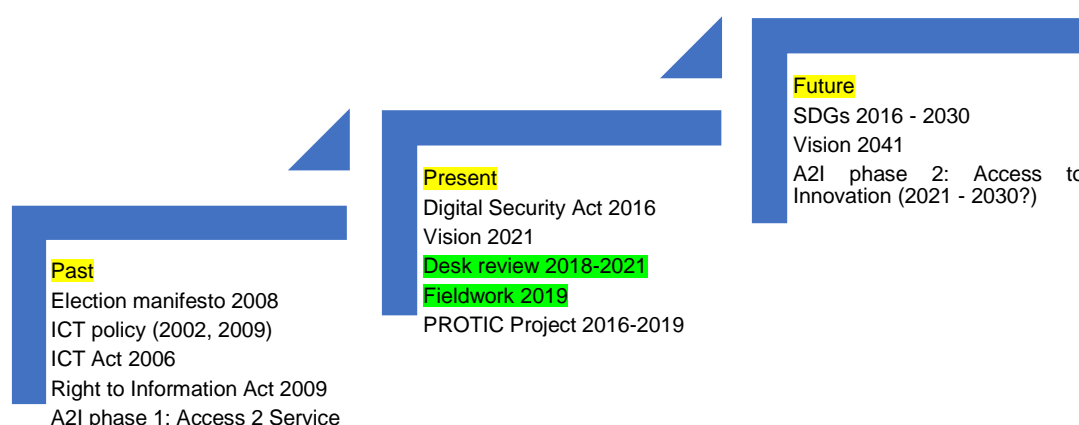
The SLF-M4D is a lens to interpret this social transformation process in ‘Digital Bangladesh’ society. Vulnerabilities are visible contextual realities regarding natural disasters, seasonal crises, financial crises, or family level shocks. Nevertheless, the visible contextual realities and perceived realities are not the same, as, in a prominent hierarchical society like Bangladesh, people’s perceptions may significantly vary from one segment to the other segments of the population. This variation is not easy to ‘observe’ because it might be manifested explicitly. Moreover, these can be value-driven, hidden and sometimes contradictory.

### 5.2.2. Defining time and space

At the research design stage, I had a broad framing of a period in mind, which evolved with defined phases based on interaction with research participants and reviewing secondary sources. I tried to understand the trend of digital development, the role of mobile technologies in rural women entrepreneurs’ lives, and their impacts on micro-enterprise growth.

Overall, I aimed to capture two decades of digital development trends in Bangladesh since 2009. Furthermore, I have carefully considered the past few years’ trends of political vision, relevant policies and schemes taken by the government of Bangladesh towards the realisation of the ‘Digital Bangladesh’ vision. Therefore, during my fieldwork in 2019, I asked rural women’s perspectives on the past trend of 10-12 years and present dimensions of mobile technologies and associated changes in their lives.

In addition to discussion and observation during fieldwork, I reviewed mainstream and social media as directed by NGO project staff and rural women participants during the data collection stage. For example, I maintained contacts and followed associated Facebook posts by PROTIC participants and project staff from 2018 to 2020. I have also discussed with experts, service providers, and rural women to understand the possible future directions of mobile technologies, financial inclusion, and micro-enterprise initiatives.



**Figure 5.2.2. A: Key Research Context and Digital Development Trend**

Seasonality was another important dimension, I checked the crop cycle of maize at the beginning of scheduling field visits. Therefore, I have deliberately chosen to begin data

collection from Dimla matching with the maize harvesting time and observed farming activities and local trading activities in the market on the spot.

### **5.2.3. Developing an eye for ‘observation’**

I was interested in exploring how people run their enterprises, with whom they interact and how they network in a complex societal context. This critical focus of my research was likely not to be adequately captured solely through interviews and focus group discussions. Therefore, I used the spirit of ‘participant observation’ despite the limitation of short stay during the day and without night spending in the village. In addition, I used photographs and video documentation of selected daily activities of rural micro-enterprise, which were influenced by the use of mobile technology. As a result, I observed the following aspects following my data collection plan:

- interaction between NGO workers and women entrepreneurs,
- interactions amongst women at their community meeting,
- interaction between women entrepreneurs and union level digital centre service providers,
- communication-related to entrepreneurial activities using mobile phones,
- interpersonal communication process within household and extended family members as manifestations of the ‘non-observable’ events, such as what kind of communications happened, who was involved, what purpose, how particular cultural practices were manifested through women’s statements, body language and behaviours.

### **5.2.4. Building Rapport and Trust with Research Participants**

Establishing a relationship with institutions and individuals involved in this study was crucial. In some cases, I faced unexpected challenges and cooperation, which influenced my relationship with research participants and other associated stakeholders. For example, I planned to select a field location of P, the most prominent Micro Finance institution, with a wide range of local partners involved in their micro-enterprise intervention. However, when I started to choose a particular location, organisation and research participants – who are micro-entrepreneurs and use mobile phones in their business, none were actually confirmed as mobile phone users in a business. Therefore, I had to exclude their project locations as I could not take the risk to arrange a field visit without being sure of an essential focus of mobile phone use in micro-enterprise. In contrast, I was approached by i-Social to explore the Infolady social enterprise model where entrepreneurs use mobile phones as an essential means of their enterprise and added them in the study though it was not planned before.

Building trust was challenging. I was an ‘insider’ because of my identity, nationality, language, previous work experience in different Bangladeshi communities and overall understanding of macro context and policies in Bangladesh. However, I was also an ‘outsider’ at the same time, because of my new insights and perspective being a Monash University PhD researcher. My recent training on qualitative research methods from the Monash University in Australia and

previous training on ethnography and 'participant observation' from the University of Dhaka in Bangladesh equipped me to conduct this PhD research project.

I also observed that the village community and PROTIC project participants in Nilphamari considered me as a 'donor' because of my previous role as a senior manager of Oxfam in Bangladesh and present association with Monash University. Consequently, I felt they were trying to impress me. They highlighted the positive role of smartphones, praising support received from the local NGOs, and claiming something that did not match other respondents. This attitude was presumably influenced by the local NGO colleagues closely connected with the women, and helped me set focus groups and interviews with them. I took time in clarifying the study purpose, assuring them their responses have no connection with project continuation. In the case of the dairy enterprise group, the response was genuine as they were not concerned to impress me as a 'donor'. My previous development professional identity was not an issue as this group was exposed to many donors, private companies, banks and government for many years. Unlike the PROTIC group, Infolady members in Jessore also accepted me as a regular visitor to the community without paying attention to my association with Monash University.

However, I believe that I captured authentic responses from all research participants after establishing a trustworthy relationship. I also maintained rapport with supporting local and national organisations throughout the process. I have shared my primary findings with local communities and NGOs to validate my observation and analysis, which significantly improved the quality of data and trust level.

### **5.2.5. Language**

Language is fundamental to any qualitative research. As a student of Social Anthropology in Bangladesh, I learned to pay attention to language, tone and non-verbal expression, which are major elements of any culture and community. Being a Bangladeshi woman, my major strength for this study was that I could follow their language and non-verbal cues. While conducting interviews and focus group discussions with the rural community, speaking the same language and being attuned to some other cultural communication elements helped build rapport and continue a natural flow of communication.

However, despite our shared language, '*Bangla*', there were some challenging moments of communication, comprehension and interpretation because the community used local dialects which were unfamiliar to me.

Example 1: A woman dairy farmer from Rangpur mentioned that she does not use mobile banking because of her reluctance (see Chapter 7 for a detailed scenario). She used a specific expression in their local dialect, '*heshkari*'. While I asked her to explain the meaning of that word, she struggled to find the appropriate word in Bangla and a community worker helped to explain that. She also suggested alternative words later on.

Example 2: During a focus group with PROTIC women farmers, participants were discussing gender roles in household chores. They explained that society expects women to do all the household chores such as cooking, serving, cleaning laundry, taking care of children and

elderly people, etc. If a man went against societal norms, he would be ridiculed by society (both men and women). At one point, a woman made a joke about how they (rural community) make fun of a man (name-calling and literal translation in English is 'wife's sheep') who helps his wife in doing household chores (see Chapter 7 for a detailed scenario), and everyone laughed endorsing her expression.

Through these kinds of interactions, as explained above, the in-depth interviews and focus group discussions became much more in-depth and meaningful two-way conversations between researchers and research participants, which is unlikely in a structured formal interview set-up.

The medium of language with local level respondents (rural women, local service providers) was Bangla, which was transcribed in Bangla and then selected parts were translated in English. However, interviews with expert respondents were held in English to avoid possible challenges in transcription and translation and save some time. Although two respondents from expert categories preferred to speak in Bangla, I was flexible enough to adapt to their preferences.

As a responsible researcher, I considered the levels of education and technical understanding of research participants with caution and modified the checklist and interview questions in simple language accordingly. Similarly, I considered language proficiency and education level and used the bi-lingual (English and Bangla) ethics form to explain and receive consent from the rural women.

The Otter mobile app has become popular for recording and automatic transcription, it worked reasonably well while testing its feature to record a meeting at our faculty event. However, when I tried to get transcriptions for interviews with experts conducted in English, the app provided significantly faulty outputs. The app could not capture the pronunciation. Presumably, it was developed targeting native English speakers and thus, was not very beneficial in this case. This unexpected occurrence has a consequence on increased time for transcriptions of interview data.

#### **5.2.6. Culture**

Cultural norms have a great influence on hierarchical administrative and social structures in a traditional setup, such as the Bangladeshi society. I was aware of these before. However, observing the interaction between individuals, structures and processes from a Critical Realism lens was an unexpectedly enlightening experience for me, helping me to 'get behind' what was being said and done to see immaterial cultural elements at play. It helped me to grow as an emerging academic researcher. For example, being a woman, I faced the typical obvious common question regarding my marital status and family members several times during the data collection process. When they came to know that I was married, the rapport-building part became easier because they could relate their situations with me. As another example, a group discussion in Nilphamari, some women even felt a closer connection comparing the long-distance marriage reality for them and me.



Presumably, marital status is perhaps the most vital dimension of a woman's identity in a patriarchal society; none of the other qualifications of a woman (and also to some extent true for men) matters if there is an issue with her marital status. An unmarried woman beyond the age of 25-30 is socially unexpected. A divorced woman is treated as a spoiled problematic character without 'morals'. This is worse than being a widow – in both cases, it is considered 'misfortune', and the woman is blamed for her 'fault'. Similarly, women's roles and activities are considered less important/significant. For example, everyday household chores are perceived as a woman's role, whether she earns or not.

Similar to social culture, organisational culture in formal government and NGO institutional structure was another aspect that impacted my relationship with research participants and the data collection process. At the beginning of my fieldwork, all local NGO staff, including the Project Manager, treated me with high respect, maintaining a formal distance. They treated me as a former senior manager at Oxfam in Bangladesh and a present PhD student associated with Monash University; presumably, both Oxfam and Monash are perceived as 'donor' organisations to them. However, I was able to overcome that challenge with some rapport building initiatives like having tea and lunch together during my fieldwork time. Traditionally Bangladeshi people treat each visitor with snacks, tea or sweets as a gesture of hospitality. So, I offered some snacks to make my preparatory meeting as an informal chit-chat with the local NGO officials.

### **5.3. MICRO-ENTERPRISE AND DIGITAL ECONOMY ECOSYSTEM IN RURAL BANGLADESH**

As my study is situated in a rural context, some terms related to administrative structures of Bangladesh are discussed in this section, which are referred to in Chapters 6, 7 and 8 in relation to power and social structure related discussion. This section provides an overview of the microenterprise and digital development landscape in Bangladesh. It also discusses the role of public policy and institutions in micro-enterprise and digital development services. The local, national and international NGOs play a vital role in rural development. Here I discuss examples of international NGOs supporting micro-enterprises through capacity building and mobile technology to set a broader context for the cases presented in the following chapters. I have also brought insights from other major national organisations that represent the reality of NGO cultures in Bangladesh and provided further valuable insights on micro-enterprises, women's empowerment and mobile technology-led development context based on my experience.

#### **5.3.1. Understanding rural development**

The dichotomy between rural and urban areas has been assumed to be a basis for policy formulation and development interventions in developed and developing countries, including Bangladesh. In Bangladesh, the areas not covered under urban areas are referred to as rural areas (IFAD, 2019). Table 5.3 offers a general overview of the distinguishing features of rural and urban areas in Bangladesh.

**Table 5.3: Comparative Features of Rural and Urban Areas**

General characteristics of rural areas	General characteristics of urban areas
<ul style="list-style-type: none"> <li>· Fast and complex lifestyle</li> <li>· Living expenses are very high</li> <li>· High level of inequality between habitats – extremely poor and extremely rich households</li> <li>· Services, business, and non-farm activities are the sources of livelihood</li> <li>· High density</li> <li>· Advanced infrastructure, transport, access to utilities - electricity, gas and water supply</li> <li>· Good health and Medicare facilities</li> <li>· Well established education set-up – from primary to tertiary level institutions</li> <li>· Limited or no sense of community, unknown neighbours are common</li> </ul>	<ul style="list-style-type: none"> <li>· Slow and comfortable lifestyle</li> <li>· Living expenses are quite low</li> <li>· Most common economic structure - middle class, poor and extreme poor</li> <li>· Agriculture is the main source of livelihood</li> <li>· Low density</li> <li>· Backward infrastructure, limited transport and utilities – no gas, limited electricity and water supply</li> <li>· Poor health and Medicare facilities</li> <li>· Access to primary education mostly available; limited access to both secondary and tertiary level education</li> <li>· Sense of community is strong with traditional cultural social order, strong connection with relatives and neighbours</li> </ul>

According to the Bangladesh Census in 1991, an urban area is characterised as a highly dense establishment providing advanced infrastructure facilities such as paved roads; supply of electricity, gas and water; and sewerage and sanitation systems. The population in an urban area depends on employment in non-agricultural sectors and businesses, whereas the rural population is primarily dependent on farm-based activities; this is a major differentiating feature between rural and urban populations. Thus, there is a general sense that a well-developed infrastructure is associated with urban areas while rural areas are considered less developed. The inequality between rural and urban is well recognised by the government of Bangladesh which has promised strategies to reduce the rural-urban poverty gap in their long-term strategic vision (NSDS, 2010, p. 32).

Furthermore, according to the National Sustainable Development Strategy (NSDS) 2010-21, agriculture is the main sector that secures employment and livelihood for the majority of the rural population, and this is also their main source of food security and nutrition. Though the national economy of Bangladesh is often referred to as an agrarian economy, the government recognises that lack of education and training for entrepreneurs, insufficient access to credit and market linkages, and poor infrastructure, such as an unreliable electricity supply, are major challenges in rural areas, particularly for rural women (NSDS, 2010-21, p. 15).

Usually, people living in rural areas, particularly in geographically remote locations, are also exposed to more risk of losing assets and their chances to overcome poverty are limited (Bird et al., 2002, p.18). Moreover, among the rural poor, rural women are more marginalised than

men (Hossain and Bayes, 2018); therefore, the gendered dimension of poverty in developing countries, including Bangladesh, is essential in ICT4D research. Consequently, an element in this study was to recognise the multiple dimensions of unseen, unknown, or unrecognised poverty of rural women, even by policy experts (Chambers, 2014). For example, drawing from several development project interventions in developing countries, including Bangladesh, Chambers (2014) argued that the rural poor, particularly women, feel shy about expressing themselves in public forums. As a result, their voices remain unheard, as it is preferred to count the vocal and active participants in many development projects. Hence, this study has been able to generate insights into rural poverty from rural women entrepreneurs' perspectives, in contrast to the national macro-policy context (see Chapters 5, 6 and 7).

### **Understanding the rural administrative typology and power structure in Bangladesh**

This section describes the use of the term 'village' typology to explain the rural power structure; this is an essential basis for understanding the research context in Bangladesh for the purposes of this study. Bangladesh has a rural administrative structure introduced during the British colonial period in the 19<sup>th</sup> century. Unlike many other countries, the village is not only an organic traditional cultural structure, with 'natural' boundaries. It is also the lowest level operational unit of rural administration, which has been the case for well over a century. Thus, the village is identified with geographic and administrative structures that are used at policy and operational levels by both NGOs and the government. Table X shows a standard rural administrative structure in Bangladesh, giving a broad overview of the power structure.

**Table X: Rural administrative typology and power structure in Bangladesh**

Division	A Division comprises several Zilas, Upazillas, Unions and Villages. The Division is the highest-level power structure in rural administration, though often it is characterised as a semi-urban area. It is well connected with the national central administrative power structure of bureaucracy.
Zila	The ' <i>Zila</i> ' or District comprises, and governs, multiple Upazillas. Usually, the highest level of health and education facilities are available.
Upazila	Usually, an ' <i>Upazilla</i> ' comprises multiple Unions and oversees the Village and Union level administration. However, in some cases, Upazilas and Unions can be in adjacent areas. In such cases, the Upazilla can become the centre of public extension services, reducing the importance of Union-level operations in that area.
Union	A Union is the most crucial functional administrator of public services provided by the government. It incorporates several villages and wards. A Union manages all vital extension services such as health, agriculture and education. Despite being a lower level of public administration, the Union has the closest relationship with rural people, its offices being located within an accessible distance of its villages and wards.
Ward	This is an operational unit of public service delivery with little power.

**Village** The lowest unit in the rural setting with geographic boundaries. People living in a village are the primary recipients of services and development projects implemented by NGOs and the government.

### 5.3.2. Micro-enterprise Landscape and Financial Inclusion for Rural Women

The government of Bangladesh has given high priority to the Micro, Small and Medium Enterprise (MSME) development for achieving rapid homegrown economic growth. The Industrial Policy 2016 defines MSME based on associated sectors, the volume of investment and number of employee's involvement. Table 5.3.2 captures basic comparative features of MSME, indicating how difficult it is to conceptualise definition from the vague characteristics in various categories.

**Table 5.3.2: Micro, small, and medium enterprises characteristics in Bangladesh**

<b>Types of enterprise</b>	<b>Types of industry</b>	<b>Capital investment</b>	<b>Employee</b>
Micro-enterprise	Manufacture, service	Below 10 million	Maximum 15 employees
Small enterprise	Manufacture, service	Below 10 million - 20 million BDT	16-50 employees
Medium enterprise	RMG, manufacture, agriculture, service	20 - 300 million BDT	51-120 employees

(Source: Industry Policy, 2016, pp 4-5)

Therefore, a perspective of national experts is presented here to provide clarity on micro-enterprise characteristics. Some new insights were drawn from the interviews with national experts, and my findings reinforced similar previous work done by others. The literature review suggested a research gap related to the lack of a standard definition of micro-enterprises. The national experts and NGOs suggested a broad range of micro-enterprise characteristics that are different from one to another. However, they all emphasised two significant aspects: a) investment associated, and b) employment created through the enterprise.

Due to the lack of a standard national definition of micro-enterprise, the characterisation or working definition of micro-enterprises in Bangladesh varied from one implementing organisation to another. One of the senior managerial professionals of a micro-finance institution, FQ explained this well:

... micro-enterprise is defined as a small economic venture which is a full-time income-generating activity for the entrepreneur, moreover, at the same time, which has the potential to emerge as a wage employment-generating activity.

Then he elaborated on the investment dimension of micro-enterprises:

There is an upper limit of this economic venture, and it varies from country to country. In Bangladesh, according to different organizations, we define it differently according to our focuses. The Central Bank defined it up as an economical venture that requires an invested amount of seven million taka, maximum, excluding the value of the land property. Nevertheless, in the case of P, we defined it excluding the value of land, an economical venture that requires a maximum investment of two million taka.

### 5.3.3. ICT4D Policies and Interventions by Government

Aligning with the SDGs, Bangladesh has set national targets to achieve the SDGs by 2030. According to the core strategic document, called the National Perspective Plan 2041, Bangladesh aims to graduate from a middle income to a high earning country by 2041. This policy document recognises two ways to achieve the aim, primarily focusing on the economic aspects of development: i) *“increase the quantum of inputs that go into the productive process”* and ii) *“innovate new ways to get more output from the same quantum of inputs”* (PP2041, p. 651). This implies a shift to a knowledge-based digital economic growth focusing on both *“process and product innovation”*.

ICT4D came into a major focus in Bangladesh in 2002, when the National ICT Policy (NIP) was introduced (ICT Policy, 2009). Since then, ICT4D has remained at the centre of the long-term development vision known as Vision 2021, popularly branded as ‘Digital Bangladesh’ (ICT Policy, 2009, Perspective Plan of Bangladesh, 2010-2021). The ICT policy was modified in 2008, 2009, and again in 2015. The NIP 2015 suggests ICT advancement in three phases: i) short term till 2016, ii) mid-term till 2018, and iii) long term till 2021. This policy holds the spirit of the national constitution aiming for inclusion and equal participation by all citizens in ICT initiatives, including services designed for them.

Both government and NGOs acknowledged the importance of ICT4D, particularly the role of mobile technologies and adopted that in many interventions. These include the use of mobile technologies in diversifying livelihood opportunities in the form of employment and various natures of small, medium and micro-enterprises. The role of UN Agencies, particularly the United Nations Development Program (UNDP) remained vital in promoting and realisation of the digital development vision of the government. An innovative partnership project, named Access to Information (A2I Project) between the UNDP and the government of Bangladesh, was established in 2007, aiming promotion of ICT4D vision and implementation of ICT based public services ‘at the doorstep of the citizens’. This flagship project is still continuing. This project remains instrumental in realising the ‘Digital Bangladesh’ development agenda with policy and operational setup from the national to the local level. Following section elaborates more on the performance of rural level institutional setup which is enabling public services at the citizens doorstep.

However, while the country is heading towards a middle-income country with huge population growth and a rapid rate of urbanisation, inequality is rising amongst the rural population without adequate digital literacy, limited livelihood opportunities and insufficient access to technology and services.

#### 5.3.4. Digital Information and Services for All

This study also looked at the role of the service providing structure, Union Digital Centres (UDCs), formerly known as UISCs. UDCs or UISCs were established in rural areas to provide digital information and services to rural communities, including women micro-entrepreneurs. According to the UISC Census 2014, the government established Union Information and Service Centres (UISCs) at every Union Parishad to provide public services to the citizens' doorsteps. The UISC usually uses desktop computers, laptops, printers, multimedia projectors, photocopy machines, generators, mobile phones, digital cameras and modems for the Internet. In some centres, additional equipment, such as webcam, lamination machine, scanners are also used. Depending on the power supply in the area, the use of IPS and Ups are also common.

After observing some positive results, the same model from the rural areas was replicated by establishing Information and Service Centres at semi-urban and urban areas at '*Pourashova*' (Municipality) and City Corporation Ward level, respectively. Furthermore, as a part of central management of information management, '*e-Tathyakosh*' (E-Portal) serves as an e-content repository in collaboration between all ministries and is managed by the A2I Project at the Prime Minister's Office (PMO).

In general, UISCs in rural areas are supporting rural communities with various ICT supports which were not easily accessible previously. Based on information from the survey, services provided by UISC can be categorised into 12 types of activities that include providing information for basic public services, mainly about agriculture, internet use for education and learning, financial transactions, personal communication and amusement or fun. These are:

- A. Getting information about goods or services.
- B. Getting information related to agriculture, education, and other social services.
- C. Getting information from general government organisations
- D. Sending or receiving emails.
- E. Making telephone calls over the Internet (VOIP).
- F. Using Internet banking.
- G. Playing or downloading video games and computer games.
- H. Downloading movies, images, music, watching TV or YouTube videos, listening to radio or audio music.
- I. Downloading computer software.
- J. Reading or downloading internet versions of newspapers, online news portals, online magazines.
- K. Reading electronic books, knowledge and skill development materials.
- L. Other education and learning activities.

The top ten services provided by the UISCs includes: birth registration, computer compose of text, issue of citizen certificate, snapshot, photocopy, death registration, email correspondence, Internet browsing, checking public education examination results, scanning of documents, checking employment information (UISC, 2014, p. 54). As birth registration is a mandatory procedure for all citizens suggested by the government, 75% of UISC reported it

as the most common service provided by them. About 65% of UISC identified computer compose as the second top service indicating digital literacy and access of a significant portion of people in the rural areas. Only 14% of UISC mentioned providing information on employment as the last of the top ten list, presumably, a lower number of livelihood and employment opportunities for the rural population. The top ten service list does not include information related to agriculture, education and other social services, provoking us to think about the usefulness of the rural poor to these UISC, which are essential aspects of their lives.

