Role of Information and Communication Technology (ICT):

Women's Empowerment in Rural Bangladesh

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This thesis is presented for the degree of

Doctor of Philosophy of

Murdoch University, 2014

School of Engineering and Information Technology

Murdoch University

Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

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Abstract

Rural women in Bangladesh have limited access to resources and public spheres (e.g., educational, health, law and human rights institutions, and many public services) due to socio-cultural restrictions. Women also suffer severe discrimination, thought to be due to lack of access to information. Information and communication technologies (ICT) can reach rural women and have the potential to address knowledge and information needs. The aim of this research was to examine the situation of rural women in Bangladesh in using ICT provided by Non-Government Organizations (NGOs), and investigated whether empowerment was enabled or enhanced through ICT intervention.

Since empowerment is a complex phenomenon to measure a model – Women's Empowerment Measurement through ICT (WEM-ICT) – was developed to take into consideration the socio-cultural norms and context of rural Bangladesh. Using a structured questionnaire based on the model, data was collected from both beneficiaries and non-beneficiaries in two villages where different ICT projects have been introduced. A second data set was collected two years later using the same instrument for longitudinal as well as new participants.

This research explored the impact of ICT intervention in women's lives in the micro (individual or domestic), meso (village or community) and macro (global, national or regional) environments through an investigation of material, cognitive, perceptual, relational and technological dimensions. Since it is important to make women aware of the benefit of their empowerment through information and knowledge sharing, this research focused on the information gap and suggested possible ways to reduce the gap at the implementation level.

The results indicated that the context of the villages, culture, awareness, maturity and engagement affected the empowerment process. ICT intervention impacted positively on many empowerment factors in both villages but other factors did not change due to cultural and traditional aspects of rural Bangladesh. This thesis concludes that consideration of the socio-cultural context at the policy level of ICT intervention for women's empowerment is a key element for the success of an ICT intervention.

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Dedication

This thesis is dedicated to my mother who passed away this year, 2014. She was a woman in rural Bangladesh, un-empowered, who suffered all through her life due to discrimination in society. Her life journey ended with breast cancer which she ignored, and did not check and treat early due to family responsibilities, unawareness and the ignorance of other family members.

Acknowledgements

My heartfelt thanks to my two supervisors. I gratefully acknowledge that it was possible to complete the thesis with the help of my two supervisors Dr Jocelyn Armarego and Dr Fay Sudweeks. They were supportive, patient and inspiring all through my journey.

Thanks to my beloved family and friends for their caring support.

Finally, I thank all those rural disadvantaged Bangladeshi women in Boitpur and Srifoltala who helped my research with their valuable life information. I salute them as they are the greatest warriors against poverty and still smiling with little achievements in their lives.

Glossary

Term	Definition
Amader Gram	An *ICT* project which means our village.
Bagerhat	A district located at south-western part of Bangladesh.
Beneficiaries	Group of people who took advantage or benefit of some project activities.
Boitpur	A village in *Bagerhat* district where *D.Net* ICT project is active.
Conceptual framework	A framework or model developed to measure women empowerment as a consequence of *micro-credit* scheme in rural areas of Bangladesh.
Cognitive dimension	Changes in level of knowledge, skills or awareness of wider environment in a person.
Computer for All programs	In this program project members carried a computer on a three-wheeler vehicle from door-to-door, to show groups of people what the computer is, how it works and how important it is.
Data	Information collected through a structured interview *questionnaire*.
D.Net	An *ICT* project which means development research network.
Dimension	Area of human lives where changes are found due to some intervention activities. Five dimensions are investigated in this thesis: *cognitive, material, perceptual, relational, and technological.*

Empowerment   When people are managing to gain more control over their lives, either by themselves or with the help of others.

Environments   An environment in society which affects a person's life. Three environments are investigated in this thesis: *macro*, *meso*, and *micro.*

Extended family   The family consisting of a group of nuclear families and related individuals from several generations who reside together in the same household, but their cooking is separate.

GO   Government Organizations.

Grameen Bank   A bank in Bangladesh working for poor people founded by Dr. Yunus, Nobel peace prize winner in the year 2006.

ICT   Information and communication technologies which consist of information technology as well as telecommunication, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions.

ICT women   Rural women involved in ICT projects through ICT education, training, awareness and employment.

Joint family   The extended family consisting of *nuclear family* and other family members such as grandparents, uncles, aunts and cousins.

Longitudinal Study   A longitudinal study is a correlational research study that involves repeated investigation of same people.

Macro	The global, national or regional level of society.
Material dimension	Access to or control over material resources such as in the level of income, in satisfaction of basic needs or in earning capacity.
Mental space	Psychological *space* consists of the feeling of freedom that allows a person to think and act.
Meso	The village and neighbourhood level of society.
Micro	Personal and domestic level.
Micro-credit loan scheme	A program of Grameen Bank, Bangladesh to give small loan to improve lives of poor people through some income generation and repay the loan over a period of time.
NGO	Non-Government Organizations.
Non-ICT women	Women who were not exposed to ICT tools by the ICT project, but were *beneficiaries* of the project indirectly through a *village information system*, *telemedicine* or not involved in any ICT project at all.
Non-mental space	Physical, political or economic condition of a person.
Nuclear family	The family consisting of parents and their children.
Overall empowerment	Empowerment in terms of confidence, freedom, awareness and independence.
Participants	Person who takes part in some project activities.
Perceptual dimension	Changes in individual confidence level and self-esteem and vision of the future as well as changes in recognition and respect by others.
Projects	*NGO* projects which work for the welfare of people with

different vision through ICT. Two projects are investigated in this thesis - *Amader Gram* and *D.Net*.

Relational dimension	Changes in decision-making roles, bargaining power, participation in non-family groups, dependence on others and mobility.
Space	The area in a person's life.
Srifoltala	The village where *Amader Gram* ICT project is active in *Bagerhat* district.
Stage I	First stage data collection during 2008 of the study.
Stage II	Second stage data collection in 2010 for *longitudinal* study.
Technological dimension	Changes in the use of different communication services and information need.
Telemedicine	Healthcare provided by *ICT project* through the internet and mobile phone.
Village pay phone	Grameen Bank of Bangladesh leased mobile phones to women members in a micro-credit program. The members repay the cost of mobile phone by weekly instalments which they get from charged service to other people in the village.
Village information system	A program of ICT project where villagers can get all kinds of livelihood information through the project worker or field worker.

CHAPTER 1

INTRODUCTION

The widespread use of Information and Communication Technologies (ICT) has the ability to overcome the existing digital divide between developed and developing countries. Developed countries provide their people with easy access to ICT (mobile phones, computer or the Internet), whereas developing countries suffer from so many economic and social crises that they cannot provide ICT services to disadvantaged people or rural communities. Even within a country, there exist inequalities among urban and rural populations in accessing ICT. The World Bank, United Nations and International Telecommunication Union have identified that the digital divide between countries can be eliminated if impoverished people in developing countries have the opportunity to access to ICT and use it as a mean for development (ITU, 2011; Marcelle, 2002; Ricardo and Kemly, 2013; The World Bank, 2001; Tongia, 2006; United-Nations, 2005b).

According to Mansell and Wehn (1998), effective use of ICT has the ability to develop and empower societies through greater inclusion, wellbeing, cooperation and participation. ICT affects the quality of life through knowledge, education and skills. ICT cannot bring about development or change people's lives without an understanding of users' actual capabilities. For example, computer training cannot bring benefits to those people living in poverty unless it addresses or enhances their abilities, where the ability could be their level of literacy. ICT tools provide people with access to and sharing of information which can increase their capabilities and then can lead to empowerment (Huyer, 2005; Obayelu and Ogunlade, 2006). It is

therefore important to implement development programs that educate people about the benefits and use of ICT in a sustainable way (Susheel, 2013).

Cook (1997) suggested that a development program becomes sustainable when it uses local resources for the welfare of people without affecting the environment and future generations. Sustainability depends on resources, socio-cultural context and needs of the people for a geographical location. Such sustainable programs are an important factor in alleviating poverty in developing countries (Huyer, 1997; Mehta and Kalra, 2006; Siddika, 2012) and are possible by the appropriate use of ICT if a government acknowledges its role and uses ICT with a development commitment that targets poverty alleviation. Poverty is a serious threat among farming population in rural areas. Many developing countries around the world are implementing ICT for rural people's development through knowledge based economic development (Tongia, 2006). In rural Bangladesh many governmental and non-government organizations (GOs and NGOs) are implementing ICT intervention as new human development programs through information and knowledge sharing (Sadan, 2004).

Bangladesh, a developing country, has 45% of the population living below the poverty line (Save the Children, 2008). One of the primary causes of poverty in Bangladesh is gender inequality (Szirmai, 2005); there is an economic and cultural inequality between women and men. Traditionally, men are the wage earners and women depend on them. This economic dependency makes women socially non-progressive and they are considered to be a burden on the family (Parveen, 2007; Parveen and Ingrid, 2004). At present, though women are earning and contributing to the family income, they are subordinated by men. This subordination is a consequence of the existing patriarchal social system that determines power relations within

households and the bargaining power of household members through the organization of the family (Kabeer, 1999; Naved, 2000).

Women actively participate in taking care of children, family members, livestock and household work without any financial benefit (Deshmukh-Ranadive, 2005; Morrell and Sterling, 2006). Although they represent half of the population, women are powerless and suffer further inequality due to illiteracy, lack of awareness, little knowledge, fewer skills, little self-esteem and confidence (Parveen and Ingrid, 2004). To improve this situation in a sustainable way, women should be empowered and included in intervention programs that would benefit future generations, the community and the environment (Szirmai, 2005; United-Nations, 2005b).

Women's inclusion in such planning and subsequent programs could contribute to both their society and their own empowerment. ICT projects, in particular, can help women by improving their access to education, health, government and financial services (Mehta and Kalra, 2006; Obayelu and Ogunlade, 2006) and thus improve their empowerment and alleviate their poverty. ICT provides opportunities for women, including entrepreneurship, allowing them to work from home and care for their families. Being able to access ICT from rural locations, women can enrich and enhance their quality of life.

Women's full and equal access to ICT-based economic and educational activities supports their contributions in business and home-based activities while helping them to be empowered. For example, ICT tools, telecentres and village information system can help rural women in their small businesses by providing the opportunity to obtain the market prices of their product and thus generate more income. The additional income would subsequently improve the economic condition, wellbeing and sustainability of the family (Huyer, 1997). Economic development of

women through ICT projects enables them to be more empowered socially, politically and economically, challenging discrimination and overcoming gender barriers. ICT cannot do anything by itself; it can just open the gateway. Yet to date, many women worldwide are still not fully able to benefit from using these tools. This is often due to lack of connectivity, inadequate access, illiteracy, and language and behavioural barriers (Marcelle, 2002).

Thus policy makers and government bodies need to take appropriate measures to use ICT effectively for rural women. This research therefore focused on how to ameliorate the status of Bangladeshi rural women's lifestyle through ICT intervention. It is important to investigate the impact of ICT in rural communities at the beginning of its implementation so that it can be modified according to the needs of women, in particular. Also the gaps or influencing factors for such intervention should be identified and resolved at that primary stage, considering the available resources, socio-cultural context and needs of rural women.

1.1. Background of the Study

In order to ground the aims of this thesis, it is important to understand the concept of women's empowerment and to consider how it can be measured. A review of the literature revealed that women's empowerment is a complex phenomenon. The following sections briefly discuss the definition of empowerment for women, the importance of women's empowerment in developing countries, the key issues for measuring empowerment, and the role of ICT on empowerment in Bangladesh.

1.1.1. What is empowerment?

Empowerment refers to power. Empowerment is the ability of people to control their own destinies and is impacted by other people in their society (Mason, 2005). There is

no universal definition of empowerment as it depends on such elements as socio-cultural, geographical, environmental, political, and economic factors (Narayan-Parker, 2005). Kabeer (1999, p. 437), for example, offers a definition of empowerment as:

> the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them

while according to the World Bank (2008):

> empowerment is the process of increasing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes.

According to Kabeer (1999), there are two key elements of empowerment: *process* and *agency*. *Process* is the ability to define one's goals and act upon them. *Agency* is related to *process*, and is more than observable action. It refers to the motivation and purpose that individuals bring to their activity, their sense of activity or 'the power within', and can be exercised by individuals as well as collectively by a group (Kabeer, 1999). Based on these and other definitions, the definition of empowerment that has been adopted for this research is:

> empowerment is a process that increases access to power and resources, which changes people's lives over time through their active participation in that process as an agent.

In this thesis, the effect of ICT intervention in women's empowerment was investigated as a *process* and active involvement of women in ICT as an *agency*. These issues were taken into consideration in developing the research methodology described in Chapter 4.

1.1.2. Why do women need to be empowered?

Women represent half of the total population in the world yet 70% of the world's disadvantaged people are women (Actionaid, 2015). Women are often the poorest of the poor because of the extreme forms of discrimination that persist in many parts of

the world (Obayelu and Ogunlade, 2006). Obayelu and Ogunlade (2006) also stated that women in the world are affected by poverty in different ways, depending on their age, race, ethnicity, linguistic background, ability, citizenship and sexual orientation. These disadvantaged women live in developing countries in Africa, Asia, Latin America and the Middle East (Adera, Waema and May, 2014; Datta and Kornberg, 2002).

As noted previously, despite active participation in taking care of family members, livestock and agricultural work (food production, preservation and processing), household work, and health care, women have limited access to resources and economy as, traditionally, men utilize and dominate their society (Deshmukh-Ranadive, 2005; Morrell and Sterling, 2006). The World Bank (2008) claims that empowering women would improve their quality of life and be instrumental in eradicating poverty in developing countries. Through empowerment, women can enhance their assets and capabilities to influence their family, community and gain the same advantages as men (Malhotra, Schuler and Boender, 2005).

1.1.3. How can women's empowerment be measured?

The empowerment dynamic is a complex and multidimensional process linked to three main environments: micro, meso and macro (Narayan-Parker, 2005). The *micro* environment focusses on the domestic or household level; the *meso* environment deals with the community or village; and the *macro* environment focusses on the regional, national or global level. The micro environment is central to gender-based discrimination and the goal of empowerment (Narayan-Parker, 2005) due to power relations in the family hierarchy. It is also affected by the meso and macro environments. A connection from micro to meso to macro is needed to ascertain the

impact of intervention on empowerment (Mason, 2005). Though domestic power dynamics were one of the main focuses of this study, this research measured women's empowerment at the individual level where reflections of all three environments (micro, meso and macro) were revealed.

Domestic power dynamics can be analysed by an individual's access to and control of different *physical* (geographic) and *non-physical* spaces. Non-physical spaces are further categorised as *non-mental* (economic, sociocultural and political) and *mental*[1] spaces. Expansion in this space leads to a feeling of strength and change in perception, which is a prerequisite of women's empowerment. Transitions in physical and non-physical spaces are closely connected to changes in micro, meso and macro environments, both backward and forward (Deshmukh-Ranadive, 2005). For measuring empowerment, environments and indicators of women's empowerment in the household, community and broader arena should focus on these non-physical (economic, socio-cultural, political and mental) spaces (Chen, 1997). The environments and their connection to women's physical and non-physical spaces are described in more detail in Section 2.7.1.

However, many authors have focused on women's improved economic condition (a non-physical space) as being essential for their empowerment (Carr, Chen and Jhabvala, 1996; Hashemi, Schuler and Riley, 1996; Jalali, 2006; Rabayah, 2010a). Women's empowerment is related to economic benefit. For example, the micro-credit loan scheme[2] is aimed at helping women in rural Bangladesh to invest in social businesses and thus empower them through economic gain (Banu, 2001). It was

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[1] Mental space is the feeling of freedom that enables a person to think and act. It is a person's inner power (Deshmukh-Ranadive, 2006).
[2] The micro-credit loan scheme to empower rural people is a sustainable development program through which beneficiaries are given small loans. People invest the loan in social businesses, farming, fisheries or poultry, and repay the loans in regular instalments to achieve economic stability and security in their lives (Kabeer, 2001).

revealed by Kabeer (2001), though, that the loans provided to these women were mostly used by their husbands and sons, which resulted in women not achieving economic empowerment. From the definition developed for this thesis, it is seen that empowerment consists of two important elements: the idea of *process* or change from a condition of disempowerment to empowerment; and the concept of *agency* which implies that women must be agents rather than only recipient of any change (Malhotra et al., 2005). Therefore, it is important to clarify through this research if ICT can help women as a complementary process in improving their knowledge and awareness to achieve economic empowerment. For this to occur, women need to be actively involved in ICT projects.

One of the main challenges in measuring power transitions or processes is the enormous problems in regards to the availability of adequate data across time. According to Malhotra et al. (2005), even if longitudinal data were available, it would be difficult to relate these to empowerment, as the behavioural or normative indicators are constantly evolving. Despite these concerns, longitudinal data were collected to investigate and further understand women's empowerment as a process because the impact of ICT intervention on village women is an evolutionary process, not a revolutionary change. So, conceptualization and measurement of women's empowerment must be considered through multi-dimensional aspects because empowerment is not the end result; it is the beginning of a continuous process (Mahmud, Shah and Becker, 2012; Narayan-Parker, 2005).

1.1.4. What is the role of ICT in rural women's empowerment in Bangladesh?

There is little published literature about Bangladeshi women's empowerment through ICT intervention. In Bangladesh, a study by Ahmed, Islam, Hasan, and Rahman (2010a) concluded that women's involvement in ICT industries and ICT-based GOs and NGOs changed the behavioural aspect of women's lifestyles and thereby affected that society as a whole. The authors introduced a protocol for the development of a women's informatisation indicator, which referred to using, exchanging, producing information and knowledge, and utilizing ICT to advance women's status and their quality of life. However, the study did not focus on the behavioural aspects of *rural women* for such ICT interventions.

In an interpretive study on the impact of ICT intervention on development in Bangladesh, Ashraf, Hanisch, and Swatman (2008) discovered that, although rural people were enthusiastic about ICT intervention, there were some negative impacts on the culture of the village. For example, rural women going outside the home and spending time in the ICT centres was not well accepted by males and elders in the village. Despite these misgivings, the study showed there were positive prospects for empowerment through ICT use by rural women.

Alam (2006) claimed that, although some ICT interventions in Bangladesh did not directly benefit rural women economically, the village information system helped to provide required livelihood information, which eventually changed their perceptions and expanded their self-esteem as human beings. The information provided through ICT tools helped women's awareness development in various social aspects such as human rights, politics, and legal issues. Information through ICT also increased their

knowledge regarding children's health and education, farming, and market price. Therefore, this research also investigated whether ICT empowers rural women by providing information and subsequently expanding their mental space through awareness development.

1.2. Research Objectives

The aim of this research was to focus on investigating the role of ICT in women's empowerment in Bangladesh and to design a model for measuring empowerment in the context of rural Bangladesh.

To address the aim, the specific objectives of this research were to:

- find the potential of ICT for women's empowerment;

- implement a model for measuring empowerment and identify any change among rural women due to intervention activities; and

- identify the information needs and the factors affecting women's empowerment.

These objectives were addressed through the research questions described in the next section.

1.3. Research Questions

To address the objectives listed above, the following research questions were investigated to understand the impact of ICT intervention on women's empowerment in rural areas of Bangladesh:

- *What is the role of ICT in women empowerment?*

This question investigated the use of ICT by rural women in Bangladesh and investigated the process of empowerment in terms of changes in material, cognitive, perceptual, relational and technological dimensions (Section 1.4) at the individual level where the reflection of all environments (macro, meso and micro) and all spaces (physical and non-physical) could be found.

- *What critical factors are needed to be considered while measuring rural women's empowerment through ICT interventions?*

The factors affecting women's empowerment in different contexts and scenarios were investigated. These factors are summarized to assist in the development of future ICT projects that aim to promote rural women's empowerment in Bangladesh.

- *What information is required for rural women to empower themself?*

The information needs of rural women are different from women in cities and towns. This question investigated the specific information needs of rural women in order to empower them and how they can acquire that information.

1.4. Research Approach

This study was undertaken to investigate whether ICT has the potential to empower rural women in Bangladesh by changing their lives in five broad dimensions. The five dimensional changes considered in this thesis were: *material* (through which changes in economic life, access to resources, level of income, satisfaction of basic needs or earning capacity are experienced); *cognitive* (through which changes in knowledge, skills and awareness are experienced); *perceptual* (through which changes in self-esteem, self-confidence or will power are experienced); *relational* (through which changes in decision-making within the family, participating in non-family activities,

mobility, dependence on others and bargaining power are experienced); and *technological* (through which women's attitude towards technology, acceptability, usability and improved knowledge, ICT skills and perception change) (Chen, 1997; Lennie, 2002).

For this research, considering the socio-cultural context of Bangladesh, a qualitative approach to data collection and analysis was required. This approach was guided by the concept of complementarity that reflects the intention to use the results from one part of the study to inform further investigation resulting in a more accurate interpretation of the results. The data collection was carried out using a semi-structured questionnaire based on the WEM-ICT model. The *Women Empowerment Measurement through ICT* (WEM-ICT) model (Section 4.2) for measuring women's empowerment as a result of ICT intervention in the context of rural Bangladesh was developed for this thesis based on the frameworks used by Chen (1997) and Lennie (2002). According to Chen (1997), any intervention may empower individual women through making changes in their lives in the material, cognitive, perceptive and relational dimensions. Lennie (2002) described the technological dimension as the fifth empowering change after women experienced ICT intervention.

The data were collected over two time periods (2008 and 2010) from two villages (Boitpur and Srifoltala) where two ICT projects – D.Net and Amader Gram – worked with rural women. Based on the interests of the projects and their beneficiaries, a convenience sampling method of data collection was carried out. Eighty seven participants responded to the investigation in 2008 (Stage I) and 77 participants in 2010 (Stage II). Data collection was performed by face-to-face interviews with individual women in their homes or project offices (ICT centres). Interviews were recorded if participants consented. The data included demographic

information and the assessment of five dimensional changes in women. The participants included women who had experienced ICT intervention and women who had not.

The comparative analyses of data between the two categories of women (with and without ICT intervention) revealed changes in women's lives towards empowerment both positively and negatively. The differential outcomes encouraged further investigation in Stage II to determine the underlying factors affecting the outcomes. Comments from participants in response to open-ended questions provided examples and further interpretations of the results.

Several demographic characteristics were taken into consideration in measuring women's empowerment: education, age, marital status of women, purpose and length of ICT involvement. The results suggested that women experienced empowerment through ICT intervention if they actively participated in project activities and applied their skills, knowledge and experience in their lives. They could experience positive changes in all five dimensions which produced expansion in both physical (i.e. home environment, outside home, and village) and non-physical (i.e. economic, political, socio-cultural and mental) spaces. It was also revealed that there were several micro, meso and macro factors that both enhance and restrict women's empowerment through ICT in Bangladesh.

1.5. Significance of the Research

In spite of great steps in terms of socio-economic development, developing countries continue to lag behind developed nations in research on the impact of ICT. Whilst developing countries are embracing ICT for socio-economic development, mainstream information systems research remains focused on the issues related to ICT in

developed economies in North America and Europe (Roztocki and Weistroffer, 2008). Increasing the understanding of the opportunities and limitations of ICT, and how to promote its adoption and use in developing countries should be of vital interest to researchers and practitioners.

Since there are few studies on ICT for rural women's empowerment in Bangladesh, this research makes an important contribution to understanding the issues and provides scholars with information relating to the following:

- a resource about *transfer of knowledge and information* to women throughout villages, NGOs, GOs, and the country;

- *the development of a measurement model (WEM-ICT) of women's empowerment by using ICT tools in the context of Bangladesh,* which will be of benefit to researchers and policy makers in this area;

- *feedback about specific information needs* for rural women in Bangladesh to NGOs, GOs, and policy makers working on these issues and helping beneficiaries to change their mindset, or way of thinking, to obtain an improved outcome of ICT intervention; and

- *an understanding of the links* between women's empowerment and spaces, helping policy makers to identify why some interventions fail in spite of an increase in access to economic and political resources (Deshmukh-Ranadive, 2005).

This research has found that women's empowerment through ICT use is of a limited range and applies mostly to a *personal level*. The results vary mainly due to behavioural and cultural factors. The analyses and participants' comments revealed that the impact level of ICT intervention is different for individual women due to

education, economic condition of the family or the village, depth of involvement in the ICT projects, age and marital status. Overall, the results indicate some positive as well as negative outcomes. For example, though positive changes occurred in women's personal lives in terms of economic gain, their decision making power in the family had not improved. Furthermore, their awareness of education, health and communication issues improved, but their awareness of legal and political issues remained unchanged. In spite of women's enthusiasm for new technologies, they were not confident about using them.

1.6. Outline of the Thesis
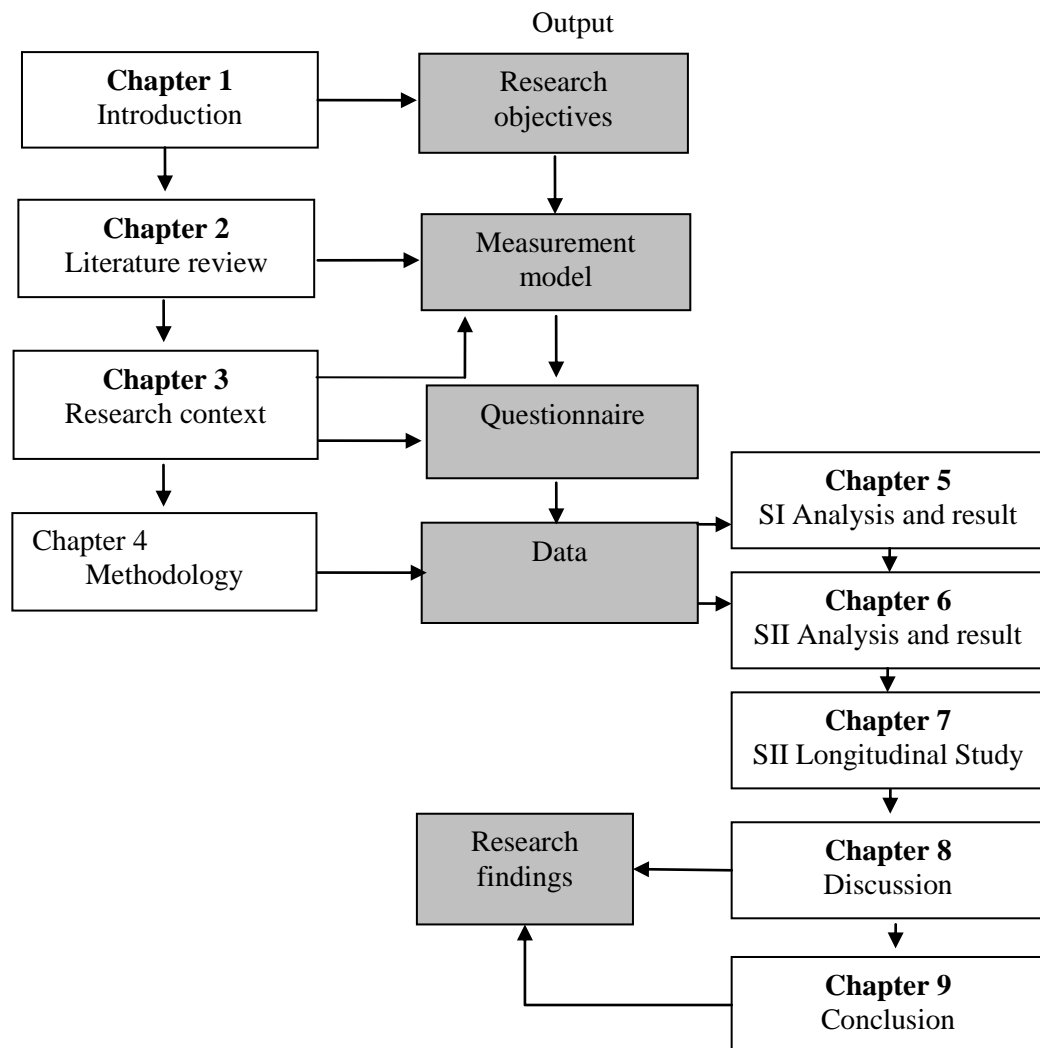
Figure 1.1 Relationships between thesis chapters.

The relationships between chapters are depicted in Figure 1.1.

Chapter 2 reviews relevant literature and research on women's empowerment, the potential of ICT for empowerment, ICT intervention in Bangladesh and other countries, and factors affecting empowerment and measuring women empowerment. Previous research on women's empowerment and ICT success stories are also detailed in this chapter.

Chapter 3 presents the details of the ICT case studies (D.Net and Amader Gram), and the context of the case study villages.

Chapter 4 discusses the research methodology along with research design, the development of the WEM-ICT model and the rationale for the instruments applied.

Chapter 5 presents the results of the first study (Stage I) with discussions and comments from the interviewees.

Chapter 6 presents the results of the second study (Stage II) with discussions and comments from the interviewees.

Chapter 7 presents the results of the Stage II longitudinal analysis and provides a comparison between the same groups of women after a two year gap between Stage I and Stage II to understand more clearly the impact and influence of ICT in their lives.

Chapter 8 discusses the results obtained in Chapters 5, 6 and 7 in terms of the themes and influencing factors contributing to such outcomes.

Chapter 9 concludes the work by discussing the findings in relation to three environments (micro, meso and macro), analysing strengths and limitations of the study, and suggesting further research directions.

1.7. Conclusion

This chapter provided an introductory overview of the problem statement, research background, research objectives and questions leading to research approach. The significance of this research and an overview of all chapters have been presented. Of significance in this chapter is the identification of the limited impact of economic gain in women's mental spaces. The next chapter reviews the literature related to the issues and themes of this research.

CHAPTER 2

LITERATURE REVIEW

Since the role of ICT in women's empowerment is the main focus of this thesis, the literature related to these concepts needs to be explored. The term 'empowerment' draws on and is influenced by many factors in human society. These also need to be explored. Women's position or status in the community and how culture affects this position are important issues in establishing a context for this study. How all these factors in turn affect women's empowerment process needs to be established.

The first sections of this literature review focus on the concepts that underpin women's empowerment. These include power, knowledge and gender. Subsequently, the contexts of women's empowerment are reviewed. These contexts address the power dynamics in the domestic environment, culture, and the context of village life in Bangladesh. Once these contexts have been clarified, women's empowerment and reasons for empowerment are discussed. ICT factors that influence the empowerment process are also described so that the potential for women's empowerment in Bangladesh can subsequently be considered. Finally, methodological issues regarding women's empowerment measurement in the context of rural Bangladesh are described.

2.1. Power

Empowerment is related to the word 'power'. Some scholars have provided definitions of this concept. According to Russell (1986, p. 19):

> Power may be defined as the production of intended effects. It is thus a quantitative concept: given two men[3] with similar desires, if one achieves all the desires that the other achieves, and also others, he has more power than the other.

While there is no exact means of comparing the power of two persons in the situation discussed by Russell, it can be said generally that A has more power than B if A achieves many intended effects and B achieves only a few. Russell also said,

> An individual may be influenced: (a) by direct physical power over his body, e.g. when he is imprisoned or killed; (b) by rewards and punishments as inducements, e.g. in giving or withholding employment; (c) by influence on opinion, i.e. propaganda in its broadest sense (Russell, 1975, p. 25).

But power does not always produce 'effects'; it is rather the capacity of a person which produces them (Lukes, 1986). For example, a person might have resources, such as wealth, skills, or organisational background, which give power even if they are not deployed. From the definition of power, 'effects' must be intended. Access to resources by more people usually enables more intended effects.

Weber's (1986) view of power is similar to Russell's, in stressing the element of intention or will, but not in stressing the capacity to realise power. Weber (1978, p. 53) defined power as

> the probability that an actor in a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests.

Weber also defined power as

> the chance of a man or a number of men to realize their own will, even against the resistance of others who are participating in the action (Weber, 1978, p. 926).

Here, power is seen in terms of resistance which, in turn, is connected to domination; domination is one of the important social actions that comes from economic power and authority (Weber, 1986). A similar approach is suggested by Dahl (1986), where power amounts to the control of behaviour. His idea of power is that A has power over B to the extent that he can get B to do something that B would

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[3] Here the word 'men' is used to denote persons. When Russell wrote this definition, this was common usage.

not otherwise do (Dahl, 2007). However, Weber's and Dahl's approaches to the idea of 'power over' have been rejected by other researchers as their focus was seen as misconceived or narrow (Foucault, 1982; Parsons, 1986; Sadan, 2004). This alternative perspective is discussed briefly below.

Parsons (1963) explored one aspect of the total phenomenon of power in the context of complex social systems. He described power as a system resource, a generalised facility or resource in society. Through the agreement of members of a society, power is given to legitimate leadership positions to enable the achievement of collective goals. Sadan (2004) also stated a similar view:

> ... power is never the property of individual; it belongs to a group and remains in existence only so long as the group keeps together. When we say of somebody that he is 'in power' we actually refer to his being empowered by a certain number of people to act in their name.

This proposes different definitions of power. However, a consistent theme is that power implies an inequitable social relationship that involves people individually or in a group (Deshmukh-Ranadive, 2006). Therefore, power changes from one form to another and has the ability and potential to influence the quality of life of individuals as well as a group of people (Lukes, 1986).

As was discussed by Foucault (1982; Foucault and Gordon, 1980), power issues and identity (or subjectivity) are important elements of human society. First, 'being a subject' may refer to being "tied to one's own identity by conscience or self-knowledge" or second, being subjected to someone else's control (Foucault, 1982, p. 212). So, people in a society or state need to understand the connection between being a subject and being subjected as a consequence of the power of society or the state.

Another aspect of power reflects the three dimensions on which it operates . The one-dimensional view focuses on decision making based on a quantitative

approach to information – yes or no. A decision is made on one set of information which prevails over any other set. Such power is often lodged in formal institutions such as the police, the military, psychiatric hospitals, or child welfare agencies. Parents of young children have such power over many aspects of their children's everyday lives.

The two-dimensional view focuses on decision making and sets the agenda; that is, how information is controlled. As an example, instead of just deciding yes or no, if a person has more information, then this person can have more options to decide on. Power of this kind operates through formal institutions and informal social processes (Magnusson and Marecek, 2012). State censorship is an example of this two-dimensional power. The ability to set the agenda is to determine what can be discussed in public and private and what ways of public discussions are permissible.

Finally, the three-dimensional view focuses on the previous two and how power shapes our perceptions and thoughts. Controlling information can reinforce dominant perceptions and assumptions (Dahl, 1986). This is ideological power. Typically, ideologies are invisible; people are unaware of them. Often these ideologies are experienced as 'the ways things are'. Sometimes ideological power can lead people to embrace stances which are detrimental to their well-being or position in the society (Magnusson and Marecek, 2012).

Therefore, access to information is an integral part of decision making power as well as for changing the behaviour of people as human beings (Schirato, Danaher and Webb, 2012). Information is essential for the wealth of a nation's state, for its freedom, and the growth of a society. It can be considered as capital; it can be guarded and controlled. Information can emancipate some groups and can also cause inequalities.

It can be seen from the dimensional view of power, that there is a deep relationship with knowledge. Foucault and Gordon said:

> I did come to what I had basically been looking for: the relations that are possible between power and knowledge. Once knowledge can be analysed in terms of region, domain, implantation, displacement, transposition, one is able to capture the process by which knowledge functions as a form of power and disseminates the effects of power (Foucault and Gordon, 1980, p. 69).

Therefore, power is connected to knowledge as well as information.

The following sections discuss the relationship between knowledge and power. Since power and knowledge are also largely influenced by culture and gender (Dewey, 2008; Foucault and Gordon, 1980; Francis and Skelton, 2006b; Haferkamp, 1989; Magnusson and Marecek, 2012; Nussbaum, 2000), how these influence knowledge and power (thereby empowerment of women) is also explored in later sections.

2.2. Knowledge

Empowerment is connected to knowledge as decision making power depends on possession of the knowledge and the ability to make most appropriate decisions (Whitehead, 2002). Weiler (2001) explained this relationship:

> power legitimates both knowledge and existing modes of knowledge production, on the other hand, knowledge is used to legitimate existing arrangements for the exercise of power (Weiler, 2001, p. 34).