The most striking point of the survey indicates a huge gap in terms of gender, age, disability, and ethnic identities in comparison with the mainstream male population (UISC, 2014, p. 48-49). The survey demonstrated that men were the highest user group (2.64 million) per month, ethnic community (16k) were the lowest user group (approximately 1%), which is slightly better in the case of people with disability (62k). Women users (9.4 million) were the second highest user, but they were less than half of the men indicating lower access to information and social mobility of women, in general. However, performance varied in different geographic locations. For example, women users' access was better in Rangpur (30k), Dinanajpur (29k) compared to Khagrachari (4,440), and Bandarban (2,180), which belong to Chittagong Hill Tracts and habitat of the majority ethnic community population.

Another challenging aspect of UISCs is the human resources, and income generated through these services. Out of 4,506 UISCs, 3,511 UISCs (78%) had two entrepreneurs. However, 45 UISCs were without any entrepreneurs and another 991 UISCs with one entrepreneur making the operation limited and non-functional for users. Despite the policy vision, women entrepreneurs' numbers and their level of involvement in UISCs are limited. For example, only 217 UISCs had female entrepreneurs who worked all seven days in a week. Men entrepreneurs in UDCs worked every day, at least some hours of each day. In 933 UISCs, there were no female entrepreneurs involved, and the majority number of female entrepreneurs worked only for 1-4 days (1-2 days: 1355, 3-4 days: 710). Moreover, according to the structure of operation, Union Parishad (UP), including the UP Chairman, are responsible for entrepreneur's recruitment for UISCs where skill and qualification might be an issue. Though 77% of UP Secretary and 81% Chairman expressed their satisfaction at high and moderate level rating performance of UISCs, there is a scope to question how far a quantitative survey can capture this when criticism is considered bad manners in Bangladeshi society.

### **5.3.5. ICT4D Interventions by NGOs**

Here I have described three development projects where micro-enterprise and women's empowerment was common project component. In addition to that, in the second and third projects, smartphones were included as a part of project intervention as a means of micro-enterprise operation and as an enabling factor for women's empowerment.

## A. REECALL Project of Oxfam in Bangladesh

The REECALL<sup>10</sup> is a flagship intervention of Oxfam in Bangladesh, which is connected with all major projects and influencing work. This intervention aims to strengthen community resilience through economic empowerment and inclusive leadership development of a community with a particular focus on rural and urban women. Approximately 2.25 million households in 14 districts of the three most vulnerable agro-ecological areas (sandy island, 'haor' and coastal belt) are targeted through this programme. A community-based approach is a key strategy of engagement with programme participants.



**Figure 5.3.5A. Conceptual Model of REECALL Project (source: Oxfam)**

The programme has been emphasising influencing and research work and accordingly established partnerships with a leading dairy company in Bangladesh (PRAN Dairy), a leading consulting firm in ICT (BIID), a government agency (Bangladesh Livestock Research Institute), and a private university (Climate Change Resilience Study Centre of BRAC University). This program identified the impact of care work burden on women as a challenge to their engagement in income-generating activities. Oxfam initiated a care analysis in 2015 using 'rapid care-analysis tools' to explore care relationships, identify women's and men's work activities, recognise gendered patterns and explore potential solutions for reducing and redistributing care work.

<sup>10</sup> [www.oxfam.org.uk/reecall](http://www.oxfam.org.uk/reecall)



The programme helped women improve their social and economic condition, influenced their decision-making ability, and encouraged addressing violence against women. Until 2019, approximately 4150 women were included in the local leadership structures. Oxfam evaluation found that 46.1% of women participants of the REECALL programme were able to take/make their own decisions. Women were also contributing in the joint decision making on household income which has increased three times more from the baseline survey, moving from 20.5% at baseline to 66.3% at the end line. It also demonstrated that 82.4% of surveyed women were involved in income-generating activities. They have opened bank accounts and made plans for savings. Individual and collective capacity to maintain their daily accounts for income-generating and enterprise activities emerged as a positive change.

This study includes Case Study 6 includes rural women participants of Panjarvanga village who are role models as Dairy enterprise group to the community and development organisations like FAO. This group was selected to explore the factors behind enterprise sustainability, women's agency, and use of mobile phones (not influenced by NGO) in their business and day to day life.

## **B. PROTIC Project of Oxfam in Bangladesh**

The Participatory Research and Ownership with Technology, Information and Change (PROTIC) Project has been implemented in three geographically remote areas – ‘char’, ‘haor’ and coastal parts of Bangladesh (Tithi et al., 2020). ‘Chars’ are defined as “sandbars that emerge as islands within the river channel or as attached land to the riverbanks” (Rahman & Rahman, 2012, p. 145). This project is a Participatory Action Research (PAR) collaboration initiative, implemented by three local NGOs (Pollisree, Shushilon and CNRS), conceptualised, funded and coordinated by the Monash University, Oxfam in Australia and Bangladesh. Additionally, WinMiaki Ltd. (a telecommunication company) has been involved in providing development content on agriculture and weather-related information. PROTIC Stage 1 (2015-9) is now completed, and funding secured for the next stage (2020-2024).

The project aims to contribute to the SDGs and national vision for ‘Digital Bangladesh’. Various local and national stakeholders were involved in sustaining this ICT4D intervention. Therefore, the project engaged the local public service officials, sub-district and district level administration, Union Digital Centres (UDC). The project was launched in two remote villages in the northern sandy island and the southern coastal part. After observing positive results from the piloting phase, another project location was added in the *haor* area in Sunamganj (Tithi et al., 2020). PROTIC aims to assist rural women by providing smartphones and training on mobile technology used to address their challenges in agriculture, enterprise, disaster, climate change, and other social issues (Sarrica, et al., 2017).

Therefore, 300 women farmers were identified from three project locations and trained as the animators for the action research, who used mobile technologies and shared their knowledge with family and wider communities. Through this project, 300 smartphones were handed over to the women farmers in the expectation of shared use and knowledge sharing within the community. At the participation selection stage, three criteria were considered: ‘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 project considers information as power and an essential tool to promote women's agency. Therefore, the project identified 'animators' from remote areas where the animators help the community with information, learning and demonstrated examples of diversified livelihood activities using smartphones. The women were provided training on handling technical information on agricultural production, pesticide management, harvesting and marketing of their products, and disaster risk reduction. They obtained information in Bangla via outbound dialling (OBD) and SMS, and call centres. The majority of PROTIC participants were not comfortable in reading long texts. Therefore, the service provided by call centres was useful for them. The project also developed two mobile apps, 'Bhutta' or Maize app is one of them, which is discussed in the case study. They applied new learning in their agricultural production and Maize enterprise. This way, the rural women animators emerged as change agents and recognised as leaders in the community. Consequently, women's resilience is built up, and their acceptance within households and communities improved.

High-quality academic research has been another critical component of PROTIC. Therefore, five doctoral students were recruited to conduct studies on various aspects of ICT and development intervention and its impact on rural women's lives (Khabar et al., 2020). My study is one of them which focuses on the greater northern and southern regions of Bangladesh.

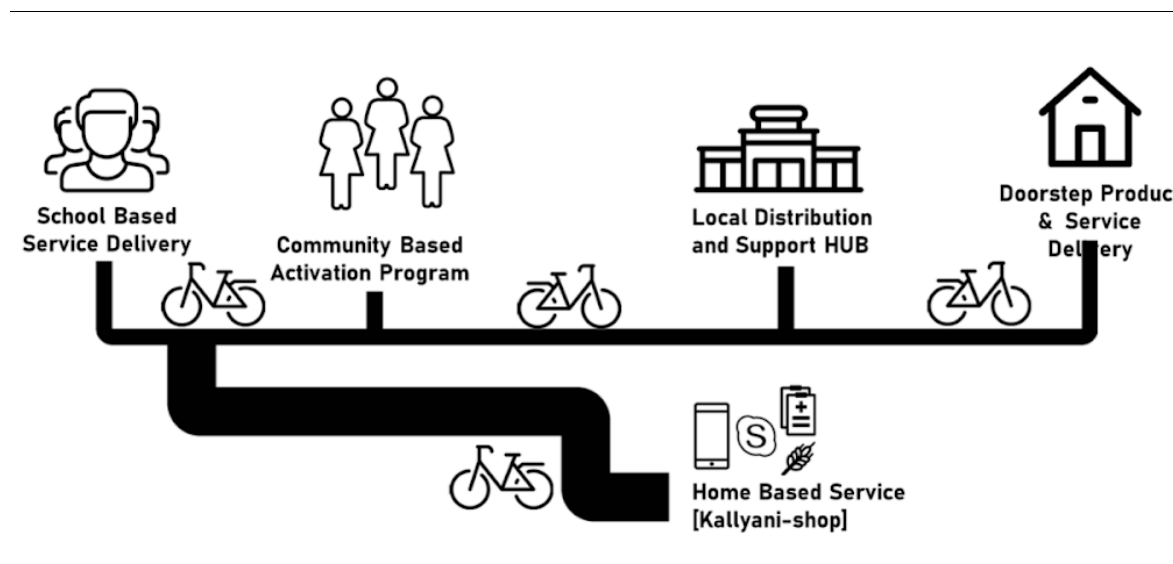
A case study on maize enterprise group members, and women farmers, mobilised and trained by PROTIC Project is presented in Chapter 7. Amongst 100 animators from the northern char areas (one of PROTIC project locations), rural women were recruited considering their engagement in Maize enterprise and trained use of smartphones in their agricultural production and micro-enterprise operation.

### **C. Infolady Model of Dnet**

Dnet is a not-for-profit social enterprise known for its ICT4D innovative projects. In 2004, the concept of information-based service became popular through a piloting initiative, named 'Rural Information Centres' where information on agriculture, health, legal aid was provided via computers. Based on that learning, Dnet launched the Infolady model in 2010 and to sustain the piloting initiative as a social enterprise with profit, the Infolady Social Enterprise Limited (called iSocial) was established in 2016. The Infolady intervention has reached 128000 households, served 19200 adolescent girls and provided various services to 192000 women and children.

The '*Kallyani*' model or Infolady model aims to create women's entrepreneurial capacity to establish a social enterprise by providing information-based services and essential products to rural households to meet their needs. The information-based services include rural households query and provide required information on agriculture, generic health, sexual and reproductive health issues. Infoladies are also trained to conduct basic health check-ups like measuring blood pressure and diabetic patients. They also provide mobile data and connectivity support as local retailers.

This intervention only includes young (18-35 years) and articulative rural women, who have passed secondary level education and are able to maintain basic accounting information for day to day enterprise operation. In addition, their language and communication skills, learning aptitude, entrepreneurial mindset, minimum investment and risk-taking capacity are also considered while engaging them as Infolady.



**Figure 5.3.5.C.: Kallyani (Infolady) Conceptual Model<sup>11</sup> (source: iSocial)**

This project includes five types of *Kallyani*: i) Information *Kallyani*, ii) Health *Kallyani*, iii) Agro *Kallyani*, iv) Adolescent *Kallyani*, and v) Nutrition *Kallyani*. These types indicate the specialisation of their information services provided to rural households. For example, an Agro *Kallyani* provides agriculture information services, such as crop cultivation, horticulture care, livestock care, fish cultivation care, vaccination of poultry and livestock. A Health *Kallyani* provides certified health service to the rural community to conduct a basic medical check-up to check blood pressure and blood test for diabetic patients, address their queries on generic, sexual, and reproductive health issues, provide referral services. An Adolescents *Kallyani* provides information related to health-hygiene practices such as menstruation which are relevant to adolescent girls. Similarly, Information *Kallyani* provides retailer services for mobile-based communication, internet use, and financial transactions.

The meaning of ‘*Kallyani*’ in Bangla is the woman who brings wellbeing to others. Accordingly, in this social enterprise, a *Kallyani* is a young women entrepreneur who offers information services and sells products to neighbouring rural households and the local community. *Kallyani* entrepreneurs connect other women with income generation activities by providing them information, supporting in managing mobile banking, connecting them with public and private agriculture, livestock and other services, helping them improve health, hygiene, nutrition of women, adolescents and children. Sometimes, they also work for government and NGO initiatives as information service providers. This way, they improve the wellbeing of the

<sup>11</sup> <https://isocial.com.bd/kallyani/>

community and engage themselves in the broader market. With 28.4% women in the labour sector, this social enterprise aimed to reduce the gender gap and engage women service providers in income-generating ventures with other women clients in a culturally accepted way. This way, the Kallyani get connected with the e-commerce market and become self-dependent.

In addition to the Maize enterprise group, this case was an extension of exploring factors associated with trained use of smartphones by X educated young entrepreneurs representing different categories of Infoladies. This case demonstrates the role of smartphones in running their social enterprises and promoting their agencies.

#### 5.4. RESEARCH PARTICIPANTS

A total of 64 research participants were covered for empirical data collection; 34 in-depth interviews were conducted and another 31 participants were covered through Focus Group Discussions (FGD).

**Table 5.4 A: Research participants in Bangladesh**

Category	Male	Female	Total	Description
Rural women entrepreneurs	-	10	10	Participants in enterprise programs of national NGOs, involved in rural micro-enterprises
Local service providers	14	1	15	Local public service providers, NGO workers, market actors
National experts	7	2	9	Issue-based experts from government, academia, ICT4D institutions
Interview participants	21	13	34	
FGD 1	3	8	11	Members of Lucky maize enterprise group, husbands of women producers, the user of advance mobile technology
FGD 2		8	8	Women engaged in livestock, agricultural production and user of advance mobile technology for e-learning
FGD 3		7	7	Members of Dairy Cooperative group, Hindu-Muslim mixed group, the user of basic mobile technology

FGD 4		5	5	Religious minority members of Dairy Cooperative group
Research participants	24	41	64	

As shown in Table 5.4 A, research participants belong to three broad categories:

- i) **Rural women entrepreneurs:** Rural women who are leading micro-enterprises (for example maize, dairy value chain and mobile-based customer services) individually or as a group in Nilphamari, Rangpur (northern parts of Bangladesh) and Jessore (southern part of Bangladesh), development program participants (agriculture production, livestock rearing and mobile technology-based knowledge and skill enhancement related development interventions) implemented by different International NGOs.
- ii) **Local service providers:** Officials of government-supported community-level digital information centres, public duty bearers related to agriculture extension and livestock support services and community workers of national NGO at rural areas, wholesaler of micro-enterprises and retailers who are connected to the enterprises led by the rural women entrepreneurs.
- iii) **National experts:** Economist, ICT4D expert, senior officials of International NGOs who provide social development services to rural women, former senior government officials in Bangladesh at the policy-making level, mobile technology support providers.

A brief summary of the basic features of the three micro-entrepreneurs' categories is presented below.

**Table 5.4 B: Basic Feature of Micro-enterprise, Mobile Phones and Women Entrepreneurs**

Enterprise Type	Milk Enterprise (group)	Maize Enterprise (group)	InfoLady Social Enterprise (individual)
Religion	Hindu, few Muslim	Muslim	Muslim
Education	Mostly Primary Few secondary	Mostly Primary Few secondary	All Secondary, Some Graduate
Location	River embankment, Rangpur	Char, Nilphamari	Semi-urban, rural periphery, Jessore
Vulnerability	River erosion, flood	Flood	Waterlogging
Class	Mostly landless, some small farms	Landless, lower middle class	Middle class

Marital status	Married	Married	Married, unmarried, separated
Movement	Moderate mobility	Less mobility	High mobility
Phone ownership	Button phone, personal	Smartphone (PROTIC & own)	Smartphone, personal
Digital skill	Basic user – calculator, alarm, contact, call	Trained with apps, Internet	Trained advanced user
Attitude to phone	The phone is a shared asset, can be good & bad	Self-restriction, bad women concern	Matter of pride
Mobile phone use & purpose	Both personal & business communication	Personal & business communication, learning & entertainment	A necessity for enterprise, personal & business communication, mobile banking, retailer service

## 5.5. CHAPTER SUMMARY

Existing policy documents, schemes, ICT infrastructure, institutional set-up and interventions provide scope to review the impact of mobile technologies in establishing and sustaining micro-enterprises and how far these contribute to women's empowerment in the rural areas. Therefore, the chapter reviewed the context of three illustrative cases of mobile technology use in three types of micro-enterprises located in rural areas and led by women entrepreneurs supported by local and national NGOs. It also provided basic details about the women entrepreneurs as participants of two case studies. This way this chapter sets a solid background for the case studies presented in following Chapters 6 and 7.

## Chapter 6: Case Study A - Basic Mobile User Dairy Entrepreneurs

### 6.1. CHAPTER OVERVIEW

This chapter presents the case study of a rural women's micro-entrepreneur group who use mobile phones with basic features for the day-to-day operation of their dairy enterprise. The chapter also integrates information about the REECALL project introduced in the previous chapter (see Section 5.3.4) and presents activity details of the dairy micro-enterprise group formed under that project.

The first two sections of this chapter detail the characteristics of case study participants, followed by an overview of the dairy micro-enterprise model and women entrepreneurs associated with that enterprise.

The relationship between mobile phones, women's agency and dairy micro-enterprises is examined in Sections 6.6, 6.7 and 6.9 and directly contributes to secondary research question ii. "What kind of transformative changes are occurring in rural women micro-entrepreneurs' lives with the use of mobile technologies?"

Sections 6.6 and 6.7 addresses secondary research question i. 'What is the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs in Bangladesh?'.

This case study aimed to review the relationships between the mobile phone use in the dairy micro-enterprise case and test application of the SLF-M4D to understand overall transformative change in women's lives. Section 6.4 informs the SLF-M4D model in terms of livelihood assets, strengths, strategies and outcomes, and consequently contributes to women's empowerment and micro-enterprise related analysis presented in the discussion chapter (see Chapter 8).

Here the case is confined to a dairy micro-enterprise operation and use of basic mobile phone features by rural women entrepreneurs located at Panjarvanga village in Rangpur Division. This case was chosen because it is recognised as an example of a successful and sustainable micro-enterprise that maintains relationships with the formal market, banks and donors. Specifically, this case examines the role of mobile phones in maintaining internal communication between the micro-enterprise group members, external communication with local service providers and the local market. By presenting rural women's voices, this case provides insights into both positive and negative aspects of mobile phone use in their business communication, social and private lives.

### 6.2. CASE STUDY PARTICIPANTS

Table 6.2 summarises the characteristics of two categories of research participants: the women dairy micro-entrepreneurs and local service providers. The first column indicates how data was collected from these participants with an identifier code. Two focus group

discussions (FGD<sup>12</sup>) and key informant interviews (KII<sup>13</sup>) were conducted with the women entrepreneurs. Another five KIIs were conducted with local government officials, NGO officials and private service providers.

**Table 6.2: Research participants for Women Dairy Micro-Entrepreneur Case Study**

Data collection method	Participant Category	Characteristics of Participants (role, association, location, religion)
FGD 3	Seven women dairy micro-entrepreneurs	Women members of Panjarvanga Milk Cooperative, Hindu-Muslim mixed participants, Users of basic mobile phones
FGD 4	Five women dairy micro-entrepreneurs	Panjarvanga Milk Cooperative group members, Hindu women (a religious minority)
KII - RW_RB	Women dairy micro-entrepreneur	Chair, Panjarvanga Milk Cooperative group (Hindu)
KII - RW_SR	Women dairy micro-entrepreneur	Member, Panjarvanga Milk Cooperative group (Hindu)
KII - RW_MB	Women dairy micro-entrepreneur	Cashier, Panjarvanga Milk Cooperative group (Muslim)
KII_LLS_HR	Local service provider, male	Entrepreneur Union Digital Centre, Kawnia Upazilla (Muslim)
KII_LS_MAI	Local service provider, male	Entrepreneur, 5 No Balapara Union Parishad Digital Centre, Kawnia (Muslim)
KII_LS_MMR	Local public official, male	Sub Assistant Livestock Officer, Kawnia (Muslim)
KII_LS_MKS	Local public official, male	Upazilla Livestock Officer, Kawnia (Hindu)
KII_LS_AKB	Local NGO official, male	NGO Management, Plan International, Rangpur Former REECALL Manager, Oxfam (Hindu)

### 6.3. PROFILE OF WOMEN DAIRY COOPERATIVE

The *Panjarvanga Mohila Dughdo Shomobai Somiti* (Panjarvanga Women Dairy Cooperative in English) is a dairy micro-enterprise located in a rural village in Rangpur Division, named Panjarvanga. It is one of the 84 dairy producer groups supported by Oxfam. During the data

<sup>12</sup> FGD – Focus Group Discussion technique used for discussion with groups and referred as FGD in Chapters 6 and 7

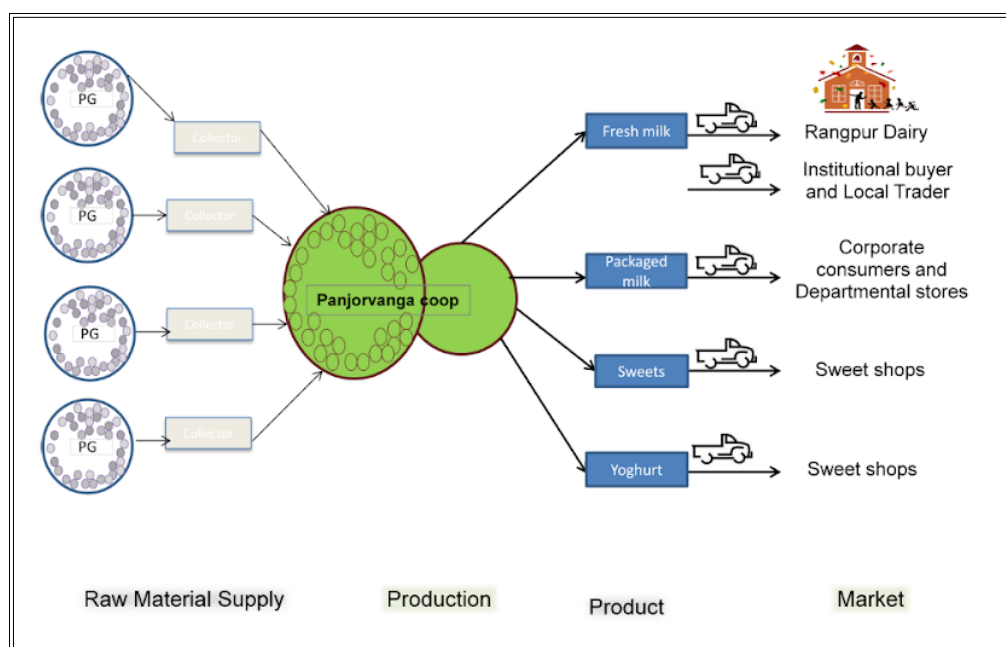
<sup>13</sup> KII – Key Informant Interview technique used for individual in-depth interview and referred as KII in Chapters 6 and 7



collection period in 2019, the cooperative consisted of 45 milk producers. All were rural women who had more than one cow and lived in the Panjarvanga village.

This group has a mixed membership of Hindu and Muslim women, and this helps to highlight the difference in their socio-economic status. In general, in Bangladesh, the average family size amongst Hindu families is smaller compared to Muslim families. For example, the case in this village, most Hindu families have one to two children, whereas Muslim families have three to five children. Family size is important because of the effects it has on economic conditions and social status.

In February 2011, this enterprise started as an informal group of individual women farmers and dairy producers. They were engaged in various social and economic development activities for rural women and their communities. At the formation stage, a local partner NGO of Oxfam, organised the group as a Community Based Group (CBO) and provided financial and technical support from the REECALL project to establish the dairy enterprise. The initial capital for this enterprise was BDT 89,000 (approximately USD 1,050).



**Figure 6.3: Dairy Enterprise Business Model (source: Oxfam internal briefing paper)**

The group was trained and mentored by Oxfam and its local partners as a women-led dairy producer group. They aim to develop associated structures for a cow feed and fodder bank enterprise and milk collection centres to make it a sustainable venture. After several years of informal operation, the dairy micro-enterprise was registered as a cooperative under the Government Cooperative Department to establish formal linkages with the market, bank and donors. However, the associated fodder and milk processing enterprises are not yet in operation.

Upon registration under the Government Cooperative Department, the group received a formal structure and legal identity to continue the micro-enterprise operation. During a FGD,

they informed me that their enterprise had two products – fresh milk and packed milk kept in a freezer. In future, they would add two more products - yoghurt and sweets. In order to do this, they have mobilised five additional milk producers to join the existing 50 milk producers.

The cooperative has an executive body with seven members. They follow a set of terms of reference, referred to as the group 'constitution' that guides them to manage and operate the enterprise and its day-to-day business. They also have a business plan that is regularly modified according to the needs of the business. During the data collection period, they told me that the dairy enterprise group decided to involve another five dairy producers beyond existing members to increase the minimum daily collective milk supply. They also assigned five group members to collect milk from other women producers who were living at a location distant from the main milk collection point. These five members were given an additional 'commission' as an incentive for their milk collection service.

#### **6.4. VULNERABILITIES AND SHOCKS FACED BY THE DAIRY MICRO-ENTREPRENEURS**

The women dairy micro-entrepreneurs identified flood and river erosion as major natural disasters in their locality. They said that during floods, everything gets damaged, and usually, the disaster has impacts that continue for weeks and even months. They explained some specific impacts on dairy micro-enterprise operations. This includes damage to livestock shelters or cowsheds, loss of natural fodder (Napier grass) for cows, feed price increase, the erosion of savings to meet the basic needs of the household, and occasional distress sales of cows.

Amongst seven women (FGD 3), one FGD participant explained the impact of river erosion on their lives:

The way our [Teesta] riverbank has eroded during this rainy season, we are at risk. If erosion keeps happening, approximately 400 families of our locality will become destitute. This is our demand to the government, that they take immediate steps here.

During all focus group discussions and interviews, it became clear that the women are aware of the role of locally elected representatives, such as the Member of Parliament (MP) and government administration, to provide long-term solutions to such causes of vulnerability. They referred to a meeting with the MP held a few days before the data collection period in June 2019. It was in Gajirhat, quite far from their village (approximately 130 km), but several members travelled by road for five to six hours to raise their concerns.

During the FGD 3, women from both Hindu and Muslim communities identified gaps between policies and implementation realities, particularly they were frustrated with lack of commitment and inadequate responses from the national and local elected representatives and government institutional mechanisms. These two quotes illustrate dairy enterprise group's frustrations, concerns and expectations of the government to address the vulnerability in their locality:

We have been doing protests, but nothing happens. The MP promised us he'd do something, but it's been so long since the election, and nothing was done.

We have one expectation [from local and national authorities]! It's for the river erosion in our area. We need dams. We need a solution as soon as possible.

The dairy enterprise group also mentioned seasonal hazards, such as heavy rainfall in the monsoon, extreme heat during summer, and cold waves during winter creating problems for their cattle (which are not a local breed), children and elderly family members. During my field visit, I observed that after heavy rainfall for a couple of hours, all village paths made of mud and bricks were flooded, making it difficult to travel between the village houses to the connecting local roads. In such cases, many village houses face water-logging problems which may continue for several days. The women confirmed my observation of the context and explained that seasonality affects their mobility, livelihood activities and education. For example, one focus group participant confirmed the impact of the monsoon on their dairy business profit: *"Yeah, in the rainy season, the rate [for milk] is less."*

During the focus group discussions and interviews, the women also mentioned shocks and uncertainty impacting their dairy business. For example, buying a cow is a huge investment for them, and if the cow faces health problems and dies for some reason, it is a great loss. They pointed out their concern at not having any coping mechanism to manage such loss. They referred to the urgent need for a solution to such a situation to protect small dairy producers and micro-entrepreneurs like themselves:

... let's say the cows might die too. Is there any insurance for that? No, there isn't any. We need this [insurance] badly. We need it first and foremost.

## **6.5. STRENGTHS, CAPABILITIES AND LIVELIHOOD ASSETS OF THE DAIRY MICRO-ENTREPRENEURS**

### **Livestock and poultry - livelihood assets and cultural norms:**

Traditionally in rural village society, ownership of a cow is a matter of pride. Because ownership of cattle is associated with the dignity of the family, this is not comparable to other poultry or livestock such as goats. The main reason behind this is that, in an agrarian society, cattle are the main source of labour for ploughing, mowing and transportation. They provide raw material for fuel (used for cooking), agricultural compost is also processed from cow dung. The cattle are also a source of household nutrition, providing milk and meat protein as and when required. This is a more sensitive issue in the Hindu community, where cattle are treated with respect and utmost care as an auspicious animal that is part of Hindu mythology. Cows are sacred symbols of life, because according to the '*Bedh*' (a religious book of Hindus) and Sanskrit religious literature, cows are associated with 'the mother of all goddesses, '*Aditi*'.

Usually, a small dairy farm in a village has five to seven cows, and a medium farm may have ten to twenty cows. When I asked the women how many cows they own, there was a huge variation in their responses. Some women own a cow or two, others own more than ten cows. Ownership of cows varies depending on the life cycle of a cow and other factors, such as access to loans. During an interview with the leader of the group (KII - RW\_RB), the lady informed me that she had 11 cows (seven cows, two bulls, two calves); two days back she had sold two cows to repay her loan.



**Figure 6.5 A: RB's Poultry**

Like other village women, this interview participant (KII - RW\_RB) has ducks, chickens and goats as well as cattle. All her livestock and poultry were kept in the '*uthan*' (courtyard in English). After feeding the ducks, she allows them to stay in the nearby small pond in the '*vita*' (homestead area in English).

When I asked about their poultry and livestock ownership, all started responding together, indicating a close connection with these kinds of assets. All members of the dairy micro-enterprise mentioned that they possessed some poultry and livestock, except one woman who only had some ducks during the time of data collection. Poultry includes hens, cocks, chickens, ducks and ducklings. Livestock includes cows, bulls, calves and goats.

### **Land is more than an asset**

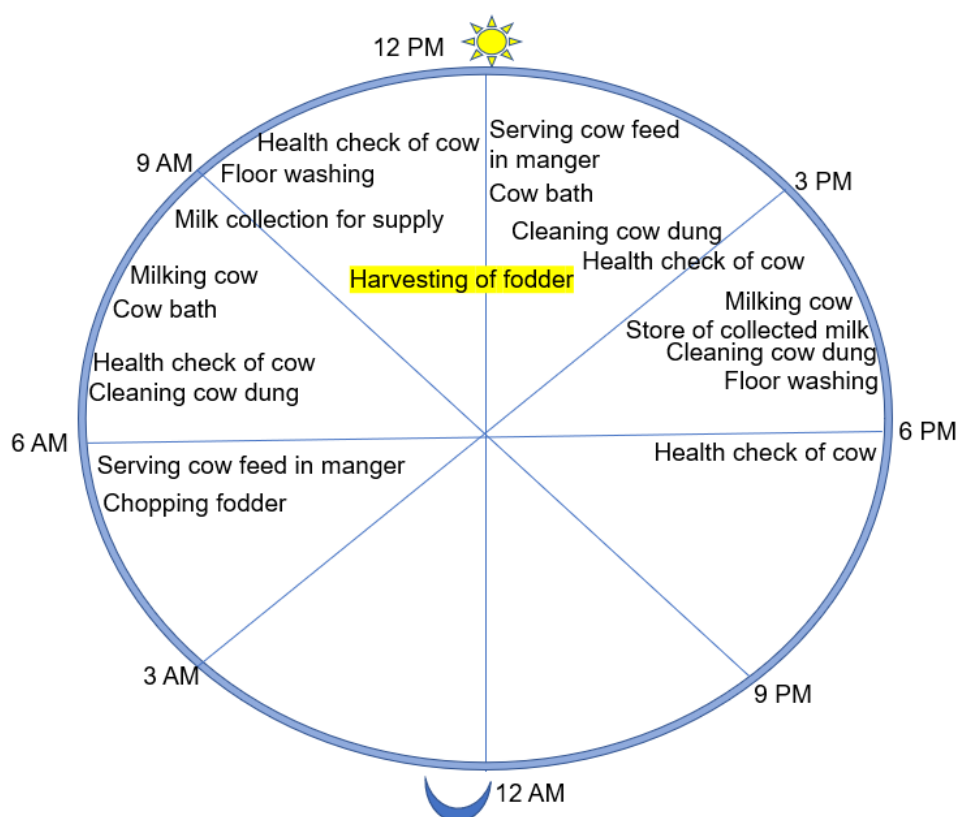
The majority of the women informed me that all of them own homesteads and some land for farming. Only a few of them have sufficient arable land to provide their household supply of grain and vegetables. For example, a successful entrepreneur specified that she and her family own 55 '*shatak*' (one *shatak* is equal to 435.6 square feet of land used in rural villages).

The small piece of land called '*vita*' is not merely a homestead area. Rather, the relationship between this land and its habitat refers to a sense of traditional identity associated with a family in a rural Bangladeshi village community. Usually, a household stays in their '*vita*' for

generation after generation. Therefore, it is considered to be their permanent address, also indicating their roots. The house on that land is recognised as their 'home' and the village society identifies them as people belonging to that homestead area.

### Daily livelihood activities of dairy producers

From collecting details of dairy producers' activities, I found that dairy farming is a labour-intensive venture. In fact, during the in-depth interviews with women entrepreneurs, they were multi-tasking most of the time. For example, whilst they were responding to my questions, at the same time, they were feeding the poultry or cows or doing household chores. I visited them at different times of the day, and I observed that they were doing something all the time. It kept me wondering if they have any leisure time throughout the day!



**Figure 6.5.B: Daily Routine of Dairy Production of a Dairy Enterprise Household**

Based on focus groups and interview notes, I developed an illustrative daily clock indicating the regular routine of dairy micro-entrepreneur women. This image highlights the major tasks associated with a dairy micro-enterprise, such as feeding, bathing, milking and checking the health of cows, storing and selling milk, cleaning cow shelters and harvesting fodder. Except for the harvesting of fodder and selling of milk, all other tasks are assumed to be done by women dairy producers. However, as cattle is considered a precious asset, some tasks are shared by other family members. Harvesting requires working in the field. Therefore, usually, this task is carried out by the husband, son or other male members of the family.





**Figure 6.5.C: Woman Producer with Her Husband and Cattle in front of the Cowshed**

The lady (KII - RW\_RB) in the Figure 6.5.B below talked about her daily activities:

We cultivate our own grass. The milk collection time is every morning and afternoon. It starts from 9 AM to 10:30 AM. And then again in the evening, from 5:00 PM to 6:30 PM. No, the wholesalers don't come. We take it there. We collect milk from all members and take the bulk amount to the main road. Some wholesalers are good, and they pay us for this. At least 20 *taka*. And during the afternoon, all of our members collect milk and keep it in the '*fridge*' [freezer] together.

### **Knowledge and skills of dairy micro-entrepreneurs**

I found members of this group are well aware of cattle varieties, production capacity, health and other associated issues. During an in-depth interview, one successful dairy farmer explained that in earlier days she used to keep cows for milk, chicken and duck for eggs to meet daily household consumption. Nevertheless, she became aware that a '*deshi*' (local in English) breed of cow produced a low quantity of milk. When they formed the micro-enterprise group, she bought all '*bideshi*' (foreign in English) breeds or mixed breeds to get a higher quantity of milk. She also mentioned that the foreign and mixed breeds require more food, medicine and care compared to the local breed. The Agricultural Extension Department officials and NGOs have introduced Napier grasses to the rural community, as it is considered as a high quality fodder for cattle. During an in-depth interview, a dairy entrepreneur told me that earlier she and her husband were not aware of this fodder which gives energy to cattle and increases milk production.

### **Mobile phone as a shared asset**

During the field data collection, I observed that the majority of the women in Panjarvanga village did not carry a mobile phone with them. All seven focus group participants have a phone at home which they do use for personal and business communication. They said the mobile phone was either with their husbands or sons, i.e., with the male members of the family, most of the time. They mentioned that they use it when they need to call or receive calls only. Amongst another group of five, one woman entrepreneur mentioned that she and her immediate family do not have their own mobile phone. They are living in an extended family and use their family phone only when required.

Unlike countries like Australia, in Bangladeshi society, many consumer goods (for example, beds, furniture, combs, body soaps and lotion) are treated as common family items rather than belonging to an individual. The sense of ownership of assets is associated with social norms and values in a traditional rural society. Consequently, I found that a mobile phone is treated as a shared family asset instead of an individual asset. However, I also found that, in the majority of cases, it is actually controlled by the male members of the family, while women have occasional access to mobile phones.

### **Collective asset and social capital of dairy micro-enterprise**

The dairy micro-enterprise uses combined forms of asset ownership. The women have individual cowsheds or shelters at their houses to keep their cattle, and also use their own land for fodder harvesting and storage. However, they share a refrigerator, which is the property of the collective. They usually use it to store a bulk quantity of additional milk, mostly collected in the evening or in case of a change in the milk supply time. The collective also has a lactometer machine, and they use it for checking the water contained in the milk. During a FGD with several members of the dairy micro-enterprise group (FGD 3), the leader told me:

If they [wholesaler collectors at the market] don't come for any reason, we keep it in the freezer. No, I don't have any [freezer], but we [dairy micro-enterprise] have one, and I keep it there. Then, the next day I sell it [in the market].

Then she (KII - RW\_RB) continued elaborating the process of milk collection during a follow up in-depth interview with her:

We don't have the fat rate one [the machine to detect fat content in milk]. Yes, *Samity* [CBO, indicates the milk collective here] has the Lactometer.

Milk is not usually collected directly from the dairy farmers by the public Dairy Company 'Milk Vitae' or any private company, such as 'PRAN Dairy', 'RDRS', 'Aarong' (market enterprise of the biggest Bangladeshi NGO BRAC). Rather, it is collected through milk supply agents, some of them are traditional '*gowalas*' (milk traders in English) and sometimes the agents may also include some dairy farmers who are engaged in the milk trade as an additional income-earning activity. When I asked the women in this case, they told me that to manage their milk collection and supply to the market, they assigned and paid five producers to act as milk collector focal points responsible for collecting milk from all group members and others outside their group.

This strategy was particularly helpful in coordinating the big group and collecting milk from producers in distant locations.

## 6.6. MOBILE PHONE AFFORDANCE AND INFORMATIONAL CAPABILITIES

During the data collection process with the Panjarvanga Dairy Enterprise Group, I realised that the use of mobile technologies could be varied within a community group, even within a household. None of the women in this group were using smartphones because they found it too complicated and expensive. I noticed that when someone says, “*I have a button phone*”, it implies that only some basic features are available on her mobile device. All of them were aware of some basic features of mobile phones, such as phone calls, SMS, alarm, calculator, contact list, camera and radio. However, most women were using only one feature – making or receiving phone calls. Only a few were using mobile phones for other purposes.

For example, the group leader use of her mobile phone was more advanced compared to other members. I observed that she was using the calculator feature in her ‘*botam phone*’ (*button phone in English*), i.e., mobile phone with basic features, to calculate collected savings and instalment amounts and to provide change to members. She also used it while reviewing individual balances and maintaining records in the ledger book. The way she expressed the different uses of her phone during the in-depth interview (KII - RW\_RB) is given below:

It’s not just a phone! I can count, it has a calculator. [I] Can listen to the news. It has a radio [feature].

However, she clarified that she does not use social media because her phone does not have that feature. Also, she thinks it is a waste of her time and money. She emphasised using phones mainly for business purposes:

I do not use my mobile phone for any other purpose, like Facebook. I use ‘*Samphony*’ [Symphony company mobile device with basic features], it is not a smartphone. Facebook is not usable on it.

The nature of personal communication varies between one member and another. Their use of a phone for obtaining and exchanging information in public life also varied. The majority of the women were aware of a variety of information and communication options via mobile phones. During a focus group discussion (FGD 4), one of the woman dairy producer said:

Mobile phones are used to get agricultural information. It is also used for Facebook. A mobile phone can be used for financial transactions as well.

And a Hindu woman dairy producer of the group (FGD 4) said:

I don't use the phone. Yes, some of our family members have it.

When I asked about their personal communication via mobile phone, in most cases, majority of the research participants of this village shared common opinions. During FGDs and KIIs,



they mentioned calling their husbands or sons before their paternal family and relatives. For example, a Muslim women entrepreneur of the dairy producer group (KII - RW\_MB) said:

Yes, I also use my phone for personal communication. For example, when my son goes somewhere, I call him. I also call my husband. Sometimes, I call [family members at] my *'baper bari'* (paternal home in English), my relatives, my friends [laughs].

Participants informed me that they are aware of mobile banking and mobile payment systems. However, women usually depend on their husbands or other male family members doing such transactions.

### Negative aspects of mobile phones

The rural women of this village said that the ***“mobile [phone] has brought both good and bad”*** things in their lives. They spoke about some fraud cases and crimes, *“mobiles come up with fake news sometimes”*. This referred to the trust issues in face-to-face and mobile phone conversations. They think that ‘terrorists’ or ‘bad people’ use mobile phones to threaten and manipulate people to get money. A general member of the dairygroup (FGD 3) said:

Sometimes, the *‘Dorbesh Baba’* [a fraud taking a fake identity as saints] asks for money through mobile phones. One [fraud] reached out to me once. I ignored. I heard one got caught. There are many.

The cashier of the group (KII - RW\_MB) elaborated the scenario which was found common by other women dairy producers of the group (FGD 3 and 4):

They tell you things like, you are lucky, you are going to receive such and such an amount of money. If you give me 60k *taka*, you'll get 1.5 million *taka*. Someone I know got trapped by them. They gave them 60k *taka*. After that they could not trace anyone, the number was always found switched off.

They (FGD 3 and 4) also referred to a problem in mobile banking:

Sometimes money goes to the wrong person. So, we called their number and said that we had sent the money by mistake. If they're good, they would send it back. But if they are not, then it's gone.

One woman (FGD 3) shared her personal experience regarding such incidents of making mistakes while transferring money through mobile banking. *“Yes! I've made this mistake. Then I let them know, but they didn't give it back.”*

Another woman (FGD 4) discussed why they are reluctant to use mobile banking. Another woman suggested checking the mobile number repeatedly before sending money via *bKash*.

The women in this group believed that there is a negative connection between mobile phones and early marriage. They observed that early marriages are still common in a rural society in Bangladesh. They said that parents are aware of this problem now. They consider educating

their daughters and sons until higher secondary or tertiary level before they get married. The official age of marriage for girls is 16 and for boys 21. But nowadays children elope and get married on their own: *“Twelve to 13 year-old children are getting married on their own. They ‘date’ through mobile phones”*. Some women also think that, like young boys and girls, some older women get into such relationships and ‘love affairs’ via ‘wrong numbers’ on mobile phones. In general, they disapproved of such behaviours of children and adults, therefore, considered these as a negative side of mobile phone use.

## **6.7. MOBILE PHONES, DAIRY MICRO-ENTERPRISE AND WOMEN’S AGENCY**

I wanted to learn the rural women’s perspective on women’s empowerment; therefore, it was a common question I asked all research participants. From the discussion, it was clear that the rural women give high value to women’s involvement in economic activities because they think there is a direct connection between income and respect within the family and society. I noticed that they value gaining respect and importance from their husbands more than any other members of their family or society.

According to them (FGD 3), an empowered woman is:

A woman who can earn, who can interact socially, can go to places, can speak—that is when there is women empowerment. No one can deceive them.

The cashier of the dairy group (KII - RW\_MB) elaborated the scenario showing the connection between earning money and gaining respect:

By earning money, be it only two *taka* for anything, we are valued by our husbands. A husband will acknowledge that his wife is working and earning, and will value her.

Another woman (FGD 4) explained how they are contributing to their family expenses:

Our cows give us milk, we get money for it. We can give the money to our husbands. We can spend it on ourselves and meet our needs. We can use the money for daily necessities.

During group discussion and individual interviews, all the rural women confidently claimed a positive change in terms of economic, social and political empowerment compared to the last decade. This quote captures a comparative picture of women’s status between the past and present time:

But before, women had to depend on their husband, on their earnings – this was a problem. But now? Both [men and women] work and earn. We have these cows. Men are earning outside, we are earning here. This has improved our livelihood. We do meetings and through them we get to learn and know about a lot. The children are going to school now and we can pay for the school fees from our earnings.

Amongst all other different kinds of contributions made to their families, all of the women valued their ability to spend money on children's education and amusement above others. The following claim shows their pride, love and confidence:

We can give some money to the kids, but before they'd only hope for that from their fathers. So this is our improvement, this is our change.

At one point, the women also connected this change with elements of the policy vision of 'Digital Bangladesh', discussing the role of mobile phones and other development interventions in their lives. Surprisingly, I did not have to explain the 'Digital Bangladesh' policy vision to them; they knew the English word 'digital' and the meaning. They were convinced to identify a positive connection to them and explained the abstraction in practical terms referring to their lives. At the beginning of this point of discussion, I asked them to identify a positive connection between 'Digital Bangladesh' and their lives. They explained the abstraction in practical terms referring to the dairy micro-enterprise. One of them (KII - RW\_SR) said: *"There are cows in every house now, milk is being produced in every house now."*

I was not sure how their response was linked with my question, so I asked them to explain how milk production was related to digital development. Then they (FGD 4) explained:

We can get a lot of information and news watching television, we get to know what's happening where. Using mobile [phone] has made it [our lives] better.

They (FGD 3) also added: *"We go to markets, we buy things – this is our 'Digital Bangladesh', things have become easier [laughter]"*.

I tried to understand what the word 'digital' meant to them. They referred to the use of technologies in different development interventions in various aspects of agricultural activities. One woman participant (FGD 3) explained:

Government is giving us new technologies. In agriculture, we have new technologies. So, our shortcomings have been met. This is digital. And the mobile has given us much knowledge.

Another woman (FGD 3) added how mobile phones made access to public service information easy for them:

You can get any agriculture related knowledge from specialists. We can ask for anything [advice from the local livestock office]. We can ask that just by sitting at our homes.

Though the men were still the main earners of family income, women have started contributing to household expenses. They take pride in helping their husbands and families with this kind of economic contribution:

We don't always give the money to our husbands, and we can't ask for money from our husbands all the time as well. We are rearing ducks, hens and cows and we get to sell

them sometimes. Now, if our kid needs a notebook or a pencil, the fathers can't always buy it. The men can't meet all the needs.

### **Benefits and challenges associated with mobile technologies for women**

Amongst the dairy micro-enterprise members, the active roles of some women were noticeable through their positive contributions and affirmative body language in discussions and interviews. RB (KII - RW\_RB) was the most prominent amongst all of them. She had been awarded as an agricultural role model through the '*Joyeeta*' (winner in English) award provided by the government. She was featured by the FAO, Oxfam and the media as a model milk producer and successful woman entrepreneur. The local NGO worker informed me that she was a known personality for her leadership qualities and entrepreneurial skills; therefore, she had been interviewed many times by media, researchers and NGOs. During the interview, she looked very confident and responded to my questions without any hesitation.

At one point in the interview, she (KII - RW\_RB) said: "*I am a more known person now*". Then she elaborated her claim with an example of her communication with strangers in addition to her family and business, portraying her confidence and pride:

For example, people can now contact me just by calling [making a phone call]. Before, many did not want to come because they had to travel to meet me. Furthermore, when one has to travel, they have to manage a lot. Some might have thought, 'No, I will not travel just to meet this lady'. Now it is not an issue.

She mentioned her connection with the Mutual Trust Bank, which is a private bank. She could not recall the name of the bank manager but mentioned his assistant's name. This quote is evidence of authentic contact information without exaggerating the relationship between a rural woman and a formal institution like a bank. Usually, rural women do not have access to such formal institutions. She clearly mentioned the details:

I communicate with the bank, with the manager, for loan purposes. But mostly, I communicate with his assistant, N<sup>14</sup>.

Though the focus group meeting was scheduled after the weekly enterprise meeting, I went to the village well ahead of time to observe their meeting (with their permission). I observed that women were summoning other members through face-to-face interaction instead of via mobile phone. Even at one point, an executive member left the meeting to fetch other members by going to their houses. However, during an in-depth interview with the leader (KII - RW\_RB), she mentioned using phones for such communication:

I keep in touch with the [dairy micro-enterprise group] members using my phone. If there is a meeting, I inform members and call them [to remind them] by my phone.

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<sup>14</sup> Name of the bank official is anonymised

In response to my question, “Are there any changes before and after getting the phone?”, all women claimed positive changes in their lives in FGDs and KIIs. For example, during an in-depth interview, the leader of the group (KII - RW\_RB) talked about how her mobile phone helped her to save money and made business communication easier. In her opinion, mobile communication is less expensive compared to physical communication in running her enterprise operation:

Before using a mobile phone, I had to go there to meet someone. Now I call them [service providers and wholesalers] if it is urgent. So, I need to spend two to four *taka* for it [to make a call] but before I would need to spend more money [for travel].

Then she explained another benefit of using mobile phones in fixing the price of their products:

The milk rate is decided using the mobile. We get a lot of business news from the mobile. If we have a businessperson number, I can easily contact them.