Knowledge is produced and transformed; political and economic power dynamics lie behind this transformation. As discussed by Foucault, disciplinary power works through knowledge which allows individuals to feel self-worth, pride and pleasure (Foucault, 1982; Foucault and Gordon, 1980). Therefore, in the context of women's empowerment, information or knowledge is a prerequisite (Obayelu and Ogunlade, 2006).

According to the Oxford Dictionary (2012), knowledge includes acts, information, and skills acquired through experience or education; the theoretical or

practical understanding of a subject; or awareness or familiarity gained by experience of a fact or situation. In a study about social knowledge and information technology, Ruzic (2011) explained knowledge as synonymous with the terms information, learning, erudition, lore, and scholarship. These nouns refer to what is known through study or experience. He also stated that knowledge is a macro phenomenon, like an entire set of connections (e.g. connections of cultural, political, social or national issues); not a micro phenomenon, such as a single connection.

Although philosophers may differ on how many different types of knowledge there are, they agree that there are different types. Table 2.1 is one schemata based on Pecorino (2000).

Table 2.1 Types of knowledge (adapted from Pecorino, 2000).

Knowledge	Definition	Example
Logical	The result of the understanding of the relationship of ideas to one another. The rules or laws of logic that permit further statements of ideas consistent with the rules and the ideas already accepted.	If A is more than B, and B is more than C, then A is more than C.
Semantic	The result of learning the meaning of words and knowledge of definitions.	Bachelors are unmarried males and people acknowledge this. Such definitions are set in dictionaries.
Systemic	The knowledge of Mathematics and Geometry, which is the result of learning a system of words, or symbols and how they relate to one another and the rules of operating in that system. Any claims made that are consistent with those definitions and rules.	There are three sides to a triangle and the sum of the angles is 180 degrees.
Empirical	The knowledge that comes through our senses. Scientific knowledge is a result of the practice of the method: observation, making a hypothesis, refinement of a hypothesis, deduction of test for a hypothesis, testing and experimentation, confirmation or falsification of a hypothesis.	Scientific research on testing a hypothesis is an example of such knowledge.

Research and theory in cognitive science have also shown that four major categories of knowledge are based on a taxonomy of learning outcomes (Anderson et al., 2000) (implying that these theories comes from education): (i) factual, (ii) conceptual, (iii) procedural, and (iv) meta-cognitive. The first two — factual and conceptual — constitute knowledge of 'what', while the latter two — procedural and meta-cognitive — constitute knowledge of 'how to'. Similarly, factual and procedural knowledge constitute low level knowledge whereas conceptual and meta-cognitive knowledge constitute high level knowledge. Table 2.2 shows the schemata for knowledge based on Anderson and Krathwohl (2001, p. 29). These researchers used examples of students as their research was in the area of education systems.

Table 2.2 Types of knowledge (adapted from Anderson and Krathwohl, 2001).

Knowledge	Definition	Example
Factual	The basic elements students must know to be acquainted with a discipline or solve problems in it. It includes knowledge of terminology and specific facts.	Knowledge of terminology, technical vocabulary, and knowledge of specific details and elements.
Conceptual	The interrelations among the basic elements within a larger structure that enable them to function together. It includes knowledge of classifications, categories, principles, generalisations and models.	Students may learn principles such as 'add s to make a noun plural' from a word game or students may form a mental model of how a word processor works. Newton's laws of motion, knowledge of theories, models, and structures, and the quantum theory.
Procedural	How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods. It includes not only knowing procedures, techniques, and methods, but also the criteria for using them.	Students may learn how to add signed numbers within a math game, or may learn the steps for logging onto a computer system as an algorithm. Skills used in painting with water colours, and algorithm for finding the greatest common divisor of two numbers.
Meta-cognitive	Knowledge of cognition in general as well as awareness and knowledge of one's own cognition. It includes knowing strategies for how to accomplish tasks, knowing about the demands (cognitive demand) of various tasks, and knowing one's capabilities (self-knowledge) for accomplishing various tasks.	Writing essays is a personal strength, awareness of one's own level of knowledge and skills.

Weiler (2001) identified new domains of knowledge – normative, aesthetic and spiritual – and draws our attention to new discourses regarding indigenous knowledge, ways of knowing specific to gender, and knowledge that arises from democratic practice. "Three new ways of knowing [have to reflect particularly] the notion of development, the role of gender and the meaning of democracy" (Weiler, 2001, p. 37). Both knowledge aspects relating to development of gender (i.e. awareness and empowerment) are important in the context of this study.

As discussed earlier, Foucault (1980) put forward an influential theory of power where he integrated the relationship of power with knowledge, and the identity of the human being. This draws on Wechsler's (1950) idea that the maturity of a person is developed through the knowledge, education, learning, awareness and experience in that person's life, which also regulate that life. According to Foucault's analytical concepts, state power and social power work to form self-knowledge. He argued that certain kinds of knowledge (but not the other kinds) about oneself are made available to individuals and made to seem necessary. This knowledge is intrinsic to the ability of modern states to govern their subjects without any direct physical coercion (Foucault, 1982). In this view, power exercised by the state is not about prohibiting certain behaviours but about enabling and guiding certain desires and forms of conduct through knowledge.

In addition, normalisation and disciplinary power work through knowledge. For instance, in a particular society, only certain kinds of knowledge about what it means to be a human being are made available. This knowledge seems sufficient, right, true, and morally correct (Magnusson and Marecek, 2012). Its exact content varies over time and between cultures. People's knowledge of the world is determined by their exchange of concepts and experience, and is laden with cultural, moral,

political and emotional meanings (Schirato et al., 2012). When people take up such knowledge, it seems to be natural to them to want to align themselves with its prescription, which is the distinctive features of a self-regulating modern society (Foucault and Gordon, 1980). Knowledge is the outcome of negotiation on both interpersonal and cultural levels.

Knowledge, therefore, is based on context and culture (Hayhoe and Pan, 2001). Knowledge across culture arises in the process of knowledge transfer, reflecting different levels of political and economic power and often analysed in terms of domination and dependency (Friedman, 2000b). With the increasing pace of globalisation, knowledge transfer has accelerated and become multi-directional, yet there are still integrated centres of political and economic power (Friedman, 2000a). In a study by Peterson (2001), it was shown that knowledge transfer in a development process should proceed from international aid policies, down through the layers of national (macro), organisational (meso) and individual (micro) environments. Peterson focused on individual people and how they bring different life experiences, attitudes and cultural sensitivities to the knowledge transfer process. Since knowledge and power influenced by gender are particularly important for sustainable development (Mansell and Wehn, 1998), the following sections describe the relationship of gender with power.

2.3. Gender

Gender is defined by FAO (2004) as the relations between men and women, both perceptual and material. From childhood to adulthood everyone bears in mind that they are in a gender category and have to perform, for instance, certain duties and responsibilities (Francis, 1998). People do not master all the abilities; even the abilities

that may be culturally appropriate for their gender category (Magnusson and Marecek, 2012). As children, women usually are pushed to master 'feminine' skills even if they do not feel those skills belong to them. Many men also experience the same. Gender is not determined biologically; it is constructed socially and culturally through numerous sources, such as the media portraying women playing with dolls and wearing pink; men typically having to be more masculine. Phillips (2010) also revealed an inevitable relationship between culture and gender, and that the respect for cultural diversity conflicts with gender equality.

Culture influences gender discrimination and is a barrier to understanding the potential or capability of women (Sen, 2004). Although gender is often misunderstood as being the promotion of women, from the FAO (2004) definition, it is seen that gender issues focus on the relationship between men and women, their roles, access to and control over resources, division of labour, interests, and needs. The concept of gender is vital because it is applied to social analysis to reveal how generally women's subordination (or men's domination) is culturally constructed (UNESCO, 2005).

Therefore, gender relations are the ways in which a culture or society defines rights and responsibilities, as well as the identities of men and women in relation to one another (Bravo-Baumann, 2000; Francis, 1998). Gender roles, as the 'social definition' of women and men, vary among different societies, cultures, classes and ages, and during different periods in history. Systems of social differentiation, such as political status, class, ethnicity, physical and mental disability, and age, modify gender roles. Gender-specific roles and responsibilities are often conditioned by household structure, access to resources, specific impacts of the global economy, national politics and other locally relevant factors such as ecological conditions (FAO, 1997; Tinker, 1990).

Gender relations affect household security, family well-being, planning, production and many other aspects of human life (Bravo-Baumann, 2000). It has been argued by Radtke and Stam (1994) that gender difference is structured in three ways: by division of labour; by power; and by emotional attachments. All three structures constrain social practices related to gender. Other authors (Place, 2010; Whitehead, 2002) identified a core in the power structure of gender where legitimate power or authority is connected to masculinity and the periphery is where power is contested. Gender is constructed through the practice of power, not only at the personal (micro) level of everyday social interaction but also at the macro environment where social institutions control and regulate the practice of gender. Therefore, Radtke and Stam (1994) consider power relations to be gender relations.

Gender inequality refers to disparity between individuals due to gender, whether empirically grounded or socially constructed (Ringen, 1994). Across the world, gender is a prime category for distinguishing among people with power and ranking them. Power, privilege, and resources tend to be inequitably distributed among men and women, whether in workplaces, religious institutions or in families (Halford and Leonard, 2001; McKie, Bowlby and Gregory, 1999). Overall, men have more power than women; although, of course, it is not true for all men (Magnusson and Marecek, 2012). Historically it is seen that the stereotypical male role emphasises egocentric power where he is taught to assume leadership and exert domination. On the other hand, the stereotypical female role emphasises communal power as she is taught to place the needs of others over her own and exercise collaboration (Dewey, 2008). Differential socialisation leads men and women to develop different power styles - men more concerned with competition and winning, and women more concerned with relationships and minimising losses (Rogers, 1984; Sanday, 1981).

Gender is thus tied to power. The groups or individuals who have access to power depend on power relations within the society (Deshmukh-Ranadive, 2006).

In much of the world, especially in developing countries, there is discrimination against women in terms of literacy, professional or technical education, physical violence, sexual abuse, health and nourishment (Francis and Skelton, 2006b; Parpart, Rai and Staudt, 2002). Entering the workforce, women face great obstacles, including intimidation from family and/or spouse, gender discrimination in hiring and sexual harassment in the work place (Date-Bah, 1997). They are also burdened with the 'double day' of taxing employment and full responsibility of childcare and housework (Kljajevic, 2011) and have fewer opportunities than men to live free from fear and to enjoy life by cultivating their imaginative and cognitive faculties (Gaskell, 1992; Halford and Leonard, 2001; Rowley and Yukongdi, 2009).

In South Asian countries like Bangladesh, gender differences in power relations are far more invasive due to social constructs, culture and family power dynamics (Deshmukh-Ranadive, 2006; Thiara and Gill, 2010). The following section discusses domestic family power dynamics in South Asian countries including Bangladesh.

2.4. The Domestic Environment

Power, as observed in all dimensions of human existence, is present in the family. Most of the research on family power has focused on dynamics between spouses (Deshmukh-Ranadive, 2005; Margolis, 1989; McDonald, 1980). Other family relationships, such as those between parents and adult children, have subsequently been studied (Heath and Ciscel, 1988; Heath, Ciscel and Sharp, 1998; Pyke, 1999). In the South Asian 'joint family' environment (defined as the extended family consisting

of nuclear family and other family members such as grandparents, uncles, aunts and cousins), relationships between all family members with regards to exercising power needs to be explored to assist in determining women's position at the national level (macro environment) (Cohn and Singer, 1968).

The dynamics of power within the domestic unit (the micro environment) are structured by hierarchies that integrate gender differences and power relations within the unit (Deshmukh-Ranadive, 2006; Jennings and Waller, 1990). The balance of power in a family is controlled by the member who can offer the greatest resources. The value of any given resource in the relationship's exchanges depends upon: (i) the amount of resources; (ii) the availability of resources from elsewhere, eliminating complete dependence on the partner or the resource; and (iii) the degree to which resources are necessary for family viability (Jennings and Waller, 1990; Panda and Agarwal, 2005). These resources are influenced by a person's rank within the domestic unit.

Margolis (1989) found that in the nuclear family (defined as the family consisting of parents and their children) in American society (Figure 2.1), there is a set of ranks: the top rank is adults (usually father); the middle or intermediate rank consists of a service position where adults (usually mother) provide services for household maintenance to the higher and lower ranks; whilst the lowest rank comprises the immature and incapacitated members including children and ill family members.

Modifying Margolis' (1989) formulation of the American family, Deshmukh-Ranadive (2006) analysed a different kind of hierarchy for the South Asian extended family (Figure 2.2). In South Asian countries, especially in rural areas, people live in an extended family which encompasses several nuclear families. Therefore, the extended