However, they had the experience that in the case of establishing a business partnership, face-to-face-interaction had been much stronger and more effective compared to mobile based conversation. Building rapport and trust and understanding both parties’ perspectives required long and intense conversation which was only possible with genuine face-to-face communication. She described:

When we start to supply milk to any party, we fix the rate beforehand. We negotiate the price face-to-face at the beginning. It requires a lot of discussion, so it has to be like that. How can such a long conversation be made via mobile phone! Nevertheless, yes, when the business starts ‘running’, then we communicate via mobile phone. Then we only need to fix the amount of milk delivery and rate.

Participants of both FGDs (FGD 3, FGD 4) also said that they use both face-to-face communication and communication via mobile phones for day-to-day operation of the dairy business. One of them (FGD 3) told me:

I communicate with them. Sometimes, my husband also communicates. Even my son also communicates sometimes.

In general, only a few women prioritised business communication with mobile phones compared to personal use. However, it was often unclear when and how the transition happened between business and private communication. A woman (KII - RW\_SR) shows her confusion: *“I think I use my mobile mostly for business purposes”*.

The cost of mobile phone use varied from one family to another. When I asked them, “Can you give me an idea of how much money you spend using the mobile weekly or monthly?”, they responded with different amounts. One woman (FGD 4) mentioned the generic weekly expense: “Yes, weekly 40 *taka*.” Another woman dairy producer (FGD 4) talked about the duration of the call with more specific details:

If you load money with a 15 *taka* [mobile recharge] card, you can talk for 25 minutes, it goes smoothly for two-three days.

The cashier of the group (KII - RW\_MB) talked about a package deal which had a time limit for usage, set by the mobile company: *"If you load 56 taka, it will run for seven days"*.

Another woman (FGD 3) emphasised the high rate of call charges applied by mobile companies:

They [mobile companies] cut a lot [of money] now. Previously, one minute cost only one *taka* and now it's two *taka*.

Some consider their expenses to be higher compared to other women in the locality. One of them (FGD 3) said:

My mobile expenses are high. If I load [top up] 40 *taka*, approximately it goes for a week. This expense is solely used for making [phone] calls.

None of the women I talked to were using the mobile banking option, a general women member (FGD 3) said:

I have not opened any account [for mobile banking]. Because I have a bank account, I maintain regular transactions through the bank.

However, the leader of the group (KII - RW\_RB) told that her husband has a *bKash* account, which has a wide coverage mobile banking service all over Bangladesh. When I asked her why she did not use it during the in-depth interview, she referred to negligence. She (KII - RW\_RB) responded:

There is no obstacle or challenge behind it. I have not done it because of my '*heshkari*' (reluctance in English). In our local language, '*heshkari*' means not paying attention or importance. It makes me annoyed when I have to go to the bank. I am such a person, who prefers to spend time with cows at home and others are annoyed with me [laugh].

## **6.8. LOCAL SYSTEM, FORMAL STRUCTURES AND INFORMAL PROCESSES**

Amongst all local service providers, the rural women have frequent functional relationships with the local service providers in the market, government office and NGOs. I asked them about their relationships with different organisations and their expectations from the national and local institutions. The micro-enterprise group wanted to scale up their dairy enterprise by adding value with new products like yoghurt and sweets. They dreamt of engaging more nearby milk producers into their supply chain. However, that requires support from local and national service providers. In general, they expressed dissatisfaction with this, except the level of support received from NGOs and the local government livestock department officials.



**Figure 6.8: Women Leader Showing Dairy Enterprise Groups Relations with Others**

In Figure 6.8, the dairy micro-enterprise leader (FGD 3) was explaining the relationship between the East Panjarvanga Milk Cooperative Group and different stakeholders to me. During the in-depth individual interview, the leader of the group responded to my question related to challenges they faced while operating their business. She took a lot of time before her response and kept her comments limited to mobile call costs between different operators. I observed that other women nodded with agreement. During the group discussion (FGD 3), on behalf of the group the leader said:

Well, what to say? Okay. The mobile company charges too much money for making calls. Some people hesitate to call [me] at my Banglalink<sup>15</sup> number. Because calls between different mobile companies [operators] are even more expensive.

Usually women's opinions are inadequately addressed, therefore, I continued asking about women's expectations and aspirations, and their relationships with different institutions and structures. I felt it was not easy for women entrepreneurs from the government, because of their sense of uneven power relation with the formal institutions, they were not comfortable to claim for their rights. It was also hard for them to articulate their dissatisfaction towards the financial service providers and mobile phone companies without trust in service providers' intentions and lack of accountability mechanisms experienced by the women. Mostly, it appears their complaints were because of the low quality and lack of accountability of different systems and structures. This topic also seemed to be a sensitive one which they were not

<sup>15</sup> Banglalink Digital Communications Ltd. is a telecommunication service provider in Bangladesh. It's the third-largest cellular service provider over (33.69 million subscribers) in Bangladesh, launched in February 2005. <https://www.banglalink.net/en/about-us>

very comfortable talking about with an outsider researcher at the beginning. It took some time to gain their trust to open up on issues regarding corruption and the power imbalance, after assurance on anonymity, they were willing to provide specific examples from their lives.

In general, the village women described having close contact with the local elected representatives. They mainly refer to the dispute handling role of the UP Chairman (leader of the lowest elected local government body). They (FGD 3) said: *"We contact the [UP] Chairman if there are any problems within the group, the chairman's presence is needed then"*.

But later they shared their frustrations regarding poor performance of bank loans, corruption and lack of political commitment from national policymakers to handle their river erosion issues. Some examples are presented here.

Referring to government bank loans for dairy producers and farmers, a woman (FGD 4) said:

There's no more chance [of getting an agricultural loan from the government] for us. The government doesn't have sufficient funds. There's just a 5% chance for us [to get a loan].

The women entrepreneur said that they are aware of government policy which sets a mandatory requirement that a certain percentage of agricultural loans must be disbursed to small holder farmers including dairy farms. However, despite that policy, the women were frustrated with the implementation gap (FGD 4): *"They [government and banks] just say this, they don't do it."*

Some of the women were very cautious about the dysfunctional interaction between the government system and loan disbursement structure of the banks. One of them (FGD 3) said, *"They [the central bank or government] give the budget, but the bank does not take it."* They (FGD 3) mentioned the low distribution of agricultural loans by A Bank and MT Bank. Then she elaborated: *"The real ones, the real farm owners do not get it. Others with a fake farmer identity get that."* Then she specifically pointed out the corruption: *"And the A Bank can't even function without taking bribes."*

Corruption at the local private bank was a piece of striking information for me. Usually, only big incidents at the national level are covered in the news. So, I was shocked. The other woman (FGD 4) confirmed her fellow member's comments with anger, *"Yes, and in the meetings, they'll show off with long speeches."*

They acknowledged that if unexpected occurrences are reported they usually get attention, and actions are taken by the authority. However, they noted the inactive role of the local and national media in the recent period. During a group discussion (FGD 3), one women dairy producer said:

The journalists take notes and leave, and then nothing happens. The 'Somobay' Day (Cooperative Day in English) is celebrated with a big function. Long speeches are given there taking the part of the farm owners or farmers, but nothing happens.



The leader of the dairy micro-enterprise expressed her lack of trust in the middleman who buys a bulk amount of milk and controls the rate. She said:

It would've been better if we [dairy micro-enterprise group] had the fat rate one [machine to detect milk fat]. For who knows how much they truly say when we give our milk. We have to accept what they [the middleman from private companies] tell us. Company rate [is based on the milk fat], they measure the milk fat. If the milk fat is above four, then you'll get a good rate.

When I asked about the usual rate they receive, she explained that milk fat and water content are important in assessing the quality of milk. This impacts the rate fixed by the companies as the milk price. Also, there is a slight difference in the unit prices set in the local market and the big private companies. She continued to explain:

Then [with above four milk fat] it's something like 40-42 *taka*, based on fat rate. And in the '*bazaar*' (local market in English), we sell it for 35-36 *taka*.

I asked them who determines the milk price. The women mentioned that gradually they are being exposed to the local market and establishing functional relationships with big dairy producer companies. However, they do not have sufficient negotiation capacity or control over the big companies. But they claimed to have some control over the local market price as a local micro-enterprise known for its capacity. A complex factor like the market price of milk depends on several other factors. In their words:

The company determines the rate on their own. For the '*bazaar*' (local market), we determine it. Sometimes if we have more supply of milk, then the rate would be low for that day. If the weather is bad, there will be fewer buyers in the market.

I found that the rural women entrepreneurs from the Panjarvange Dairy Micro-Enterprise were aware of their entitlements and existing public service schemes and allowances. They described their communication with the social welfare department through which different welfare schemes were distributed by the government:

We communicate with the social welfare department. Because they distribute different [government] allowances. We communicate with them to get those allowances. For example, there are different allowances [allocated] for women, and we get those from the social welfare department.

She (KII - RW\_RB) also indicated her ability to contact the local government office. However, she clarified that their communication with the UP is solely needs-based and less frequent compared to other administrative offices. She said:

Yes, we can contact the [UP] Chairman and members directly. Suppose we face problems within our organisation. If we have any such issues, then we will obviously need support from the [UP] Chairman to settle that dispute.

Another woman (FGD 4) referred to an increased trend in earning activity connected with their mobility:

I couldn't go outside before. Women couldn't go outside before, and they couldn't work. There were shortcomings. Women used to go outside occasionally. Now the Bangladesh government has taken many steps for women. Now women can go outside and work outside.

### **Local service provider's aspect**

A mid-level official of DLS (Department of Livestock Service) told me about the necessity of increasing human resources to meet people's service needs. He suggested that his department needs to follow the adequate staffing standard of the Agricultural Extension Service department:

In our entire Upazila, there are only three persons - one Deputy Assistant Officer and two Veterinarians. In comparison, there are three officials in each union under the agriculture department. We need human resources like the agricultural extension services. The Agriculture Department has given a video conferencing machine in each Upazila, and a man has been appointed there. He will call, receive the pictures, and he will do just that.

Then he expressed his frustration of additional workload during public holidays. Due to lack of adequate manpower in DLS, being a Hindu he had to continue during public holidays to meet people's need for service, when his majority Muslim colleagues were involved in festivals. He said:

Unfortunately, we do not have any extra workforce even for the '*Eid*' [a major religious festival of Muslims and a public holiday].

A direct connection was identified between: a) men and women's livestock asset management responsibility and b) their purpose for visiting Upazilla Livestock Office seeking livestock care services. During an in-depth interview, an Assistant Livestock Officer shared his observation with me, confidently confirming more men visit the Upazilla Livestock Office:

We have records about this. The males come to us more. The male-female ratio would be 70:30.

He also clarified the reason behind that. According to his observation, and my observation is similar, rural women are likely to handle less expensive livestock assets, and men handle the most precious livestock, such as cows. In his words:

In 90% cases, the females come [to us] for goat, sheep, and poultry-related issues. Furthermore, the males come for the cattle.

## **6.9. INTERSECTIONAL ISSUES FOR WOMEN DAIRY MICRO-ENTREPRENEURS**

Although significant positive changes are happening in terms of micro-enterprise growth and improved livelihoods, there are some structural issues challenging women's empowerment. Different forms of intersectionality were observed. Some illustrative examples are discussed here to demonstrate economic, social and political structural issues (Crenshaw, 1989) that contribute to the context of rural life. While collecting and analysing data for this case study, I found that, due to differences in the identities of women entrepreneurs, their experiences as women in dairy micro-enterprise operations also varied in terms of access to mobile phones, access to public services, recognition in the family, and mobility.

### **Example: Dowry – same event, different experience for men and women**

Rural women entrepreneurs associated with dairy micro-enterprises explained their perspectives on some burning social issues, such as dowry, and child marriage. They acknowledged the fact that both dowry and child marriage are bad for their families and society. Despite their realisation of the problematic side of dowry, they are less certain about ending this societal problem. They are not hopeful about the roles of either government or NGOs. During the FGD with Hindu and Muslim women, a middle-aged woman (FGD 3) shared her concern similar to other participants:

This [dowry] is bad. But, it is hard to stop dowry. Even the government can't stop dowry, nor can they stop child marriage. Some get married at a young age, like 12-13 years of age.

This was striking information to me because there are national laws to prevent dowry and child marriage. Awareness of these policies is expected because dowry and child marriage are campaigned against in the media and commonly discussed in NGO facilitated CBO meetings. Despite awareness of these issues, the rural women's frustrations and lack of faith in the legal system, societal structure and administrative structure are reflected in the comment that these social problems cannot be controlled or stopped by the government, NGOs or individuals.

This conversation led me to explore the reasons behind the continuation of this problematic societal trend, so I followed up on this question several times. Despite my probing, I received very few explanations. I felt they were not much interested in digging deeper and discussing the reasons in detail. Presumably, considering me as a local researcher, some of the participants assumed that I was aware of the problem and not much needed to be said. Consequently, they only gave me short answers about the mindset of people asking for dowry. For example, during an in-depth interview, the leader of the group (KII - RW\_RB) mentioned:

People take dowry out of greed. And then, after marriage, women are being abused for more dowry. They [the society] think the husband has more right to beat.

Her opinion illustrates the known and clear link between dowry and domestic violence against women, where demand for dowry is used as an excuse for violence. The comment is also a good illustration of an abstract social issue being part of close, everyday reality at the household level including that of the extended family, usually around the shared courtyard. In fact, it is a manifestation of a typical patriarchal scenario, where a woman and her family are

victims and the husband or his family are perpetrators. In such cases, both parties are known to each other and tied in a close relationship. Therefore, the cycle of domestic abuse is likely to continue.

Similar observations were shared in a focus group discussion in the presence of both Hindu and Muslim women. They explained how dowry, early marriage, and domestic violence are interconnected phenomena in society. It is perceived that husbands have complete control over their wives, including beating them. According to a Hindu woman S's opinion, violence like beating a wife has been used to pressure the wife's family to give dowry after marriage. She said:

People take dowry because of their greed. Husbands beat wives because of dowry.

When I asked her opinion on why women are treated differently to men despite their engagement in economic activities outside and household work inside the home, she opined it as an obvious reality:

This is a social phenomenon. Society has a '*shashon*' (authority in English), the social system has to be maintained.

I found there are differences in perception of dowry between Hindu and Muslim women. For example, during a group discussion with five Hindu women members, they referred to their religion, justifying the dowry system. They acknowledge the fact of increased incidents within their society compared to the other religious groups in the same locality. According to the Hindu women leader's (KII - RW\_RB) words:

It's [dowry] more for those of us who are Hindu. We don't get the property share from father's side.

This comment also reveals a hidden frustration about the existing religion-based property inheritance law of Hindus, where a daughter is not entitled to any land or property, and a son gets everything from his father. Because a daughter is not the inheritor, according to the Hindu custom, she does not get any of the family property. Moreover, a daughter loses her association from her father's family after her marriage and becomes a member of the husband's family. Therefore, according to social custom, the daughters are given jewellery (gold), furniture, utensils, clothes and cattle as a 'gift' to her and her in-laws.

They think dowry cannot be stopped because it has an economic benefit for the men's family and is deeply rooted in the social system. So, when I asked the question, all of them responded at the same time, here is an illustrative quote:

The givers give [dowry] and the takers take [dowry]. And there's also no way you don't give [dowry]!

However, at one point in the discussion, they also recognised the fact that they could play a role to prevent this discriminatory social system. However, they were not able to explain how it could be stopped. They (FGD 3) said:

Yes, instances of dowry are increasing. Women empowerment is increasing. Dowry is increasing too! This is bad. And there are some investigations going on but if we don't stop it, the government can't stop it.

### **Example: Agricultural labour – same work, different wage for men and women**

Gender discrimination in society is manifested in many forms in formal and informal ways, and farming wage discrimination between men and women came into the discussion repeatedly. Women dairy micro-entrepreneurs acknowledged some increase in the agricultural wage compared to the past five to ten years. However, women engaged as agricultural labour still get less compared to men (KII - RW\_RB):

When it comes to wages for [agricultural] labour, you'd see – a man is being paid 300 *taka* but a woman is given 150 *taka*.

Moreover, when I asked about the reason behind the discriminatory wage rate for the same labour, they tried to justify it. According to their opinions, women have less stamina and strength compared to men. They referred to a common example of agricultural activity - carrying the harvest from the field - which requires lifting heavy weights.

One woman producer (FGD 4) said: *"The difference is there because men work a bit more than women, they lift more weight, women can't do that much."*

Others agreed with that. Another woman participant (FGD 3) explained the reason for paying double to male labourers compared to female labourers:

The reason is, the male labourers can carry more weight compared to the female labourers. Other than that, in our areas, there is no difference in agricultural work done by male and female labourers.

I have heard this example many times from different levels of participants in government and NGO development events and seminars. It was also mentioned by the maize entrepreneur group (see Chapter 7). There is widespread acceptance of the principle women are in second place compared to men when it comes to agricultural wages.

The widespread belief in the justice of different wage rates demonstrates how strongly particular patriarchal values have been socialised and how difficult it is to break the stereotype of gender roles in the society.

While beyond the scope of this thesis, the issue of wage inequality is a fundamental one for Bangladeshi society, particularly as it aspires to become a more developed and skilled country.

### **Example: Local dispute – women's voices matter less than men's**

During an interview with the leader of the dairy micro-entrepreneur group, the lady gave several examples to show uneven treatment of men and women. In the first example, she

showed how women's opinions are uninvited or less valued in the context of the traditional dispute process: *"You'd notice that the men are asked to talk first. When there would be a 'bichar' [traditional local dispute handling system]."* Then she justifies the practice, *"Society has its own principle."*

There was no difference between opinions provided during group discussions and individual interviews with the rural women. A similar expression was noticed as presented in two quotes:

'Men and women should be treated as equal' – yes, these are talked about [in meetings or seminars]. But I think the case is different in real life. Society thinks that they are women and there will always be some differences [between men and women].

Then one of them (KII - RW\_SR) gave an example during a follow up in-depth interview:

For example, even today, if a woman goes to a 'bichar' (traditional informal local dispute handling mechanism in society), her opinion is not valued [by society]. You will see, men will be given a chance to express their opinions and women won't get a chance or will speak after men have spoken.

This indicates gender discrimination across religions and age groups. Another woman dairy producer (FGD 3) shared similar frustration:

We preach that men and women are equal, but there are obvious 'ved' (discrimination in English) in practice. Women are always treated differently and they will never be treated as equal.

### **Example: Mobility – same context, different experience due to women's age and religion**

In a traditionally patriarchal society, women's limited mobility compared to men is a common phenomenon. However, observation of different experiences of mobility amongst Hindu women and Muslim women, and young women and elderly women provided more nuance to these findings. I noticed that compared to a Hindu woman, a Muslim woman is less mobile because of religious and social norms. For example, the Hindu leader of the group visited Dhaka to attend PROTIC project meetings several times, which might be a big issue for a Muslim woman and her family might not permit to travel her alone.

## **6.10. CHAPTER SUMMARY**

All rural women participants in this case study are associated with the REECALL project of Oxfam in Bangladesh. Their dairy micro-enterprise implementation model is discussed in this chapter and the cultural system in which they live. This case reviewed the vulnerability and shocks faced by women, then analysed their assets, strengths, strategies to overcome those leading to improved income and better status in family and society. Though the women used only basic features of mobile phones, however, it helped them in improving their personal and business communication, in a way, it also increased their 'mobility' via mobile phones. This way the chapter contributes to the main research question, "What are the relationships between mobile technologies, women empowerment and the sustainability of micro-

enterprises?”. The next chapter presents cases of smartphone use in a maize enterprise and the Infolady social enterprise by rural women from northern and southern areas of Bangladesh.

## Chapter 7: Case Study B - Smartphone Users Maize Micro-entrepreneurs

### 7.1. CHAPTER OVERVIEW

This chapter presents the second case study of rural women entrepreneurs who were using smartphones for their agricultural production, income-generating activities and agricultural entrepreneurial activities. This case examines the role of smartphones in increasing rural women's knowledge about agricultural production techniques and other association information, such as weather, disaster. By presenting rural women's voices, this case study provides empirical evidence of positive aspects of economic empowerment, such as diversified livelihoods and market linkage. It also presents the data collected on the income generating activities (IGA) of women farmers and the entrepreneurial activities of maize entrepreneurs from Dimla. Participants for this case study were associated with the PROTIC project of Oxfam. This case study aimed to review the interrelationships between the phenomenon and taste application of SLF. Along with the first case study, this study helps to interpret and relate to the digital Bangladesh policy context in the ground level reality and suggests a model for examining similar digital development contexts.

### 7.2. PARTICIPANTS FOR CASE STUDY B

Table 7.2 summarises the characteristics of three categories of research participants, i.e., women maize micro-entrepreneurs, local and national service providers. The first column indicates how data were collected from these participants with identifier code. Two focus group discussions and key informant interviews were conducted with women entrepreneurs. Another five KIIs were conducted with local government officials, NGO officials and private service providers.

**Table 7.2: Research Participants for Women Maize Entrepreneurs Case Study**

SL No	Identifier	M/F	Location	Technique	Profile of research participants
1	KII_RW_MFP	F	Nilphamari	KII <sup>16</sup>	Chair, lucky maize enterprise group, PROTIC participant
2	KII_RW_LB	F	Nilphamari	KII	Animator, PROTIC
3	KII_RW_SB	F	Nilphamari	KII	Maize producer, PROTIC participant
4	KII_LS_AR	M	Nilphamari	KII	Maize wholesaler and supplier
5	KII_LS_HA	M	Nilphamari	KII	Maize wholesaler and supplier
6	KII_LS_AR1	M	South Kharibari	KII	Mobile service retailer, a small trader
7	KII_LS_MC	M	Nilphamari	KII	NGO field worker (Male) - Pollisree

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<sup>16</sup> KII – Key Informant Interview technique used for individual in-depth interview



8	KII_LS_MR	M	Nilphamari	KII	Entrepreneur, Union Digital Centre, Shakta Union
9	KII_LS_SA	M	Nilphamari	KII	Agriculture Extension Officer, Shakta Union, Nilphamari
10	KII_LS_PCB	M	Nilphamari	KII	NGO management - Pollisree
11	KII_LS_SR	F	Nilphamari	KII	NGO field worker (Female) - Pollisree
12	KII_DI	M	Nilphamari	KII	Enterprise Coordinator – Pollisree
13	FGD 1	M&F	Nilphamari	FGD	Doel CBO women animators, husbands of women maize entrepreneurs & producers
14	FGD 2	F	Nilphamari	FGD	Belly CBO women animators with IGA

### 7.3. PROFILE OF WOMEN ENTREPRENEURS FOR THE CASE

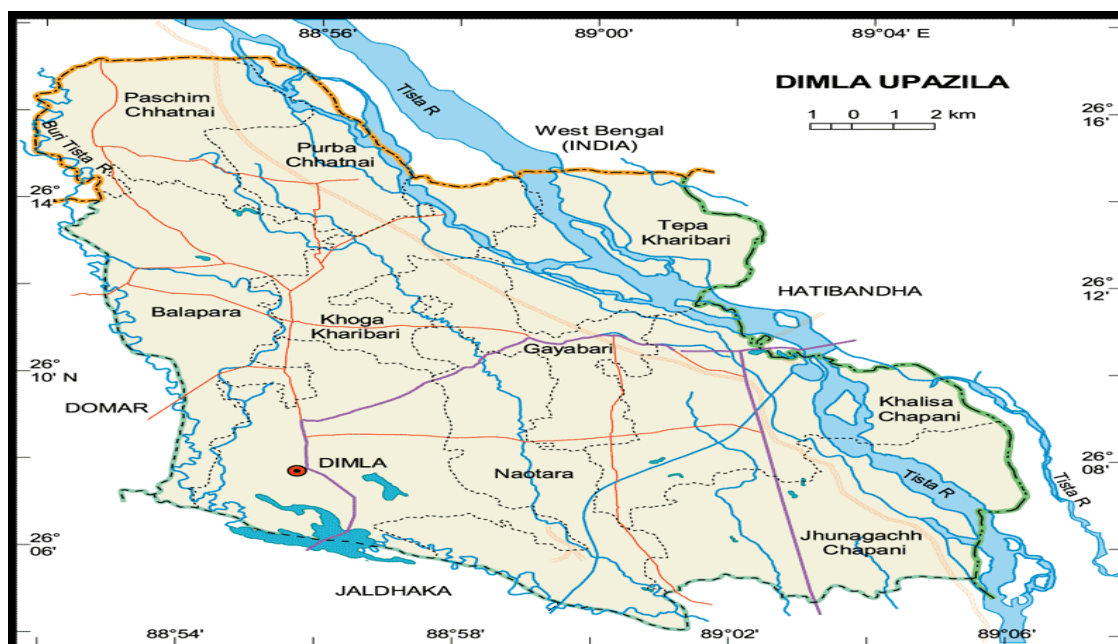
As discussed in Chapter 5, all 100 rural women were given a smartphone, then trained by the PROTIC project on smartphone use. Additionally, the women received technical support and mentoring to improve their skills in accessing information on agricultural and social justice issues. They also became aware of various aspects of women's empowerment.

Following the research participant selection criteria discussed in Chapter 4, all women entrepreneurs were participants in the PROTIC project. All of them were inhabitants of the Dakshin Kharibari village, which was identified as a remote and geographically vulnerable location. They belonged to the poorest population considering their geographic vulnerability, economic condition and social status. They were identified as successful maize producers, maize entrepreneurs and frequent users of smartphones. They were aware of mobile apps and social media and showed evidence of using them to learn about increasing maize production and addressing problems, such as insect management during harvest.

The village was quite large; therefore, the PROTIC project mobilised rural women into two community-based organisations (CBOs), named Doel and Belly. Doel CBO members were more active and articulate than the Belly CBO. Amongst the Belly CBO, five members who were successful in maize farming formed a group micro-enterprise maize business, called Lucky Maize Micro-Enterprise.

### 7.4. VULNERABILITY AND SHOCKS FACED BY THE MAIZE GROUP

Dimla is 375 km from Dhaka, the capital city of Bangladesh. Dakshin Khoribari is a village within the Tepa Khoribari union of the Dimla Upazilla located in the Teesta River basin. As shown in Figure 7.4 A, Tepa Khoribari Union shares a border with West Bengal, part of the neighbouring country, India. According to the Upazilla Profile prepared by the Agricultural Extension Department of Dimla, the approximate population of this village is 10,189, with a slightly higher number of women (female 5,270 and male 4,919).



**Figure 7.4 A: Map of Dimla Upazilla**

According to the Dimla profile shared by the Agricultural Extension Department during fieldwork, the main crop is rice which is harvested throughout the year. There are four varieties of rice called '*Rabi*', '*Boro*', '*Aush*', '*Ropa Aman*' which are appropriate at different seasons and require different agricultural inputs, such as irrigation. The second crop is maize (33% of local agricultural production), and is on a growing trend. In addition, wheat, mustard, potatoes and other vegetables are produced. For this study, I focused on maize production and maize enterprise to explore issues for women farmers and entrepreneurs in this sector while they were using smartphones for farming and enterprise. Because Maize was increasing in importance as the second major crop, it has been identified as a profitable crop compared to rice and the majority of PROTIC women were involved with maize farming and some of them scaled up farming to maize micro-enterprises.

**Table 7.4 B: Types and numbers of farmers in Dimla Upazilla**

SI No	Types of farmers	Number of farmers
1	Landless farmers	21,355
2	Marginal farmers	12,521
3	Small farmers	29,897
4	Medium farmers	6,834
5	Big farmers	2,562
<b>Total farmers</b>		<b>73,169</b>

(Source: Agriculture Extension Office, Dimla Upazilla)

Women's participation in agriculture is increasing, which is also reflected in the Agricultural Extension Department activities. For example, according to the data provided by the local

Agricultural Extension Officer (KII\_LS\_SA), in 2017-18 FY, a total of 420 farmers were given agricultural training. Amongst them, 205 were female and 215 were male farmers showing insignificant difference in numbers between men and women. However, if it is compared with previous data like in 2014-15 FY, the total number of trained farmers was 60, and only seven female farmers were trained during that year. In 2015-16 FY, both the total number (210) and number of female farmers (65) increased; however, the number of female farmers remained significantly lower, less than half compared to male farmers (145).

Dakkhin Khoribari village is in one of the '*char*' areas of Bangladesh, which has some specific characteristics that are different from the majority plain land area. A typical characteristic of a *char* is its geographic vulnerability because of less productive sandy land for agriculture and frequent occurrences of river erosion. Research participants indicated that the Dakkhin Khoribari village was frequently affected by erosion of their farming land and homesteads by the Teesta River (Figure 7.4 C).



**Figure 7.4 C: Erosion by the Teesta River in the Case Study Location**

In addition to river erosion, flood is a disaster that causes loss of life, livelihood and assets. During my fieldwork, rural women referred to flood incidents that occurred in 2017 and 2018, that damaged their harvests, livestock and poultry. The water development board provided flood warnings using hand mikes and announcements made by religious leaders at the '*masjid*' (mosque in English). Living on the embankment, they are always at risk of environmental hazards like such floods and river erosion. The participants indicated that they valued the PROTIC call centre support related to flood warnings and closer networking with the water development board facilitated by Pollisree officials.

## **7.5. STRENGTHS, CAPABILITIES AND LIVELIHOOD ASSETS OF THE MAIZE ENTREPRENEURS**

## Livelihood assets – poultry and livestock

Like many other rural villages in Bangladesh, goat and poultry farming were everyday activities as they provided additional income for women. Goats and poultry are commonly preferred livelihood assets for women maize farmers and entrepreneurs' households. Because these assets generate additional IGA for women without much investment; they also meet daily food and nutrition consumption needs for rural households. In addition to ducks, '*deshi*' (local breeds) and 'poultry' (foreign breeds) of chicken, I found that the women from Dakkhin Khoribari village in Dimla Upazilla also had turkeys. I was surprised to observe this because poultry farming became popular as a profit-making IGA, but turkeys were not commonly found in rural villages a few years ago.



**Figure 7.5.A: A PROTIC Woman Farmer Feeding Her turkeys**

Typically, in a rural village of Bangladesh, keeping poultry and livestock are considered part of women's household responsibilities in a rural household. However, usually, poultry and goats are managed solely by women and income from these are considered as women's income because of the insignificant amount of money involved. When it comes to cattle rearing, often men are involved in rearing cattle, which is more expensive than other livestock and requires labour-intensive involvement.

During an interview with the chairperson of Doel CBO and Lucky Maize Enterprise (FGD 1<sup>17</sup>), the woman talked about her poultry and livestock assets. She said:

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<sup>17</sup> See table 7.2 for details of each KII interviewees and FGD participants details in this chapter.

We sold our cow a few days ago, but we will repurchase one soon. So now we have three goats and about 10–15 chickens; along with chicks, we have about 15–20.

When I asked if she had any ducks, she said:

We do not have any ducks now. We had five ducks and sold them a few days ago. But we will buy new ducklings.

### **Use of homestead land for additional food supply and income**

As I discussed in Chapter 6, similar to the dairy entrepreneurs in Kawnia, maize farmers and entrepreneurs in Dimla also considered homestead and farming land to be important livelihood assets. In an agrarian rural village, typically, all village homes keep a small, dedicated part of the homestead for gardening and farming. Usually, it is adjacent to the courtyard or the back of the house. In addition to the main agricultural field, this tiny home space is utilised mainly for growing food for household consumption. Although men usually used to take a leading role in the main farming in the outside agricultural area, this tiny piece of homestead farming land was entirely managed by the women of the household. That is why this kind of farming is also called ‘kitchen gardening’.

During my field visit, I found that all women were managing homestead gardening, which helped them provide vegetable supplies for the household. Additionally, the women told me that if the harvest was more than their household needed, they sold the surplus to neighbours, NGO officials and other local service providers who passed through their homestead garden.

During an in-depth interview with one of the rural women farmers and entrepreneurs, (KII\_RW\_MFP) described her new knowledge of what she referred to as the ‘3D system’ of harvesting (see Figure 7.5.B, plastic box with blue lid). This had changed her knowledge of traditional agricultural homestead gardening with an effective and organic insect control mechanism. She showed me how she had applied new learning about insect management to her ‘*chalkumra*’ (hairy melons in English). I was impressed by her technical skills and the way she used technical language, including a few English terms, to explain the process to me.





**Figure 7.5. B: Insect management demonstration at the homestead**

### **Farming in *char* using new agricultural knowledge from PROTIC**

Despite the risk of river erosion, *char* is considered to be fertile land for a variety of crops, including vegetables, peanuts and fruits. Rural women told me that they applied new learning about agricultural production and found the weather forecast information useful for managing their main farming in the *char* areas. They also discussed issues or concerns such as insect management, storage and irrigation with other CBO members and posted photos of their harvest on Facebook.



**Figure 7.5.C: Pumpkin Cultivation in *Char***

### **Mobile phone as a physical and virtual livelihood asset**

I found that rural communities were using different types of phones. The majority were still using phones with basic features because of cost, and there were only a few who owned personal smartphones in addition to the 100 PROTIC provided smartphones. During the fieldwork, PROTIC project participants told me that some smartphones were broken and they could not afford to fix them; therefore, they were using their personal mobile phones. Nevertheless, despite the difference in mobile device quality and features, all of the rural women reported mobile phones as valuable assets. For example, when I raised this aspect at a focus group discussion, the leader of the group (KII\_RW\_MFP) pointed out the differences amongst their group members:

Yes, some of us have 'button phones' [mobile phones with basic features], and some have 'touch phones' [smartphones] like me.

Although having a mobile phone with the basic features can be considered a physical asset, a smartphone with advanced applications and internet access can be considered both a physical and virtual asset. Rural women confirmed that smartphones enhanced their livelihood capabilities.

During two focus groups and individual interviews, in all cases, women farmers discussed being able to make appropriate decisions to address problems in any stage of production and marketing, being able to explore diversified livelihood options and scale up ongoing ventures by using mobile technologies. One of the women said:

Now our maize production has increased more than before. We checked if there were any problems during the harvesting period. If there were any insect attacks or diseases, we could identify the problems and immediate remedies by using the 'maize app' [developed by the PROTIC project].

## **7.6. MOBILE PHONE AFFORDANCE AND INFORMATIONAL CAPABILITIES**

In both focus group discussions, the PROTIC project participants from Dimla identified their new knowledge, learning and skills acquired via smartphones. In response to my probing, they explained the process of information flow between smartphone-based communication and real-life conversations. It was interesting to note that PROTIC project participants' individual level learning was shared within the family, neighbouring community, extended families and beyond.

### **Smartphones as a means of shared learning**

The women told me that all members held group meetings on a monthly basis. Sometimes they also held special learning sharing meetings after attending a specialised training session, for instance, on harvesting or women's empowerment issues. During those meetings, they were likely to discuss different livelihood issues, such as agricultural production and marketing related problems, and access to different government services and financial issues. During my fieldwork, Pollisree officials from Dimla informed me that from April to July 2019, a total of 30 learning sharing meetings were organised. During those meetings, rural women

participants of the PROTIC project discussed 22 agriculture-related messages and 23 weather forecast related messages received from PROTIC call centres.

I noticed that compared to the middle-aged and elderly women members, the younger members of the Belly CBO (FGD\_2\_N\_F) from Dakshin Kharibari village were more confident in smartphone use. On the other hand, most of the older women expressed their discomfort, fear and shyness about using smartphones at the beginning as they were worried they might break the device. Their behaviours clearly reflected that, despite having the same device, affordances and informational capabilities or digital literacy varied between the young woman and other group members. For example, when I asked them to show me which mobile apps they used most and explain how they used them, they immediately called a young member to do that (see Figure 7.6.A). It came out of their discussion that she had some formal education as a young woman. Therefore, it was easier for her to read instructions and use the smartphone.



**Figure 7.6.A: Young Woman Explaining a Mobile App**

Rural women were also trained in using social media, such as Facebook, as a learning sharing platform with members from the other two PROTIC project locations. The PROTIC project also provided the money to manage the cost of using the internet. Otherwise, most of them would not be able to afford to use the online features of smartphones. This had a synergetic impact on learning sharing and increasing affordances of peer-to-peer learning.





**Figure 7.6.B: a monthly meeting sharing information about harvesting of crops & vegetables**

For example, Figure 7.6.B shows a gathering during the monthly meeting, where women discussed various problems and their experiences of applying new learning with other

members. I asked them to explain the content and purpose of the photo. They told me that it has two purposes: first, sometimes some members were not able to attend the meeting, so they got notified of the discussion points, and second, they loved to share their photos and get to know about other members' activities in the two other PROTIC project locations.

**Figure 7.6.C: Distribution of medicinal and spice saplings – bay leaf and neem**  
(source: Facebook post by KII\_RW\_MFP)

They also mentioned new learning and services offered by different local NGOs and government extension service providers. They said that after joining the PROTIC project, in addition to smartphone-based learning and knowledge sharing, they had become involved in environmental protection, health protection and disaster preparedness initiatives. They also said that they shared their activities on Facebook. In Figure 7.6.C, a woman posted an activity of distribution of medicinal and spice saplings, i.e., neem and bay leaf amongst PROTIC project participants and tagged local NGO field workers and other members of the group.

Through training provided by the local NGO, they learned how to use smartphones to look for the relevant information they needed in their day-to-day life. As a result, a woman farmer, R (age 34), expressed her confidence with joy:

I know how to use the Google search option and download apps from Google Play!

I noticed that the CBO members mobilised and trained by the PROTIC project were not homogenous. Consequently, their ability to use various smartphone features also varied between Doel CBO and Belly CBO members. There was even variation in usage within each group, though all of them were given a smartphone and training through the project. For example, during a focus group discussion, most rural women mentioned using 10-12 types of standard features on their smartphones despite not having a formal education. One of them said (FGD 2):

We use many apps, such as Google, Opera Mini, and ShareIt, and so on [pause] various [mobile] apps.

Another participant from the other focus group (FGD 1) mentioned that smartphones and their applications are associated with their livelihood strategies. She said:

We use [smart]phones for different purposes, including agricultural production, communicating with others, and using Facebook. We use different features and apps, such as a camera, clock, calendar, calculator, mobile apps for agriculture and education.

Based on the interview and focus group discussion data, I developed a list of features used by the participants. These are shown in Table 7.6.D.

**Table 7.6.D: Smartphone features used by PROTIC women entrepreneurs**

Phone features used by women	Purpose of use
------------------------------	----------------

Google search engine	Navigate new information
Camera	Take photographs
YouTube	Try new recipes, watch drama, listen to music
Hate khori	Teach preschool education to children/toddler
Imo	Make voice/video calls with family abroad
ShareIt	Exchange music, photos, files
Farmer's windows	Explore agricultural knowledge
'Vutta' (maize) app	Learn new techniques for maize production
Mobile internet	Interact on social media, mainly Facebook
Other standard smartphone features	Call, SMS, OBD, alarm, clock, calculator

The maize producer group members in Dimla used smartphones provided by the PROTIC project and, with training provided by Pollisree, their use of smartphones was very diverse. However, there were differences in skills and confidence levels within the Lucky maize entrepreneurs group users.

## **7.7. MOBILE PHONES, MAIZE MICRO-ENTERPRISE AND WOMEN'S AGENCY**

In general, all of the rural women drew a connection between positive changes in their lives and their access to smartphones in terms of their economic and social status and overall sense of wellbeing. This section presents some examples to show the correlation between smartphones, growth of micro-enterprise operations and promotion of women's agency.

Both male and female entrepreneurs involved in the collective maize enterprise said that the use of smartphones was beneficial for them because the devices saved them time and money. They gave examples where they were able to compare the prices offered by different wholesalers in the market. Using mobile phones for checking and tracking the market price was a deciding factor for them to fix a suitable time to deliver their products to the wholesaler. Smartphones helped them to fix a realistic time frame for collecting and delivering bulk maize stock to the wholesalers and receiving payments.

Smartphones also helped them to connect with other maize farmers in the locality. As one maize producers' production is not enough, they maintained a list of maize farmers within and outside the CBO. The Lucky Maize Enterprise group coordinated amongst themselves and other maize farmers for collecting a bulk amount of maize production to deliver to a wholesaler. Smartphones helped them in managing the whole maize collection process more efficiently than before and meant that they did not have to meet in person.



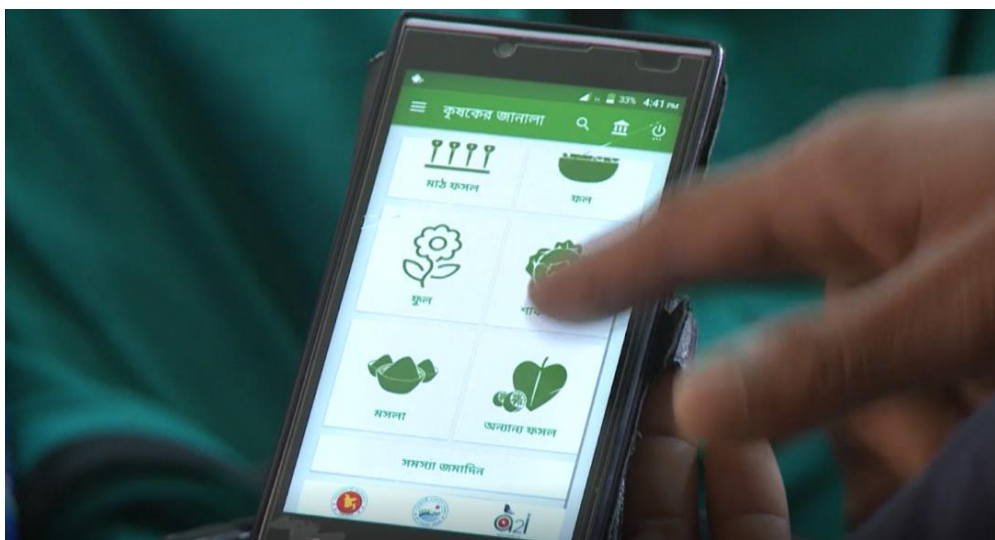
**Figure 7.7 A: Maize Storage Management by Woman (KII\_RW\_MFP) and Her Husband**

Figure 7.7 shows that maintaining moisture quality during storage after harvesting requires attention, skill and patience, which is a regular task for the maize enterprise group in Dimla.

The research participants also thought that their relationships with the local service providers had improved significantly. Receiving services from the agricultural extension officers and livestock officers was much more problem-free without travel time, cost, the need to carry goods or livestock and without having to wait. In addition to the public services, the rural women also appreciated the services provided by the private service providers like the PROTIC call centre.

### **Mobile apps for maize production and enterprise**

Many women farmers mentioned a mobile app developed by the agricultural ministry of Bangladesh with technical support from the A2I project. It is called '*Krishoker Janala*' (farmers window in English), and provides information about major agricultural production techniques in the field using non-technical terms in Bangla. This app also includes information about fruits, flowers, leaves and vegetables, and spices.



**Figure 7.7.B: Farmers window icons in a smartphone screen (source: Pollisree)**

The women praised an app developed by the PROTIC project which was most relevant for their maize production and enterprise. As an example, during a focus group with Lucky Maize Enterprise Group and Doel CBO, the maize farmers shared their successes in maize production after using the Maize App and other smartphone-based technical support from the PROTIC project. One of the women maize farmers from Dakshin Kharibari village (KII\_RW\_SB), shared her story, representing other maize producers in that village who received training from the PROTIC project. She said:

I have cultivated maize in eight *bigha*, and I am expecting bumper production. This year I got fertiliser at a low price, which eased the production process. By using the *Bhutta* (Maize) App, Google search engine, PROTIC SMS, PROTIC call centre, I got help with '*balai nashok*' (insect control in English) and all details of maize production. If everything goes on well, I expect to get 30-35 *moan* of maize from each *bigha*. Or the production could go up!

When smartphones were used to acquire useful information, they also gave rural women the ability to share that information with neighbours and relatives. When they used the information and became successful in improving harvests, solving harvesting problems, trying new things, or establishing connections and authority, they became role models within the greater family, neighbourhood and society. Because of their new-found agency, their husbands started asking for their help in checking or confirming agricultural, market or weather-related information from the PROTIC call centre. Their neighbours (other rural women) started asking for information about production and marketing issues and started depending on them for updated information. This interaction with husbands and other women helped to build trust in their capabilities and skills and developed their self-esteem. Eventually, smartphones strengthened relationships and created greater acceptance in the family and the local community.

### **Interpersonal communication and relationships via mobile-based communication**



During focus group discussions and interviews, many women claimed that interpersonal communications between husbands and wives had increased after using smartphones. One woman from Belly CBO (FGD 2) said that smartphones stopped extramarital affairs and second marriages, and others supported her statement. They explained that relationships with their husbands improved with regular communication when they went to the city for work. A rural woman talked about quality leisure time with her husband:

We are busy with work for the whole day. Only at night, we [husband and wife] get some time and watch plays or movies on the mobile phone.

Rural women entrepreneurs from Dimla valued the respect earned from their husbands most because in a traditionally patriarchal society, men had been the sole decision-makers and superior authority within a family and society. Men were considered more knowledgeable and respectable authorities compared to women. It was seen as a sign of limitation or weakness when a man asked for any advice or opinion from a woman.

### **Patriarchal barriers challenging the agency of women micro-entrepreneurs**

The rural women micro-entrepreneurs considered smartphones helpful in addressing social constraints on the physical mobility needed to access local markets and financial institutions. In their opinion, smartphones enabled ‘virtual’ access or mobility, which was a useful mechanism to deal with the control over their physical mobility influenced by patriarchal social norms.

Rural women felt that their mobility and connection with relatives had improved compared with earlier days. During a focus group because they can visit neighbouring villages with husbands. They expressed this change in their words: *“Ten to 15 years back we could not go anywhere. But now, we can!”*

A similar observation was shared by a rural NGO official referring to his 20 years of experience in working with the rural community, including women. He said:

Twenty years back, when we used to go to a village, rural women were not willing to talk with us. Even after some efforts, they were convinced to talk, they would not come outside [to keep a distance with us]. They would keep themselves inside the house.

However, rural women’s feelings about increased mobility contradicted the maize wholesalers’ opinions (see Section 7.9). I found that there were practical patriarchal structures limiting women’s mobility. The participants told me that most maize collections were conducted at ‘godowns’ (warehouses) at the market and these events usually took place in the evening. Women are not supposed to travel outside or far from home, and particularly in the evening it was impossible. A maize wholesaler (KII\_LS\_HA) said:

Women cannot work as maize suppliers for us. The delivery of maize and the transaction of payment takes place in the evening or night. Women cannot travel at that time, but their husbands can do that.

## Mobile phones as a source of entertainment

The women noticed a significant change in their quality of life compared to their earlier days. All of them said that possessing smartphones made them happy. They meant leisure, entertainment, and happiness on one side, and practical things on the other side, such as looking modern and smart. Here are some quotes which illustrate their opinions.

For example, during a focus group discussion with Doel CBO (FGD 1), a middle-aged woman said the smartphone reduces her tiredness and stress after an exhausting day:

After a whole day's hard work, when we take the mobile [smartphone] at hand, we forget all sorrows at that moment.

Similarly, several other women thought smartphones made them 'smart' and happy. They said that their lives would become dull without those phones. As one woman ((FGD 1) said:

With smartphones, our lives have become smart! It brought happiness in our lives, in our families. When a phone is broken, then our life becomes dull like old age [laughter]!



**Figure 7.7.C: Women making quilts and listing to music on smartphones**

As shown in Figure 7.7.C, women were making quilts while chatting with other women neighbours in their courtyard. Making quilts is very common for rural women. They were also listening to Bangla music on a mobile phone as they felt the music created a pleasant ambience to enjoy during leisure time.

## 7.8. LOCAL SYSTEM, FORMAL STRUCTURES AND INFORMAL PROCESSES

This section focuses on the relationship between rural women in maize farming and enterprise ventures and local service providers, including elected representatives, public service officials, NGOs and retailers at the local market. Though they were involved with approximately 15 different systems and structures, rural women indicated that they had the closest connection with local NGOs like Pollisree, public officials of the agricultural extension and livestock departments, and wholesalers at the local markets. In their opinion, the local government, which was mainly engaged in the local dispute handling process, was the least important actor.

For instance, before starting the focus group with the Belly CBO (FGD 2), I found a hand-written poster with the designation and phone numbers of several public and NGO service providers (see Figure 7.8.A). The list included the PROTIC call centre, which acted as helpline support with agricultural production and livestock-rearing information. Another category included in the list was local public officials from different departments, such as agricultural, livestock, social welfare and women's welfare offices. The women were in close contact with the agricultural and livestock officials because these were directly connected with their livelihood and income. They contacted social welfare officials to receive welfare support as that department distributed government welfare support allocated to each Upazilla, such as allowances for widows, lactating mothers and education. The list also included locally elected representatives who were occasionally contacted, such as UP Chairman, whose presence was essential in local disputes. I was impressed with the level of the rural women's awareness of their entitlements and the role of different local public service offices.