family power dynamics differ from the nuclear family. The father, as the head of the family, is still placed at the top rank. This position controls decision making, issues commands and trains subordinates. The intermediate rank consists of service positions, training positions and service-cum-training positions. The service position is initially occupied by the mother, who is economically dependent. She bears, nurtures and protects children, who in turn obey her and give her affection.

```
                    ┌─────────────────────────────┐
                    │          Top rank           │
                    │   Father (head of the family)│
                    └─────────────────────────────┘
      Obedience            ↑          │   Commands
      Defence                         │   Training
      Service                         │   Protection
      Honour                          │   Provision
                                      ↓   Rewards
                                          Disbursement
                    ┌─────────────────────────────┐
                    │      Intermediate rank      │
                    │   Mother (service position) │
                    └─────────────────────────────┘
      Obedience            ↑          │   Nurture
      Affection                       │   Reproductive services
                                      │   Protection
                                      ↓   Nursing
                    ┌─────────────────────────────┐
                    │         Bottom rank         │
                    │          Children           │
                    │  Ill or incapacitated persons│
                    └─────────────────────────────┘
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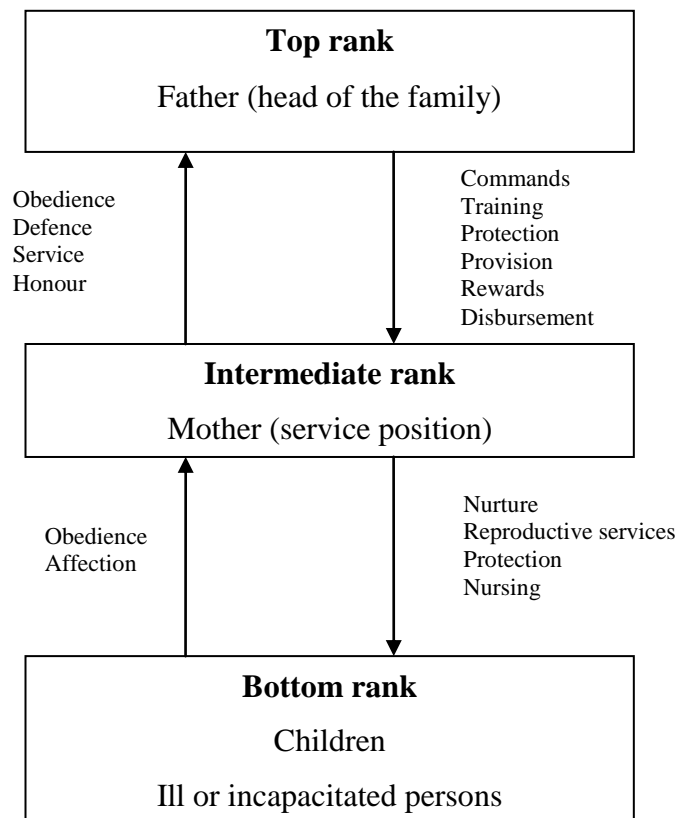
Figure 2.1 Hierarchical placement within a nuclear family (Margolis, 1989).

Service positions also offer service to the top rank which is a different service from that to the children. There are additional people (usually older daughter-in-laws, widows, divorced daughters, father's sisters and servants) who obey the top rank and also provide services. The training position prepares individuals (e.g. elder son) for promotion to the highest rank in the future. As the service positions are designed for

household maintenance and service to the higher and lower ranks, adults in those positions are barred from the top ranks by definition. The lowest rank comprises the immature children and old or ill family members (Chowdhury, 1995; Deshmukh-Ranadive, 2005; Hashemi et al., 1996; Heath and Ciscel, 1988; Narayan-Parker, 2005).

Top rank

Father (head of the family)

Obedience
Defence
Service
Honour

Commands
Training
Protection
Provision
Rewards

Intermediate rank

Training position

Training/service position

Service position

Elder adult son
Other adult sons

Adult daughters
New daughters-in-law

Mother
Older daughters-in-law
Widows
Divorced
Servants

Obedience
Affection

Nurture
Reproductive services
Protection
Nursing

Bottom rank

Children
Ill or incapacitated persons
Old persons
Guests

Figure 2.2 Hierarchical placement within an extended family (adapted from Deshmukh-Ranadive, 2005).

Therefore, whatever the family type, whether nuclear or extended people in the highest rank control decision making, distribution of material resources and admission

to all positions in the hierarchy. They are obliged to protect everyone in the family. They issue commands to those in the lower ranks and receive protection and service in return. Margolis suggested that the extent and limit of an individual's power are defined by his or her position within the hierarchy (Deshmukh-Ranadive, 2006; Margolis, 1989; Palmer, 2005).

However, within the domestic unit in the South Asian extended family, there exists another 'separate' hierarchy of women (Figure 2.3), consisting of three tiers (Deshmukh-Ranadive, 2006); the world of women functions separately from that of men. In the intermediate rank in the extended family, the service and training/service positions consist of women of different age groups. The mother usually occupies the top rank. The intermediate rank is occupied by daughters-in-law, un-married older daughters, husband's sisters, widows and servants. In this rank, older daughters and daughters-in-law are trained to prepare them for the future top rank. Usually the elder daughter-in-law moves to the top position after the death of her mother-in-law or when the mother-in-law is ill or widowed. The bottom rank is occupied by same groups of people as in the family hierarchy and includes guests and married daughters who come to visit the natal home.

This sub-ranking among women is mainly governed by age and authority, and there is scope for violence (Goonesekere, 2004). Mothers-in-law usually treat young vulnerable daughters-in-law badly in the early years when they come into the family, because of their inexperience in doing household chores and for not bringing enough dowry from the natal home (Francis and Skelton, 2006b). Within this micro-dynamics, there is also movement in rank with respect to children. Women who give birth to male children are usually well treated and have a higher status than those who do not (Deshmukh-Ranadive, 2006; Schuler and Hashemi, 1994; Sultana, 2010).

Within the family, relationships are based on dependencies, with members depending upon each other for the fulfilment of needs, both physical and non-physical. There exists an inherent vulnerability of women due to this dependency (Jennings and Waller, 1990; Kumar, Gupta and Abraham, 2002). This vulnerability can be asymmetrical or mutual (Okin, 1989). According to the philosopher Goodin (1985), it is a moral obligation of a person to bear responsibility for protecting those who are vulnerable and dependent. Vulnerable persons should not be exploited, they should be protected. Parents are supposed to protect and provide for their children; adult children are supposed to protect their older parents; the sick have to be cared for by the able-bodied; and so on. These are examples of asymmetrical vulnerability (Turner, 2006). For South Asian countries, the relationship between husband and wife is an example of mutual vulnerability where the husband supports the family by providing food and shelter through paid work and, in return, he is given care, love and trust from his wife through her unpaid work and duties within the family.

Allocation of resources within the domestic unit is embedded within the allocation of rights, needs and duties (Deshmukh-Ranadive, 2005). Rights and needs are intimately related. Women and girls may have a right to pooled resources within the household, but their ability to exercise those rights is likely to be determined by various cultural and contextual evaluations of need. For instance, among extended families in South Asian countries like Bangladesh, especially in rural areas, women are in charge of family stocks of grain, but the allocation of food among children is influenced by cultural beliefs that boys need more and better food than girls (Bhushan, 1994; Inman, 2006; Quah, 2009).

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                        ┌─────────────────────────────────────┐
                        │              Top rank               │
                        │   Mother (Wife of head of the family)│
                        └─────────────────────────────────────┘
                              ▲                    │
                       Obedience              Command
                       Defence                Training
                       Service                Protection
                       Honour                 Rewards
                                              Disbursement
                              │                    ▼
          ┌────────────────────────────────────────────────────────┐
          │                   Intermediate rank                    │
          │                                                        │
          │   Training-cum-service          Service position       │
          │                                                        │
          │   Daughters-in-law, daughters   Husband's sisters, widows,│
          │                                 divorced, and servants  │
          └────────────────────────────────────────────────────────┘
                              ▲                    │
                       Obedience              Nurture
                       Affection              Reproductive services
                                              Protection
                                              Nursing
                              │                    ▼
                    ┌─────────────────────────────────────┐
                    │            Bottom rank              │
                    │              Children               │
                    │      Ill or incapacitated persons   │
                    │            Old persons              │
                    │     Guests (e.g. married daughter)  │
                    └─────────────────────────────────────┘
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Figure 2.3 Women's hierarchy within an extended family
(based on Deshmukh-Ranadive, 2005).

Additional discrimination against female children has also been noted; as an example, girls are usually allowed to study only until the end of primary education, which is free.

Equally important is the allocation of duties and responsibilities. It is the social identity of the person that ascribes roles, and roles in turn entail duties according to socio-cultural norms. As mentioned previously, the duties of caring and rearing are ascribed to women, while men provide resources and income. In reality, however, men

do not always fulfil their duties as providers, while women do not always get their rights as wives, daughters, daughter-in-law, and mother. Within domestic units in South Asia, rights and duties are gender-biased (Ball and Wahedi, 2010; Deshmukh-Ranadive, 2006; Sultana, 2010). The pattern of the family is that men's rights are actual but duties are nominal, while women's rights are nominal but duties are actual.

However, fatherhood plays an important role in Bangladeshi society. Fathers have to be involved in their children's lives for any activities outside the home (Ball and Wahedi, 2010). These authors appreciated this fatherhood role for its positive outcome in the children's education, health care and social life.

The literature therefore indicates that women suffer from pervasive discrimination in their lives in terms of resource allocation and education opportunity due to power relations in the family. Feminist scholars have characterised the family or household as the site of women's oppression and locus of conflict of interest between men and women (Kumar et al., 2002). The following section discusses culture in relation to power and how culture affects women as a whole.

2.5. Culture

Culture is a complex and multidimensional network of local and global dimensions that intersect and influence one another in a person's life. According to Geertz (1973, p. 4), "Believing ... that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs". Similar views have been articulated: culture is an inseparable part of people's psychological functioning, not something that can be added onto an individual (Magnusson and Marecek, 2012); and a human without any culture or support of such web is not a complete human being (Bruner, 1990; Geertz, 1973).

Kluckhohn (1985) defined culture as the total way of life of people or the social legacy the individual acquires from his/her group; that is, a way of thinking, feeling, and believing, and an abstraction from behaviour. He said that culture is a storehouse of pooled learning; a set of standardised orientations to recurrent problems; learned behaviour; a mechanism for the normative regulation of behaviour; and a set of technique for adjusting both to the external environment and to other people. Further he stated culture as a precipitate of history. Geertz (1973, p. 89) also stated that culture is:

> an historically transmitted pattern of meaning embodied in symbols, a symbol of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate and develop their knowledge about and attitudes towards life.

Culture at its very heart is something intrinsically human and humans are intrinsically cultural beings. Culture makes experiences knowable in some ways. It is a set of meanings that humans themselves have created and continually re-create. Humans both perpetuate traditions and meanings, and remake and change them. Thus, culturally based interpretations of a certain action contribute greatly to the personal meaning of the action (Bruner, 1990; Geertz, 1973).

Bruner (2008) begins with the assumption about culture that seems easy to accept: to be a member of a particular culture means that one shares with the other members of that culture a number of ideas about what is ordinary and unexceptional. These ideas are supported by social institutions such as the family, the educational system and religion, as well as by language and other shared communications tools (Hofstede, 1980a).

Hofstede and his co-workers (Hofstede, 1983; Hofstede and Hofstede, 2005; Hofstede, Hofstede and Minkov, 2010) indicate that there is an intrinsic relationship

with culture's consequences in society. Through theoretical reasoning and statistical analysis, he identified these dimensions as differentiating national culture (Table 2.3).

Table 2.3 Hofstede's Dimensions of Culture (Hofstede et al., 2010).

Cultural Dimension	Definition
Power distance	The extent to which less powerful members of institutions and organisations expect and accept that power is distributed unequally.
Uncertainty avoidance	The extent to which the members of a culture feel threatened by ambiguous and unknown situations.
Individualism/ collectivism	Individualism refers to societies in which individuals are expected to look after themselves and their immediate family; collectivism refers to societies in which individuals integrate into strong, cohesive in-groups.
Masculinity/ femininity	A society is referred to as masculine when emotional gender roles are clearly distinct and feminine when emotional gender roles overlap.
Long-term/ short-term orientation	Long-term orientation refers to the fostering of virtues oriented toward future rewards; short-term orientation refers to the fostering the virtues related to the past and present.

According to Fishbein and Ajzen (2010), human behaviour is controlled by three kinds of beliefs which are reflected in their intention or action: normative beliefs - beliefs about the normative expectations of other people; control beliefs - beliefs about the presence of factors that may further or hinder performance of the behaviour; and attitudinal/behavioural beliefs - beliefs that produce a favourable or unfavourable attitude towards the behaviour. Previously, Ajzen (2002, p. 665) noted:

> … normative beliefs result in perceived social pressure or subjective norm; and control beliefs give rise to perceived behavioural control, the perceived ease or difficulty of performing the behaviour. In combination, attitude toward the behaviour, subjective norm, and perception of behavioural control lead to the formation of a behavioural intention. Finally, given a sufficient degree of actual control over the behaviour, people are expected to carry out their intentions when the opportunity arises.

Cultural processes can also be harnessed for positive social and economic transformation through their influence on aspirations, the coordination of collective action, and the ways in which power and agency work within a society (Rao and Walton, 2004). Therefore, in developing countries in South East Asia, culture has a huge impact on economic progress and political development. In effect, Rao and Walton (2004) indicate that development affects culture and culture affects development. However, cultural values do not define or constitute a culture, although they are thought to be a cultural barrier to economic progress (Huntington and Harrison, 2000).

It can therefore be concluded from the literature that culture has a great influence on society and human behaviour, and is interrelated with power, knowledge and gender relations. The cultural context of Bangladesh, which greatly influences women's empowerment, is the focus of this study so it needs to be unpacked next.

2.6. Cultural Context of Rural Bangladesh

In Bangladesh, culture has a strong influence on the issue of women's discrimination and empowerment. Females are targets of discrimination within the household from the very beginning of their lives due to socio-cultural, religious and ideological values and norms that prevail (Kabeer, 2005; Naved, 2000; Parveen, 2007). The subordination of women is a consequence of existing family power relations that determine their empowerment. The family power relations refer to kinship and marriage, gender segregation, inheritance patterns, and associated ideologies (Francis and Skelton, 2006a; Sultana, 2010).

Families in Bangladesh can be classified as: (a) joint, (b) extended, and (c) nuclear (Chowdhury, 1995). In joint families, three or more generations live together

in the same house and share common land and property. Such a family consists of brothers, their parents, unmarried sisters, wives and children. All the males are co-owners of the land and property. The family has common cooking areas, grain in a common storage, and so forth. The head of the joint family is the eldest male member or some other responsible male member of the family (Chandrasekar and Prakash, 2011; Chowdhury, 1995; Deshmukh-Ranadive, 2005; Francis and Skelton, 2006b).

The extended family is a group of nuclear families and related individuals from several generations who reside together in the same household, but their cooking is separate. In this type of family, the constituting household units do not own any common land and property - their land and property are separate, although they live in the same house. Each independent unit of the extended family is a nuclear family free from the control of the other units. Major decisions are, however, taken in consultation with the senior male sitting in the top position of family hierarchy (Chowdhury, 1995; Deshmukh-Ranadive, 2005; Francis and Skelton, 2006b).

A nuclear family consists of a husband and a wife with or without children. It may also be a family of a widowed mother living with her unmarried sons and daughters. In some cases, one or two other individuals, such as the male's father and mother, may reside with them. They live in one house and have common cooking. Usually a male, or the person who earns the living, is the head of a nuclear family. Nuclear families become extended through the addition of daughters-in-law and their children, and other relatives and generations (Banu, Farashuddin, Hossain and Akter, 2001; Chowdhury, 1995; Jennings and Waller, 1990).

The number of the nuclear family structures is growing, breaking the dominance of the traditional joint or extended family structures (Schuler, Hashemi, Riley and Akhter, 1996) in Bangladesh. Averaging the data between 2006 and 2011,

more than 55% of families are nuclear, approximately 25% are extended while 10% are joint families (Alam, 2006; Chandrasekar and Prakash, 2011)

While clear differences exist among different populations of Bangladesh (especially between urban and rural; low and high income; Muslim, Hindu, and Buddhist; and different ethnic groups), some general features remain which characterise family life. Strong family ties are the foundation of community life, and family commitment and mutual dependency overrule individuals' needs and goals (Chowdhury, 1995). Elders, especially males, play a dominant role. Monogamy is the norm, and a man's wife and children are considered his property. Children are highly valued by both men and women, especially male children.

In rural areas, it is strongly believed that a son should be educated because, unlike a daughter who after marriage serves another family, a son will need to support his aged parents. Due to such beliefs, most families prepare girls for marriage: they are taught to be obedient and quiet, to respect the leading roles played by their father or elder brothers, and to take on the responsibility for bearing and rearing children. These responsibilities not only preclude them from external jobs but also hinder them in attending school (Sultana, Jawan and Hashim, 2009). A son is always preferred over a daughter to attend school. In rural areas, a girl is less likely than her brother to attend even primary school (Zaman, 1999). In Bangladesh, the fact that an educated daughter means finding an educated groom also implies higher costs in relation to payment of dowry. Therefore, poverty as well as socio-cultural norms of discriminatory attitude is instrumental in access to equal opportunity in education.

While most Bangladeshi practice a moderate form of Islam, 'purdah' (the Bengali word for "curtain"), or the tradition of keeping women secluded, is a powerful cultural religious idea (Ball and Wahedi, 2010; Kabeer, 1994; White, 1992). Women

are excluded from many areas of social life, such as going to the market or any public gathering, and an unaccompanied woman cannot be away from the house at night even in the case of an emergency (Ball and Wahedi, 2010).

The cultural belief that the role of a woman is to be nothing more than a good wife and mother has a consequence for parents' incentives to invest in their daughters (White, 1992). Daughters are considered an economic liability due the dowry system as well as the high cost of a wedding. Once they are married, they become physically as well as psychologically isolated from their natal home, and are less likely to make any contribution to their natal family (D.Net, 2015).

Women are deprived of equal rights within the family as well as their basic dignity and human rights in the wider society (Kamal, 1995). In poor families where there is not enough food for everyone, the women and girls are most likely to go without a meal, to go without warm clothing during winter and to receive minimal health care and education (Schuler and Hashemi, 1994). From a very young age, about 6-7 years, girls learn domestic skills and begin to take on domestic duties, such as cooking, sewing, washing, cleaning, child-caring, as well as supplementing the household income with cottage crafts. It is critical to recognise that mothers are children's primary caregivers, because both Bengali culture and the Islamic religion propagate and define gender roles.

Women are also deprived of gaining property by inheritance. Under Muslim law, a daughter inherits one half of her brother's share from her parents' estate. A wife receives one eighth of the deceased husband's property. In combination with the general laws of the country, Muslim Personal Laws significantly govern property rights, marriage, divorce and fundamental rights (Zaman, 1999). Most of the rural women in Bangladesh are landless since very few own property under their own name.

In a study by White (1992) from a sample of 40 women it was found only four women (i.e. 10%) received their share of inheritance.

So, overall, as described in the World Bank study of Bangladesh (Sebstad and Cohen, 2000), women have a limited household decision making role, heavy domestic workloads, restricted mobility, limited control over assets, and inadequate knowledge and skills. These factors lead women to a more vulnerable position with a lower rank in the power hierarchy within the domestic environment and to experience gender discrimination (Parveen and Ingrid, 2004). However, such factors do not imply cultural determinism. Cultural norms can be negotiated through changing the values placed on women's work and education, particularly if women themselves are given tools with which they can reframe their role and position in society. Women's education can play an important role in bringing equal opportunity between men and women (Firdous, 2005; Nussbaum, 2000). When women are educated they can change their lives through knowledge and learning, take control of their own destinies through establishing their rights and lead to empowerment. The next section discusses empowerment and why it is essential for women.

2.7. Empowerment

The definitions of power, discussed earlier, identify terms such as 'domination' and 'decision making' (Dahl, 1986; Weber, 1986). From a feminist viewpoint, the 'power over' refers to the dynamics of oppression, both mental and physical (Deshmukh-Ranadive, 2005; Lukes, 1986; Mosedale, 2014; Rowlands, 1995). Since these affect the ability of less powerful persons or groups to participate in formal and informal decision making, and to exert influence, they also affect the way those individuals or groups perceive themselves and their ability to act and influence the world around

them. However, empowerment is more than decision-making; it includes the processes that lead people to perceive themselves as able and entitled to occupy that decision-making space. It overlaps with the other categories of 'power to' (e.g. resources, knowledge, education) and 'power within' (e.g. self-esteem, self-confidence) (Kabeer, 2005; Staples, 1990).

This concept of empowerment was first described by Spinoza in the 17[th] century (Tucker, 2009). Spinoza's idea was that every individual has an index of power related to that individual's ability to organise his or her affects and through the individual's self-conception and understanding of what increases their power. Spinoza recommended that institutional knowledge of humans and human behaviour can empower individuals, and maximise their freedom (Aloni, 2008). As Aloni noted:

> I argue (1) that Spinoza's ethics is eudemonistic, aiming at self-affirmation, full humanity and wellbeing; (2) that the flourishing of individuals depends on their personal resources, namely, their conatus, power, vitality or capacity to act from their own inner natures; and (3) that the combination of the Spinozian conceptions of humanism, liberal democracy, eudemonistic ethics, and the enlightened and sovereign individual constitute together the grounds for a comprehensive empowering and liberating pedagogy (Aloni, 2008, p. 531).

As empowerment refers to power and the ability of people to control their own destinies, it is relative to other people in society (Mason, 2005). Spinoza's theory of individual empowerment suggested that maximal inclusion through joining with others, political participation, and active communication with others in the commonwealth contribute to empowerment.

Cook (1997) has a similar view in which empowerment has to do with power that operates at various levels: within a person, between people, and between groups. First, it is possible to think of empowering an individual so that the person becomes more able to direct his or her own life and succeed in such attempts (Heeks, 2002).

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Second, a person may be empowered relative to other specific persons. Finally, it is possible to empower a group relative to other groups (Arun, Heeks and Morgan, 2007).

Another aspect of empowerment relates to investment of legal power – permission to act for some specific goal or purpose (Rappaport, 1987). Empowerment is achieved when people gain more control over their lives either by themselves or with the help of others, so that being empowered relates to both a process and an outcome for the effort to obtain a relative degree of ability to influence the world (Staples, 1990). Therefore, individual empowerment is a process of personal development within a social framework; a transition from a feeling of powerlessness to a position to actively participate, show real ability to act and to take initiatives in relation to the wider environment and the future (Rowlands, 1995).

The conceptual framework in Figure 2.4 indicates that empowerment is a process; that is, dynamic and separated into components such as resources, agency and outcomes (Malhotra et al., 2005).
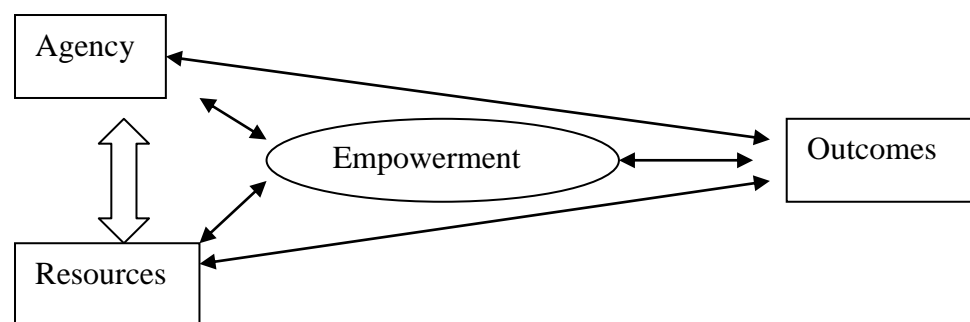
Figure 2.4 The conceptual framework showing relationship between resources, agency and outcomes correlating empowerment (based on Malhotra et al., 2005).

The two key factors in the process are identified as control over resources (the conditions for empowerment) and agency (the ability to formulate choices) (Cheston

and Kuhn, 2002). Resources can be differentiated as material, human, and social. For example, in the case of women as a disadvantaged group, access to resources is an initial condition of empowerment which is necessary for them to make strategic choices in their life (Cheston and Kuhn, 2002). According to Cheston and Kuhn, material resources, for example, are: access to credit, property, and money or any other material gains; social resources include access to education, information or public spheres; and human resources can be considered as the workforce made up to express human capability or inner potential. Therefore, access to resources is the primary condition enabling transformation into empowerment. Kabeer (2001) uses the term 'agency' to describe the processes of decision making, negotiation, and manipulation required for women to use resources effectively. As an example, micro-credit loans given to poor women in rural Bangladesh for improving their lives through self-employment can empower them. In this case, the loan or resources are offered only to women and they actively use that loan to change their lives perhaps by poultry, farming, nursery, fish cultivation or hatchery development. Empowerment results from their economic security, self-confidence and mobility. However, if women do not use the loan themselves and give the loan to the male in the family for some other purpose, there will be no change in women's lives. In other words, active participation as an individual or as a group is an important part in the process of empowerment (Kabeer, 2001). Therefore, empowerment is about change, choice, and power. It is a process of change by which individuals or groups with little or no power gain the power and ability to make choices that affect their lives. The structure of power directly affects their choices (Cheston and Kuhn, 2002; Kabeer, 1999).

Huyer and Sikoska (2003, p. 4) describe empowerment at the micro, meso and macro environment, connected to personal, interpersonal and societal aspects:

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> ... a process that leads women to perceive themselves as capable of undertaking decisions and making choices about their lives, which in turn requires sufficient levels of self-confidence and assertiveness. Empowerment, therefore, necessarily embodies challenging patriarchy at all levels of expression: social structures and relationships, moral and cultural values and norms, and institutions and power.

In another definition, Deshmukh-Ranadive (2006, p. 63 ff) explains the stages of the empowerment process:

> the process moves through several stages from 1) participation to 2) decision making, to 3) action, and ultimately 4) the capacity to take responsibility for those actions.

So, one definition of empowerment could be: a process that gives control of power and resources, and changes individual lives over time through active participation in that process.

Empowerment, like gender, is not a female-only concept but much of the literature discusses empowerment specifically as women's empowerment.

2.7.1. Women's Empowerment

Women suffer from discrimination all over the world. In order to gain their human rights (Turner, 2006) and to realise how much they can contribute to the society, they need to know their inner power. Therefore, women's empowerment is the issue of empowering women as a group or as individuals to raise their voice against violence (Deshmukh-Ranadive, 2006), have access to resources, gain self-esteem and confidence, have access to decision making, enjoy economic security, participate in politics and actively contribute to society (Kabeer, 2001; Narayan-Parker, 2005; Schuler and Hashemi, 1994). As is implicit in this discussion, there is no universal definition of women's empowerment: socio-cultural, geographical, environmental, political, religious and economic factors influence it. According to UNIFEM (2000, p. 7):

Women empowerment includes: (i) acquiring knowledge and understanding of gender relations and ways in which these relations may be changed; (ii) gaining the ability to generate choices and exercise bargaining power; (iii) developing a sense of self-worth, a belief in one's ability to secure desired changes, and the right to control one's life; and (iv) developing the ability to organise and influence the direction of social change to create a more just social and economic order, nationally and internationally.

Women's empowerment came to popularity with the feminist movement, which demanded that women take control of their lives through supporting and encouraging all women to develop their potential, contribute to and benefit from equal opportunities (Heeks, 2002; Moghadam and Senftova, 2005). Men's coercive or dominating power over women has been a main focus of feminist activists (Magnusson and Marecek, 2012; Mosedale, 2014).

The domestic or household environment is the central point of gender-based discrimination and the goal of empowerment (Narayan-Parker, 2005) because of the power relation in the family hierarchy. However, empowerment dynamics is a complex and multidimensional process linked to macro, meso, and micro environments (Narayan-Parker, 2005) (see Figure 2.5). Macro dynamics (i.e. global, national or regional level) directly affect the micro (i.e. the individual or domestic level) and as does the meso (i.e. village or community). A connection from macro to meso to micro is needed to ascertain a women's empowerment intervention (Mason, 2005).

Spaces – physical and non-physical – influence a person's capacity to enact behaviour both within and outside the household (Deshmukh-Ranadive, 2005). 'Space' is a factor that allows a person a place/freedom/margin to do what she/he intends to do (Nussbaum, 2000). It allows a person to move, manoeuvre and negotiate in order to develop her/his capabilities and is an output of negotiation. As Figure 2.5 shows, domestic power dynamics can be analysed by an individual's access to and

control of different spaces (physical and non-physical) within the domestic level. Women's ownership, access to and control over spaces indicate their power and empowerment within the domestic group (Deshmukh-Ranadive, 2005). A woman's physical space comprises her access, ownership and control to natal and marital houses. A woman's mobility and control of her own body are also included within this space. Economic, socio-cultural, political and mental spaces are considered as non-physical spaces.

Economic space is determined by economic contribution, access to economic resources and ownership of productive and non-productive assets. Improvement in this space increases women's earning capacity, bargaining power, control over resources, household decision making, improves living standard and altogether improves self-reliance and decreases economic subordination (Parveen and Ingrid, 2004).

The socio-cultural space affects women's empowerment through their position in kin-based hierarchies. Age, marital status, women's child bearing capacity, caste, class, religion, and ethnic origin all are important determinants of women's control and access to this space.

The political space can be perceived at two levels: private and public. Private political space within the household is different from socio-cultural space within the house as the latter determines women's placement in the hierarchy whereas private political space deals with how women work in that place. Therefore, this private political space is related to authority and responsibility within the hierarchy. Public political space determines women's control over and access to the public arena such as public office, participation in the administration and government – locally, regionally and nationally. Desmukh-Ranadive (2005) noted that women's public political space is severely restricted. In the South Asian context, for example, woman's public and

Development Interventions

↓ *alter*

Macro (global, national, regional and state levels)

Physical   Economic   Socio-cultural   Political

↓ *alters*

Meso (village and neighbourhood levels)

Physical   Economic   Socio-cultural   Political

↓ *alters*

Micro (domestic levels also affected by macro level)

Physical   Non-physical

↓

Person's access to ownership and control of spaces

Physical   Non-physical

Geographic   Body   Non-mental   Mental (feeling of freedom)

Within house   Outside house   Economic   Socio-cultural   Political

↓ *can result in*

Empowerment

Figure 2.5 Empowerment linkage between macro, meso and micro environments
(based on Deshmukh-Ranadive, 2005).

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private spaces are completely divided where women are largely confined to the private component.

The mental or psychological space consists of feelings of freedom that allow a person to think and act. It includes perception of gender awareness with regards to their human rights and coping with different familial issues. Improvements in this space enhance women's level of confidence, freedom of choices, bargaining power and coping ability (Deshmukh-Ranadive, 2006). Women's behaviours/attitudes toward any intervention are influenced by this mental space. Women's mental space remains as the most critical issue since it has a complex relationship with other non-mental spaces. For example, it often happens that interventions that expand a woman's economic space with increased income do not empower her if she has no control over that income; in other words, expansion in the economic space alone will not bring about empowerment. If the interventions increase women's level of confidence and self-esteem, then a process of empowerment has begun. An expansion of this space implies a change in perception and leads to feelings of strength (Deshmukh-Ranadive, 2006; Narayan-Parker, 2005).

A new space of women's empowerment is technological empowerment, which is as important as the other interrelated spaces (Lennie, 2002). Technological empowerment may expand a woman's economic space through jobs and her mental space through knowledge and skills as well as self-esteem, confidence and enthusiasm in using technology for benefit (Huyer, 2005).

Shifts in spaces are closely connected to changes in the micro, meso and macro environments, both backward and forward (Narayan-Parker, 2005). For example, ICT intervention in a village is a meso environmental change that may impact the socio-economic and mental spaces of individual women. Changes in micro

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factors, together with the social structure of domestic units at the community level, impact the meso environment and subsequently the macro environment as a country. In particular, democratising the form of family and the functions of the household are critical to widening women's access to spaces and generate processes of empowerment (Deshmukh-Ranadive, 2005). So, domestic power dynamics must be included with all its hierarchies in the analysis of empowerment (Deshmukh-Ranadive, 2006). These interrelationships indicate that women's empowerment needs to be measured across all three environments and all spaces of women's life (Charmes and Wieringa, 2003).

2.7.2. Reasons for Women's Empowerment

Voicelessness and powerlessness are pervasive among the poor, affecting every aspect of their lives. Trapped in poverty and barred from opportunity, poor people have little expectation in life (Narayan-Parker, 2005). The World Bank (2001) found a two-pronged strategy to eradicate poverty: large scale investment in developing countries; and empowering poor people by investing in their assets. Therefore, poor people themselves are an invaluable part of the poverty reduction procedure; they have the potential to develop their lives and eradicate their poverty if they are empowered.

Since the World Bank (2008) has identified empowerment as one of the key constituent elements of poverty reduction and sustainable development, it is important to empower women to change their lives through eradicating poverty and contributing to society. Generally men, unlike women, are already empowered both individually and collectively. Women need to gain individual capabilities, believe in their right to exercise those capabilities, and take advantage of their community (Mason, 2005). The

influence of (non)empowerment in the micro-meso-macro environments for women in Bangladesh is explored next.

2.7.3. Women in Bangladesh

In Bangladesh, men dominate, oppress and exploit women through private and public patriarchy (Schuler, Hashemi and Badal, 1998). Private patriarchy is maintained in the family through the misinterpretation of religion, and the non-recognition of unpaid work done by women at home. Women are also excluded from economic and political power through public patriarchy (Francis and Skelton, 2006a). In the rural public arena, women's mobility is restricted through religious binding and participation in social life is restricted by cultural norms (Kabeer, 2005).

Women constitute about 48% of the total population of Bangladesh, of whom more than 80% live in rural areas (Hossain, Bose and Ahmad, 2004; Hussain, 2010). A woman in rural Bangladesh rarely receives any of the resources available to her household. The major share of available food goes to her male guardian and other male household members. A woman is taught two virtues – patience and sacrifice – which are the ideal of Bengali womanhood. Both rural and religious traditions idealise the woman who sacrifices for her husband. She learns to accept her inferior status in the society and is trained to fit into the socially acceptable roles available to her as an ideal wife and mother (Zaman, 1999). Her formal education is to be considered not as important as her religious education (White, 2010). As soon as she reaches puberty and is considered vulnerable (Hussain, 2010), she has to observe 'purdah' (discussed later in this section) which often means that she has to leave school. Her mobility is strictly influenced by purdah. She is expected to stay inside the home and when she goes out she is expected to wear purdah, a loose fitting gown that covers the body

almost entirely. Her father will soon arrange her marriage so he can leave the responsibility of controlling her to her husband (Francis, 1998).

Child marriage was common in the traditional society of Bangladesh. Although the average age of marriage for women in Bangladesh in the early 2000s was 20.2 years, nearly half of those girls were married before the age of 18 (Francis, 1998). More recently, according to UNICEF, 66% of girls are married before the age of 18 (UNICEF, 2008). The bridegroom is normally older than the bride and the marriage is arranged by parents. "The bride resides in her husband's house where she is placed under severe restrictions with little or no say in decision making. Married women perform the role of wife and mother; in playing these the roles, they are expected to manifest the qualities of obedience, patience, endurance and sacrifice (Chowdhury, 1995, p. 38)".

As noted previously, literally 'purdah' means curtain or veil and refers to the system of isolation of Muslim women from outsiders and the imposition of high standards of female modesty (Feldman and McCarthy, 1983; Koenig, Ahmed, Hossain and Mozumder, 2003). Traditionally, purdah or the veil system keeps adult women secluded from the rest of society (Kabeer, 2001). Although the rural society of Bangladesh has undergone rapid changes in the last 50 years, purdah is strictly observed by adult women of upper and lower Muslim status groups in both rural and urban areas (Hussain, 2010), as the purdah system is encouraged by Islam (Gould, 2011; White, 2010).

Despite these restrictions, Hussain (2010) observed that women wearing purdah do not necessarily observe religious practices regularly. Some women wear purdah because it is cost effective for them. Women of middle class and lower middle class wear purdah to hide their inexpensive dresses. In addition, wearing purdah makes

it easier for women to go anywhere without having a male escort (her husband, son, brother or father) or to avoid the rage of religious leaders in the community. Religious traditions portray women wearing purdah in the public space as an image of the 'Modern Muslim Woman', which is the image of Muslim women in Arabic countries.

Although the purdah system imposed restrictions on Muslim women from attending educational institutions and work (Brown, Letsididi and Nazeer, 2009), with the decreasing influence of religion, the rigorousness in the observance of purdah, especially among the lower class, is decreasing (Sultana et al., 2009). Poor peasant women are generally freer due to their poverty. They have to go and work for other families as a helper or paid servant. Therefore, there are clear class differences in the strictness of purdah observance with the women of the solvent classes being kept most strictly in purdah (Hussain, 2010). This restricted mobility of women in Bangladeshi society has an influence in terms of division of labour between men and women, particularly in rural areas.

Based on household-level data collected in 1987 and 2000, Hossain et al. (2004) depicted the patterns and trends in women's work and analysed the factors that influence the gender division of labour in rural Bangladesh. In general, women were more involved in domestic work and men were more involved in economic work. Women undertook agricultural activities to a greater degree in 2000 and men were involved in non-agricultural economic work. More women were also involved in home-based economic activities such as homestead gardening, poultry rearing, livestock, and fishery. An important factor to note is that economic activities within the household have a weak impact on empowerment as women have little decision making power and little control on their income.

Hossain et al.'s study (2004) confirmed that women worked more hours than men, particularly in low-income households, engaged more in agricultural than in non-agricultural economic activities, and more as unpaid family labourers than as managers. While women do most of the work, men mostly control their decision making power and ownership of household resources (Ruchira Tabassum and Persson, 2010). Even when women are targeted in micro-credit intervention programs, they are often used as a front, with men keeping control over managing the resources (Banu, 2001; Schuler et al., 1998).

The persistent gender division of labour in rural Bangladesh has been found to be associated with both economic factors (e.g. wage rates, access to production, factors like land, micro-credit, and infrastructure) and socio-cultural factors (e.g. cultural norms and customs) as well as gender roles in production and reproduction (Hossain et al., 2004). To overcome this situation, Hossain et al. (2004) suggested educating women and increasing their mobility to outside economic activities by reducing the household work load.

Although through the constitution of the People's Republic of Bangladesh men and women are equal, in reality they are not (Parveen, 2007). Women's powerlessness arises from their illiteracy, lack of awareness, poor knowledge and skills and also from their lack of self-esteem and confidence (Parveen and Ingrid, 2004). It has been found that intervention activities to promote and raise awareness among women, such as the micro-credit program (Gomez, Camacho and Batsú, 2011) and the Self Help Group (SHG) (Deshmukh-Ranadive, 2004), had some success in changing women's lives, leading to elements of empowerment in South Asian countries like Bangladesh and India (Mehta and Kalra, 2006; Melhem, Tandon and Morrell, 2009; Prasad and Sreedevi, 2007; Pushpabai, 2007). Therefore, with active participation in economic

and political activities outside the home (Kabeer, 2001; Lennie, 2002), increasing their knowledge, awareness, and skills through education and information sharing, women can play a role by changing their situation through the process of empowerment (Marcelle, 2002; Obayelu and Ogunlade, 2006).

In order to empower women, the government of Bangladesh has taken the initiative of providing free education for girls up to Grade 12 (age 16-17) as well as providing stipends and financial support to buy books and reading materials (Siddika, 2012). As a result, the enrolment of female students has increased in primary and secondary levels. Women's health, child and mother mortality rates have also decreased. In addition to micro-credit and self-help programs, incorporating ICT intervention can play an important role by providing increased job opportunities, increased self-confidence through accepting and using technology, and increased knowledge through information sharing (Huyer, 2005). The following section discusses how ICT can affect women's empowerment process.

2.8. Potential of ICT for Empowering Women

Among the many causes of poverty, unemployment is the main one (Obayelu and Ogunlade, 2006). Sustained poverty alleviation is possible by the appropriate use of ICT if the government and other organisations acknowledge their role as major employers and use ICT with a development commitment targeted at achieving that alleviation (Kelkar, Shrestha and Veena, 2002). Women are seen as a largely untapped resource to overcome the skills shortage in core ICT occupations (Prahalad and Hammond, 2002; Subramanian, 2012). ICT creates employment opportunities for women, including working from home and Internet-based work, such as data entry and analysis, telemedicine, telemarketing, tele-teaching, desktop publishing, email service,

and IT education (Obayelu and Ogunlade, 2006; Pattanaik, 2006). Women's full and equal access to ICT-based economic and educational activities support women's contribution in business and home-based activities and help women to become more empowered (Huyer, 1997; Subramanian, 2012).

ICT provides other opportunities for women including overcoming illiteracy and creating opportunities for entrepreneurship. Information is indicated as a prerequisite for empowerment, while participation drives empowerment by encouraging people to be actively involved in the development process, contribute ideas, take initiative and articulate needs and problems, and assert their autonomy (Obayelu and Ogunlade, 2006). By accessing information from rural locations, women can enrich and enhance their quality of life (Huyer, 2005). One study found that rural women spend more of their income on their household and families (Cheston and Kuhn, 2002). Therefore, women's success benefits more than one person and results in an improved lifestyle.

Hence, when used effectively, ICT can be a powerful tool for women's empowerment; it can create better opportunities for women to exchange information, gain access to online education and to engage in e-commerce activities (Marcelle, 2002). Gender equality and economic development can be also achieved through use of ICT by women (Chen, 2004; Hossain and Beresford, 2012). Successful case studies from many countries describe the use of ICT as a tool for the economic empowerment of women (Prasad and Sreedevi, 2007), participation in public life (Lennie, 2002), and enhancement of women's skills and capabilities in society (Mitchell and Gillis, 2007). The United Nations Division for the Advancement of Women (UNDAW) focuses on "ICTs and their impact on and use as a tool for the advancement of women" (Marcelle, 2002, p. 1). However, ICT cannot do anything by itself; it can just open the gateway

(Pattanaik, 2006). It is also important that ICT be designed and implemented in ways to meet women's diverse needs as opposed to inhibiting in the community participation process, so that the use of ICT becomes important in facilitating social, technological, political and psychological empowerment of rural women (Lennie, 2002).

To leverage this potential, it is necessary to explore strategies to integrate a gender perspective into national ICT policies. All stakeholders should work together on establishing a network to improve connectivity, access to ICT, skills, training and eliminate negative behavioural attitudes to women's full engagement with ICT (Mitchell and Gillis, 2007). However, women and men should be equal beneficiaries in using ICT. For example, the UN millennium development project (United-Nations, 2005b) focused on globalisation as a positive force, and, as well as gender equality and empowerment of women, targeted effective ways to combat poverty in a sustainable way.

2.9. ICT for Development in Developed and Developing Countries

The uneven distribution of technology is one reason for the 'digital divide' which refers to "the perceived gap between those who have access to the latest information technologies and those who do not" (Compaine, 2001, p. XI). Developed countries are connecting with modern technologies that accelerate their economic growth, enabling them to improve their standard of living (Kagami, Tsuji and Giovannetti, 2004). It should be noted that in developed countries, such as the USA, there still exists a digital divide (Brown, 2008). Brown proposed research on intended and unintended outcomes of technology in household use as a means of exploring the digital divide. Other research, in Australia, found that a digital divide exists between rural and metropolitan

areas due to lack of motivation to use the technology available (Rooksby, Weckert and Lucas, 2002). By the late 2000s, more than 40% of the world's population lived on agriculture, with 75% of these people living in developing countries (Anríquez and Stloukal, 2008). They are yet to experience ICT, as statistics indicate that people living in developing countries have less access to the Internet, fixed phone lines and mobile phones than in developed countries, so their level of use is below the average world ICT use (ITU, 2011).

In developing countries, the digital divide occurs due to lack of infrastructure (such as electricity) or access to modern technology (the Internet, computers or mobile phones) (Omole, 2013). Thus, developing countries remain poor (Kagami et al., 2004). A low rate of literacy, as well as slow adoption of technology and lack of infrastructure, is a common barrier for developing countries, leading to decreasing economic growth. While the digital divide among nations can be reduced by using low cost technology, sustainable livelihood technology and content-based technology in developing countries (Kagami et al., 2004; Sukkar, 2004; Touray, Salminen and Mursa, 2013), the importance of cultural differences in the adoption of technologies has been recognised in the literature (Ess and Sudweeks, 2001, 2005; Zhang and Maruping, 2008). Zhang and Maruping (2008) theorised that cultural values – individualism/collectivism, masculinity/femininity, power distance, uncertainty avoidance, and long-term orientation (Hofstede, 1983) – play an important role in affecting consumers' belief structures; that is, attitudinal beliefs, normative beliefs, and control beliefs in adopting technology (Brown et al., 2009).

Foley (2004) reported that a society accepting and practicing technology (he used the term "technologising of society") in the context of work, is a dominance of knowledge and a confirmation of its power. In his study, an interpretive analysis of

office-based employees in three organisations revealed that the technologising of society to establish a prevailing knowledge base provides a range of opportunities, not only in communication, but also in employment prospects, and a greater sense of self-sufficiency, accountability and responsibility.

Another study, by Huyer (2005), discussed the development of ICT and the digital divide in developing and developed countries from a gender perspective. Huyer stated that, in developed countries, the focus is on promoting participation of women in science and technology and ICT, whereas, in developing countries, the focus is on access to ICT and the use of ICT in support of healthcare (helpline) and job creation for economic improvement. Huyer noted that it is important that equality in ICT access, knowledge and use across all races, genders and classes are affirmed by international organisations like the United Nations (UN) and the International Telecommunication Union (ITU). It is also necessary to establish enabling environments for women to access ICT, provide information reflecting women's concerns, educate women, and create ICT-based jobs for women to improve their lives.

Another paper had a similar discussion about how women in developing countries access and use ICT (Melhem et al., 2009). It examined the discourse and controversies in the gender digital divide, including linkages to poverty and illiteracy. The authors explored major themes concerning women and ICT, such as women in the ICT workforce, how they relate to ICT differently, and opportunities and barriers for women in science and technology. While current research relating to gender and ICT is often more prevalent in developed countries, in developing countries, poverty reduction and sustainable development are possible by eliminating the barriers to

women's access to ICT, and, through ICT, to low-cost education, health, government and financial services (Cecchini, 2002).

2.9.1. Developed Countries

ICT is an integral part of society in developed countries. It has been found from the literature that ICT has a positive impact on empowering women by improving their economic and social lives (ITU, 2007). Some studies on developed countries, including Australia, the UK and the USA, that address this issue are described below.

A study in *Australia* by Lennie (2002) showed some contradictory effects of using ICT by rural women in Queensland. The study was conducted over a two-year period (1996-97) among 350 women of different ages, who lived in rural or remote town areas and were involved in farming, grazing or other types of occupations. The outcome of the project was the empowerment of women in four spheres (social, political, psychological and technological) and was achieved through increased knowledge, awareness and understanding of new technology, developing skills, abilities and gaining access to new and useful information. On the other hand, some disempowerment factors were found, such as a sense of powerlessness, oppression, disadvantaged or exclusion. It should be noted that the technologies studied were less advanced at that time and could explain these differential results.

An article by Siddiquee and Kagan (2006) described the relationship between the Internet, empowerment, identity and participation, and focused on refugee women in the *United Kingdom* participating in a Community Internet Project (CIP) to gain Internet skills. The study, using semi-structured interviews and non-participant observation, was conducted with six refugee women, and with the course tutor participating in the final session of the CIP. Empowerment was observed among

women through ICT (the Internet) engagement and participation, and was related to the development of personal identities and awareness of collective consciousness.

As gender is often thought of as women alone, the move from 'Women in Development' to 'Gender in Development' has changed the development process very little. Men have always been present, involved, consulted, obeyed and disobeyed in development work. An article by Chant and Gutmann (2006) addresses conceptual and operational obstacles to men's involvement in gender and development, drawing on interviews with over 40 representatives of development organisations in the UK and the USA in 1999. The study concluded that there are unequal power relations between men and women, and that women, as a gendered category, have rarely been drawn into development programs.

2.9.2. Developing Countries

Ashraf et al. (2009) noted that all the international development organisations, such as the United Nations, the International Telecommunication Union and the World Bank, declared that ICT improves development in third world countries. To attract funds from donor agencies and to fulfil the conditions of donations during late 1990s, most of the developing countries were rushing to implement various ICT interventions in urban-rural areas with the aim of promoting local and national development.

Heeks (2002), Place (2010) and (Rekha and Theo Van der, 2012) studied and described policy level implementation of ICT diffusion in developing countries and how it could be successful. They found the 'design and reality gap' as the main problem for the diffusion of ICT for development. Livelihood approaches to ICT-based enterprises should provide insights of particular relevance to issues such as vulnerability, sustainability and impact, especially in relation to those ICT-based

operations that work with the poor (Arun, Heeks and Morgan, 2004). Heeks (2010) later suggested that a sustainable livelihood approach could be successful if the application of ICT to development attempts are made based on the context of the target country. Therefore, rapid implementation of ICT for development is needed to be advanced at a pace linked with understanding the context at the policy level first, as suggested by Heeks.

Many developing countries have been experiencing rapid changes in the information and telecommunication sectors. Some studies regarding ICT in developing countries, including in Africa, the Middle East, and South Asia, are described below.

In a study in the *Republic of Guinea*, Kaba, N'Da, Meso and Mbarika (2008) found that macro factors, such as subscription conditions, were often mentioned to explain the adoption and use of ICT in developing countries. The authors revealed that little attention was paid to micro factors that directly influence the real motivations of the end user. This study examined the influence of microeconomic factors on individuals' attitude towards the use of cellular telephones which include mobility, group characteristics (familiarity), social influence (social pressure and image), and the possession of resources.

In another study in *Uganda*, Litho (2007) found that there was a relationship between empowerment and ICT based on factors such infrastructure, skills, connectivity, access and participation. Mijumbi (2002) claimed that an ICT revolution in Uganda could play a resounding role in the socio-economic transformation of people, especially those living in rural areas. Mijumbi suggested that, in an effort to bridge the gender digital gap, international agencies like the International Development Research Centre (IDRC), International Telecommunications Union

(ITU), International Institute of Communication Development (IICD), UNDP, UNESCO, World Bank and others, have supported initiatives that aimed to:

- discover the role ICT can play in empowering rural women;

- encourage women to take advantage of the developments in ICT;

- demonstrate the use of ICT and how they can facilitate the development process; and

- provide access to ICT and ICT-based information.

Initiatives undertaken and aimed at providing women with access to ICT as tools for social and economic empowerment included the International Women's Tribune Centre (IWTC) CD-ROM project and the Centre for Economic Empowerment of Women in Africa (CEEWA) ICT women's project. Litho (2007) questioned whether these ICT projects were empowering rural women in Uganda because of the relationship between empowerment and ICT noted above, as well as cultural influence.

A study in *Nigeria* (Obayelu and Ogunlade, 2006) proposed using ICT for women's empowerment by creating job opportunities. The researchers suggested that the government should take appropriate measures at the policy level to incorporate women into the ICT job market. Another study (Akpan-Obong, 2009) discussed Nigeria's ICT policy, framework and societal context where the potential of ICT had emerged. Akpan-Obong also demonstrated that constraining/disabling factors, such as infrastructure, skills, connectivity, access and socio-economic barriers, can limit the success of ICT.

Tiwaah and Kwapong (2007) shed some light on the logic of designing a disaggregated ICT policy to empower rural women using information from three

selected rural areas in *Ghana*. The study tried to determine the factors influencing rural women's choice of information delivery technology. It pointed out that regional and local authorities should be given policy making responsibilities in setting priorities and approaches to empower rural women through the use of ICT. Here also the socio-cultural and economic contexts were the main barriers in the development process.

In a study in *South Africa*, it was found that telecentres working in the same context suffered from technical-social functionality, and power relation in three levels of people (Braathen, Attwood and May, 2012). The research assumed that empowerment of the local operating organisation and its personnel is a key factor and that success can be achieved by changing the power relationships. Three sequential stages of empowerment are suggested: the operating organisation; the telecentre manager/staff; and the telecentre users. Therefore, empowering people at each level may result in successful ICT intervention for development.

Another study in *South Africa* showed that language was one of the many barriers to entry to ICT education and training for women in developing countries (Dlodlo, 2009). With the high levels of illiteracy among rural women, it is common that a large number of them cannot communicate in English, the standard language in ICT use. Therefore, in order to achieve a women-friendly information society, that society should comprise content that not only speaks about women's concerns but also reflects their knowledge, language, and cultural contexts (Dlodlo, 2009).

Jalali (2006) reported that telecentres in the village of Shahkooh in rural *Iran* were used to teach women through the Internet, assist women in finding jobs, educate women about their rights and provide families with information regarding health and education for their children. Participation of rural women in ICT was found to have an

impact on their empowerment. The research indicated that more than half the participants reported the rural telecentres had a positive impact on their lives.

It has been documented that in *South Asian* societies, the socio-cultural environment restricts women's mobility (Pichappan, 2003). This lack of mobility can hamper a woman's ability to benefit from educational opportunities (whether offered traditionally or through ICT). It is widely understood that education keeps women unmarried for a longer period, thereby increasing their autonomy and ability to take control over their lives (Huyer, 2005). If women become more experienced with ICT tools over time, and gain persistent and cumulative knowledge of ICT, then women could find their appropriate place (at home or outside the home), which could lead to empowerment over the years.

A case study in *India* (Prasad and Sreedevi, 2007) discussed the success story of an ICT-based government project. The case study described a self-help group that used the potential of ICT for poverty eradication through economic empowerment of poor women. Another study by Mehta and Karla (2006) reported that ICT could reduce poverty by improving poor people's access to education, health, government and financial services. ICT can also help small farmers and artisans by connecting them to markets (Bhatnagar, 2000). As described by King (2010b), mobile phone use also assisted rural women to improve their situation by maintaining transparency with their donor NGOs about loans and repayments.

Another study revealed that middle-class women's involvement in ICT industries helped them act as agencies in the empowerment process in two cities in *India* (Kelkar et al., 2002). The study showed that a large number of women continued with their home duties while working outside the home, balancing domestic and business responsibilities with little help from the men. In this study, women preferred

to work outside the home to improve their position and build greater scope to enhance their agency, and therefore reduce gender-based inequalities.

A study in *Thailand* (Hongladarom, 2004) discovered that providing ICT tools to rural people did not reduce the digital gap between rural and urban people. The government provided free computers to schools and sold low cost computers to the public. However, this policy failed because access to only hardware or infrastructure could not bring change. Social or cultural factors were needed to be considered before formulating any policy. The author suggested that modern science and technology should provide real and sustainable benefits at the grass-root level by helping them to develop (be empowered) according to their own needs and priorities.

A study in *Malaysia* revealed that a government-initiated ICT project to train Muslim women in ICT to promote business, regardless of their age, racial background or economic status, had a positive impact (Hashim, Razak and Amir, 2011). The project (named 1Nita) has been successful and increased the confidence level of women entrepreneurs, especially those living in the rural areas. After four days training, 1Nita participants increased their knowledge and skills in using the computer and accessing the Internet, which enabled about 60% of them to participate successfully in online business. With the participants' ability to access the Internet, their online presence was also increased. The study found that this new skill empowered women economically and socially. In terms of economic impact, about 50% of the participants expressed increased sales using ICT. Thus, from the above study, the positive impact of ICT in rural areas on Muslim women had proved that, in spite of low level of ICT literacy, women can be empowered if they are trained well.

A study by Ahmed, Islam, Hasan, and Rahman (2010a) explored whether digital technologies empower women in *Bangladesh* to be more vocal in the family

space as well as in the national and global communities. Though there were no standard informatisation indicators at the global level, the protocol used in the study supported the definitions, model questions and methodological notes provided by the core ICT indicators in the United Nations' *Measuring the ICT Report* (2005a).

Another study, by Bhuiyan (2011), reported that the use of e-governance had been successful in limiting corruption and alleviating poverty in *Bangladesh*. The results showed that the Bangladeshi government attributed a fall in poverty from 49% in 2000 to 40% in 2005 to using ICT and leveraging on the benefits of e-governance. The Village Pay Phone (VPP) service in rural areas, introduced by Grameen Bank to empower rural women by selling mobile phone services to villagers, improved their lives through income generation, increasing status in the society and lowering dependency on their husbands (Francis and Skelton, 2006b). It also narrowed the gap between urban and rural areas by enhancing communication between members of the family. Some NGOs are already using ICT intervention for development in rural areas (Ashraf et al., 2009). Therefore, these studies depicted that ICT has had some positive impacts on women's empowerment. Since ICT intervention in Bangladesh is the context of the research reported in this thesis, an expanded discussion of these interventions is given in Chapter 3.