নাম	মোবাইল নম্বর
০১. প্রটিক কল সেন্টার	০৯৬৭৮৮৮২২২৮
০২. প্রটিক ওবডি	০৯৬৭৮৮৮৭৭৬৬
০৩. প্রটিক এসএমএস	০১৭২৯ ০২ ৭৭১৫
০৪. উপজেলা কৃষি অফিস	০১৭১২-০৫ ৬৭ ২৩
০৫. উপ-মহাকর্ষ কৃষি অফিস	০১৭২২-৬৭ ৮৯ ০৫
০৬. উপ-মহাকর্ষ অফিসার	০১৭২২-২৩ ৯০ ৩৬
০৭. জাতিসংগদ অফিসার	০১৭১২-১২ ৮৩ ৩৫
০৮. সমাজ সেবা অফিসার	০১৭০৮-৭১ ৫১ ২৯
০৯. মহিলা বিষয়ক অফিসার	০১৭১৬-৩৬ ৬৫ ৯৭
১০. চেয়ারম্যান ইউপি	০১৭১৩-৭১ ৭৭ ৭৭
১১. ইউনিয়ন ডিজিটাল সেন্টার	০১৭১৩- ৭০ ৯৭১০

Figure 7.8.A: Community information calendar

SL No	Name	Mobile number
1	PROTIC Call Centre	09678882228
2	PROTIC OBD	09678887766
3	PROTIC SMS	01729024715
4	Upazilla Agriculture Officer	01712056723
5	Assistant Agriculture Officer	01722678905
6	Fisheries Officer	01722239036
7	Livestock Officer	01712128335
8	Social Welfare Officer	01708415129
9	Women Affairs Officer	01716366594
10	UP Chairman, <u>Tepakharibari</u>	01713717449
11	Union Digital Centre, <u>Tepakharibari</u>	01713709410

Women farmers said that they knew about available support and services through the Union Digital Centres (UDCs) provided by the government, and they regularly visited the local UDC to obtain those services. They obtained that information from the 'Citizen Charter' and other



mobile apps using smartphones. One of the women farmers and maize entrepreneurs explained the categories of services they accessed:

We go to the UDC on various occasions. For example, to obtain a birth certificate, to collect paper for land disputes, to take photos, to get welfare benefits for widows and elderly people.

During interviews with women farmers and local agriculture extension officials, it became clear that the weather forecast was a critical factor at all stages of farming. Rural women mentioned that their awareness of the adverse impact of extreme heat, heavy rainfalls or absence of rain on different varieties of crops and harvest has increased. They acknowledged information support received from the PROTIC call centre and local agricultural extension officials regarding weather forecasts. They told me that timely information and suggestions helped them to deal with agricultural production and harvest and storage-related issues, and they consequently benefited from increased agricultural production and profits.

At one focus group discussion with rural women, I found that when the PROTIC project call centre support was reduced, women had to depend more on the government helpline. A frontline worker from Pollisree (KII\_LS\_MC) described the change to me:

In July 2019, WINMiaki stopped providing [agricultural] message [SMS] service. Naturally, PROTIC women [maize farmers and entrepreneurs] started using similar support from the public agricultural extension department. They collected 12 agricultural production-related messages and three weather-related messages from the department.

During an in-depth interview with the Senior Agriculture Extension Officer (KII\_LS\_SA), I noticed that a big poster (Figure 7.8.B) was displayed on the wall of the Upazilla Parishad office. At the top, it showed the logos of the Agriculture Ministry (left), Government of Bangladesh (centre) and the World Bank (right). This display indicated the agricultural weather forecast in easy, non-technical language (Bangla) and icons and symbols. Content included the previous three days' record and the following three days' forecast of rainfall, temperature, humidity, wind flow and sunlight. It also suggests contacting the Upazilla Agriculture Officer, Agriculture Extension Officer and Assistant Agriculture Officer. This is an example of the combination of physical and virtual information flow management between the government, donors and the local rural community.

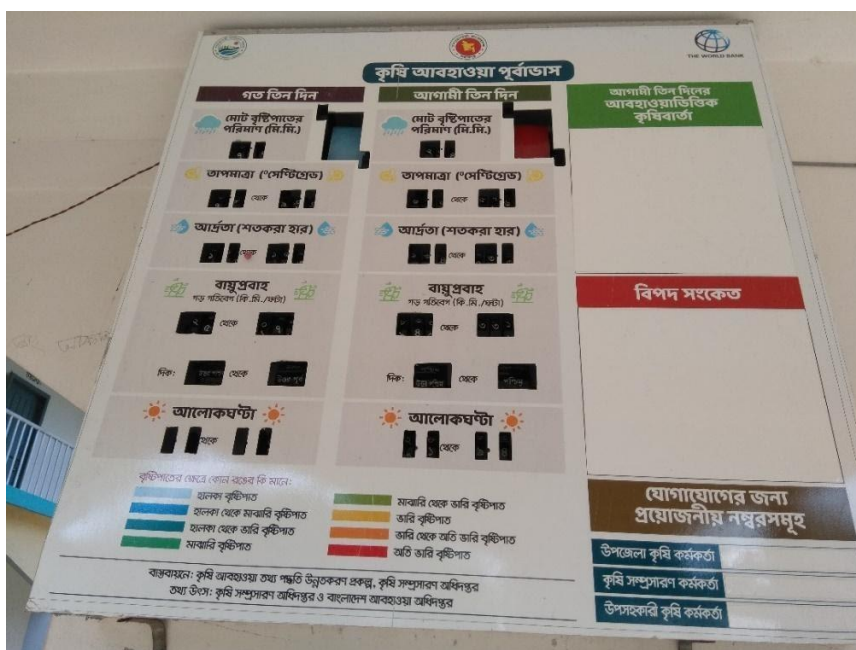


Figure 7.8.B: Agriculture Weather Forecast Display

I noticed a gap between the women's claims and the real examples of men's role in the maize micro-enterprise. It seemed that the rural women were trying to impress me by exaggerating some facts related to communication with the wholesalers and handling financial transactions for maize supply in the market. For example, in response to my question about who communicates with the wholesaler in the market, the women (FGD 2) claimed that they had direct communications. However, when I asked the same question to wholesalers in the market in a follow-up interview, the male wholesaler (KII\_LS\_AR) could not initially recognise any of the women maize entrepreneurs. I was accompanied by an NGO official of Pollisree and, based on her prompting, he could remember the name of the leader of Lucky enterprise. He mentioned that the leader of the maize enterprise group used to communicate with him when they started a business relationship with him. He emphasised that, later, the men (women entrepreneurs' husbands) continued communication with him to fix the maize supply date, time and amount of delivery. The husband also used to collect payment from the market against the delivery. He (KII\_LS\_AR) said:

... their [women maize producer and entrepreneurs] husbands handle the money matters. They [women maize entrepreneurs] help their husbands at home to organise the delivery or supply [for the day] to the market.

I asked the leader of the maize enterprise group (KII\_RW\_MFP) again, and she changed her statement. She said that both she and her husband communicated via phone with wholesalers at the market to fix the amount of maize supply and negotiate the price. She added that the maize production and enterprise operation are shared ventures of their family. Therefore, both husband and wife worked together to do what was necessary.

According to several participants in this case study, the locally elected representatives play minimal roles in rural communities' lives. Surprisingly, the wholesalers also could not identify their role in the maize value chain despite acknowledging the lack of government policy on

maize production and the need for additional formal financing and central control over the market. This reflects a huge gap between locally elected representatives and the local community to handle local development issues. Similarly, the locally elected administrative officer has no influence on, and limited access to, the national policy-making process, indicating a highly centralised power structure. For example, a young male maize wholesaler totally ignored the role of locally elected representatives in their lives. When responding to my question whether they had any expectations from them to improve the situation of local business, he (KII\_LS\_HA) said with sarcasm:

Oh, you are talking about the local government? They [locally elected representatives] do not serve any purpose [to support wholesalers, maize micro-entrepreneurs and maize farmers]!

## **7.9. INTERSECTIONAL ISSUES FOR WOMEN DAIRY ENTREPRENEURS**

Similar to women dairy entrepreneurs, as discussed in Chapter 6, contextual realities and perception of realities for maize farmers and entrepreneurs in Dimla were not the same. This section discusses different aspects of the effects of intersectional relations (gender, economic relations, social custom, time and space use) experienced by the PROTIC project participants with some illustrative examples. I observed that women's experiences in maize production and micro-enterprise operations varied in terms of expertise in smartphone use, access to public services, recognition in the family and society, and mobility. For example, constraints on physically meeting male strangers in the local market. This reflects the intersections of constraints of women talking to men outside of family in general as well as constraints on going to physical locations not approved by family (mainly husband). The women's perceptions of changes varied due to differences in their social identities, education and leadership qualities. In addition to that, individual factors, economic, social and political structural issues played a role in bringing social change, though the exact generative relationship may not be very clear, as discussed in Chapter 3.

### **Example: Experiences of men and women in maize value chain varied**

According to my fieldwork data from Dimla, all maize wholesalers were men, and most micro-entrepreneurs were also men. This is not surprising because it reflects the typical reality of rural patriarchal societies in Bangladesh, where women's access to the local market is limited. Thus, women's participation in the market or open space was not welcomed, as I discovered from my interviews with the maize wholesaler from the Union level local market in Dimla. He (KII\_LS\_HA) said with confidence:

There is no female *paikar* (supplier in English) [in this case, maize micro-entrepreneur] in this market.

Another male maize wholesaler (KII\_LS\_AR) talked about women farmers' access to the market:

Women [maize producers] do not come here [to the market] to collect money or fertiliser.

I asked him for clarification, and he indicated that patriarchal social norms set discriminatory gender-based role boundaries for women. It was evident how this limits their mobility and involvement in the market space. Consequently, the acceptable social norm was to ensure business communication and transaction between men (women's husbands in this case) rather than with the women. One of the maize wholesalers said that women would often ask their husbands to arrange the maize transportation and delivery. He clarified women's expected role as a 'helping hand' rather than as independent farmers or entrepreneurs in the maize business. The only exception occurred in the case of a few widowed or divorced women who did not have male family members to carry out the tasks of maize production and supply to the market. Women who were not married or widowed were left with no other choice than to communicate with the wholesalers directly. However, in general, women's interaction with men outside the family was not encouraged by the village society. The maize wholesaler (KII\_LS\_AR) said:

We collect maize directly from the maize producers. I have regular contacts with 120 maize farmers. The majority of them are men. Only some four, five women work on their own as farmers. All of them are either widowed or divorced, so they do not have any male family members to help them. Otherwise, women mostly help their husbands in farming.

I continued the conversation to explore what made the male maize wholesalers think women were less capable compared with men and asked them to show evidence to support his views. Then one of them pointed out two aspects during an in-depth interview: women's restricted mobility to market, particularly at night, and women's physical limitations in lifting heavy weights. He (KII\_LS\_HA) said:

In our locality, there is no such custom. Women do not come into the market as a '*paikar*' (supplier in English). The money comes at night. It is not possible for a woman to come here at night. Their husbands come at that time.

I was surprised to note that this negative gender role perception was similar, whether coming from a 60-year-old wholesaler (KII\_LS\_AR) or a 25-year-old young graduate wholesaler (KII\_LS\_HA). The following quote shows the very rigid mindset of the young maize wholesaler. He (KII\_LS\_HA) thought that women did not have physical capabilities for the labour required for the maize business:

No, it will never be possible for a woman. Because the women are weak. They will never have the strength to lift a 60 kg or 65 kg sack [of maize]. Tell me '*apa*' [addressing me as 'elder sister'], did I say something bad?

### **Example: Few exceptions of sharing domestic and care work between men and women**

A rural Bangladeshi woman usually works from dawn until midnight. Despite her increased economic participation, the burden of household chores and care work remains the same, with

men by and large not participating, or they may be absent. Cooking, cleaning and serving are perceived as women's roles in traditional Bangladeshi society. Cooking is a common task for rural women and also for urban women. Cooking is the most time-consuming effort amongst the long list of domestic chores in the context of rural Bangladesh because it requires lengthy preparation, such as collecting firewood or dung, lighting up the '*chula*' (clay stove in English) fire, cleaning and processing cooking materials including preparing spices from their raw state, cooking, serving, cleaning after cooking, preserving and storing cooked items and other foodstuffs.

As in many other rural areas, I observed that women in Dimla used the traditional '*chula*' for cooking (Figure 7.9). It is tedious work to gather fuel, light the fire and maintain dry fuel on a rainy day or the monsoon season. It is a time-consuming task to collect and form cow dung into 'cakes' on house walls or sticks and then dry and store them. However, all these were considered normal daily tasks for the farming women, given the gender role expectations set by society and internalised by the women themselves.



**Figure 7.9: Woman Maize Entrepreneur is Preparing Lunch for her Family using '*Chula*' (Clay Stove)**

Only a few exceptions were pointed out from interviews and focus group data, where participants mentioned that men have started helping their wives or women were teaching their boys to acquire domestic skills. For example, some rural women from Doel CBO (FGD 1) mentioned that their husbands and other family members now help in their household chores. Generally, however, if a man goes against societal norms, he will be ridiculed by society (both men and women). Listening to the wife's opinion or extending support to her in household chores is seen as humiliating and a matter of shame for a man and his family. He is likely to be ridiculed in society for his 'less masculine nature'. Despite this prevailing attitude, I noticed the wives of men who helped with domestic work considered themselves 'lucky' and felt

grateful when their husbands were doing them a 'favour' by taking up 'their tasks'. One Doel CBO (FGD 1) member said:

In earlier days, wives were very anxious with fear when husbands used to come back home to have their meals. They used to keep everything ready to serve the meal properly. Now both men and women go to [agricultural] fields for work. Now husbands bring their own water and get their own meal without waiting to be served.

In another similar example, during a focus group discussion with Belly CBO (FGD 2) women farmers and their husbands, participants discussed their gender role perceptions regarding household chores. They explained that society still expects women to do all the household chores such as cooking, serving, cleaning, laundry, taking care of children and elderly people. At one point, a woman made a joke about how they (the rural community) make fun of a man calling him '*maiggyar verua*' (a name like 'wife's sheep') who helped his wife in doing household chores, and everyone (both men and women) laughed out loud endorsing her expression.

This discussion provoked me to think about whether women's involvement in economic activities would necessarily reduce their workload. It occurred to me that engaging in the maize business, learning new skills, and attending meetings with NGOs and government officers might be an added burden on a woman's shoulder. However, it was clear that even though a woman can be empowered in an economic aspect, her social empowerment will not be achieved or challenged unless there is a broader change in the patriarchal mindset in her family and society.

## **7.10. CHAPTER SUMMARY**

This chapter contributes to the main research question by discussing relationships between ownership, access to and use of smartphones by rural women in their maize micro-enterprise operation and their empowerment. This chapter has specifically focused on secondary research questions A and B by exploring the role of smartphone access and applications in improving rural women's livelihood outcomes and contributing to women's empowerment. It was clear that smartphones can be considered 'physical' and 'virtual' assets simultaneously because of their new role in making information and services related to maize production and enterprises available to women across the traditional boundaries. Thus, despite a few negative aspects of mobile phone use, smartphones were an enabling factor for improving livelihood outcomes and promoting rural women's agency. The next chapter will summarise the study findings and present an informed and modified version of the SLF-M4D model, followed by a discussion to situate the thesis in the body of ICT4D research and knowledge.

## **CHAPTER 8: SLF-M4D MODEL DEVELOPMENT AND DISCUSSION**

### **8.1. CHAPTER OVERVIEW**

This chapter presents a modified version of the SLF-M4D model developed for the thesis, informed by research findings discussed in previous chapters, and discusses major insights drawn from the findings. It has two major sections: i) modification of the SLF-M4D model, and ii) discussion of major findings.

Section 8.2 explains elements of the SLF-M4D model informed by the research findings based on two case studies on mobile phone use by dairy and maize micro-entrepreneurs, and directly addresses the secondary research question 1.6.2.C.: ‘How can the SLF-M4D model be informed and improved with empirical research and theoretical analysis?’.

Section 8.3 connects the research findings with the broader ICT4D research context showing their relevance and contribution referring to major arguments and lessons arising from this study. While doing so, this section contributes to the main research question, i.e. ‘What are the relationships between mobile technologies, women’s empowerment and the sustainability of micro-enterprises?’ and the other secondary research questions.

### **8.2. THE MODIFIED VERSION OF THE SLF-M4D MODEL**

This section presents a modified version of the SLF-M4D model developed for the thesis that is informed by empirical data and analysis. As a result, it demonstrates the relevance of using the SLF-M4D model to understand the relationship between mobile technology, micro-enterprise sustainability and women’s empowerment.

There are five dimensions of value addition generated through this study which are presented in the proposed SLF-M4D model in Figure 8.2 on the following page. The five dimensions are as follows:

- A. Influenced by Duncombe (2006), I have incorporated M4D elements to the original SLF, which specifically includes mobile phones as ‘physical capital’, and recommends smartphones as ‘virtual capital’ under the livelihood asset element.
- B. Influenced by Leonardi’s (2012) conceptualisation of ‘socio-materiality’, I adopted mobile technology’s potential as the ‘material agency’ under the livelihood strategy. It implies that mobile device acts as a material factor and ‘physical asset’ with an agency. Furthermore, the smartphone, via its virtual connectivity, also functions as a ‘virtual asset’ with an agency. This is also manifested in the livelihood outcome element of the SLF-M4D model.
- C. Adopting Gigler’s (2011) conceptualisation, the SLF-M4D model suggests the inclusion of ‘mobile-based informational capabilities’ of users (rural women entrepreneurs in this case) under the livelihood strength or asset element of the model. This concept is also connected with Sen’s (1993) ‘social capital’ and ‘wellbeing’ concepts which promote women’s personal agency. Consequently, women’s social

capital and informational capabilities fit well as 'human capital' under the livelihood asset and strengths element.

- D. A significant extension to the SLF-M4D model is the incorporation of a gender lens adopting Kabeer's concept of women's empowerment, which includes women's access, agency and achievement in relation to mobile phone-based development or social transformation.
- E. The SLF-M4D model advocates for the inclusion of excluded communities' (rural women entrepreneurs in this case) voices labelled as 'aspiration' under the context and vulnerability elements. At the same time, I focus on the digital development context in addition to vulnerabilities that can assist our understanding of policies and digital divide reality on the ground.



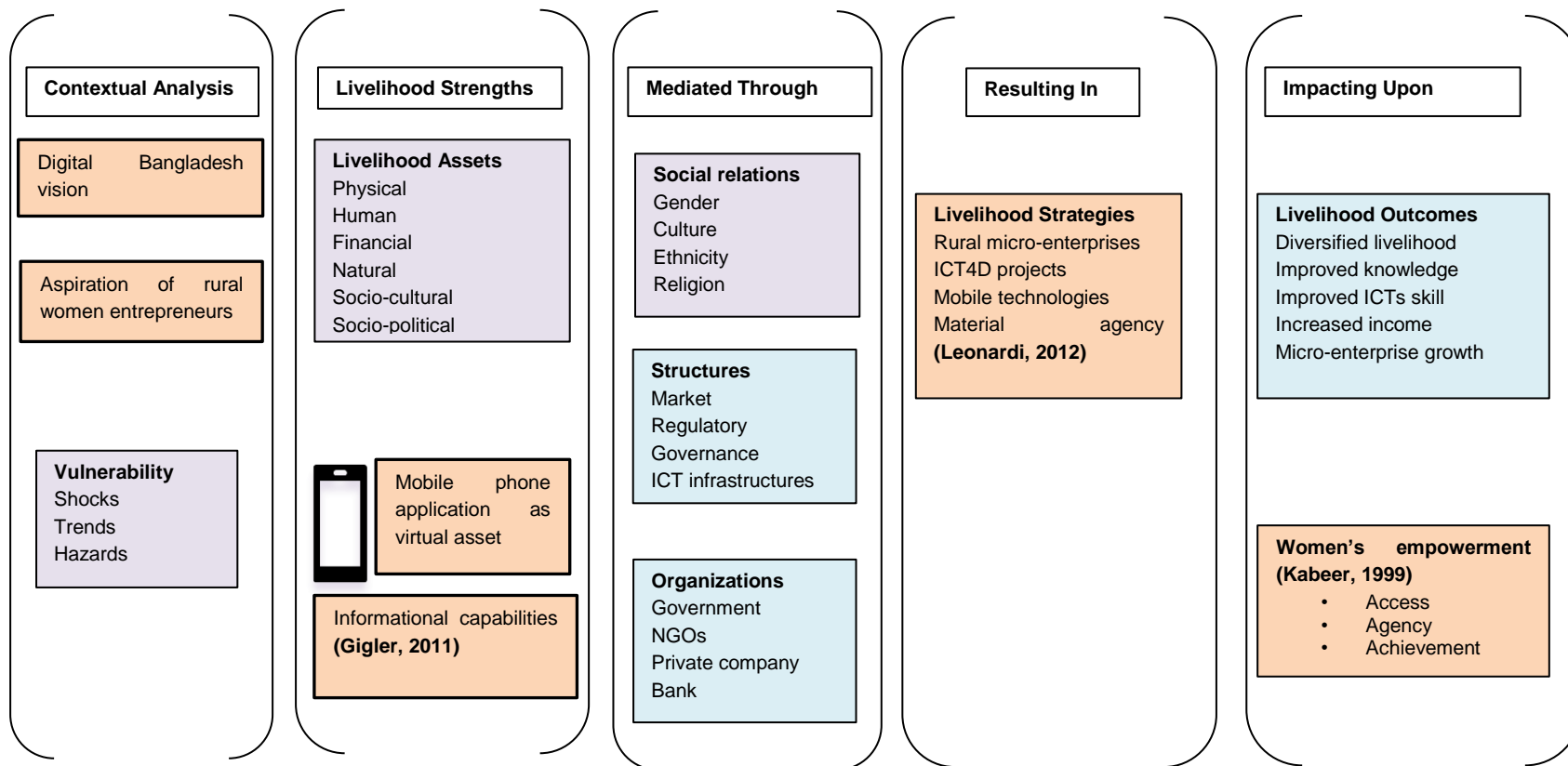


Figure 8.2: Modified and Informed SLF-M4D Model (authors own creation)

As explained in Chapter 3, the role of mobile technologies in bringing social transformation in rural women's lives and their micro-enterprises was evaluated through the following questions in the case studies of dairy (see Chapter 6) and maize (see Chapter 7) women entrepreneurs. I followed a reflexive exploration process to observe and examine the mutually influencing, correlative and causal relationships of empirical events, activities and non-observable events happening in rural women micro-entrepreneurs' lives during my fieldwork. The Critical Realism lens as an overarching theoretical perspective, helped me to pay attention to the 'non-observable' events, such as patriarchal social and cultural norms and their manifestations on actual events, such as men's (husbands of women micro-entrepreneurs) control on financial transactions in the maize enterprise case. As discussed in Chapter 5, this reflexive exploration and interpretation of data helped me to develop a deeper understanding of rural women's attitude and nuance of cultural influences on real-life behaviour, such as power relationships between men and women within a household or dependent relationship between NGO officials and women. These kinds of more hidden tacit and social factors are not adequately addressed or only rarely directly explained in ICT4D research. The following set of reflexive queries was helpful in exploring new insights for this study:

- I. How the technological artefact, i.e., mobile phones, are being used by rural women entrepreneurs?
- II. What kind of attitude, behaviour, knowledge, skills constitute the 'technology-in-practice'?
- III. Whether there is any difference in mobile phone use in economic activities, i.e., micro-enterprise operation and social activities, compared to personal communication?
- IV. Whether social relations, such as the relationship between husband and wife, play any role in mobile phone ownership, access to mobile technologies and the use of mobile phones?
- V. What kind of roles is being played by organisations and structures (such as government, NGOs, banks) in rural women's access to mobile technologies?
- VI. Whether there are any gaps between the macro and micro level realities; for example, variance between national ICT policies and their implementation?
- VII. Whether there is any variation amongst similar women users and other service providers such as public service providers and wholesalers in the market?

### **8.2.1. Context and vulnerability**

The 'contextual analysis' element of the proposed SLF-M4D model acts as a guide to capture both macro and micro perspectives of digital policy vision and digital technology transfer and implementation processes. The study observed that geographic location caused natural hazards like river erosion and flood; additionally, it was excluded from adequate digital infrastructure with limited power supply and poor internet bandwidth. Regular weather incidents like heavy winds also impacted internet connectivity, limiting women's use of smartphones. Presumably, the advanced level of digital intervention in the urban area with 4G connectivity is not accessible by rural women from the remote villages in study locations.