2.10. ICT Factors Affecting Women's Empowerment

The factors that are important for women's empowerment through ICT intervention can be categorised as enabling and disabling. Enabling factors to promote ICT include extensive telecommunication networks; good ICT infrastructure; preference of ICT jobs by women; availability of educated women; easy geographical access; high level of literacy; and low capital investment for ICT micro enterprises (Prasad and Sreedevi,

2007). As the study by Hashim et al. (2011) showed, after a short period of training, ICT-related activities can be performed by women. A lack of skilled women, the cost of training and lack of micro-credit schemes and supporting organisations are disabling factors in promoting ICT for women.

Without proper utilisation, ICT cannot bring individual or collective changes to the lives of women. Yet, to date, many women worldwide are still not fully able to benefit from using ICT tools. This is because of physical barriers (such as lack of connectivity, inadequate access) as well as illiteracy, language and behavioural barriers (Marcelle, 2002). In order to become empowered, women must be able to overcome shyness, talk and act confidently, know and accept their capabilities and limitations, break through barriers, convert their desires into objectives, develop the abilities needed and develop a strong will to achieve their objectives (Marcelle, 2002).

It was thought that gender differences have an influence on technology acceptance. According to Gefen and Straub (1997), women perceived the importance of email, but found it more difficult to use than men did. Later, though, it was revealed that there were other issues that affect technology acceptance: technology acceptance depends on culture, demographics and social practices (Simon, 2006; Van Belle and Stander, 2005). A study by Van Belle and Stander (2005) found that younger women appeared to have overcome the technology gap identified by Gefen and Straub (1997); there was no significant difference in perceived ease-of-use of technology and actual use (Schmitz, Mebmer and Schinzel, 2006; Simon, 2006; Van Belle and Stander, 2005). In contrast, a study in Japan (Igarashi, Takai and Yoshida, 2005) found that women's interactions through social networks using a mobile phone expanded more quickly than interactions between men. The women interacted with their friends more

frequently and exchanged emotional support more often than men and established stable relationship with friends (Igarashi et al., 2005).

Gefen and Straub (1997) noted that cultural dimensions of gender difference in thinking and behaviour were the main underlying factors of technology acceptance by women. Basically, gender differences are one aspect of the overall cultural differences that exists between human beings (Hofstede, 1980a). Expressed in another way, perception and behaviour are influenced by socio-cultural factors which are constituted from national/ethnic and gender differences. Loch and co-authors found that culture can both inhibit and encourage technological innovation (Loch, Straub and Kamel, 2003). They proposed a Technological Culturation model that has different stages towards actual use or diffusion of IT: Perceived Use (PU); Perceived Ease of Use (PEOU); and Social Presence and Information Richness (SPIR) of the medium. Above all, gender has an influence on all those factors. The Technological Culturation model was further extended by Meso and Musa (2008) with other two factors: Accessibility of Technology (AT) and Perceived Socio-Economic Prospects (PSEP) on the usage of ICT. The authors suggested that accessibility to ICT influences technological culturation as well as ICT usage, and the perceived socio-economic factor influences the extent of ICT usage of an individual in a country.

The discussion about women's access to and use of ICT in developing countries has been inconclusive, as some researchers (Broos, 2005; Brosnan, 1998) claim that women are rather more technophobic than men while, more recently, another author argues that women enthusiastically embrace digital communication (Hilbert, 2011). Hilbert found, from an extensive empirical study, that the reason fewer women access and use ICT is a direct result of their unfavourable conditions with respect to employment, education and income. Umrani and Ghadially (2003)

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suggested that both familial (encouragement, finances, a computer literate member, computer ownership, and access) and institutional (proximity of the training centre, preferred gender of the trainer, attributes, and role) support influence women to adopt technology. Umrani and Ghadially also found that if technology is evaluated to be useful to them and their family, women accept it very easily.

From Figure 2.6, it can be seen that the key controlling factors of Bangladeshi women's ICT use are behavioural and socio-economic. Behavioural factors in mental spaces (women's psychological resistance, women's attitude towards women, and men's attitude towards women) are enrooted socio-cultural norms, which are important controlling aspects of women's ICT use (Rabayah, 2010a). Sometimes women encountered resistance from their family members, both male and female (such as their husband or in-laws or even their parents) when they tried to go to ICT centres to get information. In this case, family members were barriers against women gaining benefits from ICT. Women usually chose social acceptance rather than obtaining the benefits of ICT so they experienced psychological resistance within themselves. Another key controlling factor, socio-economic perspective, originates from existing gender discrimination and power relations in Bangladeshi society (Hossain and Beresford, 2012). It includes religious influence, family constraint, women's level of education, violence against women, social acceptance of women's ICT use, women's access to ICT, gender gap, and empowerment level. Ahmed et al. (2006) suggested that the situation could be improved by developing awareness among women and removing the stereotype mindset towards women's ICT use.

If women are trained to gain the required skills in technology, they feel confident and this self-esteem helps them to become empowered (Pushpabai, 2007). Therefore, ICT may be considered as an enabling factor, which is used to advance

women's status and their quality of life when they use, exchange and produce information and knowledge and gain economic empowerment through ICT-based job opportunities. However, according to Avgerou (2000), people in developing countries not only lack economic resources and indigenous techno-scientific capabilities, they also do not make the best use of their opportunities for technology transfer. She suggested people can always improve their life condition; ICT may become effective only when it is truly appropriated by the actors in a social contexts.

A similar view was suggested by Beardon (2008), that ICT projects in developing countries strengthened the capacity of poor and marginalised people through the potential of communication structures and technologies. The author suggested that it is necessary to give priority to the development methodologies and structures that enable poor people to influence the planning and delivery of the projects that are aimed to help them. It is important for these people to develop their own analyses of social, economic, cultural and political issues in ICT development projects.

However, Veltman (2006) argued that the digital revolution is completely different from simply introducing any technology to a culture. ICT is becoming the Universal Convergent Technology (UCT). He said that it marks a paradigm shift in relation to all media, to all senses, and all expressions. Veltman hoped that the new media was transforming the definitions of culture and knowledge, the ways of knowing, and transcending barriers in ways that would have lasting implications for centuries to come.

Developing countries have some characteristics that make ICT diffusion more difficult, such as relatively high ICT prices, lack of infrastructure and cultural aspects

towards technology (Grazzi and Vergara, 2012). One cultural aspect that affect ICT diffusion is related to language (Kiiski and Pohjola, 2002), as noted previously.
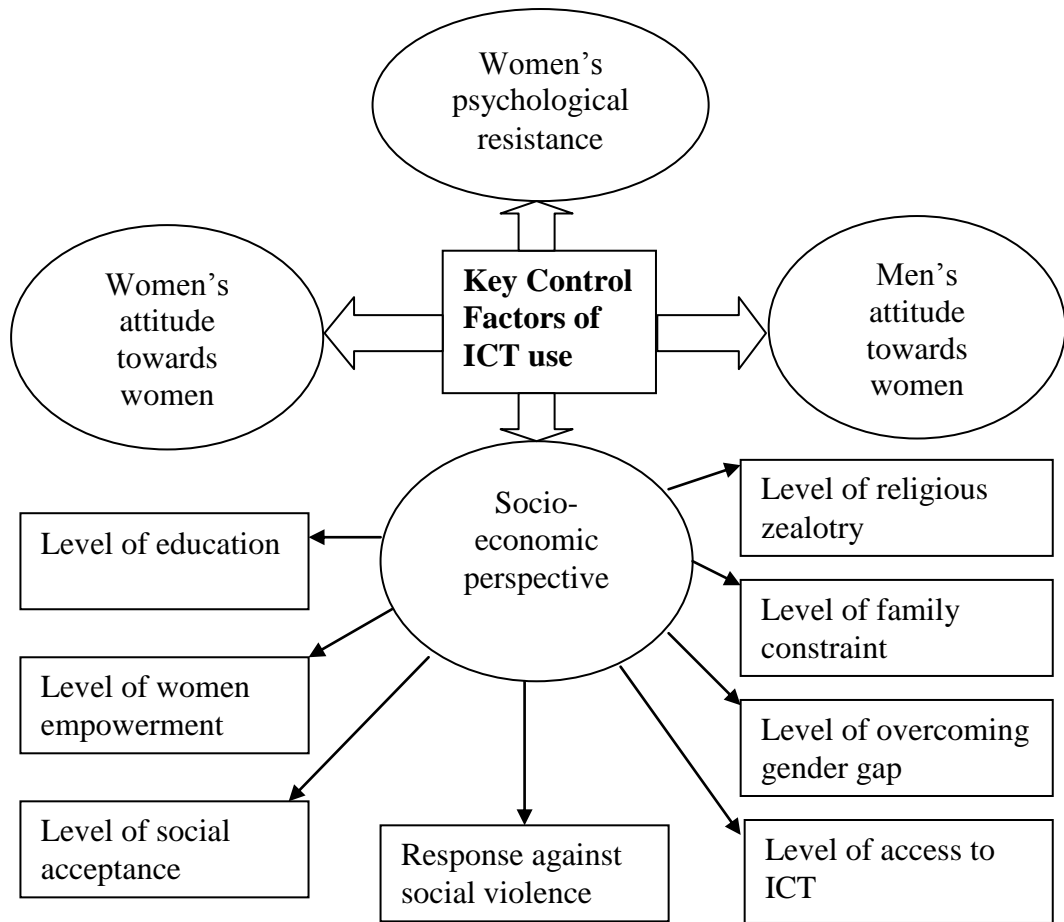
Figure 2.6 Protocol of the identification of informatisation indicators for Bangladeshi women (based on Rabayah, 2010a).

For the majority of current and future ICT users, English is a universal but second language. Therefore, the English language cannot be fully exploited in certain cultural contexts. The ICT sectors of many developing countries are facing the problems of poor English language skills and an overall weakness in education and training (Review, 2003). This language barrier may be for several reasons: the indigenous languages may be widely used by the population; the web content and software may not be readily available in local languages; and familiarity with English

language is generally low and highly concentrated in well-educated and high-income people (Grazzi and Vergara, 2012). In the case of email and SMS communication, though English is used as the only language, cultural values or cross-cultural interpretations affect the fruitfulness of the communication services (Francis and Skelton, 2006b; Trudgill, 1992).

The discrepancy between the local language and the language of ICT tools may create not only a cultural and technological mismatch, but also a gap in perceptions of ICT benefit at the individual and household levels (Grazzi and Vergara, 2012; Mariscal, 2005). So, as suggested by Dlodlo (2009), a women-friendly information society can be achieved if it reflects their knowledge, language and cultural context.

2.11. Measurement of Women's Empowerment

Women's empowerment is conceptually complex and methodologically challenging to measure (Malhotra et al., 2005; Mason, 2005). Though ICT intervention is used for the empowerment process for women in many developing countries in the world, there is no standard method for measuring and tracking changes in levels of empowerment. There is substantial agreement in the literature that 'process' and 'agency' are essential for women's empowerment (e.g. Kabeer, 1999; Malhotra et al., 2005). The idea of *process* is the change from a condition of disempowerment to empowerment, and the concept of *agency* implies that women must be agents rather than only recipient of any change (Malhotra et al., 2005). In other words, women have to actively participate in the process. Dimensions of empowerment, its contextual nature, and various environments (i.e. micro, meso and macro) at which it could be measured, are also important (Deshmukh-Ranadive, 2005; Pradhan, 2003).

Considering the above mentioned issues, there are examples of quantitative, qualitative and mixed method (i.e. the combination of quantitative and qualitative methods) approaches for measuring women's empowerment in the literature. This section discusses the different approaches and provides the rationale for selecting an appropriate approach for this thesis.

2.11.1. Quantitative Approach

There are not many purely quantitative studies in the literature that measure women's empowerment. However, in a Bangladeshi study, Williams' (2005) Confirmatory Factor Analysis (CFA) method quantitatively measured empowerment of women who had micro-credit loans. Williams re-conceptualised the process of women's empowerment and considered gender (e.g. decision making power), economics (e.g. access to assets) and health (e.g. access to health care) components separately. She subsequently focused on measuring the gender component (women's relative position in the gender system[4] and the capacity to exercise power as agency which reduces the gender inequality) using cross-sectional data. Gender norms become measurable when they are broken, which is an indication of empowerment. For example, if a woman makes more household decisions than other women in the same context, she is considered empowered.

However, the gender norms that were used as indicators in measuring empowerment in Bangladesh have changed over time. For example, the mobility and visibility of women in public places (i.e. in market places and on public transportation), which were rare a decade earlier, are now common in Bangladesh. Most women go outside the home whether they are empowered or not. So, this method

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[4] Mason (2005) defines gender system as the socially constructed expectations for male and female behaviour that are found in every known society.

of CFA would not be suitable in measuring women's empowerment through ICT intervention in Bangladesh because there are not enough cross-sectional data and standard gender indicators to use.

Quantitative analyses of empowerment based on socio-economic indicators, such as health, education, income and labour force participation, are useful as first approximations, though they may not be sensitive enough to capture the nuances of gender power relations. Pradhan (2003) argued that quantitative methods alone are unable to capture the interactive processes through which women in a weaker position strategise ways of gaining power from the unequal relationship of power. She suggested that, in order to understand the socio-cultural context within which women's behaviour in social interaction and gender relationships takes place, an in-depth anthropological method is essential. Therefore, a qualitative approach could be considered more appropriate to measure empowerment in a socio-cultural context.

2.11.2. Qualitative Approach

Many of the studies in the literature use qualitative approaches to measure empowerment (e.g. Hashemi et al., 1996; Malhotra et al., 2005). Qualitative studies of empowerment make an effort to capture a process through in-depth interviews and case studies using conventional indicators (e.g. health, education, income and labour force participation) (Pradhan, 2003). Hashemi, Schuler and Riley (1996) argued that initial ground work, through qualitative and exploratory methods, conceptual analyses and stakeholder consensus through participatory processes, is essential to establish parameters that define empowerment in a specific country and development project context.

A study in India (Prasad and Sreedevi, 2007), on an ICT project named Kudumbhasree, was based on primary and secondary data analyses from IT industries, ICT-promoting GOs and NGOs, IT professionals and related websites. The case study of participants in the Kudumbhasree project was undertaken to ascertain the success factors of the project. An analysis was conducted to find the strengths, weaknesses, opportunities and threats (SWOT) of the project.

A qualitative approach has the drawback of bias as it only represents the participants' experience, not the whole group of people (Mason, 2005). In addition, according to Malhotra et al. (2005), the unavailability of adequate data across time is a drawback in measuring empowerment as a *process*. Also, Kabeer (2005) mentioned that macro-level studies are weak in measuring women's *agency* due to limited data from developing countries. These drawbacks may be avoided by using a mix of both quantitative and qualitative methods.

2.11.3. Mixed Method Approach

To address the drawbacks with either a quantitative or qualitative method, a mixed method approach has been used increasingly to measure empowerment (e.g. Chen, 1997; Hashemi et al., 1996; Malhotra et al., 2005; Mason, 2005). For example, Chen (1997) proposed a mixed methodological approach, combining a qualitative case study and a quantitative survey, to test hypotheses related to the impact of micro enterprises at the individual level. In this mixed approach, a quantitative survey can measure broad patterns and correlate changes, while case studies can explore the empowerment process, counter factual or rival explanations, and investigate complex or unexplained phenomena. Moreover, Chen claimed that case studies, including life or work

histories, were thought to have particular salience in understanding individual level impacts.

Mixed research approaches were also used to investigate empowerment and disempowerment of rural women in Australia, a developed country, as an impact of ICT (Lennie, 2002). Those approaches (participant observation, individual interviews, group interviews, analyses of selected email messages, and feedback questionnaires) provided qualitative and quantitative data, and enabled statistical analyses of demographic information. The key activities in that project were workshops, online conversation groups and audio conferences.

Mason (2005) also described a mixed method approach to overcome some of the shortcomings of each approach, such as difficulties of quantification and generalisation versus measurement problems. She suggested measuring *factors* and *outcomes* for any intervention attempts to empower poor women through observational studies and sample survey questions. However, these measures have drawbacks too.

Mason suggested that the approach to measure *factors* that are hypothesised as empowering women, such as paid employment, do not always lead to a perception of empowerment. Measuring *outcomes* that empowerment is supposed to achieve (e.g. 'the income of poor women has risen', 'the marriage age of girls has risen', 'the abandonment of wives by husband has declined'), is less complex. The problem with measuring outcomes, however, is that it does not measure women's involvement at the political or social level accurately, and outcome is not as important as the empowerment itself.

Mason also proposed to measure empowerment through *observation*, which is effective because this approach can evaluate the actual outcomes (e.g. assess the extent to which women enjoy freedom of movement, their ability in to make household decisions, and other aspects of empowerment) and avoids any distortion associated with reports to outsiders by the parties whose interests prevail (e.g. wives and husbands). The drawback is that it cannot cover enough households and communities to aggregate data at the group level.

Another approach suggested by Mason was to measure empowerment by *survey* questions that ask sample respondents about different aspects of their empowerment, not only in domestic spheres but also at the community and national levels (e.g. the study of Hashemi, Schuler and Riley (1996) in Bangladesh). The drawback of a survey is being unable to frame questions that will be applicable for different language and cultural groups. Also, the difficulties in conducting surveys by private interviews can result in interviewer bias and respondents' inattention which may give rise to random measurement error (Foddy, 1992).

Therefore the drawbacks of individual tools can be addressed in a mixed method approach for collecting and analysing data by using multiple tools. For example, the problems with observational studies can be overcome partially by a survey with an appropriate questionnaire instrument and thus avoid interviewer bias.

2.11.4. Qualitative Methods with Multiple Tools

Thus, no one method is superior or without issues so methods must be matched to the subject of interest and be credible to the end users and often also to policy makers (Malhotra et al., 2005). In most contexts, a mix of data collection tools provides a more reliable and complete picture of the phenomenon under study, as the tools

balance each other's weakness (Parker, 2005). Since ICT intervention and its impact on rural Bangladeshi women's empowerment are intended to be measured for the first time, this is exploratory social research. There are not many rural women who are impacted by ICT; therefore, a qualitative approach to data collection and analyses using multiple tools would be more reliable and less biased in giving an overall picture of the empowerment process of ICT beneficiaries. This study uses multiple tools, specifically case studies, structured interviews and a longitudinal study. Longitudinal studies have been used for ICT studies in developing countries such as in India (Venkatesh and Sykes, 2013).

2.11.5. Framework for Measuring Women's Empowerment as an Impact of ICT

Though Mason (2005) argues that women's empowerment in developing countries should be confined to the *domestic environment* and be measured and analysed through the effectiveness of any intervention in women's empowerment, Deshmukh-Ranadive (2005) argues that it is difficult for the researcher to carry out a detached investigation at the domestic level because women may not report discrimination for their own safety or for the good of the family. However, Deshmukh-Ranadive (2005) proposed a framework to show the relationship of macro, meso and micro environmental impacts on individual women's access and control of different 'spaces' (i.e. physical, economic, sociocultural and political). Therefore, this thesis measures empowerment at the individual level which then highlights the impacts on other environments.

To measure empowerment in practice, a framework needs to be established that covers the economic, socio-cultural, political and psychological spaces in

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women's life (Malhotra et al., 2005). In practice, measuring empowerment depends on universal standards such as human rights but, at the same time, allows for indicators that are sensitive to context (Hashemi et al., 1996). So, conceptualisation and measurement of women's empowerment must be considered multi-dimensional because empowerment is not the end result; it is the beginning of a continuous process (Narayan-Parker, 2005). These challenges suggest a framework developed by Chen's is ideal as a foundation to measure women's empowerment in Bangladesh using ICT. Chen's (1997) consolidated framework, as discussed previously, includes four broad dimensions through which an individual experiences changes (Table 2.1).

As the impact of ICT is an integral part of the research reported in this thesis, a technological dimension (Lennie, 2002) of women's empowerment needs to be included. This measures women's different types of ICT use, access to ICT, attitude towards ICT use, level of use, participation in ICT projects, information need, benefit and satisfaction level. A framework, including both Chen's and Lennie's dimensions at the individual level, was developed for this thesis and is described in Chapter 4.

Table 2.4 Four dimensions of Chen's consolidated framework (adapted from Chen, 1997)

Dimensions	*Definition*
Material	Through which changes in access to or control over material resources such as in the level of income, in satisfaction of basic needs or in earning capacity, are experienced.
Cognitive	Through which changes in level of knowledge, skills or awareness of wider environment, are experienced.
Perceptual	Through which changes in individual confidence level and self-esteem and vision of the future as well as changes in recognition and respect by others, are experienced.
Relational	Through which changes in decision-making roles, bargaining power, participation in non-family groups, dependence on others and mobility, are experienced.

2.12. Implication for This Study

The focus of this literature review is to reveal the background relationship of empowerment with power, knowledge, gender, domestic power hierarchy and culture. From the definition of power, it was found that, in modern societies, power takes an institutional form where there are manifold relations of power that constitute and characterise the social bodies. For example, a court works as an institution to establish law and order in the society in the form of power (Foucault, 1972). This power is based on right and truth, which implicitly guides people to live a life where they are forced to produce the truth of power according to society's demand.

Power is also defined at the individual level. An individual may enjoy freedom of choice if he/she is empowered within legitimacy (Aloni, 2008; Tucker, 2009). Knowledge or information is necessary for individuals to know how they can exercise the power at different levels of human society (Foucault and Gordon, 1980). This thesis explores how knowledge or information accessible through ICT can empower individual women in rural Bangladesh despite the disempowering factors in their lives.

Women in Bangladesh suffer from severe discrimination due to the patriarchal nature of the society (Schuler et al., 1998; Sultana, 2010). To overcome this discrimination and to alleviate poverty, women need awareness of their status and human rights to enable them to achieve a better living, and empower themselves (The World Bank, 2008; Ugbomeh, 2001).

Empowerment of women is directly connected with family power relations in society (Deshmukh-Ranadive, 2005). In South Asian countries, access to and control of resources are influenced by these family power relations (Deshmukh-Ranadive, 2006; Kabeer, 2001). This thesis investigates the effect of domestic power relations in

achieving decision making power within the family after ICT intervention activities have been introduced in the village.

Also, cultural context influences women's empowerment in South Asian countries like Bangladesh (Deshmukh-Ranadive, 2005; Hofstede, 1980a). When the cultural context and gender perspective in Bangladesh were discussed, it was found that women suffer from discrimination due to religious influence, cultural norms, and traditional values originating from the patriarchy (Parveen, 2007). Disparities in education and literacy levels, economic conditions, freedom of movement, and access to public areas, are a few of many persisting causes of the divide between men and women in Bangladesh. It is necessary for those women to overcome this situation through realising their capability, experience equal human rights through growing knowledge and awareness, and achieve economic and mental independence. It is possible through interventions such as ICT for development projects to empower rural women in a combined effort with micro-credit programs, awareness developing programs, and adult education programs (Alam, 2006; Dlodlo, 2009; Parveen, 2007; Pushpabai, 2007).

In developing countries, ICT could have greater impact on the empowerment process if there were no barriers. Such barriers include cultural barriers to technology acceptance, language, physical (infrastructure, access) as well as psychological barriers (fear of technology) (Litho, 2007; Melhem et al., 2009). Though several authors suggested technology acceptance depends on gender difference, the deep rooted problems are poverty, and culture (Gefen and Straub, 1997; Hafkin, 2003; Hofstede, 1980b; Meso and Musa, 2008). Other authors (Ashraf et al., 2008, 2009) in Bangladesh suggested that rural people were enthusiastic towards accepting ICT. So,

this thesis investigates what is the actual situation: whether rural women accepted technology enthusiastically or if they experienced barriers.

ICT success stories in developing countries reveal that ICT can reach women in remote villages and can change their lives through information and job creation, leading women to empowerment (Huyer and Sikoska, 2003; ITU, 2007). However, with regard to rural Bangladesh, it may not be possible to create jobs through ICT industries and improve economic condition of women as was found in other developing countries like India and African countries (Mijumbi, 2002; Obayelu and Ogunlade, 2006; Pattanaik, 2006; Pushpabai, 2007). Poor infrastructure, language and other limitations in terms of low levels of education, awareness, skill and limited access are barriers to ICT job creation (Meso and Musa, 2008; Omole, 2013). However, ICT projects in Bangladesh that assist women in becoming information rich through village information systems, mobile phone kiosks and the Internet, may help them to enrich their level of knowledge and skills and increase their mental space (Alam, 2006; Amader-Gram, 2015; D.Net, 2007). This thesis investigates the gap between the delivered information and the actual information need of women through the ICT services.

Though some ICT interventions in Bangladesh were not benefiting rural women economically, they claimed to provide required information to rural women, which was eventually changing their perceptions and expanding their self-esteem as human beings (Alam, 2006; D.Net, 2007, 2015). Therefore, it is appropriate to investigate whether ICT can empower rural women with or without economic benefit. Understanding the link between non-physical spaces (e.g. mental, economic and political) would help policy makers understand why some interventions fail in spite of an increase in physical spaces (e.g. access to resources) (Deshmukh-Ranadive, 2005).

Access to resources is an important pre-condition for the empowerment process (Cheston and Kuhn, 2002; Kabeer, 1999). Intervention activities may promote the supply of resources to women in the form of education, micro-credit loans or ICT skills or information. Thus, keeping in mind the cultural context, socio-economic status and gender difference in rural Bangladesh, a framework adapted from Chen (1997) is considered appropriate for measuring women empowerment for this thesis as it addresses the same socio-cultural context in Bangladesh.

2.13. Conclusion

It can be concluded from this chapter that empowerment is related to power, knowledge, gender, domestic power relations and cultural context in the society. To understand women's empowerment, the background information on women's condition in the Bangladeshi rural society (Section 2.6), why they need to become empowered, and how ICT can help them, are justified through the literature (Sections 2.7 and 2.8). ICT can act as an important and potential tool for empowering women in developing countries if it is used appropriately through their increased awareness and access as discussed in Section 2.9. The factors that affect women's empowerment most were identified as socio-cultural (education, relationship within family), psychological (women's mindset), as well as physical (access to ICT centres and resources) (Section 2.10). Therefore, these enabling (i.e. awareness, education) and disabling (i.e. family restriction, lack of resources) factors need to be identified while measuring women's empowerment.

There is no standard way to measure women's empowerment after ICT intervention in a community (Section 2.11). Chen's (1997) framework for measuring empowerment was found to be the most appropriate in the context of rural Bangladesh

as it measures multiple factors of changes at the individual level and is therefore used for this research.

The next chapter provides a context for this study by describing the environment in rural Bangladesh and the projects that were deemed to support the aims of this study. The two projects that agreed to participate are described in greater detail. This then provides a rationale for the research design proposed in Chapter 4.

CHAPTER 3

RESEARCH CONTEXT

With a total area of 147,570 km^2, Bangladesh has a population of around 142.3 million, making it one of the most densely populated countries of the world (BOI, 2012). The majority of the people are Muslim (89.5%). There are small minorities of Hindu (9.6%) and other ethnic groups (0.9%) (CIA, 2012). It has the world's third largest Muslim population after Indonesia and Pakistan (Sadanand, 2010). Over 98% of the people speak Bengali (Wikipedia, 2012). English is taught as a compulsory subject at primary and secondary levels. English is understood in urban areas but not used in rural areas.

According to the World Bank Report (2012), approximately 80% of the population live in rural areas and 53% of this rural population is poor. The rural poor represent 85% of the country's poor (The World Bank, 2012). Poverty strikes the rural population due to illiteracy, ill health, dowry problems, family dependency ratios, vulnerability to natural disaster and unemployment (Davis, 2007). However, poverty can be reduced through ICT by enhancing poor people's opportunities with improved access to markets, health and education, as was found in India (Cecchini, 2003).

ICT for development in rural Bangladesh is lagging due to the socio-cultural context (Ashraf et al., 2011). People in rural Bangladesh are underprivileged and illiterate. As they struggle to meet their daily needs, ICT use seems to be a luxury for them. Rural women are more deprived than males because of the gender discrimination in Bangladesh. Rural women have little access to technology, because they are restricted from public spheres due to cultural and religious reasons. Moreover, they fear using ICT as they have

little knowledge of its benefits. Therefore, Ashraf et al. (2011) suggest the important issues for ICT development in rural areas are: sustainability, capability and local context.

To be able to investigate the impact of ICT on women in Bangladesh, it was necessary to identify potential case studies to collect relevant data. The criteria for appropriate case studies were based on their location (specifically the southern part, where the cultural background and local language matched that of the student researcher), activities and availability. Also, since the objective of the study was to investigate any impact of ICT on women, organisations that were working for women in rural areas were targeted. Ultimately, the response and interest of the projects themselves to this research investigation was one of the criteria for selecting them.

3.1. ICT Projects in Bangladesh

There are many ICT projects that have been working in rural areas in Bangladesh for the past decade, most of which are run by Non-Government Organisations (NGOs). Five ICT projects working in Bangladesh were contacted at the email address available from their websites. Brief descriptions of these projects are provided in the following sections.

3.1.1. D.Net ICT Project

The action research project in Bangladesh, developed by D.Net (King, 2012), in three villages located in three different districts, is to facilitate the use of ICT for poverty alleviation through sustainable social and economic development. It uses digital knowledge shared by end users via an efficient and cost effective ICT delivery channel, the mobile phone (Global Knowledge Partnership, 2008). This livelihood model has been used to test various options of the sustainability of ICT-based information centres in rural communities. The process and outcome of the project have

been of interest to various international agencies and donors. The project was the winner of the Gender and ICT (GICT) award in 2005 for the Pallitathay Help Line Centre (Village Information System), which worked for the poor and underprivileged people in the villages to gain livelihood information (IDRC, 2008).

From the experience of rural people, it was found that a lack of relevant and timely information was the major bottleneck to rural development, especially for underprivileged women. With women's economic empowerment as its centrepiece, the Village Information System directly addressed the community's information needs on various important issues, while keeping the beneficiaries' anonymity intact. This project employed educated women in the community as 'mobile operator ladies' who moved from door-to-door and asked about problems and information needs of women, mostly housewives, regarding livelihood, health, agriculture, job opportunities, education and legal rights. The mobile operator lady used her mobile phone to relay the women's queries to the helpdesk operator (working at the village information system office) who responded using the Internet and their own database of information called 'Jiyon Kathi' (Key to Life). To expand the information database to provide a steady stream of responses to frequently asked questions, resource persons from government, NGOs, health groups, educational institutions, and human rights organisations were partnered with D.Net.

There were three groups of women who were advantaged and empowered from the project:

a) As *mobile operator ladies*, women were consciously given a crucial role as "infomediaries", increasing their self-worth, their potential to earn, and their knowledge about various issues;

b) As *help-desk operators*, women were enhancing their knowledge of various issues and considerably improving their communication skills;

c) As *village residents*, women who availed themselves of the Help-Line services professed a higher self-assessment and realisation of their potential and worth in society, increased incomes, and increased authority over decisions (D.Net, 2007; IDRC, 2008).

More details of the D.Net ICT project are provided in Section 3.2.1.

3.1.2. Amader Gram

Amader Gram (Our Village Online) is an ICT for Development (ICT4D) project working in rural Bangladesh. One of the missions of this project is ICT awareness for women in rural villages. The project objectives are to:

a) provide access to information and transfer knowledge from 'have' to 'have-not's';

b) support ICT and ICT-based education at the community level;

c) promote local knowledge for development; and

d) improve rural livelihoods through integrated development programs (Amader-Gram, 2015; Amader Gram, 2015; Amader Gram Online, 2008).

Urban women have a reasonable orientation towards technology as mobile phones, computers or the Internet are available in these areas, whereas rural women know little or nothing about such technologies (especially computers and the Internet) as they are rarely used there. Because of this situation, the Amader Gram ICT4D project developed village-based information technology awareness activities from July 2001; awareness is fundamental for the expansion of computer education. These

activities focused on 12 villages and many schools of the Rampal sub-district in the Bagerhat district. The project discussed the importance of computer education with school students, unemployed youth and village women. This awareness program developed interest, and village women were amazed to know the uses and functions of computers. They became curious about computers. With the women's interest in mind, the Amader Gram project began a computer training program in Srifoltala in 2004. Amader Gram targeted both women and their children. The primary aims were to:

a) help women to keep pace with the times through awareness-raising activities; and

b) eliminate the differences between city and village women through computer training (Amader-Gram, 2015).

Amader Gram's secondary aims were more distant. They conducted awareness-based activities among women, such as the one day 'Computer for All' program. In this program, project members carried a computer on a three-wheeler vehicle from door-to-door, to show groups of people what the computer is, how it works and how important it is. The staff engaged the women by allowing them to touch the computer and use it (writing names using the keyboard) so that their fear of new technology could be reduced. Women who could not be involved in the program enrolled their children. So, by raising awareness among women, Amader Gram aimed to train their children as well. They also organised a three day 'Knowledge Fair' as part of the awareness development program each year to promote ICT and introduce it to the village people.

3.1.3. Grameen Village Pay Phone (VPP)

The Grameen Village Pay Phone (VPP) program is a part of the Grameen Bank micro-credit loan program that gives mobile phones instead of money to women beneficiaries and teaches them how to use the mobile phone for communication. Other people in the village, who do not have mobile phones, use the beneficiaries' phones with payment as they do in the phone kiosk. In this region, mobile phones are the only feasible way to communicate in remote areas as most parts of Bangladesh have poor fixed land-line telecommunication infrastructure. Mobile phone technology is easy to deploy and is cost effective. This mobile phone technology plays an important role in promoting greater awareness of women and children's rights, trade, disease prevention, humanitarian principles and cross-cultural understanding in the world (Absar, 2003).

In the VPP program, the women beneficiaries repay the cost of the mobile phone and associated costs (including fast charger, sign board, calculator, stop-watch, user guide in Bangladesh and price list for calling to different locations) by weekly instalments. This VPP program was the pioneer in introducing technology to rural people. The aims of this program were to empower rural women by enabling them to earn their living through selling communication services, and to benefit villagers who bought such services (UNPAN, 2007). The benefits of VPP were found to be:

    a) decreased digital divide between urban and rural areas;

    b) increased sphere of information flow;

    c) increased income through selling mobile phone services;

    d) increased social inclusion through the phone calls; and

    e) increased knowledge of market prices of commodities, employment opportunities, transactions, remittance, business-related information, family

and personal issues, immigration, health and natural disaster related information.

All this information was perceived to help rural people in their economic and social development (Barua and Diacon, 2003).

3.1.4. Ganokendra (Community Learning Centre), Dhaka Ahsania Mission (DAM)

One of the projects developed by the Dhaka Ahsania Mission for enhancing non-formal education at any age and for any group of people is the ICT for education and empowerment program, called Ganokendro (Community Learning Centre) (Ali, 2003). This is one of the innovative projects that implemented ICT to assist people in their current economic activities, including farming, trade and entrepreneurship; for example, farmers could greatly increase productivity using information about improved technologies, agricultural inputs, weather and markets. Traders and other entrepreneurs need to find information about markets and to disseminate information about their business. Students from local communities who learn computer skills could be trained rapidly to serve as information intermediaries for older generations (Alam, 2006).

As an agricultural country, Bangladesh can benefit if farmers (both male and female) can use the Internet and download information about seeds, manures, insecticides, diseases of animal or plants, marketing agricultural products through e-marketing and information about weather and other natural calamities like flood, drought, cyclone and so forth.

3.1.5. Bangladesh Telecentre Network (BTN)

Under the umbrella of Telecentre.org, Bangladesh Telecentre Network (BTN, 2008) gathered together several NGOs, such as Grameen Telecom (GTC), Bangladesh Rural Advancement Committee (BRAC), D.Net and government organisations like Bangladesh Telephone and Telegraph Board (BTTB), with the goal of working with ICT for development. BTN aimed to establish 40,000 telecentres across the country with the mission to build sustainable ICT-based information and knowledge systems for the poor and the marginalised by the year 2011, which was the 40th anniversary of Bangladesh's independence. So far, many telecentres have been established and some of them are in rural areas.

3.1.6. Selection of ICT Projects

From the above discussion of these ongoing ICT projects in Bangladesh, it is evident that ICT is a potential tool for serving rural people and impacting on their lives, and provides an opportunity to study social inclusion of ICT in remote villages of Bangladesh. Some projects work implicitly on women's empowerment (D.Net), while other projects only work in general without focusing on gender issues (Ganokendra), some work to develop ICT awareness among women (Amader Gram), some work with women for their economic benefit and social service (Grameen VPP), and some work to maintain a liaison between different ICT projects all over the country (BTN) without emphasising the issue of women's empowerment.

Since D.Net and Amader Gram were working with rural women to benefit them with information and awareness through ICT, they were selected as appropriate case studies for this study. D.Net was the first ICT project that responded and the program officer provided details of their working ICT projects (Appendix II). Formal

permission was received from the deputy director of D.Net after some email communication (Appendix II). As a comparative ICT project, Amader Gram was chosen based on its interest in being included and the location of the project. After email communication, the project director of Amader Gram also granted permission to work with their project (Appendix II).

The ICT projects had centres in remote areas where women beneficiaries were involved directly by training and employment (both D.Net, Amader Gram) and indirectly by village information system (D.Net) and computer awareness programs (Amader Gram). These villages were accessible by road transportation from Khulna district where the student researcher was based during field visits. These two projects are particularly appropriate as the proposed research investigates the gap between ICT interventions and rural women empowerment issues; in particular, how these interventions could result in women's empowerment through disseminating knowledge and information efficiently, and fill the gap of information needs of women in rural Bangladesh.

Both projects are located in the Bagerhat district in south-western Bangladesh, 60 km from Khulna and 250 km from the capital city Dhaka (Figure 3.1 and Figure 3.2). Along with their other activities, the projects work with women in the villages of Boitpur (D.Net) and Srifoltala (Amader Gram).

Figure 3.1 Map of Bangladesh
(WorldAtlus.com, 2011).

Figure 3.2 Bagerhat district in Bangladesh
(Bagerhat, 2009).

3.2. Case Studies

3.2.1. Case Study 1: D.Net Project

The D.Net project has promoted ICT for economic development and poverty alleviation in Bangladesh since 2001. The Community for Learning Information, Communication and Knowledge (CLICK) is one of the programs of D.Net, supported and funded by Microsoft, as a part of the Unlimited Potential Program (Figure 3.3).

Figure 3.3 Website of D.Net project.

The main motto of the D.Net project is the 'Development of human working capability'. Targeting this vision, the project established 13 Rural Information Centres (RIC) in different geographic locations in Bangladesh in 2007. One of these RICs is Shamsuddin Nahar Trust (S.N. Trust), which is a non-profit organisation established in Boitpur in 2002. Figure 3.4 illustrates the hierarchy of the Microsoft Unlimited Potential Program. The D.Net women interviewed for this study were part of the S.N. Trust program (see Section 4.3).
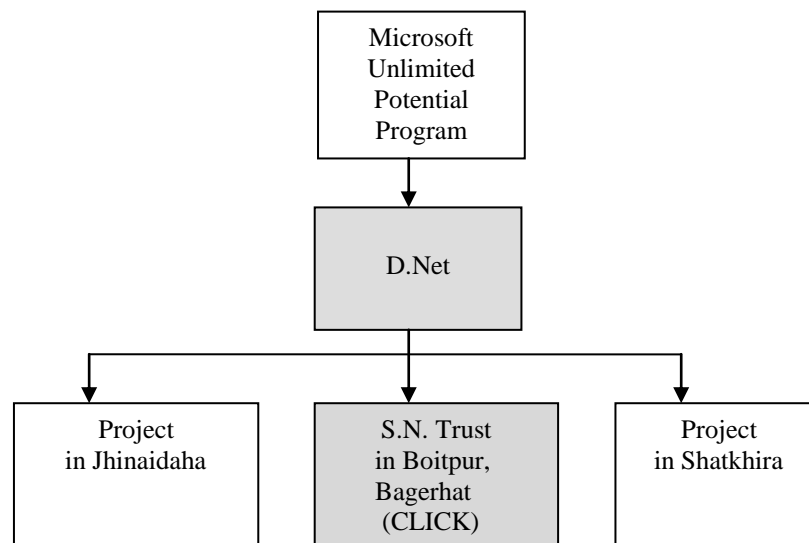
Figure 3.4 Hierarchy of D.Net project.

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Since 2002, the S.N. Trust has been working on health, education and social awareness for children, youth and women. The S.N. Trust has a school, a health clinic and ICT centre. Under the Computer Learning and Education Program (CLEP), this organisation has been teaching students and youth of the village about computers since 2005. Through this project, a student or trainee can learn ICT under the curriculum of Microsoft Unlimited Potential and attain a certificate from Microsoft.

The Pallitathay Help Line Centre (Village Information System) disseminates information among villagers, especially rural women, and specialist advice regarding livelihood information by mobile operator ladies (see Section 3.1.1). It also disseminates information through computers, the Internet, and movies along with mobile phone. In 2007, in the Bagerhat sub-district, there were 16,000 participants in their project, of whom 10,000 were females. There are ten types of information that are provided to villagers, depending on livelihood problems and needs. These are:

a) Agriculture

b) Health

c) Education

d) Self-employment

e) Sustainable technology

f) Law and human rights

g) Natural disaster management

h) Village employment creation

i) Passport, license and other government forms

j) Other paid services like Internet browsing, email, mobile phone, digital photos.

The characteristics of the D.Net environment suggest it is an appropriate project for this research.

3.2.2. Case Study II: Our Village Online (Amader Gram)

Amader Gram began their project in Bagerhat in 1998 (Figure 3.5). They selected this region because it was the most vulnerable area in terms of poverty and education.

Figure 3.5 Website of Amader Gram project.

The project initially began with micro-credit and social awareness development programs. Micro-credit is a loan scheme that is given to impoverished people in the village for farming, small business, fishing, poultry, and livestock. This micro-credit scheme provides loans with very low interest rates so that rural people can repay the loan easily. With the loan, these impoverished people can start a new business, farming, gardening or any self-employed work and earn money to change their lives. The Amader Gram micro-credit loan scheme was not operating during the field study in 2010, though their beneficiaries were still involved in the project through healthcare, education and other awareness developing programs.

In 2003, in Srifoltala, the Amader Gram ICT centre was established to engage young people with ICT activities and guide them in a moral direction. Due to unemployment problems, the young males often passed time with idle games like playing card or board games and sometimes bullied school girls. Furthermore, most of the village people are farmers or fishermen who work seasonally and are idle the rest of the time. Sometimes, in these idle periods when they have no work and food, they turn to crime. To motivate both groups of people morally, Amader Gram took initiatives to change their mindset through education and learning. The six ICT programs on which they are working are:

a) Breast Cancer

b) Amader Gram Database Program

c) Knowledge Centre

d) Literacy for Livelihood

e) Monitoring and Evaluation

f) Rural News Online.

Among these programs, the two run by Amader Gram in Srifoltala are the Knowledge Transfer Group (KTG) and Telemedicine (Breast Cancer), which have 691 enlisted beneficiaries. The Breast Cancer ICT project provides a telemedicine service (through the Internet and mobile phone) for breast cancer awareness. The hierarchy of Amader Gram project is given in Figure 3.6. The Amader Gram women participating in the study are part of these programs (see Section 4.3).

The characteristics of the Amader Gram environment suggest it is an appropriate project for this research.
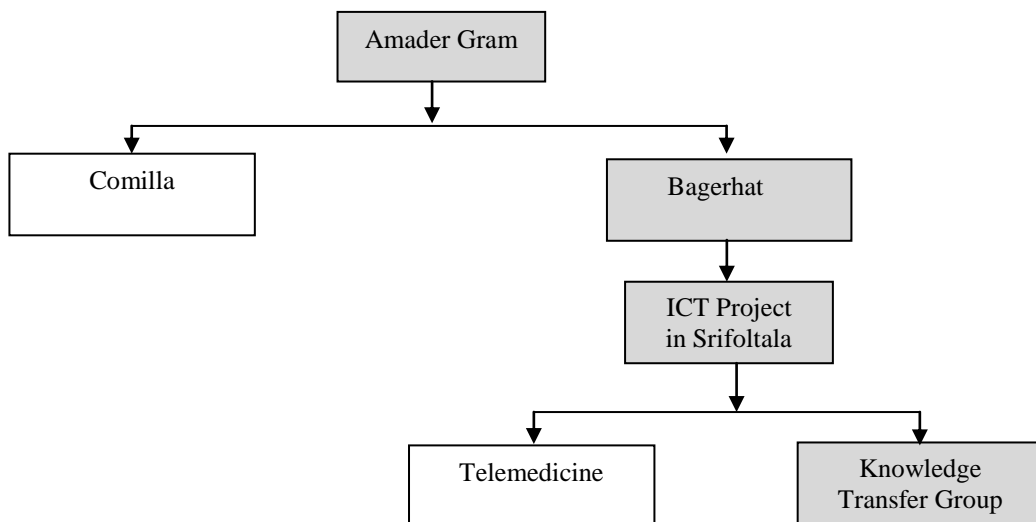
Figure 3.6 Hierarchy of Amader Gram project.

3.3. Background of the Two Villages

The D.Net and the Amader Gram ICT projects are situated in the Bagerhat district in Boitpur and Srifoltala respectively. Both Boitpur and Srifoltala had high telephone service coverage with fixed line and two or more mobile service providers. Most of the families in Boitpur had access to electricity with 1-2 hours of load shedding (power supply cut) in the evenings. However, the D.Net project had a solar panel (Figure 3.7), which supplied electricity 24 hours per day to the ICT centre. In Srifoltala, economically solvent families had electricity supply to their houses with more than 1-2 hours load shedding. As Amader Gram project did not have a solar panel, the power supply to their ICT centre was frequently interrupted.

Women in both villages follow a traditional lifestyle, as described in Chapter 2, where religious and cultural norms influence all their activities from childhood (Sultana et al., 2009). From the observation of the researcher, it was perceived that women were more aware of children's health and education and they go outside home

more often than reported in the literature (Section 2.7.3). The student researcher also observed that in rural villages many mothers waited in front of the primary school while their children sat for their final viva tests. Most of these women were wearing *purdah*.

Figure 3.7 Solar panel in the D.Net ICT project in Boitpur.

For most of the women, the main market place was within a distance of 3-4 km from their house. The distance from their house to the ICT centre in the village was different for each participant, as they came from different locations in the same village as well as from nearby villages. However, most of the participants lived within the vicinity of ICT centres which was convenient because of the available means of transportation, travel costs and travel time. This was important due to security reasons, as their families only allowed them to go to the ICT centre if it was located within the vicinity of the village. They felt comfortable about sending women to centres where everyone was known to each other in the community.

The D.Net ICT centre was easily accessible by people in nearby villages due to the good paved or concrete (paka) road network. The Srifoltala roads, though, were poorer with some being semi-paved or paved with bricks. Due to the road conditions, access to the ICT centres differed based on seasons: the D.Net ICT centre was

accessible during the rainy season whereas the Amader Gram ICT centre was only partially accessible during the rainy season.

The economic condition of Boitpur appeared to be better than Srifoltala. In Srifoltala, most of the people were involved in seasonal occupations, whereas in Boitpur there were people engaged in a number of other occupations such as small business owners, shopkeepers, rickshaw pullers, and drivers. More people in Boitpur were educated so, as a result, they were involved in occupations in NGOs, health clinics, ICT projects, schools and other government organisations. As Boitpur was located near Bagerhat's main town, its people had easy access to colleges, schools, hospitals and courts. Table 3.1 summarises the backgrounds of the two ICT projects.

Table 3.1 Summary of case studies.

	Case Study 1 -D.Net	Case Study 2- Amader Gram
Village	Boitpur	Srifoltala
Geography/ infrastructure	• Bagerhat –South western part of Bangladesh. • Roads were bitumen paved. • Not flooded during rainy season. • 100% mobile phone coverage.	• Bagerhat –South western part of Bangladesh. • The roads were semi-paved or paved with bricks, except bitumen-paved main roads. • Partially flooded during rainy season. • 100% mobile phone coverage.
Economy	• Solvent economic condition with more employment opportunities due to more education and nearby location of Bagerhat district centre. • SN Trust health clinic, School and D.Net ICT projects were employing people. Also, people were engaged in a number of other occupations such as small business owners, shopkeepers, rickshaw pullers and drivers.	• Poor economic condition with backward location. • Fewer employment opportunities in schools and ICT project and with fishing, poultry and farming as seasonal occupations for villagers.
Culture	• Traditional lifestyle dominated by Muslim religion with the influence of Bagerhat town where educational institutions, courts and hospitals were located.	• Traditional lifestyle with the influence of the Muslim religion and remote location from town where people need to travel long distances for work, health care and educational purposes.

Objectives of ICT Project	• ICT for economic development and poverty alleviation in Bangladesh. • The Community for Learning Information, Communication and Knowledge (CLICK) supported and funded by Microsoft. • Computer Learning and Education Program (CLEP). • Pallitathay Help Line Centre (Village Information System).	• ICT centre to engage young people with ICT activities and guide them in a moral direction. • Awareness development through Knowledge Transfer Group (KTG). • Telemedicine (Breast Cancer) program.
Target Users	• Women (Village Information System) • Educated people and students in the community (Computer Training and other programs)	• Women (former micro-credit loan scheme and Breast cancer awareness) • Students (Computer Training) • General villagers(Computer awareness program)
Duration	• One month field work in 2008 and 2010 to conduct interviews.	
Funding	• MURS	
Rationale	• Based on the unique characteristics and interests of the ICT projects. • Both projects were working with rural women to benefit them with information and awareness through ICT.	

3.4. Conclusion

Two ICT projects, the D.Net and the Amader Gram, which were selected after considering their mission, location and availability, fulfilled most of the aims of the proposed research in rural Bangladesh. The next chapter discusses the methodology of this thesis and includes a model for measuring women's empowerment, the development of an instrument for data collection, evaluation of the instrument as well as a discussion of the ethical consideration.

CHAPTER 4
METHODOLOGY

In this chapter, the research design, research model, selection of participants, sample size for the purpose of interviewing, and ethical considerations for interviewing rural Bangladeshi women are discussed. The process of data collection for Stages I and II of the study is described. The development of the questionnaire instrument and the rationale for the questions is also discussed, making connections between theories and the questions asked. The questionnaire instrument is validated by pre-testing it with women of the same cultural and ethnic background as the target population. The process of data analysis and unit of analysis at the individual level is also described.

4.1. Research Design

As women's empowerment in rural Bangladesh is to be evaluated for a particular technological intervention, specifically ICT, this thesis is social research. Three purposes of social research are exploration, description and explanation (Babbie, 2001). This research adopts an exploratory or interpretive perspective, since ICT intervention for women's empowerment is a relatively new issue. This research takes a qualitative approach because of its exploratory nature. The rationale for using a qualitative approach with multiple tools is discussed in Section 2.11.

Women's empowerment is a complex entity to measure due to its multidimensionality (see Sections 2.7.1 and 2.11). There are no standard methods in measuring women's empowerment, as empowerment depends on the socio-cultural context of a region. In this exploratory research, ICT intervention and its effect on rural women's empowerment in Bangladesh is investigated. In response to the issues

raised in measuring empowerment, and the variety of approaches taken by previous research (see Section 2.11), this study uses multiple tools, specifically case studies, semi-structured interviews and a longitudinal study.

Although Deshmukh-Ranadive (2005) presented a framework to show the impacts of three environments (micro, meso and macro) on an individual woman's empowerment (Section 2.7.1), many of the women in rural Bangladesh spend much of their life within the home. The effect of the domestic power hierarchy (i.e. micro environment) is therefore the most important phenomenon for women. However, the other environments (macro and meso) also directly or indirectly influence women and should be investigated. In this study, the presence of ICT intervention in the village can be a meso level impact on women. As examples, employment opportunity through ICT projects improves the economic condition of an employed woman and her material gain, or a woman's knowledge of health care through an ICT village information system may improve both the woman's and her children's health. Therefore, if the impact of ICT at the individual level is investigated, its connection with all three environments should be revealed.

To capture the effect of any interventions, considering the influence of macro, meso and micro environments in the South-Asian cultural context, Chen's framework of material, cognitive, perceptual and relational dimensions, adapted to include Lennie's technological dimension, is considered useful (Chen, 1997; Lennie, 2002). Changes in these five dimensions are used to identify impacts of ICT intervention on rural women's empowerment. The dimensions are discussed in detail in Section 4.2.2.

The research design is a case study methodology using a questionnaire and a comparison of sample groups with and without ICT intervention. The researcher investigated ICT projects that aimed to empower rural women in Bangladesh (Chapter

3 describes the case studies and environment in which the research was undertaken). After identifying two projects, participants were selected based on convenience sampling. Women were questioned about their level of empowerment in order to explore changes (outcomes) as a result of either direct or indirect intervention of ICT, and also to investigate the type of information needs in their lives and factors (causes) affecting their access to ICT. In addition to asking core questions, the semi-structured interviews explored why and how changes occurred in the women's life. Interviews were considered useful for examining social phenomena, such as a woman's role in a family and in the community (Babbie, 2001). The interviews in this study therefore explored the process of empowerment through ICT intervention. A longitudinal study after two years investigated the progress of empowerment.

Comparisons were made between the two groups (women with ICT intervention and women without) in terms of influencing factors (influencing variables, see Section 4.2.1) and desirable outcomes (impact variables, see Section 4.2.2). Partial validation is achieved through interview responses regarding women's overall empowerment. Further, in response to the concern of Malhotra et al. (2005), that one of the main challenges in measuring the empowerment process is the scarcity of adequate data across time, this investigation includes a longitudinal study. This study over two time periods (2008 and 2010) validates the empowerment process as the impact of ICT on rural women is an evolutionary process, rather than a rapid revolutionary change.

4.2. Research Model

As previously noted, researchers (e.g. Kabeer, 2001; Malhotra et al., 2005; Mason, 2005) acknowledge both the complexity and difficulty in measuring women's

empowerment, since it involves different environments and dimensions of women's life and is a process where involvement of women in terms of active participation (agency) is necessary. However, Chen's (1997) conceptual framework covers many of the areas and domains (particularly for women) in which change at the individual level results from a particular intervention. The framework was developed for South-Asian countries like Bangladesh and India, where socio-cultural norms are similar and women in rural areas suffer similar types of discrimination.

Chen's consolidated framework incorporates all components of three separate frameworks, developed to measure empowerment for low income women in South Asia. Two frameworks were used in Bangladesh (Chen and Mahmud, 1995; Hashemi et al., 1996) and one framework was used in India (Schuler, Hashemi and Pandit, 1995). Chen (1997) suggested that the framework should be adapted to fit a specific program and the context in which it operates. Thus, the technological dimension from Lennie (2002) was included in the model for measuring women's empowerment as impacted by ICT (e.g. mobile phone, the Internet, computer, telecentre or village information system). The model developed for this research is the *Women's Empowerment Measurement through ICT (WEM-ICT).* Using this model, information was gathered from participants who had ICT intervention and a comparable group of participants who did not have ICT intervention in two rounds of data collection, with a two-year interval between.

As can be seen from Figure 4.1, education, age, types of information, purpose and level of access to ICT are *influencing* variables, so they affect how an individual woman would gain knowledge and skills through ICT. Also, depending on the level of gained knowledge and skills through ICT, women experience *impacts* in different

dimensions *(material, cognitive, perceptual, relational and technological)* of life, addressing elements of empowerment.
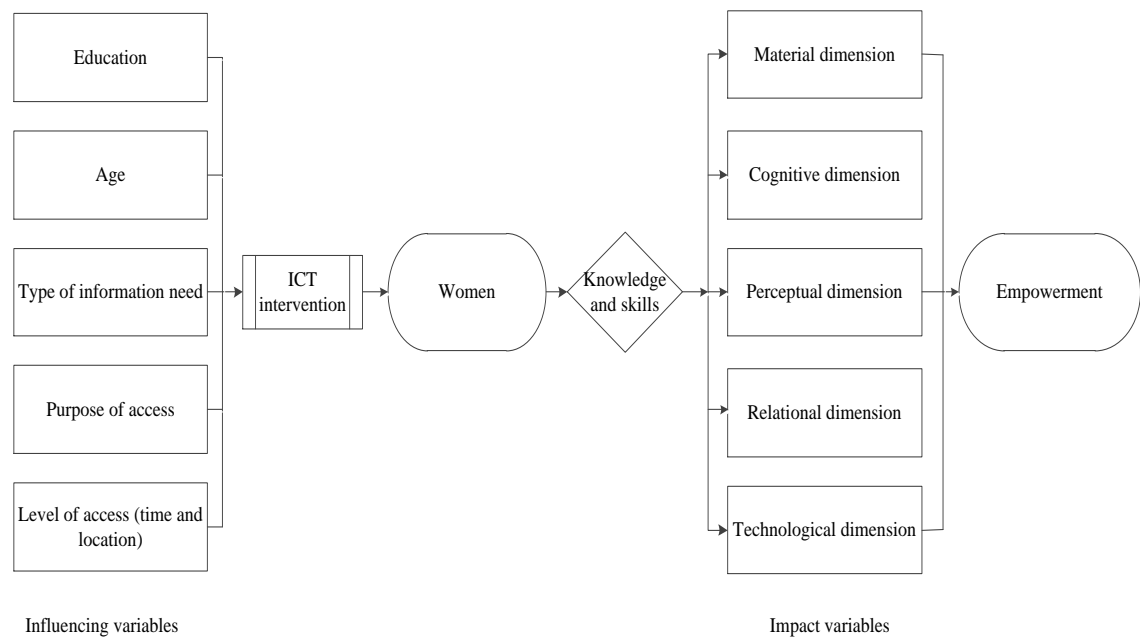
Figure 4.1 Proposed WEM-ICT (Women's Empowerment Measurement through ICT intervention) (based on Ahmed et al., 2006; Chen, 1997; Lennie, 2002).

This study will use the term**s** *influencing* and *impact* variables to describe independent and dependent variables (i.e. dimensional changes) respectively. Typically, influencing variables work as stimuli, either present or absent. For example, in this research, women's access to ICT is an influencing variable since women might have access to ICT or might not. In an alternate approach, influencing variables are cause, and impact variables are effect (Chen, 1997). Therefore, in research, both variables must be operationally defined. It is sometimes appropriate to make a wide variety of observations during data collection and then determine the most useful operational definition of variables later during the analyses (Babbie, 2005). Thus, the variables are assumed to be non-static. The influencing and impact variables are described in detail below.

4.2.1. Influencing Variables

Demographic information, such as marital status, age, education, children (number, gender and age), type of information need, purpose of access and level of access, was collected, as these are considered influencing variables for women. The educational qualifications of participants influence the easy acceptance of technology. Age also acts as a stimulating factor for women in accessing and accepting ICT. The purpose of ICT use, whether improving economic situation, gathering information or increasing social status, is an influencing factor. The level of access to ICT, in terms of times and locations, needs to be considered since it varies for different women. The acquired knowledge and skill level after using ICT tools vary so can be considered as influencing the empowerment process as well.

4.2.2. Impact Variables

Based on several studies (Chen, 1997; Lennie, 2002), the model developed (Section 2.11.5 provides a summary of each of the dimensions of the framework developed in Chen (1997) and an overview of elements of Lennie (2002)'s technological dimension) explores the individual level impacts in the following forms:

(a) Material dimension:
- Level of change in income, earning and wages
- Level of change in savings
- Level of change in control over savings and assets

(b) Cognitive dimension:
- Level of change in awareness of rights, status and exploitation
- Level of change in vision about future
- Level of change in knowledge of socio-political environment
- Level of change in knowledge of voting rights and legal rights

(c) Perceptual dimension:
- Level of change in self confidence

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- Level of change in self-respect
- Level of change in self esteem

(d) Relational dimension:

- Within the family: level of change in harmony between couples; respect, and mutual understanding with other family members
- Within the village: level of change in respect evaluated by advice, decision making and leadership role
- Within the public sector: level of change in access to medical facilities, drinking water, fair price, irrigation facilities, and other livelihood services
- Within the political system: level of change in respect and power as a voter, and more influence on local government

(e) Technological dimension:

- Level of change in knowledge about the benefits of technology
- Level of change in skills and competence in using technology
- Level of change in awareness and understanding about new technology
- Level of change in confidence to use and speak about ICTs.

Though a positive change in each of these five dimensions should occur if women are empowered, this research examines any change, either positive or negative, and justifies the reasons for such outcomes.

4.3. Participants

From the literature, it is evident that the success of any research depends not only on the questions and interviews but also on the sample of participants (Fowler, 1984). For this research, the participants were chosen based on convenience sampling of rural women. Convenience sampling, which is a non-probabilistic sampling approach (Fowler, 1984), was used because of the rarity of women with ICT experience in villages. This is a common approach for exploratory research work. As the name implies, the sample selected is convenient, with less time and cost involved for selection.

Researchers argue that convenience sampling is seriously biased, as it does not represent the entire population. However, sometimes it is appropriate to select a sample on the basis of the knowledge of a population, its elements, and the purpose of the study (Babbie, 2005). The advantages of this sampling are that it is considerably less complicated and it is useful in an area of research that has not been investigated extensively (Cooper and Emory, 1995; Rea and Parker, 2005). Therefore, to choose a sample of women with ICT experience is the main consideration. As not every woman in the entire population has experience with ICT, the selection of convenience sampling is justified. It was used in each target village where the intervention was available and compared with a similar group without intervention effect.

Searching the web about the use of ICT for women's development in Bangladesh, several appropriate projects were identified as possible case studies. After communicating with key personnel through email and formal application, two projects ─ Development Research Network (D.Net) and Our Village Online (Amader Gram Online) ─ granted the researcher permission to work with their beneficiaries (Chapter 3). At the time of contact, both projects were at an early stage of ICT intervention and were eager to learn the outcome of this research through feedback. The selected group of women beneficiaries and non-beneficiaries was based on their interest in being interviewed. The data was collected by going from house to house in the village, asking women if they were willing and available to be interviewed.

In the village of Boitpur, where the D.Net project had been working, 20 women who were using ICT tools like mobile phones, computers, or Internet and were beneficiaries of the Village Information System were interviewed. These women are categorised as "ICT women" throughout this thesis. Another 30 women in the village, who were part of S. N. Trust (a sister program), but not part of the D.Net ICT project

or any other ICT project, were also interviewed. These women are categorised as "non-ICT women". In the Amader Gram Online project in Srifoltala, 20 women were interviewed who were participating in the project using Telemedicine or ICT for education and knowledge. An additional 17 women in the village, who were not using ICT for education and knowledge, agreed to participate.