Based on the conceptual SLF-M4D model, findings explored rural women's expectations and perception of digital development. Their main expectation was addressing the high cost of phone calls and internet use, and power supply issues. Regarding environmental vulnerability, the women from Kawnia demanded an embankment and expressed their concern about unfulfilled commitments made by the MP of that constituency.

### **8.2.2. Livelihood strengths and assets**

In both cases, rural women referred to farming land and homestead land as valuable assets, which they considered as a part of their identity. This is characterised as 'natural capital' under the model.

Another common and essential 'livelihood asset' for rural women is poultry and livestock, which is also natural capital. In particular, the dairy women entrepreneurs were heavily involved with cows as milk was their main source of livelihood.

### **Mobile phones and smartphones: 'physical capital' vs. 'virtual assets'**

The mobile phone is considered as an important asset by rural women and their family members. This can be a part of 'physical capital' as discussed in Chapter 3 under the original framing of SLF. There is scope to also consider mobile technology as a 'virtual asset' (Biswas et al., 2022), which because of its connective agency includes women's improved knowledge, skills, sense of dignity and new identity facilitated by mobile technologies.

Women's capabilities, skills and knowledge can be also considered as 'human capital'. Their mobile based informational capability, digital literacy and social capital are also examples of human capital. Rural women's connections and relationships within the CBO, and their collective efforts like micro-enterprise and networking skills are also part of human capital. Women's profit from micro-enterprise, loans and savings at banks and CBOs are examples of 'financial capital'.

### **8.2.3. Livelihood strategies**

As livelihood strategies include both long-term and short-term aspects, there is scope for discussing these issues that may guide ICT4D project professionals to bring immediate benefit and sustain achievement through micro-enterprises. Undoubtedly, smartphones influenced the diversification of livelihood strategies from maize farming to maize micro-enterprise by opening additional information services and communication opportunities with the local market, government offices, NGOs and financial institutions. The study observed different use and ownership patterns between men and women, and also within a group. Findings also noted how far livelihood strategies were useful in bringing positive livelihood outcomes and sustaining social changes in rural women's lives. This way, the SLF-M4D model was helpful in guiding my exploration of the interconnected elements of livelihood from a holistic social and technological perspective.

As discussed in previous chapters, this study identified major dimensions and reviewed some illustrative examples of mobile phones and smartphones use within ICT4D and mobile technology-led development interventions. Previous studies considered mobile technology as

an important phenomenon to influence the overall social and economic change process in the development scenario of Bangladesh. Similarly, all three categories of research participants shared the same points of view that mobile phones, particularly smartphones, are the most popular and effective component of ICT4D in Bangladesh. Mobile technology can be considered as a 'material agency' and the role of mobile phones as an 'enabling factor' for social change requires further discussion and attention in ICT4D research. Consequently, the proposed SLF-M4D model can serve that purpose by generating a debate and providing a standard conceptual framing for the design of M4D projects.

#### **8.2.4. Livelihood outcomes**

Past research has shown that livelihood outcomes facilitated by mobile technologies could be positive or negative. Livelihood outcomes are directly linked with women's well-being in terms of increased income, improved food security, and better access to public services and mobile technologies. The SLF-M4D model helped me to develop a systematic understanding of the livelihood outcomes as a consequence of smartphones and micro-enterprise operations.

Only a few studies have discussed the negative impacts or failures of ICT4D projects. Similarly, the government and NGOs in Bangladesh tend to showcase successful models because of various factors, such as uneven power relationships between donors and NGOs and government and private sectors, and there is an unstated fear of jeopardizing funding if problems are demonstrated (Wood et al., 2018). This phenomenon is challenging, as lessons from failures are missed and may lead to the repetition of similar mistakes in future ICT4D interventions. Moreover, evaluation reports and monitoring documents are shared in confidence rather than subject to open discussion because of possible implications for resource supply and the image of the respective organisation. Therefore, this study offers valuable insights by including limited or negative outcomes, and unexpected consequences as a built-in conceptual element in the SLF-M4D model, such as the potential form causing harm to users. This extended model and empirical analysis are likely to initiate greater debate and draw out deeper analysis of development intervention outcomes.

#### **8.2.5. Adding gender lens to the SLF**

As explained in Chapter 3, by adding Kabeer's (1999) empowerment framework, the extended SLF-M4D model captures the gender dimension discussed in the case studies in Chapters 6 and 7. According to Kabeer's conceptualisation, women's empowerment can be measured from three interconnected dimensions (Kabeer, 1999), and this guided me to organise the findings related to women's empowerment in this way:

- A. Women's access to resources: Women's access to resources includes several aspects, thus the model explored women's ownership of and access to assets (poultry, livestock, mobile phone); opportunities (livelihood options such as farming and micro-enterprise); power to spend her income (such as contributing to children's education or purchasing personal items).
- B. Enabling women's agency: agency refers to women's increased participation in different activities, including decision-making processes, and playing different roles within the household as well as in the broader community and societal structure. My findings show that in both cases, women were able to engage with the market (though

to a limited degree because of patriarchal social and cultural constraints), local service providers, such as agricultural extension services, and banks. Despite such limitations, their acceptance and value within the family and society increased. There is evidence of improved self-identity and confidence, with women valuing respect from their husbands as a big change indicating women's agency.

- C. Women's achievement: Kabeer emphasised achievement as an outcome of the other two dimensions, which result in improving women's status from a holistic perspective, including economic, social and cultural aspects. This occurred in two cases of women entrepreneurs in this study.

### **8.3. DISCUSSION ARISING FROM MAJOR FINDINGS**

Following the modified version of the SLF-M4D model informed by empirical data and analysis in the previous section, this section emphasises major lessons and concerns arising from the study findings. It is therefore important to discuss further how the findings reveal new knowledge and validate previous works on the relationship between mobile technology, micro-enterprise sustainability and women's empowerment from a Critical Realist perspective. Consequently, the discussion contributes to design and research implications for ICT4D researchers and professionals.

#### **8.3.1. 'Digital Bangladesh': From Digital Divide to Digital Inclusion**

Inclusion of community voice in digital development intervention design is essential, but it is hard to ensure. Moreover, there is no adequate mechanism to capture it. In this context, the SLF-M4D model as a theoretical framework has the potential to be incorporated with grass-roots methods as a bottom-up design and implementation tool for M4D projects, particularly for women, and it is likely to be transferable for other excluded communities.

As discussed in Chapter 5, digital development initiatives in Bangladesh have changed over time, both in terms of policies and implementation strategies, such as ICT services provided through the UDCs. Despite government and NGO interventions, 'Digital Bangladesh' is not a current reality for all citizens, and the digital divide remains a major concern for some sections of the population, including women, ethnic communities, rural communities and people with disabilities. The findings from this study contribute to that knowledge by offering empirical examples of mobile technology-based digital development and overall access, affordability and the digital literacy and informational capabilities of rural women. Therefore, there is a need to develop an appropriate inclusive mechanism for digital inclusion.

In presenting the Australian Digital Inclusion Index 2021, scholars argued that three crucial aspects of digital inclusion are relevant to the Australian context: i) access, ii) affordability and iii) digital ability (Thomas et al., 2021, p.11). This categorisation can be used to consider the different capacities of mobile phone users in the context of Digital Bangladesh. While a developed country like Australia moves towards 5G connectivity and other qualitative aspects of digital inclusion, a developing country like Bangladesh still struggles to ensure basic access and benefit because of the high cost of the device, the high cost of the internet and poor electricity supply. Therefore, further discussion of the vulnerability, structural and social barrier

dimensions are crucial to under the gender digital divide and improve women's access and achievements.

For example, previous studies on the PROTIC project found there are five types of ICT device ownership: a) self-supported ownership, b) family supported shared ownership, c) government or NGO supported ownership, d) occasional access without ownership of a device, and e) no ownership and no access (Sarker, 2020). Similar to that study, my findings also demonstrate very low ownership or no ownership of smartphones (for example, dairy entrepreneurs from Kawnia) when the devices were not provided by the government or NGO. Despite limited access to mobile phones and smartphones, the positive impact of smartphones in the agricultural farming and micro-enterprise sector is evident from a number of studies (Stillman et al., 2018; Stillman et al., 2020; Duncombe, 2006).

In addition to access, another reason behind the digital divide can be termed as informational capability or digital ability or digital skill. My findings in Chapters 6 and 7 revealed conditions where rural women's access, affordability and digital skills varied, leading to a different level of access to and impact of mobile phones on their personal lives and micro-enterprise operations. Another study by Aziz (2020) also recommended an analytical framework of digital inclusion and evaluated the agendas outlined in ICT policies of Bangladesh. He argued that digital technology could not ensure maximum benefit without users' competencies, such as motivation, literacy, and skill.

Cultural barriers, such as language issues and technical language competency of marginalised rural women with poor literacy, have not been a feature of past, traditionally oriented research which did not capture the more hidden aspects of women's lives. The use of the Critical Realism lens was useful for me in revealing the usually constraining effects of traditional cultural norms of patriarchy, systems of power, and different internalisation of cultural norms in Hindu and Muslim communities. I felt that women by and large, accept their lesser status as legitimate limiting their potential to promote personal agency.

My study findings also revealed that women preferred face-to-face and virtual communication, such as OBD, over long SMS in technical language, mostly because of their lower literacy level. Some other studies observed a lack of confidence and 'technology phobia' in general amongst rural Bangladeshi women (Sultana, 2010; Sultana et al., 2019). This was also reflected in conversations with rural women during the data collection stage. However, maize farmers and entrepreneurs from Dimla preferred two mobile apps, one developed by the agricultural ministry and the other by the PROTIC project, because of easy operation and visual content. This suggests that more visual-based content in non-technical language can encourage women's independent engagement with smartphone-based agricultural and other development information.

Avgerou (2010) warned that introducing innovative digital interventions may create an additional digital divide between different groups when all people do not have equal access to ICT opportunities. This is the case for 'Digital Bangladesh' interventions. The benefits are different for rural and urban populations, for men and women (Sawada, Mahmud & Kitano, 2017). Moreover, internet use is comparatively expensive in Bangladesh, and rural women

entrepreneurs in both cases identified affordability as a major concern for them. They also mentioned that without government or NGO support, they find it difficult to purchase a smartphone and afford the maintenance cost. In addition to government initiatives, mobile phone companies need to consider addressing these challenges. For example, they can introduce a device with limited features at low cost and offer an instalment based purchase option to enable rural women to have a smartphone of their own.

Finally, as discussed in previous chapters, the recruitment of skilled entrepreneurs in the UDC and the capacity building of entrepreneurs can improve the quality of service. Previous studies show that women entrepreneurs at the UDC also struggle with patriarchal social barriers limiting their presence in the office and their ability to operate in ICT public service delivery at the expected level (Sarkar, 2020; Islam & Tsuji, 2011). Additionally, the government helpline can function better with adequate human resources, which can be challenging to achieve, as reported by the DLS officials in Chapter 6.

### **8.3.2. Roles of Mobile Phones in Rural Micro-enterprises**

Based on the findings discussed in previous chapters, it is difficult to identify a direct correlation between mobiles phones and the sustainability of rural micro-enterprises as there are other factors associated with sustainability. However, it was evident in the cases of both the dairy and maize enterprises that women's institutional connection was initiated by NGOs, suggesting lack of adequate market infrastructure and supportive institutions.

Previous studies have shown that mobile phones have a contribution directly to marketing and sales (Donner, 2004, 2006a, 2006b, 2007; Esselaar et al., 2007; Jensen, 2007). My study finding that women fixed the price of their supply with wholesalers via mobile phones also validated this dimension. However, the experiences of dairy entrepreneurs and maize entrepreneurs are slightly different. For example, the women dairy entrepreneurs mentioned that they use the mobile contact list and maintain regular communication with banks and wholesalers directly using their 'button phones'. In contrast, the maize entrepreneurs were dependent on their husbands to maintain contact via phone and face-to-face relationships with maize wholesalers though they were given smartphones and trained to use them. This indicates that having a mobile phone is not enough, as establishing a sustainable relationship with markets, banks, and formal institutions requires time, experience and a certain skill set. Compared to a decade-long experience in managing enterprises by the dairy entrepreneurs, the maize enterprise group members were less experienced, having operated for only a few years. Therefore, the dairy enterprise was more successful and sustainable despite their limited access to mobile technology. However, the maize enterprise group showed potential to grow as a sustainable venture with smartphones playing an enabling role to growth and scaling up according to the local market situation.

### **8.3.3. Mobile Phones and Transformative Changes in Rural Women's Lives**

I observed that access to information and increased agency for decision-making improved women's overall wellbeing. As explained in Chapter 3, the 'socio-materiality' (Leonardi, 2012) dimensions of mobile phone use and consequent transformative changes in rural women's lives were reflected in both case studies presented in Chapters 6 and 7. Therefore, this study

suggests that mobile phones can be considered as having ‘material agency’ (Leonardi, 2012) in promoting ‘women’s agency’ (Kabeer, 1999) in socio-technical change processes happening in the rural ‘Digital Bangladesh’ context. As a result, this study suggests that mobile technology-led socio-technical transformation from a holistic perspective can be considered, in which physical infrastructure, administrative and social structures, social norms, individual and collective perspectives, language and cultural discourses are all influenced by each other. This findings reinforces a previous global report in 2015 that demonstrated that mobiles phones play a positive role to help women to access information and services in resource constrained countries (GSMA, 2015). Therefore, this discussion generates a useful debate and contributes to the greater body of research to review the role of mobile technology in women’s empowerment.

Further, as identified by Heeks & Molla (2009), ICT can also act as an immaterial ‘functioning enabler’ by promoting conversation, capabilities and choice. But at the same time, ICT may also constrain capability and choice. The same thing can be said for smartphones in my research. Referring to the case of the PROTIC project and iSocial projects, rural women entrepreneurs’ experience revealed that ownership of smartphones and the ability to use their special features influenced their livelihood strategies and their relationship with social structures and systems, going beyond the functional aspect of smartphones. In the case of the REECALL project, choices and capability opportunities for women dairy entrepreneurs in terms of accessing digital spaces and services were limited while they were using only the basic features of mobile phones. The rural women participants in the PROTIC project from Dimla mentioned that smartphones had saved them money and time in approaching the public extension services for information, making an appointment to receive service and arranging visits to their agricultural field or livestock. Smartphones also helped them stay up-to-date with government welfare schemes, track the allocation of public benefits to their community, and to access accurate information easily.

There was an additional finding with considerable potential for future research. Because of the structure of rural life, rural women typically have minimal recreational opportunities. This aspect of their lives is often ignored by researchers, as economic empowerment is emphasised. Therefore, my findings relating to the significance of leisure time and the smartphone’s enabling capacity in that regard provide an insight that will contribute to greater awareness of this important dimension. The advanced features of smartphones led maize farmers and entrepreneurs to have fun that can be found online and on social media (mostly Facebook). This finding emphasises the importance of leisure as a key dimension of wellbeing, something that is not usually taken into account in research or policy circles in development. This ‘ludic’ or fun aspect of mobile phone use needs to be further researched and considered as an option for ICT4D in countries like Bangladesh.

#### **8.3.4. Mobile Phone, Gender and Patriarchy**

Men’s control over women in terms of reproduction, sexuality and labour-power are manifestations of patriarchal social structures (Connelly. et al., 2009; Kleine, 2013); similar control continues when it comes to access to and ownership of mobile phones. Therefore, the intersectional aspects of gender disparity, patriarchy and inequality issues are well-discussed issues in ICT4D research (Rode, 2011). As discussed in previous chapters, Kabeer’s (1999)



conceptual framing was useful for me in conceptualising and evaluating correlations between women's agency, women's engagement in agriculture and micro-enterprise, access to public services, and mobile phones.

As discussed in the case of dairy entrepreneurs, religion and culture played a role in controlling women's mobility. In the case of maize entrepreneurs, gender role expectations from maize wholesalers, husbands, and society hindered women's direct engagement in the market, additionally limiting control of day-to-day financial management. Previous studies show similar challenges are faced by women entrepreneurs and farmers while handling micro-enterprises and using mobile phones in a patriarchal structure (Tacchi et al., 2012). My findings validate similar studies in which both positive and negative impacts associated with mobile phones were revealed (Masika & Bailur, 2015; Pei & Chib, 2020, Anwar & Johanson, 2012).

Mobile phones and security concerns for women: As discussed in Chapter 7, while the smartphones given by the PROTIC project acted as enablers for women maize farmers' and micro-entrepreneurs' empowerment, the risk of cyberbullying or harassment, damage to personal self-image and public reputation remained a constant barrier for them, limiting their ability to avail maximum benefit from those devices. Similar studies conducted in the South Asian context identified various types of challenges faced by women while using a device shared with others (Sambasivan et al., 2018; Sambasivan et al., 2019). One of the main reasons behind that is a low level of awareness and technical knowledge about privacy concerns (Sambasivan et al., 2018), while the women are using mobile phones for interpersonal communication and interacting in the digital space, such as Facebook. Another study in the Bangladesh context demonstrates that, in general, women's privacy is undermined as they do not have their own private space in the house (Mim & Ahmed, 2020) and their mobility is also limited in the traditional patriarchal social context. Stalking on social media like Facebook or harassment from unknown callers on mobile phones is a very common problem in patriarchal societies like Bangladesh. This is not only revealed through my findings. Rather, it is a much-discussed topic on mainstream media and social media, in addition to academic research.

Previous studies and my study also identified dowry and violence against women happening at the domestic level, where husbands and marital family members act against women's well-being and advancement. A previous study indicates sexual abuse within marriage is a negative consequence of a husband's exposure to pornography using the internet on smartphones (Sarker, 2020). As discussed in Chapters 6 and 7, physical and verbal abuse by husbands is treated as 'normal' behaviour and women are taught to accept it while growing up in a patriarchal family norm which questions women's capability, dignity and achievements.

This situation suggests that awareness-raising among women users and the wider digital society in Bangladesh is necessary to create an enabling environment where the women's positive experience can be ensured without the fear of such privacy and security concerns. To make this happen, ICT4D and M4D designers need to consider developing security and privacy measures for women users in a shared device and communal environment (Sultana, 2009, 2010; Sultana et al., 2019; Rotondi, 2020). Some of this can only be done by close HCI design work with women themselves. Additionally, this kind of negative experience and social

stigma can be addressed by development practitioners and media by creating safety awareness and a positive mindset through campaigns and other practical development interventions.

### **8.3.5. Good Woman vs. Smart Woman Dilemma**

In both case studies, rural women were overburdened with economic and household responsibilities forcing them to multitask. Moreover, household chores were perceived as a good wife's responsibilities without much recognition and without a question of monetary value. My fieldwork data indicates that in general, rural women acknowledge the significant positive role of mobile technologies in their lives and livelihood. But at the same time, they are cautious about keeping the expected image of a 'good woman' by limiting their mobile use. It was revealed that maintaining the image of 'good women' becomes more challenging when they are using smartphones. This was an additional psychological pressure for them when they wanted to be smart but afraid of being labelled as 'bad women'. Such cultural expectations need to be considered in any future design for ICT4D projects for women in Bangladesh and, by extension, other developing countries.

## **8.4. CHAPTER SUMMARY**

The modified version of the SLF-M4D model presented in this chapter is informed by empirical data and analysis. I have demonstrated the model's relevance to understanding the relationship between mobile technology, micro-enterprise sustainability, and women's empowerment. While the discussion validates the findings of some previous studies, some new knowledge has been generated, such as the negative consequences of mobile phones. Additionally, it expands on some less discussed topics, such as leisure or entertaining aspects of smartphones for rural women, which I had not planned to address in this study.

Overall, after reviewing the study findings, it can be said that there is a positive impact of mobile phones in both cases of rural women. Though the features used by the dairy group and maize group were different, all research participants acknowledged that mobile phones saved their time and money. All women identified an increase in income with earnings from their micro-enterprises. Despite that factual evidence, women's contribution to the household expense was limited, and men's role was prominent as the primary earner in the family. In this aspect, women's sense of dignity, pride and confidence associated with their financial contribution to family expense was noteworthy. However, some constraints remained challenging despite minor signs of progress, such as women's mobility. In the case of maize entrepreneurs, women felt their physical mobility had increased a little, but through smartphones, their 'virtual mobility' increased compared to their earlier experiences before using mobile phones. This kind of hidden layer of patriarchal control is manifested in social norms and power relations between husbands and wives. It can be said that Critical Realism as a theoretical lens was proved useful to develop my understanding of women's empowerment and socio-technical change processes.

Consequently, I conclude this chapter by noting that all research questions were addressed. The following chapter concludes this thesis with a summary of findings against all research

questions, discusses lesson drawn from this study, makes a set of solid contributions for future ICT4D research and development interventions.

## **CHAPTER 9: CONCLUSION, IMPLICATIONS AND FUTURE RESEARCH**

### **9.1. CHAPTER OVERVIEW**

This study has observed, documented, analysed, and theorised certain aspects of trends in mobile technology-driven societal change processes. In particular, it has focused on the role of mobile technologies in promoting the emergence, growth, and sustainability of micro-enterprises led by women in rural Bangladesh. This concluding chapter summarises the key findings, discusses limitations and research implications, and concludes by suggesting future research. This chapter returns to the study objective and research questions in Section 9.2, followed by a reflection on the relevance of research design and methodologies in Section 9.3. Subsequently, Section 9.4 summarises the major findings in relation to the research questions. Next, Section 9.5 discusses the theoretical, methodological, and practical contributions of this PhD study. Finally, limitations and future research are discussed in Sections 9.6 and 9.7, followed by concluding remarks in Section 9.8.

### **9.2. RESEARCH OBJECTIVE AND RESEARCH QUESTIONS**

My research aimed to examine the role of mobile technologies in the lives of women micro-entrepreneurs in rural Bangladesh and provide critical insights into social, cultural, and economic change processes by examining the relevance of the SLF-M4D from a Critical Realism perspective. The study objective guided the development of a set of research questions.

The main research question of the study was:

What are the relationships between mobile technologies, women's empowerment and the sustainability of micro-enterprises?

The following three secondary research questions were addressed while examining the main research question:

- A. What is the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs in Bangladesh?
- B. What kind of transformative changes are occurring in rural women micro-entrepreneurs' lives with the use of mobile technologies?
- C. How can the Sustainable Livelihood Framework be informed and improved with empirical research and theoretical analysis?

The elements of the main question motivated the adoption of Critical Realism as a meta-theoretical lens and the application of the SLF-M4D as an overarching conceptual model.

Consequently, the third sub-question particularly focused on the SLF and generated theoretical and methodological knowledge contributions (see Section 9.5).

### **9.3. RESEARCH DESIGN AND METHODOLOGY**

Overall, the research design and methodology were effective in addressing the research questions. As explained in Chapters 4 and 5, the design was flexible in order to accommodate the field level reality and make changes as the need arose.

The study was conducted in three interrelated stages: i) a review of selected literature, ii) data collection from Bangladesh, iii) a reflexive analysis and writing of the thesis using the empirical data and triangulation of the perspectives of the different categories of research participants through interviews and focus groups. Particularly, stage three helped me to consider other literature, references, and ideas to connect the research findings to the broader knowledge spectrum. Having three categories of research participants; rural women entrepreneurs, local service providers, and national experts, helped me to develop a deeper understanding of the research questions by triangulating different perspectives and validating them against secondary data sources. This research used the case study method to understand the correlation between different elements of research questions.

My training and intellectual development over several years as a student at Monash University and my previous role as a Bangladeshi development professional resulted in an intuitive reflexive process using the philosophical position of Critical Realism. My previous expertise and knowledge of the local language and rural communities were also helpful in communicating research concepts, establishing rapport, and obtaining informed consent. While addressing some practical challenges, such as identifying more representative research participants, accessing high profile research participants and secondary data, and the internal power dynamics between rural communities, NGOs, and local government officials, led to new knowledge and understanding of the context beyond the original research design.

### **9.4. SUMMARY OF MAJOR FINDINGS**

My research findings and analyses validate previous work showing the enabling role of mobile technologies in bringing significant positive changes in women's lives.

**Findings related to secondary research question A:** What is the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs in Bangladesh?