Interviews were conducted in 2008 and 2010, referred to as Stage I and Stage II respectively. Table 4.1 shows the number of participants in Stage I of the study and Table 4.2 shows the number of participants in Stage II.

Table 4.1 Number of Participants in Stage I.

	D.Net	Amader Gram
ICT	20	20
Non-ICT	30	17

Table 4.2 Number of participants in Stage II

	D.Net	Amader Gram
ICT	20	20
Non-ICT	20	17

4.4. Ethical Consideration

Ethical issues involving disempowered women from different cultural backgrounds in the third world context are complex for fieldwork (Scheyvens and Leslie, 2000). Many researchers are now aware of the need to consult women, as much past research ignored or misrepresented them, and such misinformation was often used to inform development policy and practice (Kozma and Vota, 2014). Developmental work with women is sensitive if it reveals aspects of women's disadvantages in their society. Critical research examines issues such as decision making or the impact of any intervention on men and women which can inherently challenge the status quo. If the

purpose of such research is published, then such intervention can be of concern to people who are in power and who benefit from women's disadvantaged position. Another important issue in face-to-face interviews is the physical characteristics of the interviewer including gender, age, ethnicity and social status (Rea and Parker, 2005). Therefore, it is necessary to create an environment in which women will speak freely without fear. This issue can be addressed by using female researchers. However, the researchers should be careful to avoid exploiting the women for the purpose of the research.

Therefore, in this research, emphasis was given to the privacy of participants by keeping their identity anonymous and requiring their signed consent for the interview. An application, including the questionnaire, was submitted to the Human Research Ethics Committee, Murdoch University, and Ethics Permit number 2008/197 granted.

4.5. Data Collection

In this research, semi-structured interviews were conducted. Typically, an interviewee was asked questions from a written questionnaire and the answers recorded verbatim. Personal interviews are generally used when subjects are not likely to respond to survey methods by email, telephone or the web.

According to Babbie (2001), every questionnaire administered by interviewers should contain clear instructions and introductory comments to help the respondent understand the questions and facilitate responses. For this reason, a short introduction was added to each group of questions about different dimensions in women's life. Language is another issue of consideration. As rural women have no knowledge of English, the questionnaire was translated into Bengali.

After gaining permission from a participant, the interview was conducted individually. Each interview took approximately half an hour. In Stage I, twenty of the 87 participants in Stage I agreed to have their interviews tape-recorded. In Stage II, only seven of the 77 participants were recorded. Answers from all interviewees were written on the printed questionnaire by the researcher.

4.5.1. Stage I

Figure 4.2 D.Net project office (S.N. Trust) in Boitpur.

Figure 4.3 Interview of D.Net ICT beneficiary at project office.

Figure 4.4 Meeting the deputy director of Amader Gram in Khulna.

Figure 4.5 Interview of Amader Gram non-ICT beneficiaries in Srifoltala.

On arriving in Dhaka, the student researcher met with the deputy director of D.Net in the project's head office on 16 October 2008. The deputy director described their project and provided the contact person and address of the project in Boitpur, Bagerhat. The field work in Boitpur began on 20 October 2008 (Figure 4.2 and 4.3).

The student researcher also met twice with the project director of Amader Gram; the first meeting was on 16 October 2008 in Dhaka and the second on 20 October in Khulna (Figure 4.4). After discussing the research objectives, procedure of

data collection and their projects, data collection commenced on 22 October 2008 with the help of project staff in Srifoltala (Figure 4.5). On arrival at each project office, it was found that the staff had already been informed of the purpose and the data collection process.

4.5.2. Stage II

Figure 4.6 Interview of D.Net ICT beneficiaries at project office in Boitpur.

Figure 4.7 Children and their mothers in front of S.N. Trust School in Boitpur.

Figure 4.8 Meeting the deputy director of Amader Gram in Khulna.

Figure 4.9 Amader Gram non-ICT participant, Srifoltala.

Figure 4.10 Interview of Amader Gram ICT participant at main office, Khulna.

Figure 4.11 Computers in the Amader Gram Project office, Srifoltala.

In November 2010, a follow-up study was conducted. The student researcher met with the director of the D.Net project in Boitpur. She also went to the S. N. Trust School in Boitpur (Figures 4.6 and 4.7). That study began on 11 November 2010.

The student researcher met with the managing director of Amader Gram at his office in Khulna on 22 November 2010 (Figure 4.8). After discussing the follow-up study, data collection commenced on the same day with the help of project staff in Srifoltala (Figures 4.9 and 4.10). Figure 4.11 shows the computers in the project office of Srifoltala.

4.6. Instrument

4.6.1. Rationale for the Questionnaire

The questionnaire is one of the most common instruments used for social research (Babbie, 2001). According to Foddy (1992), asking questions is the most widely accepted cost-effective way of gathering information about past behaviours, experiences, private actions and motives, beliefs, values and attitude (i.e. subjective variables that cannot be measured directly). Therefore, this research used a questionnaire instrument (see Appendix I). Since this research takes a qualitative approach the instrument was designed in such a way as to elicit information that would be useful for analysis. Both closed and open-ended questions were used. Closed questions were used for descriptive analyses; open-ended questions provided data for qualitative analyses. The questions addressed different types of changes experienced by women in all spheres of their lives.

Questions should be asked of participants so that their answers give unbiased output irrespective of the intention of the research (Babbie, 2001). Negative items should be avoided in questions since sometimes negation leads to misinterpretation.

For the success of subsequent analysis, the questions should be clear, relevant, short, with respondents willing and competent to answer (Babbie, 2005; Rea and Parker, 2005). The questionnaire should commence with easy, non-threatening, but useful information (Sudman and Bradburn, 1982). Therefore, in the interviews, questions about personal information and participants' involvement in ICT projects were asked first, so that respondents would feel comfortable and at ease with the interviewer. The order of questions sometimes affect responses in survey research (Schuman and Presser, 1981). To avoid such an effect, questions dealing with aspects of the same issue or closely related issues were grouped together. When several questions have the same set of answer categories, a Likert-like scale for responses should be used. A tabular format of questions is recommended in order to use space efficiently, for faster response and ease of analysis (Babbie, 2001).

The questionnaire was aimed both at women using ICT and women not using ICT. The questions addressed all aspects of a woman's life to find changes in their empowerment. The justification for these questions is described below:

- *Question 1* asked the participants about demographic information such as name, age, educational level, other qualifications, marital status, number of children and number of dependent and independent family members. Answers to these questions addressed the WEM-ICT model; for example, a woman with secondary education may have more capacity to absorb ICT education than a woman without any formal education.

- *Questions 2-3* asked the participants about their involvement in the ICT project in terms of duration, training obtained, purpose and usefulness of training, and direct or indirect participation. For example, some women may have participated in ICT projects and learned how to use the computer or the

Internet; on the other hand, some women may not have received any ICT training but could be benefiting from information officers or intermediaries who travelled from door to door and informed rural women about their livelihood information needs such as healthcare, legal rights, childcare, farming, market price and so on.

- *Question 4* asked about the reasons for using some ICT tools to identify the perceived acceptance and usefulness of those tools in the lives of rural women.

- *Question 5* asked about distance and mode of transportation to the ICT projects and personal time management. The involvement of women in ICT projects may have affected interfamilial matters, such as childcare or relationships with other family members.

- *Question 6* focused on *material dimensions* in a woman's life that empowerment through ICT is said to impact in terms of economic status, assets, contribution to family expense and savings. Responses to this question highlighted the changes before and after ICT intervention in a woman's economic life.

- *Question 7* focused on *cognitive dimensions* in a woman's life, which highlighted changes in terms of knowledge, education and awareness that may have led them to empowerment through ICT.

- *Question 8* focused on *perceptual dimensions* in a woman's life that empowerment through ICT is said to impact in their mental spaces such as level of confidence, self-esteem, self-respect, freedom and so on (Chen, 1997).

- *Question 9* focused on *relational dimensions* in a woman's life such as decision making power and relationship with her husband as well as

relationships with other people within the community in terms of political involvement and participation in social activities. If women experienced changes in the above-mentioned areas, then these changes would be an indication of their empowerment because decision making power, good understanding with their husband, participation in social and political activities, and speaking power, are all indications of women's empowerment in Bangladesh (Kabeer, 2001).

- *Questions 10* focused on *technological dimensions* in a woman's life that facilitates empowerment (Lennie, 2002). This question targeted the level of acceptance of technology, the level of understanding and benefits of ICT, and the information needs in their life.

- *Question 11* asked participants about the *overall empowerment* and some summary type questions which would elicit their level of empowerment through ICT in terms of their confidence, security, political power and speaking-out power.

Therefore, the rationale and context of each question of the research instrument are justified by the theories that form the foundation for the questionnaire.

4.6.2. Pre-testing of the Questionnaire

According to Presser (2004), pre-testing of a questionnaire is an indispensable way to evaluate whether the questionnaire could cause problems for interviewers or interviewees. Conventionally, the problems of a questionnaire are signalled either by the answers that the questions elicit (e.g. does not know or refuses to answer) or by visible consequences (e.g. hesitation or discomfort in responding). In addition, Moser and Katton (1971) judged that the adequacy of the questionnaire depends on the

fieldworker's (interviewer's) report on how the interview went, what difficulties were encountered, what alternations should be made, and so forth. Also, Harkness, Pennell and Shcoua-Glusberg (2004) suggested that careful translation of the source questionnaire is important in cross-national survey research.

As the respondents of this questionnaire were Bangladeshi women and the language of communication was Bengali, the questions were translated into Bengali, focusing on the meaning of questions rather than the words. The questionnaire was checked by Bengali speaking women or researchers for their views and comments. Before commencing fieldwork, the questionnaire was pre-tested by four Bangladeshi women for their comments. Two of the women had experience in social survey research in Bangladesh and their comments and suggestions helped in restructuring and modifying the language of some questions.

Two Bangladeshi housewives were also interviewed with this pre-test version of the questionnaire and some suggestions from them were added. For example, it was pointed out that childcare services are not available in rural areas of the country. Only maidservants or helpers take care of children with either payment or meals with accommodation. So, questions regarding childcare were modified. Some words in English have a similar meaning in Bengali; for example, 'freedom' and 'independence' has the same meaning. Such questions were clarified with appropriate examples.

Even though the questionnaire targeted rural women in Bangladesh, pre-testing the questions with the above-mentioned educated urban Bangladeshi women living in Australia was meaningful. These women had migrated to Australia 1-2 years before pre-testing and had parents and relatives in Bangladesh so they had retained the same values and traditions.

4.7. Data Analysis

4.7.1. Unit of Analysis

In this research, the unit of analysis chosen was the individual (i.e. women), which is an effective way of collecting original data and for measuring attitudes and the impact of ICT intervention in women's life.

The sample size was an issue for consideration. However, where longitudinal data may be potentially unavailable or inadequate, it is appropriate to collect cross-sectional data to provide in-depth knowledge of a particular phenomenon. Thus, within the two stages of this study, interviews were conducted with a cross-section of rural women, ICT student trainees, beneficiaries and non-beneficiaries of ICT projects. As mentioned in Section 4.1, data was also collected from a smaller sample of participants in a two year longitudinal study.

All interviews were conducted in the local Bengali language. Upon returning from fieldwork, the data was first transcribed into English. A Microsoft Excel file (Figure 4.12) was prepared for each group (2 projects x (ICT group + non-ICT group)), resulting in four different Excel files. Each file had 10 worksheets with themes like demography, reasons for using ICT, details of involvement, personal issues and six types of changes (five dimensional changes and one overall change) that could occur after using ICT.

During the data entering process, nominal values were used for easy understanding and for the purpose of analysis. Each participant was given an ID; for example, D1 was used for participant 1 of the D.Net project who was involved in the ICT project and N1 was participant 1 for a D.Net non-ICT project. Category ranges were converted to nominal numbers and coded accordingly; for example, an age less

than 20 years was converted to 1, ages 21-30 years was equal to 2. Comments were inserted for encoding the questions. For Likert-like scale answers, values were 1 to 5, 1 being for less strength and 5 being for more strength. The coded data were analysed and represented with the appropriate figure.

Figure 4.12 Screenshot of Excel sheet.

4.8. Conclusion

In summary, the qualitative research methodology with multiple tools to investigate the research questions was considered appropriate. The proposed model to measure empowerment was designed in the context of Bangladesh. The instrument for data collection at the individual level covered most of the spheres of women's lives. Human ethics, the data collection procedure, sample size, data analysis and the coding procedure were discussed to provide an understanding of the methodological process.

The next chapter, Chapter 5 discusses the results of Stage I of the study including the demographics of the participants, analyses of collected data and discussions of the results with interpretations. Chapter 6 discusses the results of the total Stage II and Chapter 7 discusses the results of the longitudinal participants only.

CHAPTER 5

RESULTS OF STAGE I STUDY

5.1. Introduction

In this chapter, the results from the interviews are examined to explore the research questions: *what is the role of ICTs in women empowerment; what critical factors are needed to be considered while measuring rural women's empowerment through ICT interventions;* and *what information is required for rural women to empower themself*? First, the demographics of the participants are discussed and then the results of each dimension (material, cognitive, perceptual, relational, and technological) with regards to women's empowerment are addressed using qualitative analyses. Descriptive analyses of the results are detailed to provide both a broad and in-depth understanding of the issues. Excerpts from interviewees' responses are included to support the analyses.

As discussed in Chapter 4, participants responded to a semi-structured questionnaire that included 11 questions (Appendix I). Responses to Question 1 about participants' demographics are summarised in Table 5.1. Questions 2-3 addressed participants' involvement in ICT projects and are discussed in Section 5.3 (see Figure 5.2 and Figure 5.3). Questions 5-10 were designed to elicit possible changes in women's lives due to the use of ICT. In Section 5.4 each of the five dimensions is investigated, presented and discussed in relation to its impact on women's empowerment. Question 11 was a summary-type question which asked participants to report their perception of the changes with regards to their overall empowerment through ICT. These results are also presented in Section 5.4. Finally, the results are summarised in Section 5.5.

A few responses to questions are not addressed in this thesis, as those issues do not show a differential picture compared to other issues. For example, answers to the questions regarding religion indicate that almost 95% of the women have the same religion, which suggests that this demographic does not affect the research questions, but does confirm the religious influence on women's empowerment process as discussed in the literature review provided as Chapter 2.

5.2. Demographics

As noted in Chapter 4, the data was collected using convenience sampling of women from two different villages (Boitpur and Srifoltala) in Bangladesh. Boitpur is within the area of operation of the D.Net project while Srifoltala is part of the Amader Gram project. These projects were described in Chapter 3. The interviewees were rural women who either did or did not participate in these projects.

The D.Net ICT project involved Boitpur women directly with ICT education, training and employment. These women are referred to as "ICT women" in this thesis. Women who were not exposed to ICT tools by the ICT project but were beneficiaries of the project indirectly through a village information system and other programs such as healthcare and education, were also interviewed (Section 4.3). These women are referred to as "non-ICT women".

Similarly, women in the Amader Gram ICT project who were employees of the project, student trainees or involved in the Computer for All program, either for their own or their children's interests, are considered as "ICT women". Other women in the village who were not involved in the ICT project directly through training or education or indirectly through village information system are categorised as "non-ICT women" (Section 4.3). Note that some of these non-ICT women were involved in the Computer

for All program, but were not able to take advantage of the program because they were not literate and, therefore, could not assimilate and apply the knowledge gained.

It can be seen from Table 5.1 that the highest percentage of respondents was from the age group 21–30 years (61%). Figure 5.1 is a comparison between younger and older women to show more clearly the generational difference in each village for both ICT and non-ICT women. It can be seen that, in the ICT groups, there were more younger than older women. The generation gap affects ICT use because the younger generation uses ICT tools more efficiently, effectively and confidently than the older generation (Prensky, 2001).

Table 5.1. Demographics of participants (N = 87)

Demographics		D.Net (Boitpur)		Amader Gram (Srifoltala)		Total (N = 87)
		ICT (N = 20)	Non-ICT (N = 30)	ICT (N = 20)	Non-ICT (N = 17)	
Age group	< 20 years	6	0	0	0	6
	21-30 years	13	18	14	8	53
	31-40 years	1	10	3	5	19
	41-50 years	0	2	2	4	8
	>50 years	0	0	1	0	1
Marital status	Married	10	27	16	14	67
	Single	10	2	4	2	18
	Other	0	1	0	1	2
Level of education	Unable to read	0	3	5	9	17
	Non-formal schooling	0	4	0	0	4
	Primary school	0	5	3	3	11
	Lower secondary	0	8	5	2	15
	Secondary school	1	4	2	0	7
	Higher secondary	10	4	1	2	17
	Post-secondary	9	2	4	1	16
Employed	Yes	12	5	5	7	29
	No	8	25	15	10	58
ICT use	Mobile	15	22	20	15	72
	Computer	7	4	4	0	15
	Internet	10	0	2	0	12
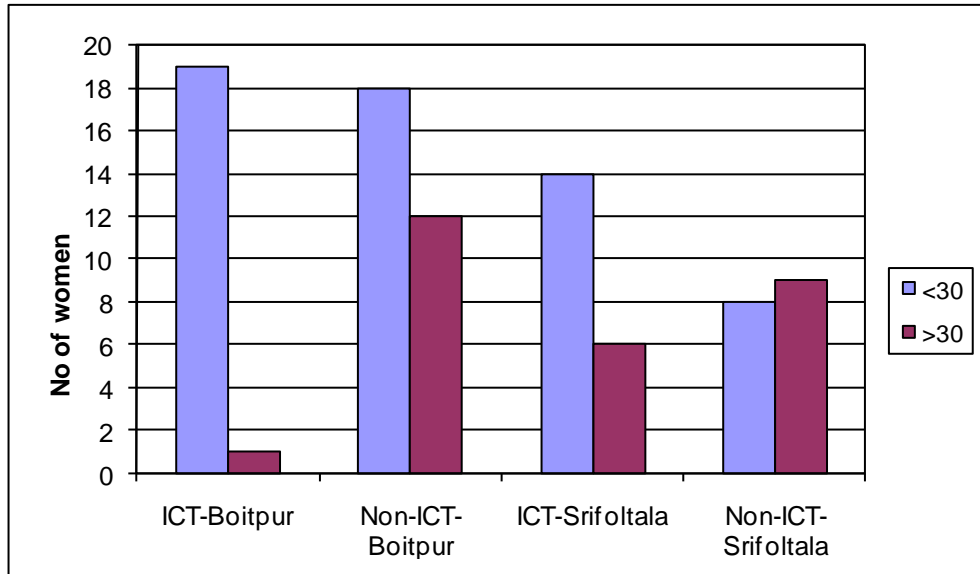
Figure 5.1. Number of younger (<30 years) and older (>30 years) women for both ICT and non-ICT participants (Boitpur and Srifoltala).

From Table 5.1 it can be also seen that most of the women were married (77%) and had no employment (67%) outside the home. Table 5.1 indicates that, although a higher percentage of women had some form of education and could read (80%), less than half completed secondary school (46%), while a smaller percentage completed higher secondary education (20%) and post-secondary education (18%). Overall the majority of women, both ICT and non-ICT, could use a mobile phone as an ICT tool (83%), but only a few could use the Internet (14%) and computers (17%).

Across both villages, 17 of the 87 (19.5%) women could not read. Some respondents had attended primary school, but left school at an early age and had forgotten how to read. All the Boitpur ICT women could read, but 25% of the Srifoltala ICT women were unable to read; they could only sign their names. Most of these Srifoltala ICT illiterate women (who had children involved in ICT or who were interested to know about ICT), were involved in the one-day computer education program, Computer for All, which was not restricted to women who were able to read.

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5.3. Involvement in ICT Projects

The interviewees were asked about their involvement in ICT projects (Appendix I, Q. 2-3). From Figure 5.2(a), it can be seen that the purpose of involvement varied among ICT women.

In Boitpur, most of the ICT women (85%) were students supported by their family (40%) or trainees from other organisations (45%) (both groups were referred to as trainees in this thesis). These trainees were involved in a training program of at least 3 months. The rest of the ICT women were employees (15%) of the D.Net project, who could use a computer and the Internet. These ICT women, therefore, had the opportunity to gain more knowledge and education because they had greater access to ICT.

On the other hand, from Figure 5.2(b), it can be seen that, in Srifoltala, there were various purposes for involvement with ICT. Most of the ICT women (60%) participated in the Computer for All program. In addition, 5% of ICT women were beneficiaries of Amader Gram's village information system; 15% were involved in the healthcare program (telemedicine and breast cancer awareness program); 10% were employees of the project; and 10% were student trainees who were involved in two to three months paid computer training. As mentioned in Section 3.2.2, the Amader Gram ICT project provided a telemedicine service for breast cancer awareness. Women who took advantage of this ICT related healthcare program were considered ICT women. So, most ICT women in Srifoltala had a lack of in-depth involvement compared to the ICT women in the D.Net project in Boitpur.
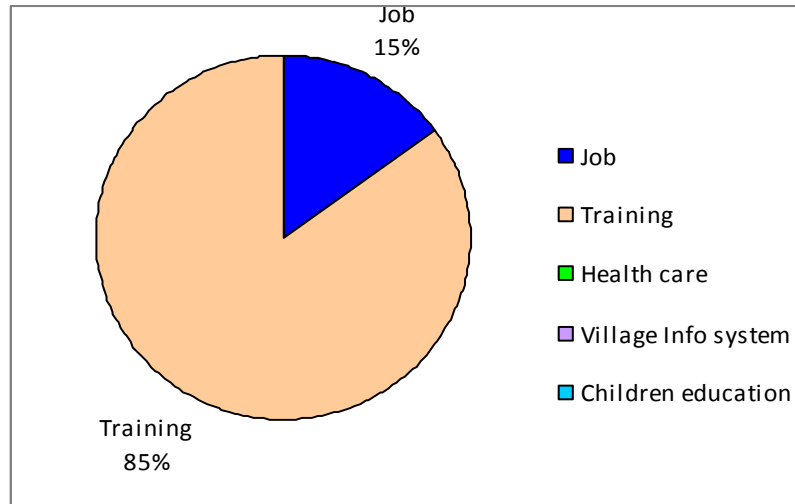
(a) Boitpur (D.Net)
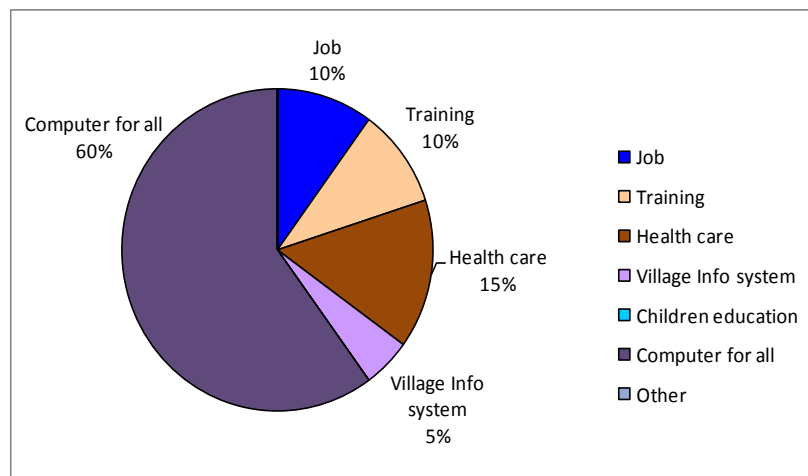
(b) Srifoltala (Amader Gram)

Figure 5.2. Purpose of involvement in ICT projects.

From Figure 5.3(a), it can be seen that for most of the non-ICT Boitpur women (90%) the purpose of involvement in D.Net was the village information system, with only a few using the S.N. Trust School for Children Education and S.N. Trust Health Clinic for healthcare (see Section 3.2). So, non-ICT women who used the village information system were advantaged indirectly from ICT through field workers of the project who moved from door-to-door to assist rural women with their livelihood

problems. These women also benefited from the ICT project through the intervention of the information field workers, without actually using ICT tools or going to the ICT centre physically (Section 3.2). It should be noted that the programs provided through the D.Net project did not include a micro-credit loan scheme.
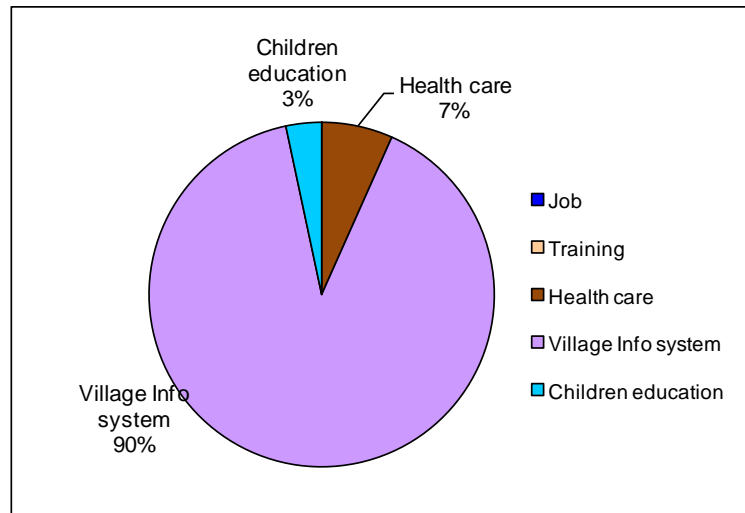
(a) Boitpur (D.Net)
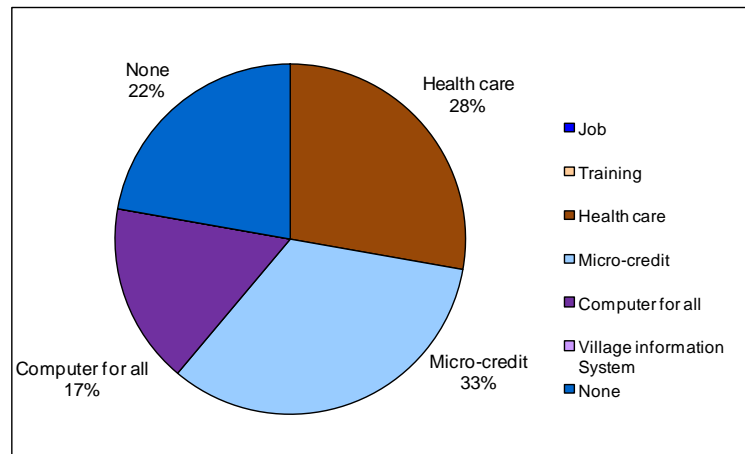
(b) Srifoltala (Amader Gram)

Figure 5.3 Purpose of involvement of non-ICT participants.

From Figure 5.3(b), it can be seen that, though the Amader Gram project in Srifoltala had a village information system, the non-ICT women were involved in various other programs such as the Computer for All program (17%), the micro-credit loan program (33%) and healthcare programs (28%). As noted previously, some women who participated in the one-day Computer for All program and who did not benefit directly were categorised as non-ICT women based on their lower level of interest in ICT. The micro-credit loan scheme (Section 3.2.2) was one of the Amader Gram project's activity to help impoverished rural women when it was established 10 years previously. Though this loan program was no longer active, the members of that program were involved in other project activities and were treated as the project's founding beneficiaries. Non-ICT women also benefited indirectly from ICT tools through the breast cancer awareness program. It can be noted that, though Srifoltala had a village information system, rural women did not benefit since it was not as active as in Boitpur where women acquired livelihood information either through D.Net ICT centre or through the information field workers.

In answers to the question regarding the satisfaction level with the ICT projects (Appendix I, Q.2e), most of the participants involved with these projects in both villages indicated that they were very satisfied.

5.4. Dimensional Changes and ICT Use

As mentioned earlier, one of the research aims was to discuss changes in women's lives due to the use of ICT (Appendix I, Q. 5-10). Changes in each of the five dimensions − material, relational, cognitive, perceptual, technological − are discussed. For each dimension, changes in ICT women were compared with changes in non-ICT women to identify the impact level within each village.

5.4.1. Material Dimension

Changes in women's material dimension are described in terms of economic security, acquisition of assets, loans, savings and contribution to family expenses (Chen, 1997; Hashemi et al., 1996). These aspects of material dimension are discussed in this section.

5.4.1.1. Economic Security

The responses to the question related to economic security (Q.6a) are shown in Figure 5.4. A Likert-like scale of 5 was used where changes experienced by women were indicated as 5 for 'much better', 4 for 'better', 3 for 'no change', 2 for 'worse' and 1 for 'much worse'. The average value of each change was calculated and plotted.

It can be seen from Figure 5.4 (combined results of both villages) that, after acquiring knowledge of ICT, more ICT women obtained or hoped to obtain jobs outside the home than their non-ICT counterparts. Therefore, ICT could be considered as a mechanism to realise material gain. However, there were fewer changes in business expansion and repaying debt since most of the ICT women were students or employees who were not involved in any kind of business or micro-credit loan scheme.

Figure 5.5 and Figure 5.6 show economic changes in each village separately. Looking at income increments, it can be seen that ICT women in Boitpur had increased job opportunities, increased income and increased economic security (Figure 5.5). Repaying debts was not a critical factor since most of the women did not have any loans. As mentioned earlier, the micro-credit loan scheme was not part of the D.Net ICT project. However, there were many other non-government organisations in Boitpur that provided micro-credit loans and some ICT and non-ICT women were

involved in those. Nevertheless, due to more positive changes in employment and income, ICT women had more economic security than non-ICT women.
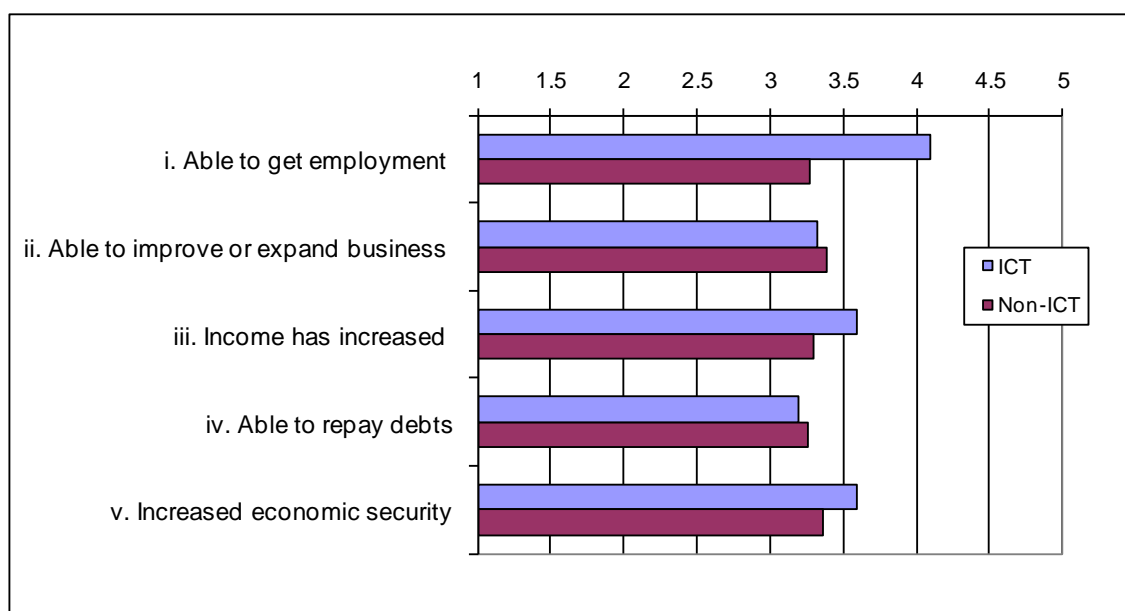
Figure 5.4 Average differences in economic status of ICT and non-ICT women (Boitpur and Srifoltala).

Mahela (B4I)[5], who was aged below 20, a student of higher secondary level, and lived with her parents said, "I hope to obtain a job after finishing my studies". She was a student trainee of the D.Net project at the time of interview. The overall economic changes in all aspects were positive, which might be a positive indication of the impact of the ICT project, along with the impact of other NGO activities in the village.

In Srifoltala (Figure 5.6), it can be seen that only the category of employment opportunity showed little improvement for ICT women compared to non-ICT women. This could be because the 20% ICT women who were employees and student trainees had obtained or hoped to obtain a job, while other ICT women commented that, by

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[5] Interviewees are identified by codes which are of the format: Village, ID, Group. Village is either B (Boitpur) or S (Srifoltala); ID is a number assigned to the interviewee; Group is either I=ICT or N=non-ICT. So, for example, "B4I" is Interviewee No 4 in the Boitpur ICT group.

acquiring ICT knowledge and education, their children expected to have more job opportunities.
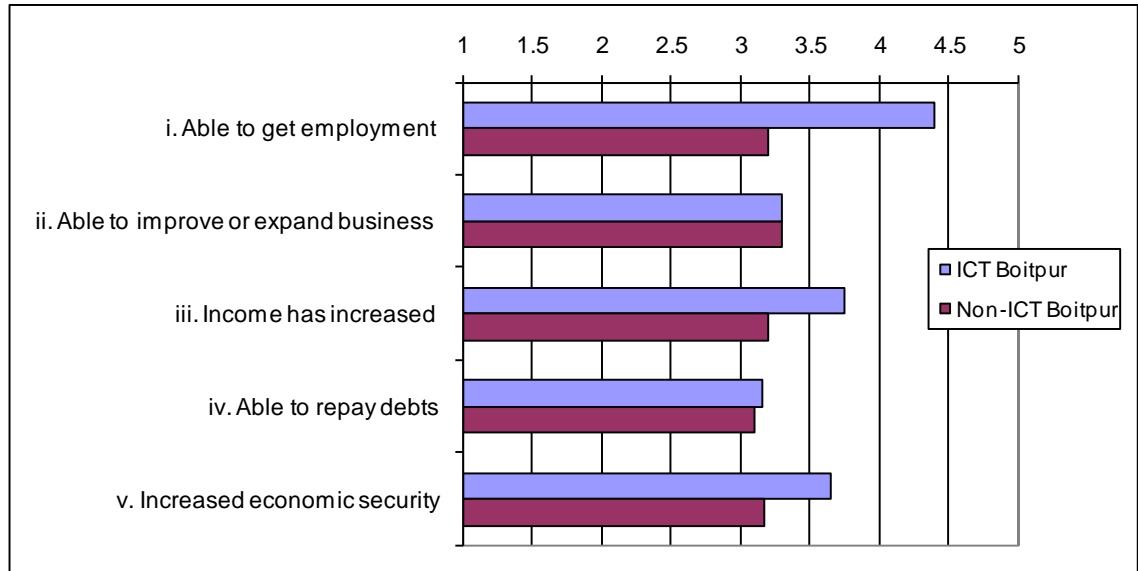
Figure 5.5. Average economic change of ICT and non-ICT women (Boipur).
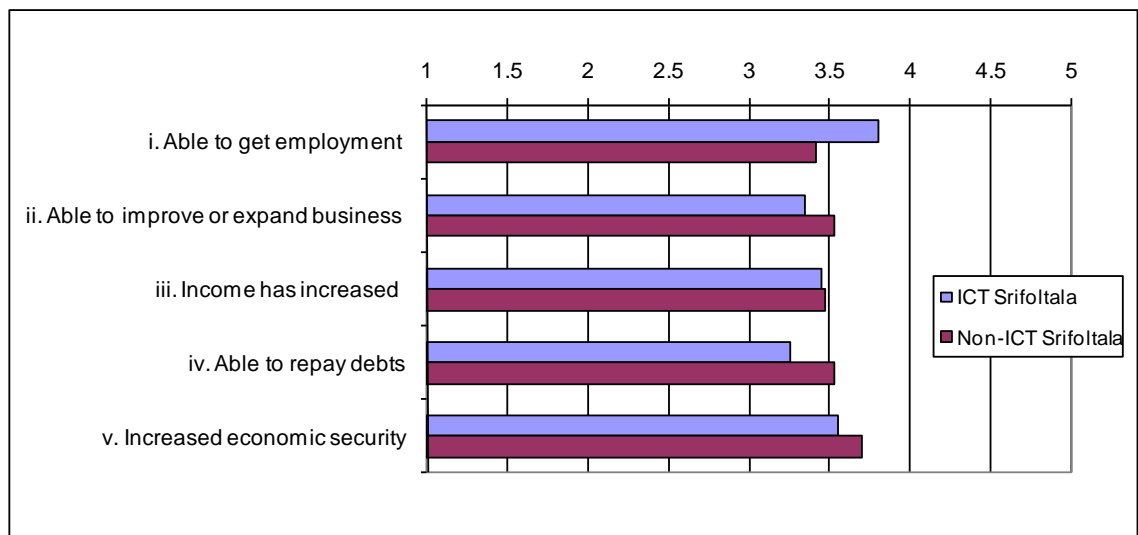
Figure 5.6. Average economic change of ICT and non-ICT women (Srifoltala).

5.4.1.2. Acquisition of Assets

Questions 6b-e (Appendix I) asked women about their assets (Table 5.2). Most of the women in both villages had land, a house (where they lived with their husbands or

parents) and jewellery from both their own family and their husband's family. The land and house were not in their possession but they would acquire them when the assets were distributed according to law after the death of their husband or parents (Banglapedia, 2006). Only one woman in the non-ICT group in Srifoltala had her own land which came from her parent's family.

In Boitpur, most of the ICT and non-ICT women had their family land and house (Table 5.2). Eleven ICT women (55%) had jewellery, whereas only 9 non-ICT women (30%) had jewellery. Four ICT women (20%) owned cattle compared to 8 non-ICT women (26%). One ICT woman (5%) had a two-wheeler vehicle (a bicycle is an important asset used for transportation) compared to 8 non-ICT women (26%). Therefore, in relation to asset acquisition, ICT might not have much impact on these women. However, it should be noted that approximately 40% of ICT women were unmarried students and therefore, being dependent on their parents or elder brothers, they had not acquired any assets at the time of their interview.

So, it can be stated that, in terms of acquisition of assets, there was little difference between ICT and non-ICT women in Boitpur, as both groups were economically solvent. However, spanning more age groups, non-ICT women had more jewellery which they acquired as a gift or dowry from their parents at the time of their marriage.

In Srifoltala, most of the ICT and non-ICT women had their own family land and houses (from 60% to 75%) (Table 5.2). Ten ICT women (50%) had jewellery compared to three non-ICT women (17%). Two ICT women (10%) had cattle and one ICT woman (5%) had a two-wheeler (but no other assets). None of the non-ICT women had cattle or a two-wheeler. As discussed in Section 3.3, the economic

condition of Boitpur was better than that of Srifoltala, which might have affected asset acquisition.

Table 5.2. Acquisition of assets (N = 87).

	Boitpur (D.Net)		Srifoltala (Amader Gram)	
Assets	ICT (N=20)	Non-ICT (N=30)	ICT (N=20)	Non-ICT (N=17)
Family land	13	23	11	9
Family house	12	22	14	9
Jewellery	11	9	10	3
Cattle	4	8	2	0
Two-wheeler vehicle	1	8	1	0
Other	0	0	2	0

5.4.1.3. Loan/Debt
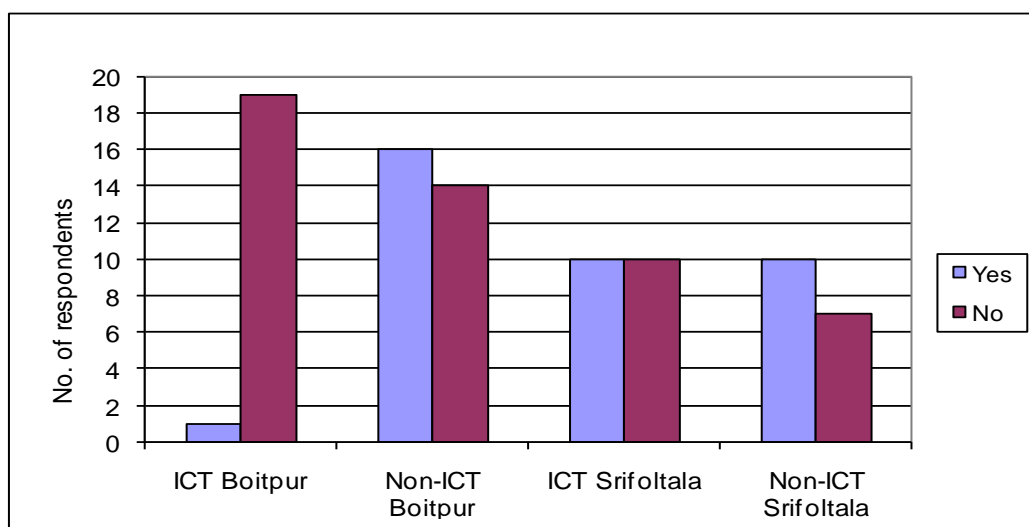
Figure 5.7. ICT and non-ICT women having loans or debts (Boitpur and Srifoltala).

It is interesting to see from Figure 5.7 that, in Boitpur, 19 ICT women (95%) were not liable for any loans. The reason could be that most of these women were student trainees, employee trainees and employees of the project. Students did not have any loans or debts and employees did not need to borrow as they had their own income.

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On the other hand, more non-ICT participants had loans, which were from micro-credit schemes outside the project.

In Srifoltala, there were the same number of ICT women with and without loans, but there were more non-ICT women with loans than without. The ICT and non-ICT women who had loans were involved in micro-credit schemes outside the project. As mentioned in Section 3.2.2, the Amader Gram project did not provide micro-credit loans after they had changed their vision to an ICT for development program in 2008. However, 66% of non-ICT women could not save enough to repay the loans, perhaps because they were overburdened with multiple loans. If their money from loans invested in small business, poultry or fish cultivation could not make a profit due to natural calamities or diseases of farm animals, they took further loans from other NGOs or from other rich people of the village to overcome the loss and repay the previous loans.

So, overall, the combined results for two villages showed 73% ICT women had no loans or debts compared to 45% non-ICT women. As students or employees (mostly in Boitpur) and members of well-to-do families, ICT women had more economic security. Most non-ICT women, on the other hand, were beneficiaries of micro-credit loan schemes and had more loans or debts.

5.4.1.4. Savings

In Boitpur, only 30% of ICT women reported having savings (most probably due to reasons already reported for this cohort: youth, status as students), compared to 40% of non-ICT women (Figure 5.8). In Srifoltala, 70% of ICT women had savings, compared to only 24% non-ICT women. It could be suggested from these data that, in a context of lower economic solvency, involvement with ICT provided greater

opportunity for economic gain. Alternatively, the wider range of involvement with ICT (i.e. fewer were students) may address these differences. Nevertheless, combining the two villages, 50% of ICT women had savings compared with 34% of non-ICT women. So, it could be inferred that, while both ICT and non-ICT women were saving, more ICT women were able to save, for whatever reasons.
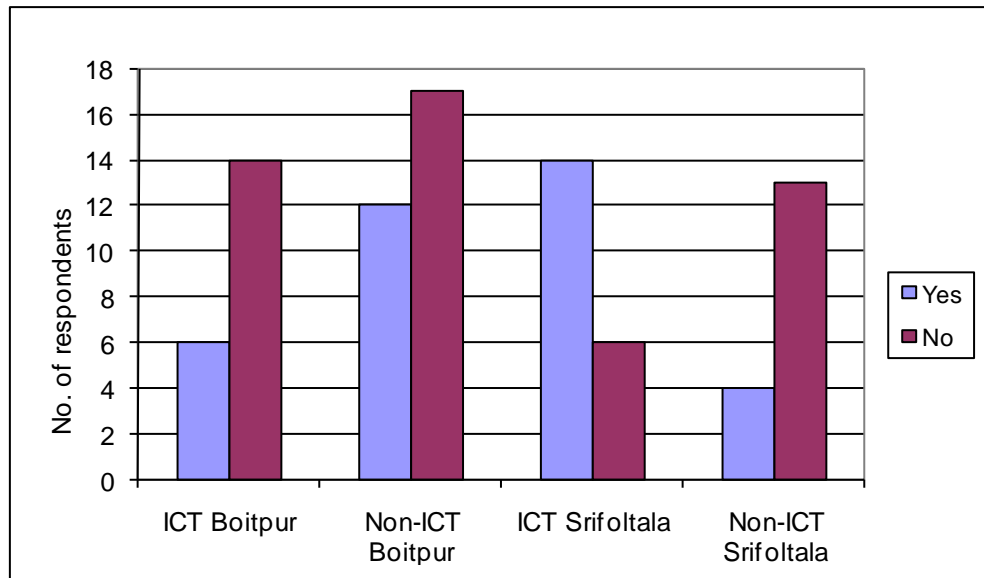
Figure 5.8. ICT and non-ICT respondents having savings (Boitpur and Srifoltala).

5.4.1.5. Financial Contribution

Even though rural women contribute to their family in terms of non-monetary activities such as farm chores, housework, child and elder care, livestock and poultry rearing, fish culture, harvesting and preservation of food, handicrafts and so forth, their monetary contribution towards the total family income reflects their independence and empowerment.