While exploring the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs, some new insights arise from the in-depth interviews, and some findings reinforce similar previous works done by others. For example, the literature review for the study suggested a research gap related to the lack of a standard definition of micro-enterprises. Due to this lack, the characterisation or working definition of micro-enterprises in the context of Bangladesh varies from one implementing organisation to another. Several national expert participants made similar observations and

stated the need to develop standard definitions and elaborated explanations. Therefore, one of the major contributions of this study has been to discuss the challenges of applying the current national definition of micro-enterprise and suggest a set of characteristics of micro-enterprises informed by the empirical data. While not of direct relevance to technical development per se, it offers a framework for much more accurate research and policy development in the social-technology arena. As part of this, it also offers a working definition of micro-enterprises applicable in the informal rural contexts particularly relevant to the farming/agricultural sector.

The study findings generally show positive relationships between mobile technology use, micro-enterprise growth and development of women's agency or empowerment. However, the study also indicates barriers which hinder this positive impact, formed by women's limited access to mobile phones and technologies due to various factors. These include insufficient infrastructure, lack of access to education, the high price of devices and the internet, patriarchal social norms and attitudes challenging women's agency and self-image.

**Findings related to secondary research question B:** What kind of transformative changes are occurring in rural women micro-entrepreneurs' lives with the use of mobile technologies?

The findings demonstrate and analyse different forms of transformative changes happening in women's lives and explore the connection with mobile technologies by reviewing specific cases of rural women entrepreneurs. The fieldwork data also indicates that rural women generally acknowledge the significant **empowering, transformative and positive effects of mobile technologies** on their lives and livelihoods. Nevertheless, at the same time, they were cautious about preserving the expected image of a 'good woman' by limiting their own mobile use. I found that mobile phones were used to maintain contact with the local public officials and market, which had a direct correlation with improved access to agricultural extension services and increased income. Furthermore, rural women did not differentiate between 'button phones' (i.e., basic phones) and smartphones when they explained positive changes in their lives relating to those devices and technologies. However, smartphones' advanced features led to users expressing the fun that can be found in being online and social media (primarily Facebook). This finding emphasises the importance of leisure as a key dimension of wellbeing, which is not usually taken into account in research or policy circles in development.

The findings of this study clearly indicate that smartphones and mobile phones act as enablers for women's empowerment and significant transformative social change. The rural women participants from a northern village mentioned that smartphones had saved them money and time in approaching public extension services for information, making an appointment to receive a service, and arranging a visit to their agricultural fields or livestock. On the other hand, rural women entrepreneurs from another northern village faced a dilemma leading to the restrained use of smartphones. These devices helped them to stay up to date with government welfare schemes, access accurate information quickly and improve status to their community. However, social perceptions of the image of 'good women' and the need to maintain that image challenged the frequent use of mobile phones and communication with strangers, particularly with unrelated males. In some cases, the experience of using

smartphones was associated with the risk of facing cyberbullying, harassment, and trolling on the online platform, and rumours in real life challenged the possibility of availing maximum benefits from mobile technologies.

**Findings related to secondary research question C:** How can the Sustainable Livelihood Framework be informed and improved with empirical research and theoretical analysis?

The SLF-M4D conceptual model enabled me to follow a continuous reflexive process during data analysis and generated a critical understanding of the role of mobile technology-led interventions in rural Bangladesh. Some notable insights have arisen from the Critical Realism perspective, which informed the conceptual model in reviewing the vulnerability, assets and capability, structures, processes, systems, livelihood strategies, and outcomes of rural women:

- **Vulnerability:** Access to smartphones and mobile-based information technology can reduce marginalised women's vulnerability and improve their capacities to absorb shocks. The study findings show that collective capacities can be developed by sharing knowledge and information through mobile technologies. For example, rural women were informed about weather forecasts and disaster warnings well beforehand and managed their harvesting and storage of production accordingly.
- **Livelihood assets:** All research participants considered their mobile phone an essential asset. The study findings suggest that mobile phones and technology could be considered as 'virtual assets' beyond their worth as physical assets, because increased virtual connectivity is associated with enhanced self-confidence and stronger identities for rural women entrepreneurs.
- **Social structures, institutional processes, and systems:** Understanding local and national systems, structures, policies, and processes using the SLF-M4D from a Critical Realism perspective was instrumental in this study. By triangulating the responses of local service providers, rural women entrepreneurs, and national policymakers, the gaps between existing policies and implementation realities, such as lack of power supply, were identified. The study findings captured the social barriers hindering women's access to mobile technology-based development interventions. It also captured the power dynamics of rural communities, local NGOs, local service providers, and local elected representatives and administrative structures, which are crucial in addressing the implementation challenges.
- **Livelihood strategies:** The research findings and previous studies show rural women's potential to adopt diversified livelihood strategies to contribute to household income and wellbeing. The case studies demonstrated that some women entrepreneurs were more successful than others and, in some cases, they managed the workloads of farming and household care work simultaneously, leaving them without much leisure time. It also became clear that mobile technologies were effective in reducing vulnerability and improving rural women's capability. Mobile technologies contributed to diversifying livelihood opportunities for rural women entrepreneurs. The study

findings show that smartphones improved their access to information and services. Even the basic features of mobile phones, such as the calculators, were used in keeping accounts on a regular basis.

- **Livelihood outcomes:** Previous studies and my research findings confirm direct and positive correlations between mobile technology, micro-enterprise growth and women's agency. Some indirect livelihood outcomes facilitated by mobile technology-based development were also observed.

Understanding the dimensions of socio-materiality through a Critical Realism lens using the SLF-M4D model was effective. The findings show that providing smartphones and training in the use of mobile technologies are not sufficient for women's empowerment. In fact, attitudes towards women's uptake and ownership of mobile phones, access to mobile technologies, the internet, and social media are determined by a number of factors, and some of those are not easily captured in conventional research. For example, patriarchal social norms, recognition of women's economic contribution to the family, women's status in society, their connection with local service providers, and power relationships with family members, particularly with husbands are difficult to explore through quantitative surveys conducted through a positivist approach.

While reviewing and reflecting on the above questions, I also explored the gender dimension of the mobile technology-led social change process through the SLF-M4D conceptual model. The case studies of maize and dairy enterprises were valuable examples for understanding women's human and informational capability in terms of their education, social identity, skill in using mobile phones, smartphones and the internet for engaging in micro-enterprise, connecting with the local market, accessing public extension services and maintaining relationships within the family and community.

## **9.5. MAJOR CONTRIBUTIONS TO RESEARCH AND PRACTICE**

My PhD research findings provide a unique contribution from theoretical, methodological, and practical perspectives, which are explained here:

### **1. Theoretical Contribution**

Outcomes from the research provide three specific theoretical contributions to knowledge:

- I. A theory outcome for ICT4D and M4D research on the nature of relationships between mobile technologies, micro-enterprise development, and women's empowerment is offered in this study. The SLF-M4D conceptual model makes a major contribution through the extension of concepts including sociomateriality, informational capabilities, human capabilities as livelihood assets, livelihood strategies, and livelihood outcomes showing causal relationships and connections between mobile technologies, women's agency, and transformative changes. This theoretical insight can be a reference point to help other academic researchers to



develop a theory-based understanding of the relationship between mobile technology, micro-enterprise sustainability and women's empowerment.

- II. Previous chapters have already noted that quantitative and positivist research approaches are much used in ICT4D research. However, this qualitative case study adds to knowledge to understanding the research problems and relevant concepts of the vulnerabilities and capabilities of rural women, physical infrastructures and social barriers hindering their access to mobile technologies. Furthermore, the study extends understanding of research concepts, such as rural micro-enterprise and rural women's agency, and suggests working definitions for them, considering rural women's capabilities of mobile technology use as a 'virtual asset'.
- III. The literature review for this study showed a need to align SLF with a theoretical lens and explore its potential for understanding ICT4D contextual reality. The findings and analysis of this research address that needs by providing a conceptual model and demonstrating the application of the SLF-M4D to explain empirical data from Bangladesh using the Critical Realism perspective. In particular, the study findings and discussion capture the link between the national policy perspective and implementation reality in rural women entrepreneurs' lives through a review of the impact of mobile technologies in bringing transformative changes. The study suggests that the conceptual model SLF-M4D has the potential for application in similar contexts in designing ICT and mobile technology-based interventions and measuring their impacts from a gender lens.

## **2. Methodological Contribution**

This study has generated the following methodological contributions for ICT4D researchers and development practitioners:

- I. The case studies compared commonalities and differences amongst diverse rural women entrepreneurs, providing a reference point for future academic research. Through interviews and focus groups, it became clear that technology transfer and skill development alone are not sufficient for women's empowerment. Therefore, addressing broader structural issues such as cyber security is also important to promote women's agency and sustain social changes. The study generates a solid understanding of relationships between mobile technology, women's empowerment and micro-enterprise sustainability by triangulating the perspectives of three categories of research participants (rural women entrepreneurs, local service providers and national policymakers), field observation and a literature review on the relationship between mobile technology use, the establishment and growth of rural micro-enterprises, and women's empowerment.
- II. The conceptual SLF-M4D model is an extended and modified version of the SLF. It provides methodological guidance in capturing data related to the digital divide and explores the roles of policy, system and structures in hindering marginalised women's access to mobile technology-based interventions from a Critical Realism point of view. This study presents solid empirical evidence aligned with a philosophical

position suggesting the relevance of using the conceptual model SLF-M4D to understand the context and user-specific realities in other access-constrained contexts. The model can potentially guide us to understand the vulnerabilities and capabilities of marginal communities in the COVID-19 scenario where physical mobility is restrained.

- III. The findings provide fresh insight for managing insider and outsider dynamics in IS interpretive research (see Chapter 5, Section 5.2) and extend the reflection from previous studies (Sarrica et al., 2019). In particular, they challenge the authority of Western perspectives in studying ‘another culture’ from a Western feminist perspective. In fact, an effective study in IS in a gendered Global South context requires an insider ‘Southern’ feminist point of view. Therefore, my personal reflexive review during data collection and analysis generates a representative testimony of collective consciousness and interpretation of gender, identity and inclusion concerns for rural women entrepreneurs. This knowledge-based reflection offers a deeper insight into community informatics and development informatics, such as internal power conflicts between the local NGOs and community, intragroup and intrahousehold power dynamics, self-image and constraints faced by rural women in a patriarchal society. Some of these hidden layers of patriarchal norms are manifested in intrahousehold and intragroup settings. Nuances of such complex factors can only be understood by a researcher with an intimate knowledge and experience of the local culture and the community.

### **3. Practical Contributions**

This PhD research project makes the following contributions to practice for various ICT4D stakeholders, including development practitioners, policymakers, and HCI designers:

- I. The case study provides a robust theoretical basis for academic and practitioner-researchers on the impact of mobile technologies concerning sustainable development in a developing country context like rural Bangladesh.
- II. The study offers a specific reflection on contextual reality highlighting some gaps and suggesting possible recommendations for national policymakers in Bangladesh to take appropriate policy measures, design women-friendly mobile technologies, and establish the necessary soft infrastructure and a safe environment.
- III. The study generates critical practical insights providing an empirical reference point for the significance of social factors (information culture, communicative transactions, gender, power, class, and social capital), which are useful in designing socio-technical projects focusing on women’s empowerment and other mobile-based development interventions in Bangladesh and elsewhere with a similar context.
- IV. The study creates scope for a future research collaboration by offering a set of reflections on the perspectives of different stakeholders’, including rural women entrepreneurs, government extension officials, mobile technology service providers, national policymakers, academia, and development practitioners.

## **9.6. LIMITATIONS OF THE STUDY**

This study focused on reviewing the relationship between the use of mobile technologies, women's empowerment and micro-enterprise sustainability in rural Bangladesh using SLF-M4D as a conceptual model to explain the socio-technical change processes from a Critical Realism perspective. The study has some limitations, which are discussed below.

- A. As multidisciplinary research, my thesis aims to understand the interrelationship between mobile technology, the sustainability of rural micro-enterprises and women's empowerment. Thus, it attempts to develop a particular definition of women's empowerment relevant to understanding the case studies of rural women micro-entrepreneurs. It refers to certain dimensions of inequality and gender discrimination faced by rural women in Bangladesh. However, the thesis does not study gender and empowerment from an international gender studies perspective, though aspects of my research are relevant.
- B. The study represents a deliberate effort to capture rural Bangladeshi women mobile phone users' viewpoints through capturing their direct opinions and experiences and theorising this information through the SLF. As discussed in the findings and discussion chapters, the study also includes service providers and national policymakers' points of view to better comprehend rural women entrepreneurs' perspectives. Consequently, this study captured gender-based dimensions of mobile technology use and drew attention to social barriers which were not sufficiently captured in prior digital development projects and policy mechanisms.
- C. The study's findings document and theorise specific groups of rural Bangladeshi women entrepreneurs' perspectives in a specific time and space through interpretive case studies using a qualitative approach and a Critical Realism meta-theoretical lens. Therefore, while there is potential to draw insights from these cases, caution is required if interpreting the findings of this study as generally applicable in other contexts.
- D. The case studies capture the differences between different groups of rural women entrepreneurs and offer a deeper understanding of the diverse use of mobile phones in personal and business communication. More significant insights could have been generated by staying with the community beyond the interview and group discussion set-up. Unfortunately, as discussed earlier (see Chapter 5), it was not possible for me to stay overnight or for a more extended period, primarily because of safety, security, and resource considerations.

## **9.7. RESEARCH IMPLICATIONS AND SUGGESTIONS FOR FUTURE RESEARCH**

This study has focused on reviewing the relationship between mobile technologies, micro-enterprise growth and women's empowerment. This section reflects on possible research implications and presents a set of recommendations.

The study findings clearly show how some rural women have set examples as role models to their communities in managing their micro-enterprises successfully. They have been sharing their knowledge with others using mobile phones and direct communications, and in some cases, they have been invited as spokespersons to community meetings organised by local agricultural extension departments. Promoting successful women's stories and achievements can be a powerful technique in social awareness-raising campaigns and advocacy initiatives, which may inspire other rural women in similar contexts. There is a need for collaborative approaches between local, national NGOs and government extension departments in this respect.

However, the findings also identify challenges to women's ownership of mobile phones and access to technology-based interventions because of social norms and a patriarchal social structure. Women's dilemma of choosing between the identities of 'good women' and 'smart women' needs to be addressed in future digital development programmes and social awareness and policy-level interventions. As discussed in the findings and discussion chapters, over several decades, NGOs in Bangladesh have targeted women for raising awareness on women's empowerment, excluding men. In fact, while not included in this thesis, from my own knowledge as a development professional and based on later discussion with Oxfam and other development organisations during research findings validation workshops, it was felt that there is a need to include men in future development interventions to shift their mindset, and explore different tactics to address patriarchal norms and practices. Elements of advocacy and training to increase understanding and awareness of patriarchal social norms are recommended for men and women when designing future government and NGO digital development initiatives.

Previous studies and the findings of this research validate the need for ensuring access to affordable low-cost smartphones or other mobile devices for marginalised people, both men and women, though social and cultural factors have to be considered. Particularly in the case of rural women, both social and economic factors are hindering access to the internet and smartphone technologies; this requires urgent attention from policymakers and mobile phone companies. Policy incentives, such as special packages for marginalised women at a subsidised rate and instalment based purchase options, could increase their access to mobile devices. Appropriate policy and central ICT mechanisms are recommended to address cyber safety and security issues faced by women and their privacy concerns (see Chapter 8).

The role of the UDCs and government extension services, such as agriculture, livestock and social welfare departments, were found to be necessary for rural micro-enterprises in this study. However, the findings also indicate a lack of manpower and coordination at the grassroots level, which are hindering the execution of the 'Digital Bangladesh' vision of the government. Insufficient infrastructure such as electricity and internet connectivity is another gap in realising the policy vision of ensuring access to mobile technologies and ICT for all citizens. This insight requires attention from policymakers and academia for further understanding, appropriate policy measures and practical solutions.

Future research may explore local service providers' and national policymakers' perspectives in detail, as these are also important for designing, implementing and measuring more

inclusive and bottom-up ICT4D and mobile technology-based interventions. Moreover, referring to policymakers' opinions, future studies may focus on the possibilities and challenges relating to mobile banking, such as security and accessibility for grassroots people; this would be useful in Bangladesh and, presumably, in other developing country contexts.

Most importantly, understanding the social norms and power dynamics affecting women's use of and access to mobile technologies can be explored in future ethnographic research by other social researchers. However, as already discussed, issues of safety and limited resources mean that long-scale longitudinal ethnographic studies of the sort that were carried out some decades ago are no longer possible, and other means of short-term, sensitive, responsive research need to be developed. This has implications for future research design and for the training of not just researchers from Western countries but also for local researchers.

## **9.8. CONCLUDING REMARKS**

This concluding chapter has presented a summary of thesis findings against research questions in Section 9.4. This thesis has answered all research questions in the following ways:

In response to the secondary research questions A and B, the general conclusion of the thesis is that women research participants were benefited from both basic features of mobile phones and advanced features of smartphones. They acknowledged that both mobile phones and smartphones had provided them positive results with otherwise inaccessible information, saved them time and money when approaching public extension services, enabled them to speak directly to officials with whom they were otherwise isolated, and given them a generally stronger sense of personal agency. Information was also directly applied to their business practices, resulting in improved outputs and incomes. However, their interaction with market players and acknowledgement of their capabilities were limited because of patriarchal social and cultural norms.

The secondary research question C is answered with a comprehensive analysis of the SLF-M4D model from a Critical Realism perspective. While using empirical cases of dairy and micro-enterprises run by rural women, discussion on the relevance and potential of applying this conceptual model also generate new knowledge for the main research question. It can be said that the Critical Realism perspective was helpful for me in understanding the relationship between mobile technologies, women's empowerment and micro-enterprise sustainability. However, it was also felt that transformative changes in rural women's lives, women's empowerment and sustainability of micro-enterprises are complex to draw a firm standard conclusion referring to differences between two cases of women entrepreneurs and within the group from the same development project.

Additionally, social expectations of being a 'good woman' within a patriarchal society and the risk of cyberbullying and harassment create significant barriers to rural women gaining the maximum benefit from their smartphones, despite the capacity of those devices to enable women's empowerment and social change. Women felt that they could only go a certain

distance in taking advantage of the smartphone without crossing the invisible barrier of cultural norms that restrict their personal agency.

Despite these limitations, my research also notes the importance of fun and leisure as critical dimensions of wellbeing, which was an unexpected result, and something that is not usually addressed in research or policy circles in digital development context in developing countries like Bangladesh. Given the worldwide phenomenon of mobile phones as a means for entertainment, enjoyment and diversion, this is an important design and policy issue that should be investigated along with other digital gender divide concerns by NGOs, government and ICT developers. After all, a woman should have the right to enjoy and access all available benefits without being forced to choose between being a 'good woman' or a 'smart woman' in an inclusive digital world.

## APPENDIX 1: ETHICS

Consent Form: The National Experts

Project ID: 18821

Research Project title: The Role of Mobile Technologies in the Sustainability of Women-Led Micro Enterprises and Women's Empowerment in Rural Bangladesh

PhD Student Researcher: Ms. Monisha Biswas

Chief Investigator: Dr. Larry Stillman

Co-Investigator: Dr. Gillian Oliver

Co-Investigator: Dr. Misita Anwar

I have been asked to take part in the Monash University research project as specified above. I have read and understood the Explanatory Statement and I hereby provide consent to participate in this project voluntarily.

I provide consent to the following:	Yes	No
I consent to take part in an interview for this research project	<input type="checkbox"/>	<input type="checkbox"/>
I consent for audio recording and documenting my speech during the interview	<input type="checkbox"/>	<input type="checkbox"/>
I consent for taking photos of myself and relevant actions during the interview	<input type="checkbox"/>	<input type="checkbox"/>
I consent for the photos of myself to be used in research findings sharing and thesis	<input type="checkbox"/>	<input type="checkbox"/>
I understand that the data will be held in secure storage at Monash and accessible only to the research team during the life of this research project	<input type="checkbox"/>	<input type="checkbox"/>
I consent if the research findings and thesis quote my speech by my name or	<input type="checkbox"/>	<input type="checkbox"/>
I understand that the research findings, reports and thesis will use my views anonymously	<input type="checkbox"/>	<input type="checkbox"/>
I understand that research data and findings will be published and presented in academic journal articles and conference papers and social media platforms	<input type="checkbox"/>	<input type="checkbox"/>
I understand that my participation is voluntary and that I can withdraw from the research project anytime during data collection and data analysis	<input type="checkbox"/>	<input type="checkbox"/>
I understand that I can request to see the research reports for this field research and the research team will make these available upon my request	<input type="checkbox"/>	<input type="checkbox"/>

Name of the participant: .....

Participant Signature: .....

Date: .....

## **APPENDIX 2: INTERVIEW QUESTIONS**

### **A. Key Informant Interview questions: Rural Women Entrepreneurs**

#### **1. Perceptions about mobile technology and ICT for development:**

- What device and application of mobile technology that you in your daily life? Provide examples.
- How do you use this device in your daily life eg. family communication, communication with the social network, getting/sharing knowledge, access to finance etc.
- How do you use mobile technology for your micro-enterprise for example, marketing, communication with supplier, service provider, customer relation? Give examples.
- Do you know about the existing mobile technology-based facilities for micro-enterprise?

#### **2. Awareness about women empowerment:**

- Do you notice any changes in your lives over since you started using mobile? What are those?
- Do you think your role of women is valued in your family and society? Explain why you think so.
- Do you think your contribution to economic activities is equally treated? Explain why you think so.

#### **3. Awareness of sustainable development:**

- Do you think mobile technologies have reduced your vulnerability in day to day life? Explain why you think so.
- Do you think mobile technologies have contributed to your livelihood improvement and micro-enterprise related activities? Explain why you think so.

#### **4. Experience in using mobile technology:**

- How mobile technologies are helping you to run your micro-enterprise?
- What kind of challenges you are facing in using mobile technology?

#### **5. Suggestions and recommendations:**

- What is your suggestion to improve mobile technologies for women entrepreneurs like you?
- What is your recommendation for better access to financial services for women entrepreneurs like you?
- What is your expectation from the local service providers?
- What is your expectation from the government?



## **B. List of Topics for Focused Group Discussion: Rural Women Entrepreneurs**

1. Perceptions about mobile technology and ICT for development:
  - What type of information and communication technology do you use in your daily life? Provide examples of mobile technology used in your daily life.
  - Do you use mobile technology for your micro-enterprise? Give examples.
  - Do you know about the existing mobile technology-based facilities for micro-enterprise?
2. Awareness about women empowerment:
  - Do you notice any changes in rural women's lives over the last decade? What are those?
  - Do you think the role of women is valued in family and society? Explain why you think so.
  - Do you think women's contribution to economic activities is equally treated? Explain why you think so.
3. Awareness of sustainable development:
  - Do you think mobile technologies have reduced your vulnerability in day to day life? Explain why you think so.
  - Do you think mobile technologies have contributed to your livelihood improvement and micro-enterprise related activities? Explain why you think so.
4. Experience in using mobile technology:
  - How mobile technologies are helping you to run your micro-enterprise?
  - What kind of challenges you are facing in using mobile technology?
5. Suggestions and recommendations:
  - What is your suggestion to improve mobile technologies for women entrepreneurs like you?
  - What is your recommendation for better access to financial services for women entrepreneurs like you?
  - What is your expectation from the local service providers?
  - What is your expectation from the government?

### **C. Key Informant Interview questions: Local Service Providers**

1. What kind of mobile technologies is relevant and useful for micro-enterprise and sustainable development for the rural community including women entrepreneurs?
2. What kind of capabilities do the rural women entrepreneurs have which can be further explored for better financial service and women-friendly technology?
3. What are the challenges hindering rural women entrepreneurs in accessing mobile technology-based services?
4. Are there any replicable best practice examples showcasing the impact of mobile technology for micro-enterprise development and women empowerment?
5. What kind of policy measures and implementation steps can be taken by the local and national level service providers?

#### **D. Key Informant Interview questions: National Experts**

1. How can be micro-enterprise defined in the context of rural Bangladesh?
2. Why and how mobile technology is important for achieving the digital Bangladesh vision by the government?
3. What is the role of mobile technologies and micro-enterprises in improving livelihood outcomes and empowerment of rural micro-entrepreneurs in Bangladesh?
4. What kind of transformative changes is happening in rural women micro-entrepreneurs' lives with the usage of mobile technologies?
5. Why mobile technologies are useful for micro-enterprise development and sustainability?
6. How women empowerment and sustainable development can be measured in relation to the use of mobile technology in rural Bangladesh?
7. Do you consider existing schemes, services are women-friendly in the context of rural Bangladesh? What is your recommendation in designing women-friendly technology?

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