It can be seen from Figure 5.9 that ICT women in Boitpur had the ability to contribute more to the total family income. Of the 20 ICT women, 6 contributed 26-50% of total family income through their income from employment while 6 contributed 0-25% from other income (through handicrafts or poultry). The remaining

8 women did not contribute as they were students who were unemployed (see Table 5.1). In Srifoltala, only 5 ICT women who had employment (2 with the ICT project and 3 with other employment) contributed 0-25% of the total family income and the remaining 15 women did not contribute as they were either students or unemployed. Therefore, Boitpur women who were exposed to ICT had expanded their employment opportunities (see Figure 5.4), and contributed more (i.e. 26-50%) to their family's finances.
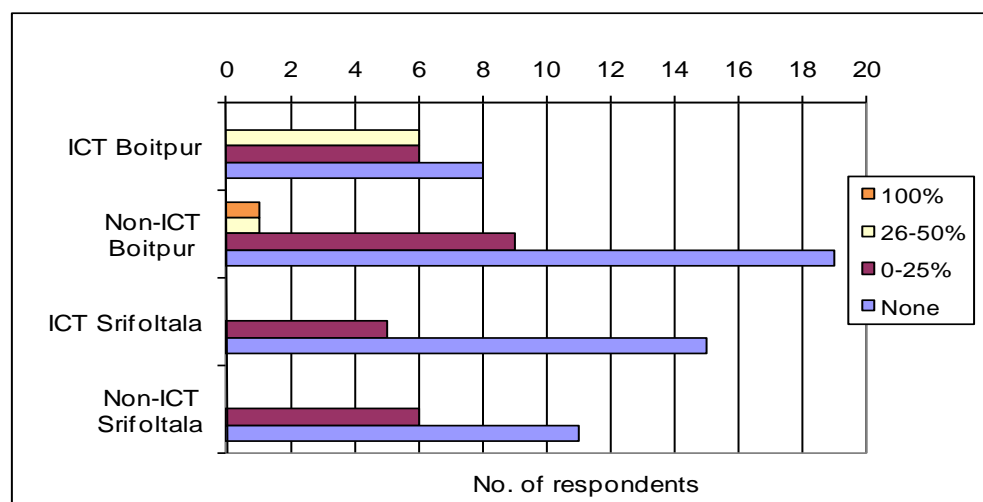
Figure 5.9. ICT and non-ICT respondents' contribution to total family income (Boitpur and Srifoltala).

Of the 30 non-ICT women in Boitpur, 9 women contributed 0-25% of the total family income through small businesses, handicrafts and employment, but 19 did not contribute. Surprisingly, one woman contributed 100% and another woman contributed 26-50%. These two cases could be regarded as anomalies. There was a slightly higher proportion of Srifoltala non-ICT women (6 out of 17) who contributed 0-25% of the family income through their micro-credit loan, small business or handicraft but the rest (11 out of 17) did not contribute.

Comments from ICT and non-ICT women in Boitpur (D.Net project) and Srifoltala (Amader Gram project) support the analyses above. Asma (B8I), a bachelor

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degree student aged 21-30, was not married. She lived with her brother's family away from her parents. Her brother encouraged her to go to the ICT centre for computer training. Though she did not have her own mobile phone, she knew how to use one. She considered her use of ICT was for need, not for status, and after learning computer applications (e.g. MS Word or Excel) she hoped to get a job. She said:

> I have acquired some jewellery from my academic prize. My importance in the family has not increased until I get a job and earn money. I have no loan or savings.

Rikta (B35N), aged 21-30, a beneficiary of the Boitpur village information system who joined the project to gain information about poultry and livestock, completed her primary school education up to class 5. She had two children, a son (10 years) and a daughter (7 years). She was involved with a micro-credit loan scheme, through an NGO, which she used for cattle farming. She said:

> I live in rented house with my husband and two children. I have bought a cow and a two wheeler from the money which I borrowed from a NGO. My husband uses the two-wheeler as transport. Every month I have to save money to repay my loan. Still I have no economic benefit until my loan is paid.

In Srifoltala, Lipi (S14I), aged 31-40, was involved with Amader Gram's ICT project through the one day Computer for All program. She stopped going to school at class 3. She had two children, a son (20 years) and a daughter (13 years). Her son worked as a volunteer in Amader Gram. She was also engaged with the micro-credit loan scheme through an NGO and saved money for the future. She said:

> My husband is a taxi driver. We live in our own house with our two children. I borrowed money from a NGO to help my husband to buy a taxi. I repay my loan monthly from my husband's income.

Another woman, Banu (S21N), aged 31-40, was a mother of 2 children − a son (10 years old) and a daughter (8 years old). Though she left school after class 3, she thought education was the most important thing in life. Her son had mental

disabilities, so she wanted to educate her daughter as much as she could. She had a house tutor for her children's education. She had been involved in the Amader Gram micro-credit loan scheme 10 years previously. Banu said:

> I have some jewellery acquired by myself. I have some loan (less than 50,000 Tk.) from a NGO and invest that in fish cultivation. I earn from there and repay debt. I can also save some money from making and selling fish nets.

These comments indicate that, though ICT women were in a more favourable position in obtaining a job and contributing more to the family's income than non-ICT women, non-ICT women were also able to contribute through their micro-credit loans. While, non-ICT as well as some ICT women in both villages had loans and/or some savings, in the material dimension, ICT and non-ICT women in Boitpur were in a better position than ICT and non-ICT women in Srifoltala.

5.4.1.6. Summary of Material Dimension

The results in the material dimension reveal women's economic gains through increased income, control over earning and savings, and amount of savings and assets, all of which are indicators or influencing factors of their empowerment. Even though Boitpur was more economically secure than Srifoltala, it can be seen from the above analyses that ICT women experienced positive changes in the material dimension in both villages. ICT women had more *economic security*, either as employees of the ICT projects or employees of other organisations. Student trainees were financially supported by their parents or elder brothers.

Both ICT and non-ICT women in Boitpur village were in a similar condition in *acquiring assets*. However, ICT women in Srifoltala were in a more favourable position in acquiring assets compared to non-ICT women, possibly due to other factors such as personal income (through employment and investment of micro-credit loans),

and the women's marital status (during marriage they are usually given jewellery from their parents as a gift or dowry) (Quisumbing and Brière, 2000).

As mentioned in Section 5.4.1.4, non-ICT women were more likely to have a micro-credit loan which they used for business expansion through their husbands or sons and for debt repayment (see Figure 5.7). Therefore, they were likely to have more *loans* and *debts*.

In addition, most of the non-ICT women had no *savings*, because they may be burdened with multiple loans and in a poor financial condition. ICT women with employment were able to *contribute* more to the family income than non-ICT women because of their higher financial achievement and economic security. Therefore, it can be summarised that ICT women gained more in the material dimension because of the direct benefit of ICT projects in the villages through job creation. Moreover, positive changes in this dimension affected women's personal lives, which influenced their position in the family (the micro level environment) as well.

5.4.2. Cognitive Dimension

This section examines whether there were any changes in women's awareness, skills and knowledge in the wider environment (i.e. meso and macro levels) on issues such as health, education, legal rights, management or entrepreneurship, communication skills, and relationships with friends and families. In Chapter 2 these were referred to as women's non-physical spaces in the cognitive dimensions (Section 2.7.1).

It can be seen from Figure 5.10 that, for each question in relation to women's awareness, skills and knowledge (Appendix I, Q.7a), the combined average cognitive awareness of the participants in both villages indicated more changes for ICT women than non-ICT women with regards to own knowledge and education,

management/supervisory skills, entrepreneurial skills and communication/social skills. Therefore, ICT intervention in rural villages appeared to be impacting women through education and learning.
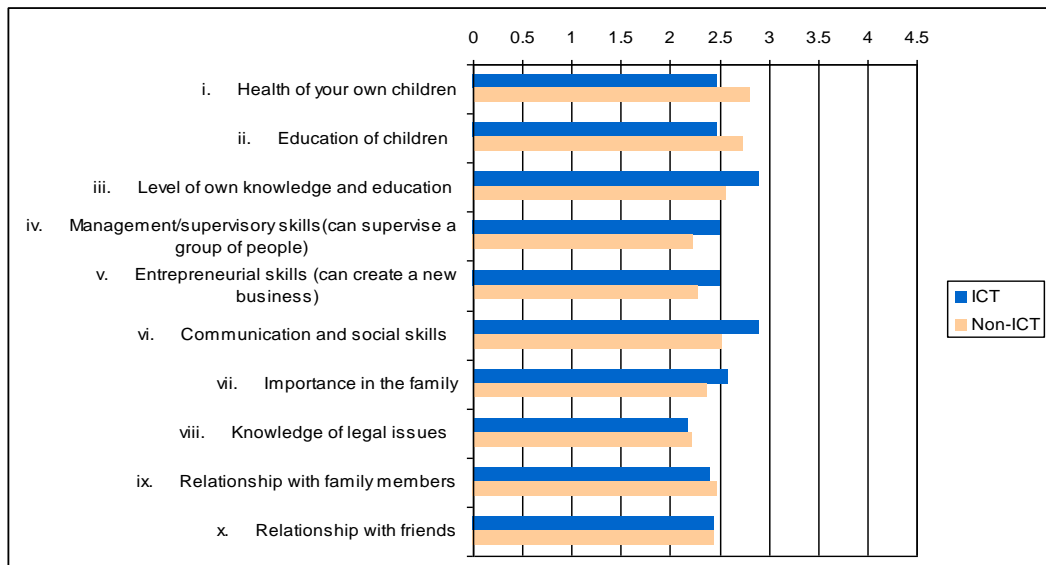
Figure 5.10. Average cognitive change of ICT and non-ICT women (Boitpur and Srifoltala).

Figure 5.11 shows that ICT women in Boitpur were slightly more aware and had more knowledge than those who were not involved with ICT. However, education and health of children show higher values for non-ICT women because there was a noteworthy number of students in the ICT group who were not married (50%) and of younger age (95%) and therefore would not need to be aware of these children's issues.

Figure 5.12 shows that the data for ICT and non-ICT women in Srifoltala indicate variations. Non-ICT women experienced more positive cognitive changes than ICT women in the categories of health and education of children, relationships with family and friends, and knowledge of legal issues.
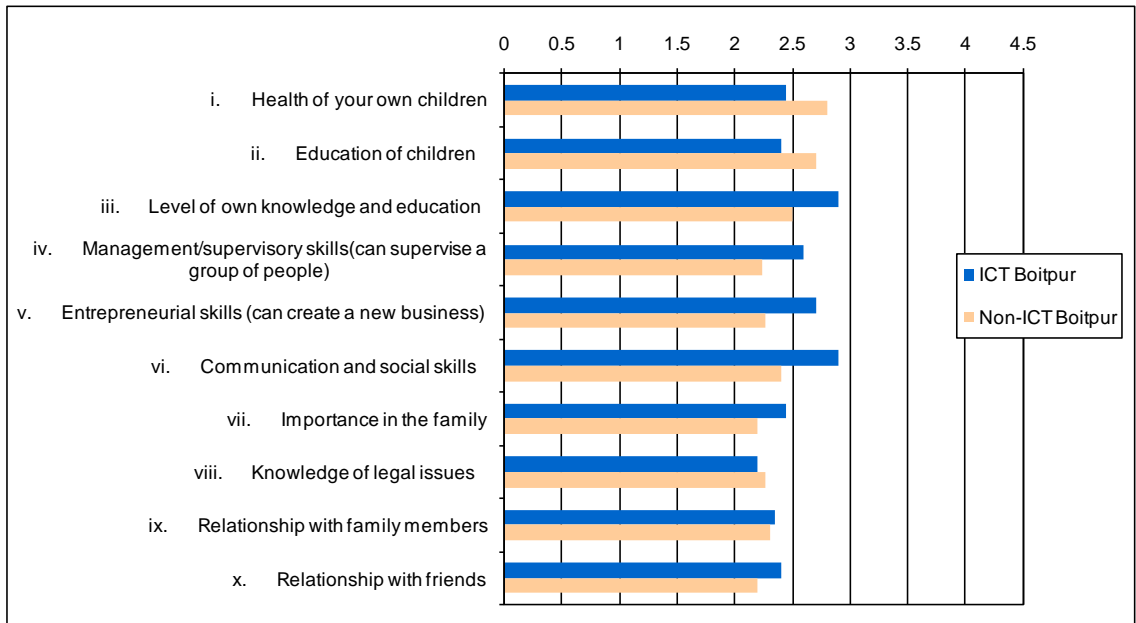
Figure 5.11. Average cognitive change of ICT and non-ICT women (Boitpur).
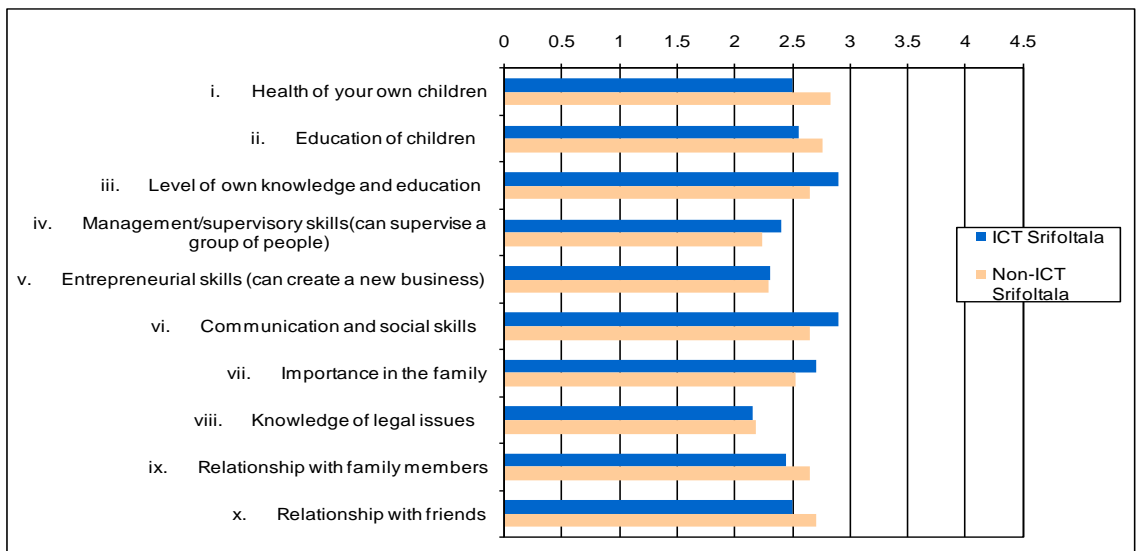
Figure 5.12. Average cognitive change of ICT and non-ICT women (Srifoltala).

A comment from a non-ICT participant in Srifoltala also supports the finding in Figure 5.12. Sabina (S21N) was aged between 41 and 50, and a mother of four children. She could not read as she had never attended school, but was aware of the need of ICT. She sent her youngest daughter (who was studying higher-secondary education) for computer training to increase her job opportunities. She thought education could change their lives by alleviating poverty. She used other people's

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mobile phones, asking them to dial the number in emergency situations; for example, if she needed to gain information about her relatives or to help a sick member of the family. She saved money for her daughter's marriage. She said:

> I am aware of all kind of knowledge specially health and education of children. I am not afraid of speaking in public which is rare among uneducated women in the village. My husband earns and gives me the money to spend. I also make and sell fishing nets and earn some money. I have importance in the family.

5.4.2.1. Summary of Cognitive Dimension

In this dimension, ICT women experienced positive changes in more aspects than non-ICT women because of their exposure to ICT projects in their lives. The changes that did occur among non-ICT women could be because they were more involved in other NGOs where they experienced a higher awareness of the wider (meso) environment. Also, there appears to be a relationship between greater economic security and involvement with ICT in Srifoltala. Wealthier families could afford to educate their girls, thus were able to equip them to benefit from possible ICT opportunities.

5.4.3. Perceptual Dimension

The development of ICT skills in women is said to produce changes in their perceptual dimension such as level of confidence, self-esteem, self-awareness, dignity, freedom, and independence, which are related to their mental spaces (Chen, 1997). The responses to the questions exploring perceptual dimensional changes (Appendix I, Q.8a) are plotted in Figure 5.13 to 5.15, using average values to compare ICT women with non-ICT women.

When the two groups of ICT women's perceptual changes were compared (Figure 5.13), it was found that Boitpur women indicated a higher perception than Srifoltala women in all aspects except for self-awareness. Nevertheless, it is

interesting to note that the average changes in all cases are more than the average value of "no change". This indicates that ICT intervention projects can change women's perception positively.
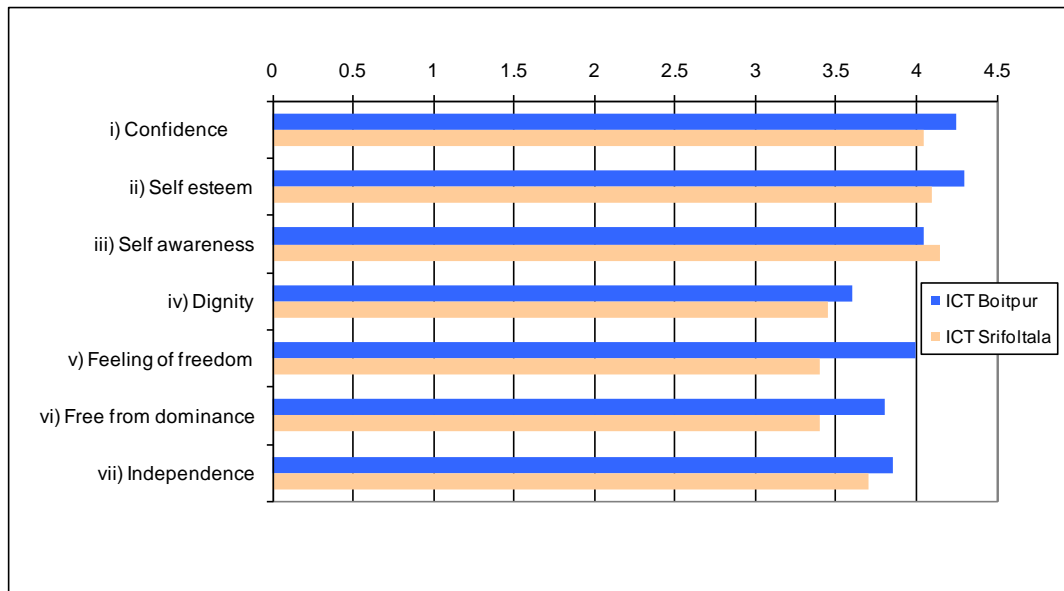
Figure 5.13. Average perceptual change of ICT women (Boitpur and Srifoltala).
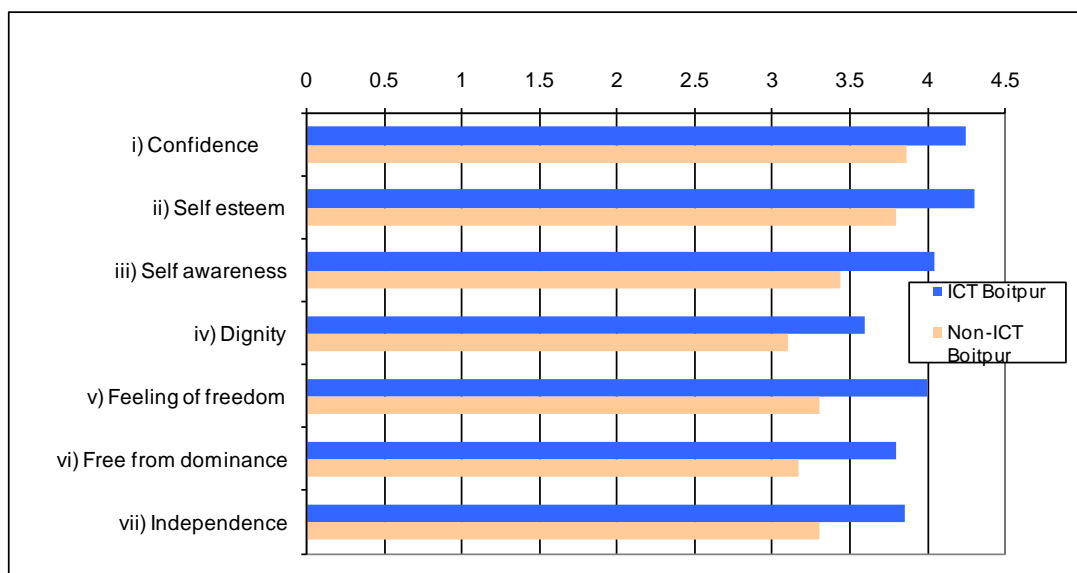
Figure 5.14. Average perceptual change of ICT and non-ICT women (Boitpur).

It can be seen from Figure 5.14 that Boitpur ICT women had a higher confidence level, more self-esteem, self-awareness and dignity, and felt freer and more

independent than non-ICT women. However, in Srifoltala (Figure 5.15), there was less change in ICT women than non-ICT women in all aspects except self-esteem.
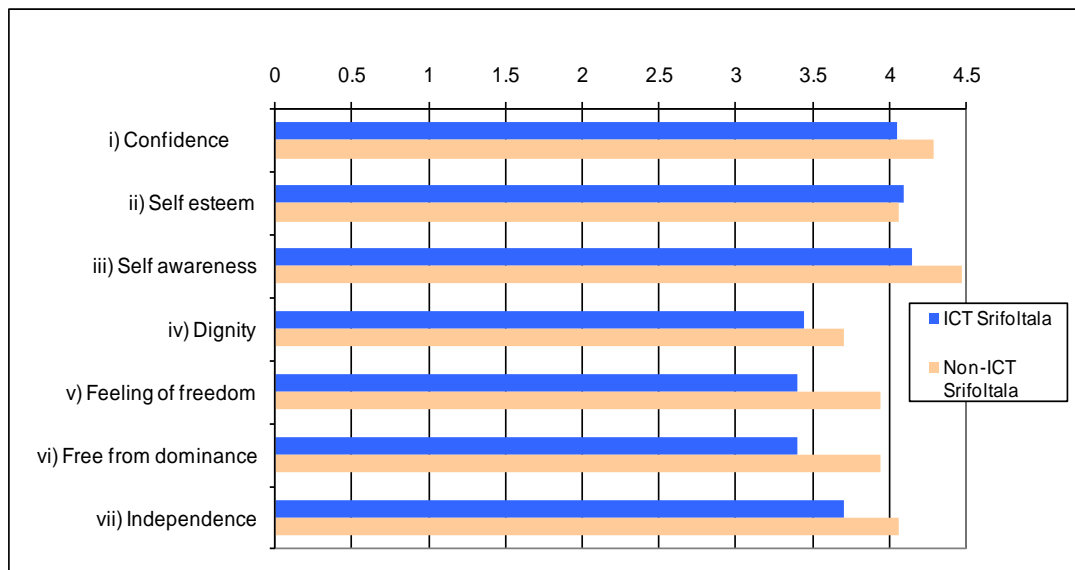
Figure 5.15. Average perceptual change of ICT and non-ICT respondents (Srifoltala).

5.4.3.1. Summary of Perceptual Dimension

In the perceptual dimension, women's confidence, self-esteem, self-awareness and dignity reflect their empowerment. The results above show that, through gaining knowledge and ICT skills, ICT women's perceptual dimension was higher in Boitpur than Srifoltala. The reason for this differential result could be the depth of involvement in the project; that is, the purpose and length of involvement in the project by the participants. The minimum length of involvement in the D.Net project was 12 weeks (by student trainees and trainees of other organisations) whereas the length of involvement in the Amader Gram project was as low as one day (by Computer for All participants).

Even though there were younger ICT women in Boitpur, the variation in results between the two villages may be due to some other reasons such as the better economic condition of Boitpur, higher levels of education, as well as in-depth

involvement in the ICT project's activities for improving women's lives, all of which were absent in Srifoltala.

So, to be of benefit, it is important that ICT projects working with rural women look at their needs and inspire them to become involved more actively and for a longer period. Although women in Srifoltala had computers and the Internet facilities within their village, they were not getting the full benefit of the Amader Gram ICT project for enriching their knowledge and education because of their lack of active participation in the project. So, the Amader Gram project in Srifoltala appeared to be less successful in meeting its goal of empowering women and changing their personal lives in terms of confidence, self-esteem, self-awareness and dignity.

5.4.4. Relational Dimension

Changes in the relational dimension among ICT women was investigated and compared with changes in non-ICT women. It was noted in Chapter 2 that, when women are empowered, they have more control over their lives and can exercise some power in their domestic environment. In that case, women make some of their own decisions and also gain their husband's co-operation in their everyday life. Decision making power is an indication of women's empowerment in the micro environment. When women participate in the village community or in any organisation, it reflects their empowerment in the meso environment. A connection of empowerment from macro (national or global) to meso to micro is needed to determine women's empowerment (Mason, 2005). The domestic or household level (micro) is the central point of gender-based discrimination and, therefore, the relational dimension in this study analysed empowerment through an individual's access to and control of

different spaces (economic, socio-cultural and political) within micro and meso environments.

Women's relationship with their husband with regards to decision-making power and their husband's co-operation in the house were analysed. Women's participation in the village community and any other organisations were also investigated. Therefore, the responses to the questions on the relational dimension (Appendix I, Q.9) were analysed to determine any impact of ICT in these areas.

5.4.4.1. Decision Making Power

In the relational dimension of the questionnaire (Appendix I, Q.9), each item in 'decision making power' had five values ranging from 1 to 5. The highest decision making power is 5 (I decide). The other values are 4 (I consult and decide), 3 (we consult and decide), 2 (I am consulted) and 1 (I am not consulted). Married women were asked questions about their decision making power and their husband's cooperation. Among the 20 ICT women in Boitpur, 10 were married, whereas among the 30 non-ICT women, 27 were married. In Srifoltala, 16 of the 20 ICT women were married and 14 of the 17 non-ICT women were married.

It can be seen from Figure 5.16 that ICT women from both villages demonstrated more *decision-making* power than non-ICT women, except for the purchase of furniture or consumer durables. However, all these changes were less than the average value, which means women consult with their husband on everything and then decide.

From Figure 5.17, it can be seen there was little positive difference in ICT women's decision-making power compared to non-ICT women in Boitpur. Most of the decisions were still made by their husbands and women were consulted. Women

reported that they usually asked their husband about all matters to avoid any dispute and to maintain peace and harmony. Only the amount of saving or borrowing was a little higher than the average value 3, which indicates women tended to take the decision themselves after consulting their husbands. So, ICT women showed slightly more decision-making power than non-ICT women in most categories. A comment from an ICT woman in Boitpur supports this statement.
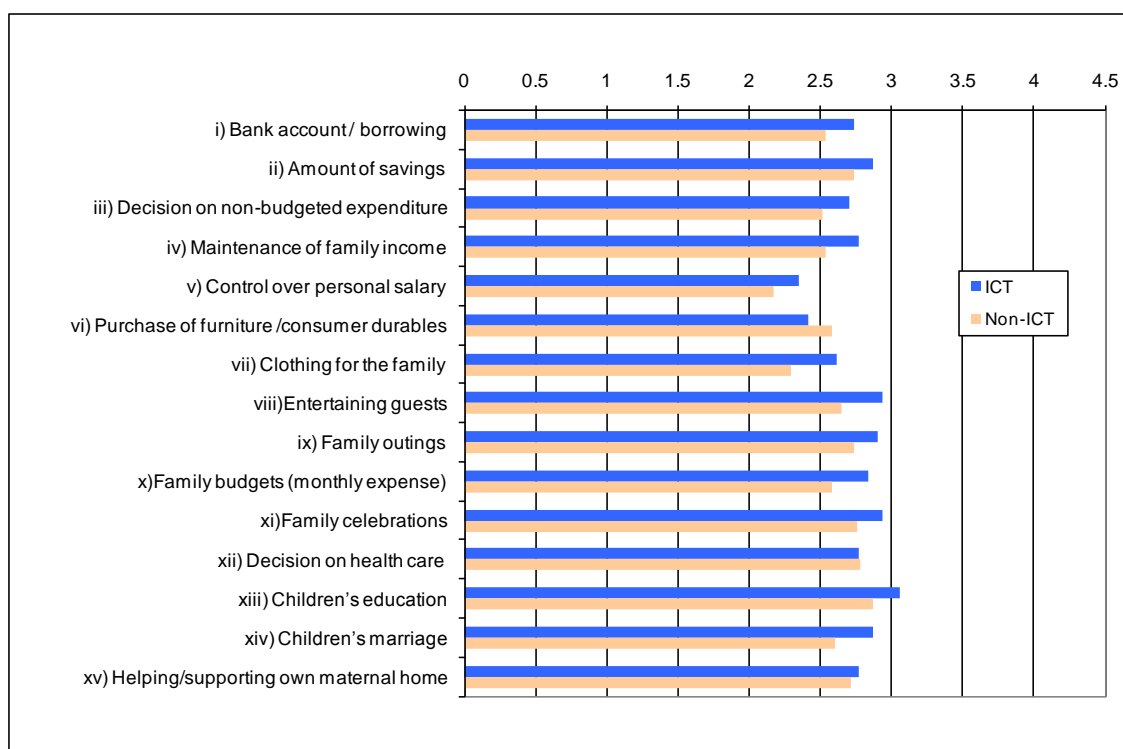
Figure 5.16. Average change in decision making power between ICT and non-ICT women (Boitpur and Srifoltala).

Kajol (B1I), aged below 20, who was a mother of one daughter (3 years old) lived with her parents along with her husband, and worked in the D.Net project. She had been working since completing her higher secondary education in 2007. She worked as a village information media staff member and provided information to the rural women visiting them in the village. Kajol said:

I always discuss everything with my husband about making any decision, but if he does not agree with something which I think is good, then I decide by myself for

example bank account. Thinking of my family expenditure I usually don't save money and contribute to my family. I buy my own dresses of my choice but my mother decides about other family matters as I live with them as an extended family.
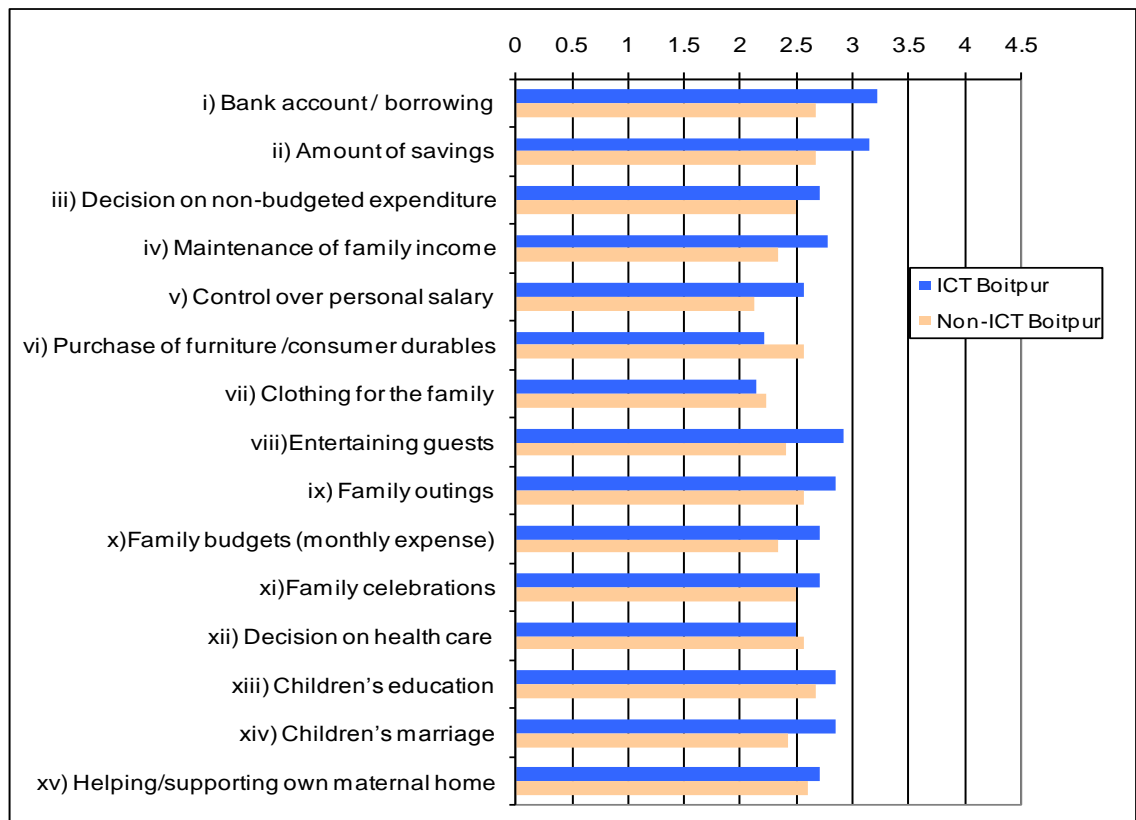
Figure 5.17. Average decision making power change of ICT and non-ICT women (Boitpur).

It can be concluded from Kajol's comment that, even though some ICT women show decision making power, most women's relationship with their husbands had not changed much overall and they usually maintained a peaceful relationship by avoiding any dispute.

From Figure 5.18, it can be seen that there was no substantial improvement in women's decision-making power after the Amader Gram ICT intervention.

Therefore, in terms of decision making power, married ICT women in Boitpur were in a better position than married ICT women in Srifoltala.
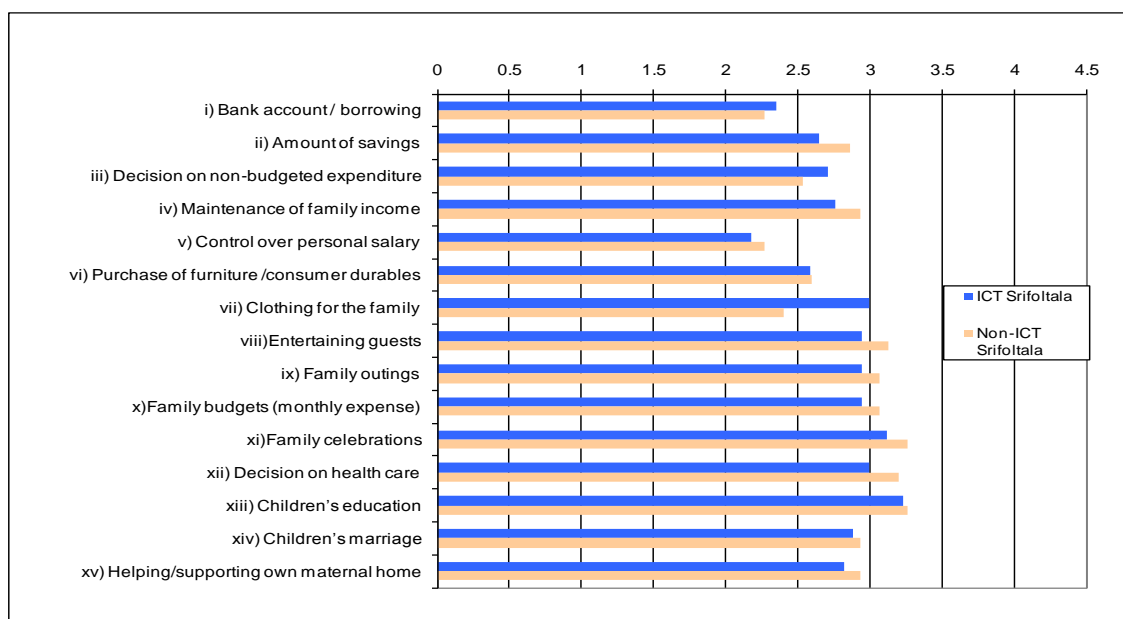
Figure 5.18. Average decision making power of ICT and non-ICT women (Srifoltala).

5.4.4.2. Spouses' Cooperation

Analysing *spouses' co-operation* (Q9.b) on various household issues and women's freedom in purchasing or movement, it was found that the comparison of total ICT and non-ICT groups shows little variation in both villages (Figure 5.19). However, the changes that were found are above the value 3, which means they are positive. In particular, ICT women had more cooperation from their husbands in regards to sharing household chores, taking care of children and listening to women's problem.

While examining spouses' cooperation at the village level, it was found that there was little improvement in almost all items (Figure 5.20 and Figure 5.21). Women in both villages reported that they usually did not ask for any help from their husband since it is traditional that men work outside and women work in the home. So, women do not expect their husbands to help them. Also, women thought it is always good to inform their husbands where they are going for safety reasons and to avoid their husband's mistrust.

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Figure 5.19. Average change in spouse's cooperation between ICT and non-ICT women (Boitpur and Srifoltala).
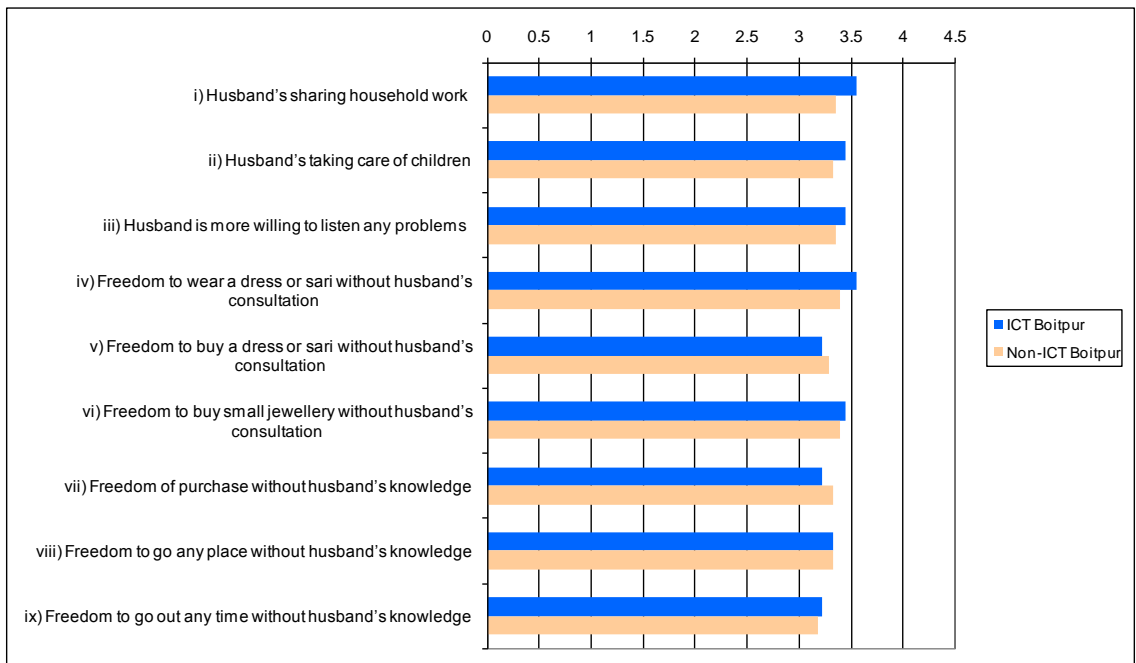
Figure 5.20. Average change in husband's cooperation of ICT and non-ICT women (Boitpur).

However, one participant's husband did help her in the home sometimes. Modina (S1I) was aged between 21 and 30, a mother of one son (13 years old), had

been working in the Amader Gram project for 7 years as an accountant and computer

trainer, and had an undergraduate degree. She said:

> I share everything with my husband and consult and decide. Even I know some
> women can open their own bank account without the knowledge of husband, but I
> don't think this is good. I want to avoid conflict with my husband. My relation with
> my husband is very good. He helps in taking care of my children in my absence.
> Sometimes he helps me in house work by fetching water. My husband listens to my
> problem. Sometimes when I am late in office or in any meeting, my husband doesn't
> mind and calls me on mobile when I am on the way, to check whether I am alright or
> not.
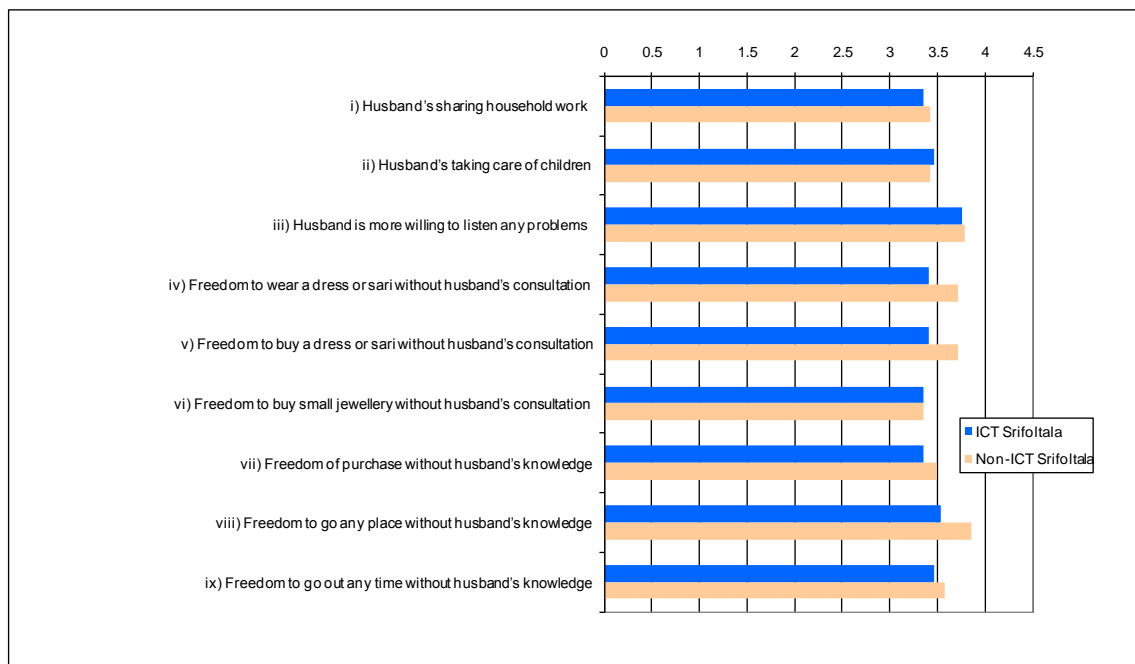
Figure 5.21. Average relational change of ICT and non-ICT women (Srifoltala).

Thus, this comment indicates that some ICT women were getting cooperation from

their husband and could discuss their problems, even though they did not take

decisions on their own.

5.4.4.3. Community Level Involvement

Analysing Question 9c regarding women's involvement in the community (meso

environment), it was found that ICT women in both villages experienced a slight

improvement in getting respect from villagers, participation in decision-making and

social/cultural activities, voting power, and involvement in women's issues in the village (Figure 5.22). A Likert-like scale of 5 was used where changes experienced by women are indicated as 5 for 'much better', 4 for 'better', 3 for 'no change', 2 for 'worse' and 1 for 'much worse'. All the changes are higher than the value 'no change', which is an indication of a positive impact of ICT on both ICT and non-ICT women.
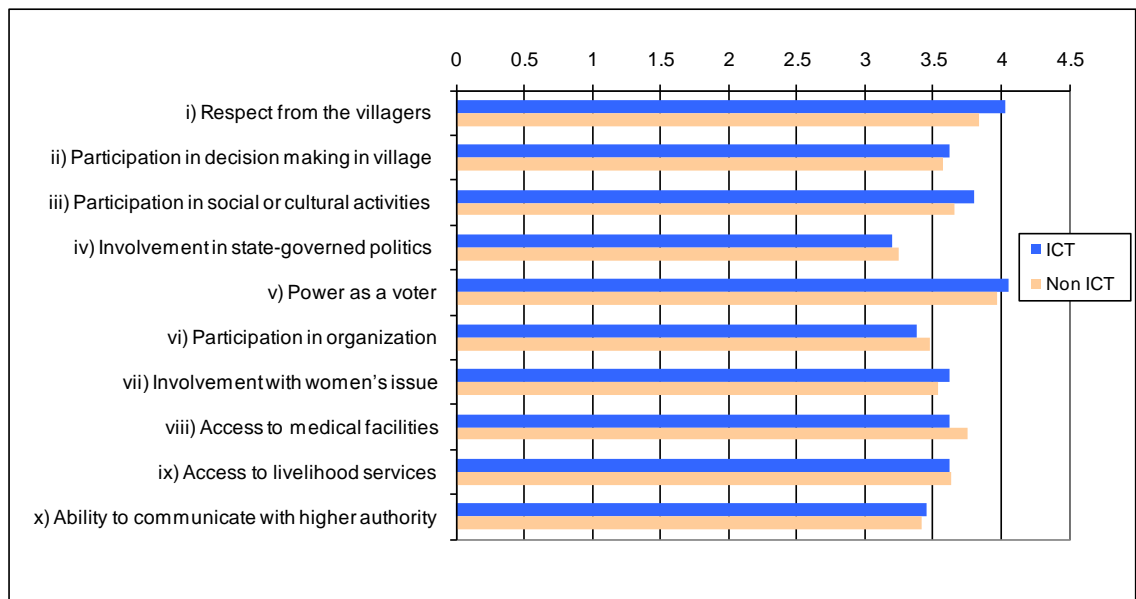
Figure 5.22. Average change in community level of ICT and non-ICT women (Boitpur and Srifoltala).

In Boitpur, ICT women showed more positive changes than non-ICT women; especially in relation to respect from villagers and voting power (

Figure 5.23). During the time of the field study in 2010, there was an election in which women participated. Although they used their voting right, they voted according to their husband's instructions.

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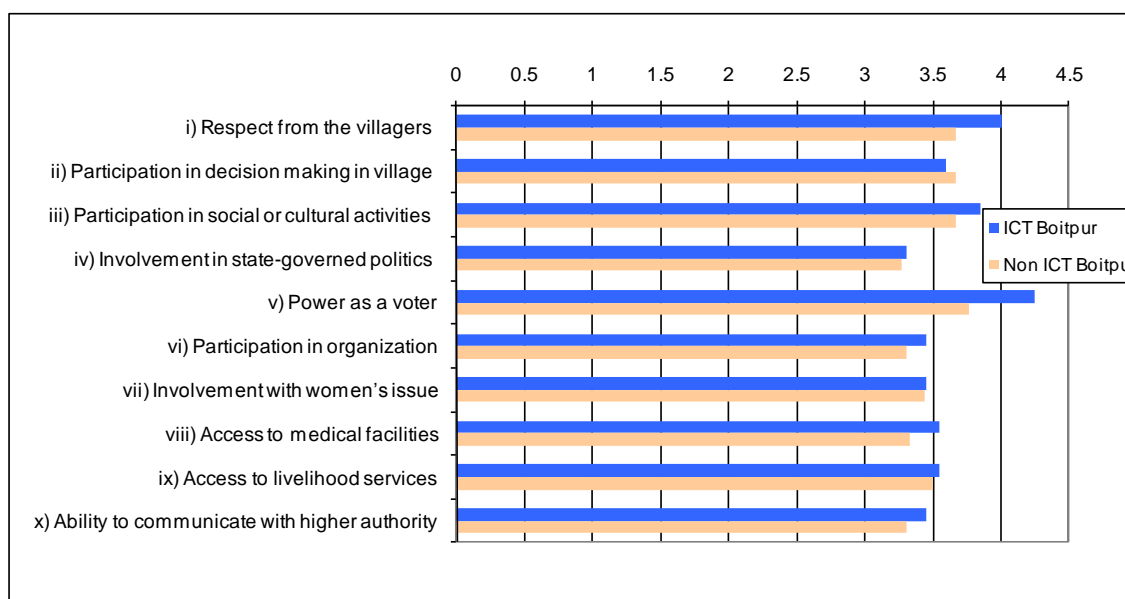
Figure 5.23. Average change in community level of ICT and non-ICT women (Boitpur).

In Srifoltala, the average change at the community level was not higher for ICT women than non-ICT women for most categories (Figure 5.24). The only differences were a little more respect from villagers, participation in decision-making in the village, participation in social/cultural events, and involvement in women's issues. However, non-ICT women showed higher positive changes than ICT women in involvement in state governed politics, voting power, participation in organisations and access to medical facilities. Conversely, other changes were a little higher for ICT women in most of the categories at the community level.

Therefore, in the relational dimension at the community level, ICT and non-ICT women in both villages had an average improvement because of the culture and tradition of rural Bangladesh where women usually do not participate in any activities outside the home. As discussed previously, women's movements are restricted by their husbands and in-laws after marriage. Also, women have little spare time after having

children due to the added duties and responsibilities (Francis and Skelton, 2006b; Sultana, 2010).
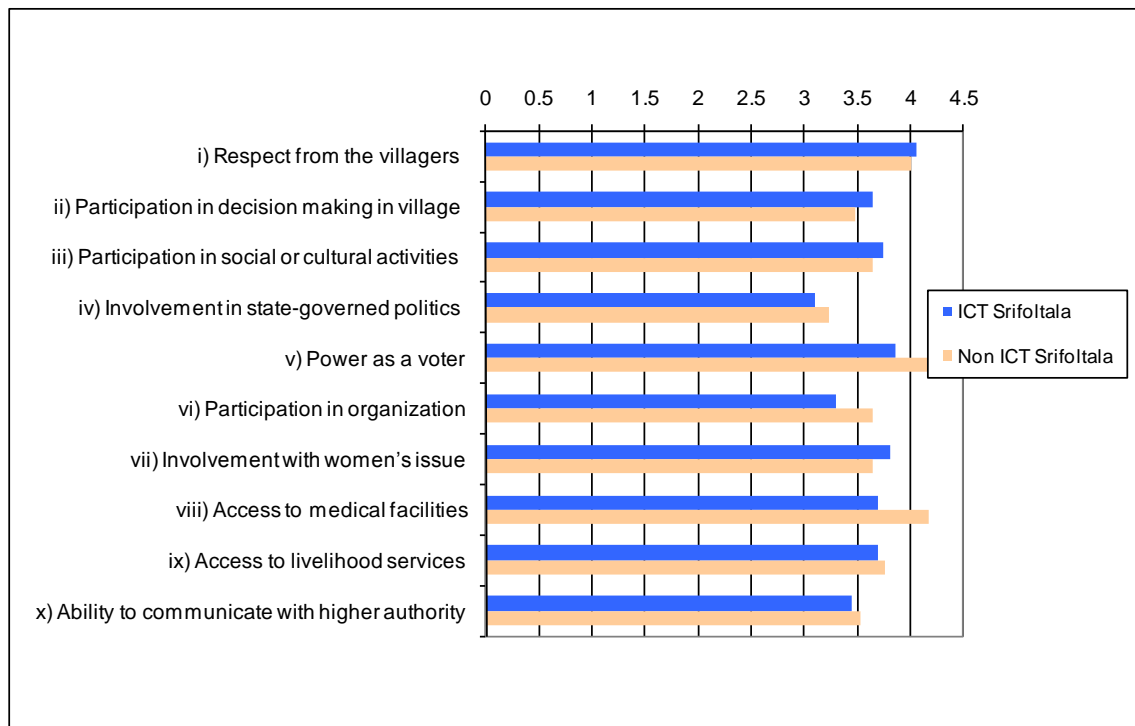
Figure 5.24. Average change in community level of ICT and non-ICT women (Srifoltala).

Still, due to interventions such as ICT projects, micro-credit loan programs, and other non-profit NGOs who work for developing awareness among rural people, positive changes were found.

5.4.4.4. Involvement in Other Organisations

Question 9d (Appendix I) asked respondents about their involvement in any organisation other than ICT projects. As previously noted these were NGOs that assisted in the development of marginal people through micro-credit loan programs and various awareness development programs on health, hygiene, education, and legal rights (Alam, 2006). Figure 5.25 shows that most of the women had less involvement in other organisations. However, there was an opposite trend in the villages with more

non-ICT women than ICT women involved in Boitpur, and more ICT women than non-ICT women involved in Srifoltala.
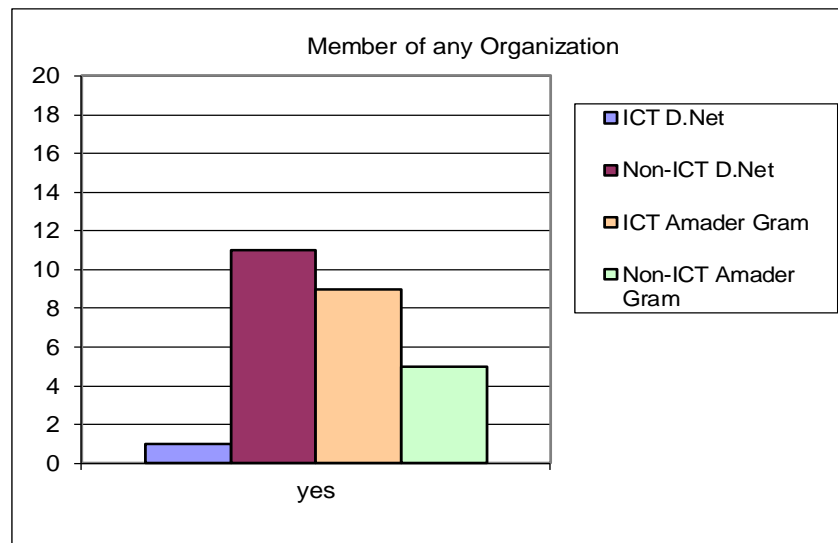
Figure 5.25. Organisation membership of ICT and non-ICT women (Boitpur and Srifoltala).

A comment from a non-ICT woman in Boitpur supports this trend regarding changes in the relational dimension of rural women at the community level and their involvement in other organisations. Sofura (B1N), aged 31-40 and a mother of two children, left school after class 7, and earned her living as a fruit seller. Her example was used in Section 5.4.1.3. She was aware of the need of mobile phones to learn market prices. She thinks that education is important to give her status in the society along with money and family background. She said:

> I am involved in the S. N. Trust healthcare project and help as a volunteer to make village women realise the importance of health and hygiene and make them to join any awareness program led by the project. I am attached with many NGOs and work actively as chairperson or member. Village people respect me and ask me to stay in any meeting or seminar to represent the village women to speak about their problems.

So, as a non-ICT woman, Sofura benefited from using an ICT tool (mobile phone) for her small business and was also empowered by getting involved with other organisations in the rural village.

5.4.4.5. Summary of Relational Dimension

The relational dimension reflects women's empowerment in their increased harmony, respect and mutual understanding with other family members, as well as increased respect, decision making and leadership role in the villages. Increased power as a voter, and more influence on local government, also reflect their political empowerment. From the above results, the changes indicated that some ICT women had more positive *decision making power* which could be because of their employment, improved economic security, financial contribution to the family and perceived positive changes in the cognitive and perceptual dimensions. However, non-ICT women in Srifoltala were involved in micro-credit loan schemes and seemed to have more decision-making power because of their age, marital status and financial contribution to the family through the loan.

Overall, both ICT and non-ICT women showed improved relational change at the *community level*, especially in voting power and respect from villagers. Boitpur ICT women were respected by the village community because they were more educated and many of them were employed. However, being younger, they were less likely to participate in decision making in the village, although they participated a little more in social and cultural activities. Srifoltala ICT women were respected because they were engaged with NGOs who worked for issues like women's rights, legal issues and building awareness among women. As some were older, their greater participation in village decision making was logical.

Therefore, it can be concluded that there was a positive influence of ICT in women's empowerment in both villages irrespective of other NGO presence. Women experienced positive changes in their lives in the micro (through decision making within family), meso (through participation and decision making within community)

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and macro (through exercising voting power as a citizen) environments, which reflected their empowerment.

5.4.5. Technological Dimension

As discussed in Chapter 2, technological change is important for rural women and, since this thesis is investigating the impact of ICT in their lives, this aspect of empowerment needs to be unpacked. The responses to the questions on technological change depict the level of acceptance of technology in the women's lives, the level of understanding of ICT, the benefits of ICT, and the information needs in women's daily lives. The first two questions (Appendix I, Q.10a-i) regarding different communication services with their usage level and information needs are discussed in detail, as those (with 21 sub-questions) focus on changes in the technological dimension in rural women. Other questions (e.g. which means of communication are commonly used by rural women; how they use mobile phones; how often they use mobile phones or kiosks) are implicit in the first two questions. Therefore, these questions helped in cross-checking the respondents' answers to the first two questions about technological change.

5.4.5.1. Use of Communication Services

The questions regarding communication services (Appendix I, Q.10a) were developed to investigate the level of use of these services. The answers were plotted on a Likert-like scale. The values were 5 (more than once in a day), 4 (more than once in a week), 3 (more than once in a month), 2 (less than once in a month) and 1 (not used).

Combining ICT women in both villages, it can be seen from Figure 5.26 that most of these women did not use radios but they had good access to television (70%). Most ICT women (95%) had not used a fax machine or private fixed line phone. The

only exceptions were two employees of the D.Net project who used the fixed line phone in the project office. Only 50% of ICT women used a phone kiosk when their own mobile phone was not working or needed to be recharged. Most of the ICT women (80%) used a mobile phone more than once a day. However, a much lower proportion of participants (40%) used SMS. This may be the result of the language barrier. A small number of ICT women (30%) used personal computers and the Internet in their workplace and for training.
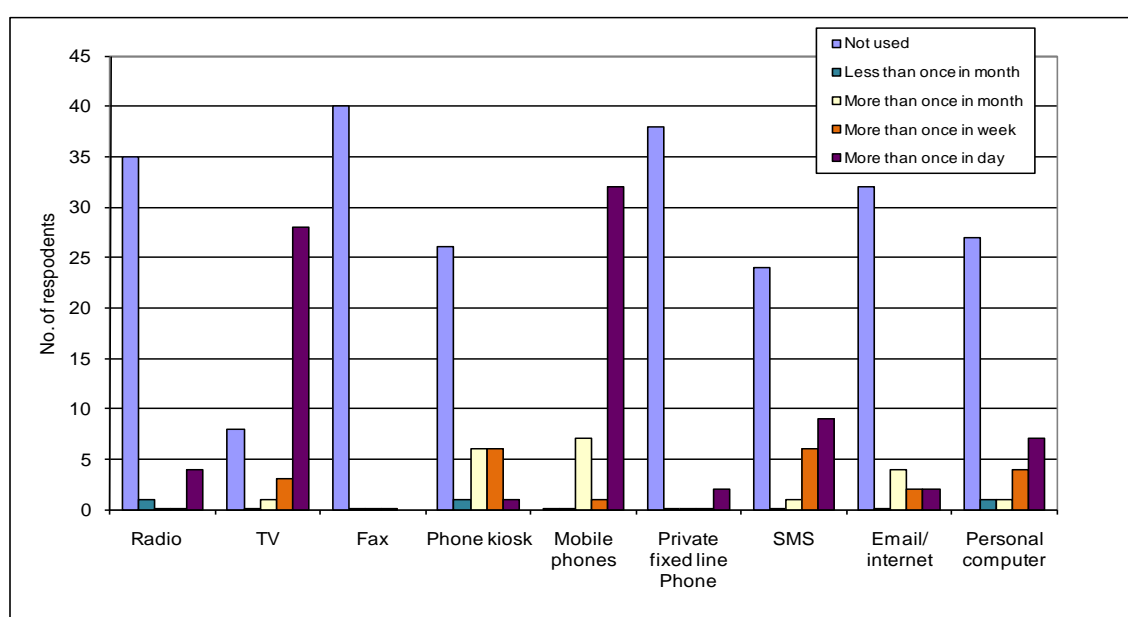
Figure 5.26 ICT women using various ICT tools after involvement in ICT projects (Boitpur and Srifoltala).

Combining non-ICT women in the two villages (Figure 5.27), it can be seen that most of them did not use a radio, fax machine, email/Internet, fixed line phone, or a personal computer. Some non-ICT women (22%) in both villages did not have good access to a mobile phone and therefore used a phone kiosk more frequently than ICT women. However, despite limited access in their homes, television and mobile phones were the primary communications services as more than 38% of non-ICT women had acquired them and used them more than once a day.

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Figures 5.26 and 5.27 indicate that ICT women in both villages used a wider variety of communication services than non-ICT women. ICT women also had better access to TV and mobile phones as their primary communication services as these services tended to be available in their household.
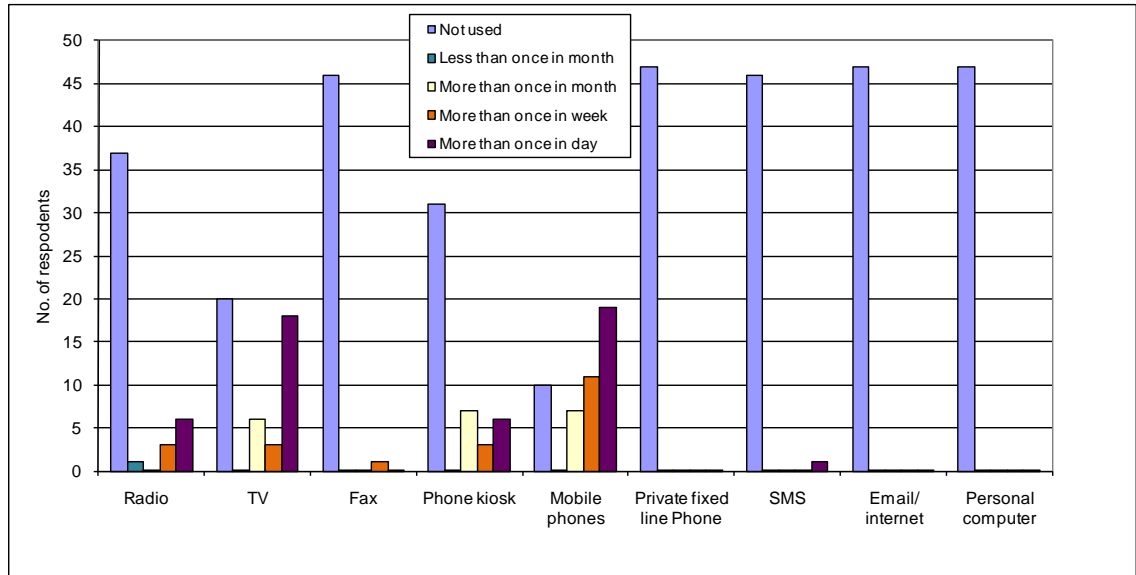
Figure 5.27 Non-ICT women using various ICT tools (Boitpur and Srifoltala).

Comparing the level of use of ICT tools between ICT and non-ICT women in Boitpur, it can be seen from Figure 5.28 that ICT women used communication services more frequently as they had access to these services through the ICT project office. Communication tools, such as fax, fixed line phone, SMS, email/Internet and personal computers, were used by project employees and student trainees.

Although it is an older communication tool, radio is still popular among the older generation. Since about 45% of the non-ICT women were from older age group, they used radios more than ICT women. However, the use of television was similar between ICT and non-ICT women. As Boitpur was economically more solvent, both ICT and non-ICT women could afford television in their household. Both groups also used their own mobile phones, primarily to make and receive calls. As mentioned

earlier, some non-ICT women did not have a mobile phone of their own and thus used phone kiosks more than ICT women.
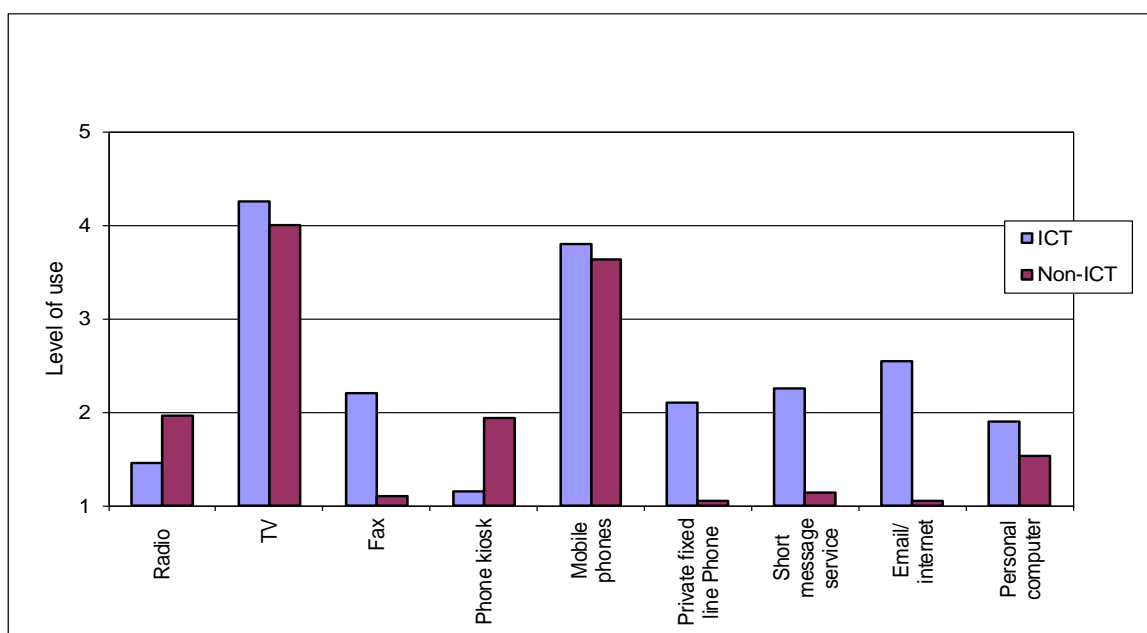
Figure 5.28 Comparison of average technological change in using communication services between ICT and non-ICT women (Boitpur)

Nevertheless this data confirms the importance of the mobile phone service in rural Bangladesh: mobile phone technology is easy to deploy and is cost effective. They are the only feasible way to communicate in remote areas as most parts of Bangladesh have poor fixed land-line telecommunication infrastructure.

Text messaging (SMS) was not popular due to the foreign (English) language barrier. It would be difficult for non-ICT women with lower education levels to send messages. Even if ICT women understood English, they did not feel comfortable writing in English. Overall, it can be inferred that ICT women had access to and therefore used a higher and wider range of ICT tools than non-ICT women.

Similarly, from Figure 5.29, it can be seen that use of communication services among ICT women in Srifoltala was higher than non-ICT women in all items. The possible reason could be economic solvency, awareness and access to those services

through the ICT projects. Though the usage level was very low for most of the ICT tools, ICT women used television and mobile phones more frequently than non-ICT women. Public phone kiosk use was similar for both groups as it was used when they did not have mobile phone of their own or when their phone needed to be recharged.
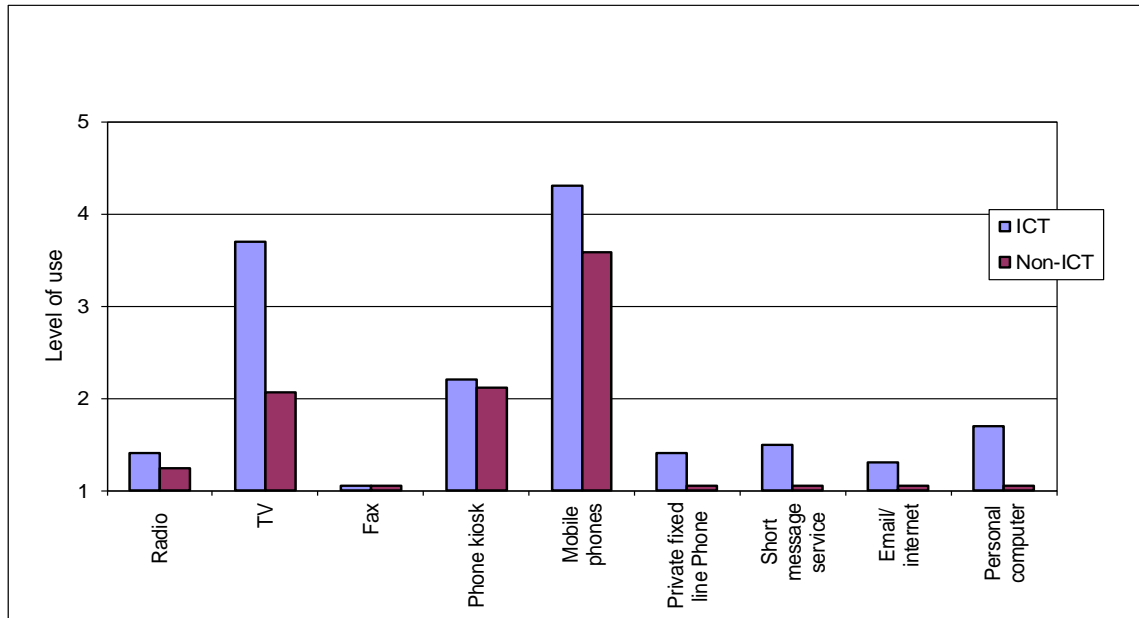
Figure 5.29 Comparison of technological change in using communication services between ICT and non-ICT women (Srifoltala).

5.4.5.2. Information Need

Question 10b (Appendix I) explored the information needs of rural women and the importance level of the responses were plotted on a Likert-like scale of 1 to 5, with the value 1 representing not important and 5 very important.

Figure 5.30 shows that many of the ICT women (ranging from 32% to 68%) said that information about employment, social information, emergencies, healthcare, education, weather news and daily news was important in their lives. They were less interested in information about farming, business, government, politics and legal issues.
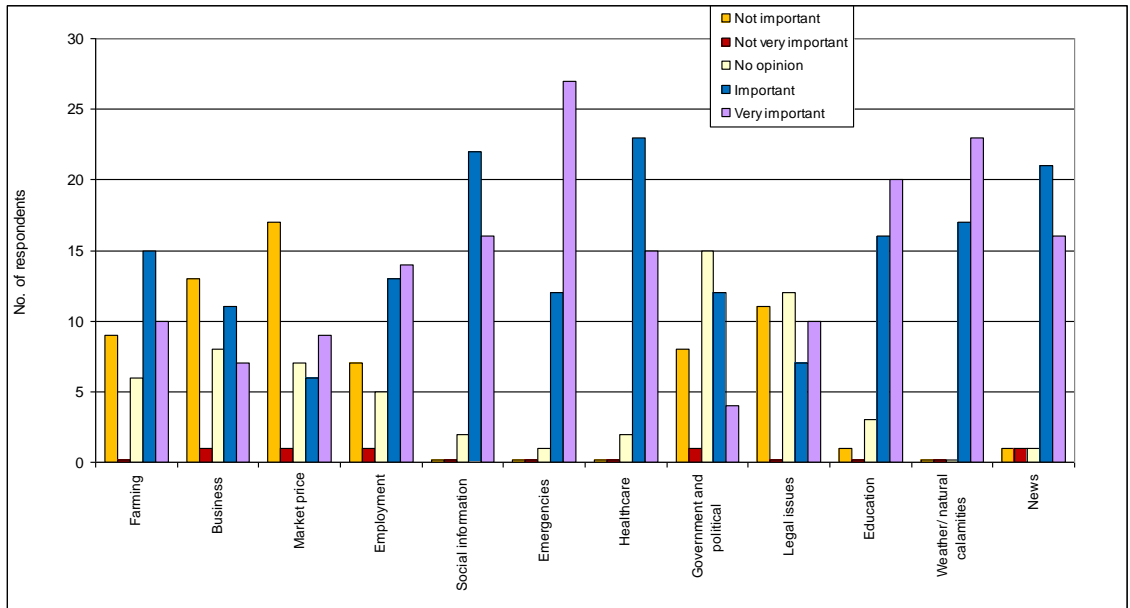
Figure 5.30 Information needs of ICT women (Boitpur and Srifoltala).
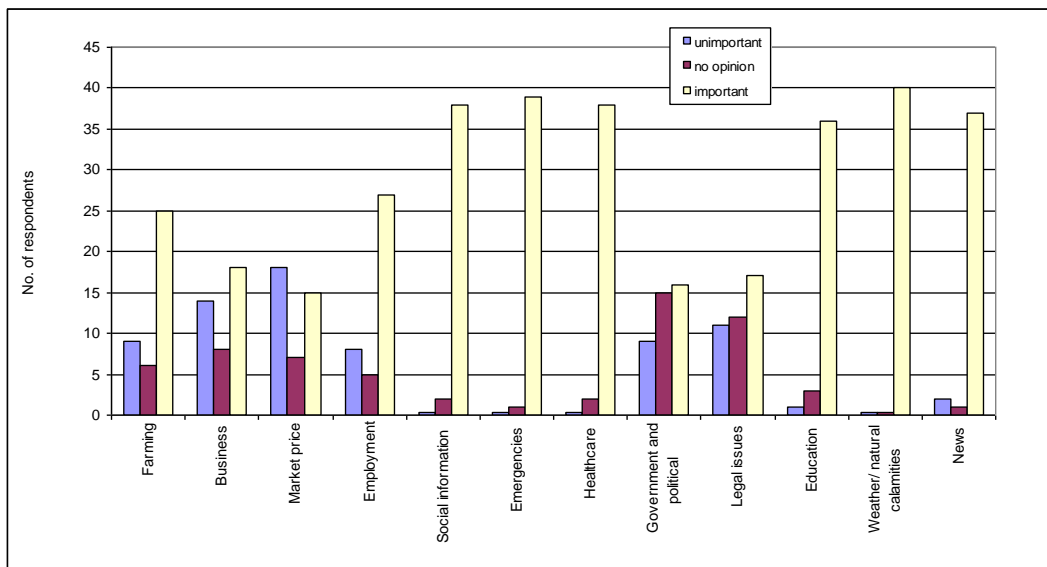
Figure 5.31 Information needs of ICT women (Boitpur and Srifoltala).

In Figure 5.31, the 5 point scale is collapsed to a 3 point scale (unimportant, no opinion and important) to show more clearly the level of importance for each information need. Six types of information were particularly important for the majority (about 80%) of ICT women: social, emergencies, healthcare, education, weather/natural calamities and news. Information about farming and employment was

not as important while business, market price, government/politics and legal issues was even less important.

From Figure 5.32, it can be seen that about 85% of non-ICT women indicated a need for information on farming, employment, social information, emergencies, healthcare, weather news and daily news. However, about 40% of non-ICT women did not give an opinion about education, government and politics and legal issues.
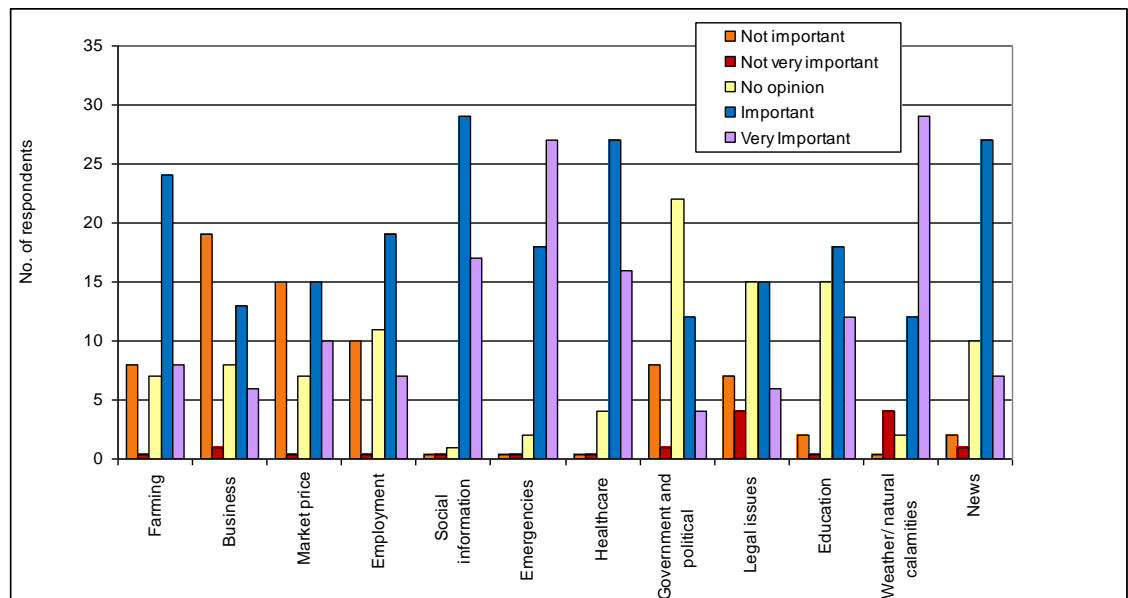
Figure 5.32 Information needs of non-ICT women (Boitpur and Srifoltala).

Comparing ICT and non-ICT women in Boitpur (Figure 5.33), ICT women were more interested in information about employment and education as they were student trainees or employees of the project. Students were more in need of educational information such as exam schedules, results of exams or updates on curricula. Those who were employees were in need of employment information if they wanted to improve their career and switch to other organisations. Students about to complete their studies wanted to know about employment information to search and apply for suitable jobs. Information on farming was needed by non-ICT women more because most of these women's husbands and sons were farmers.

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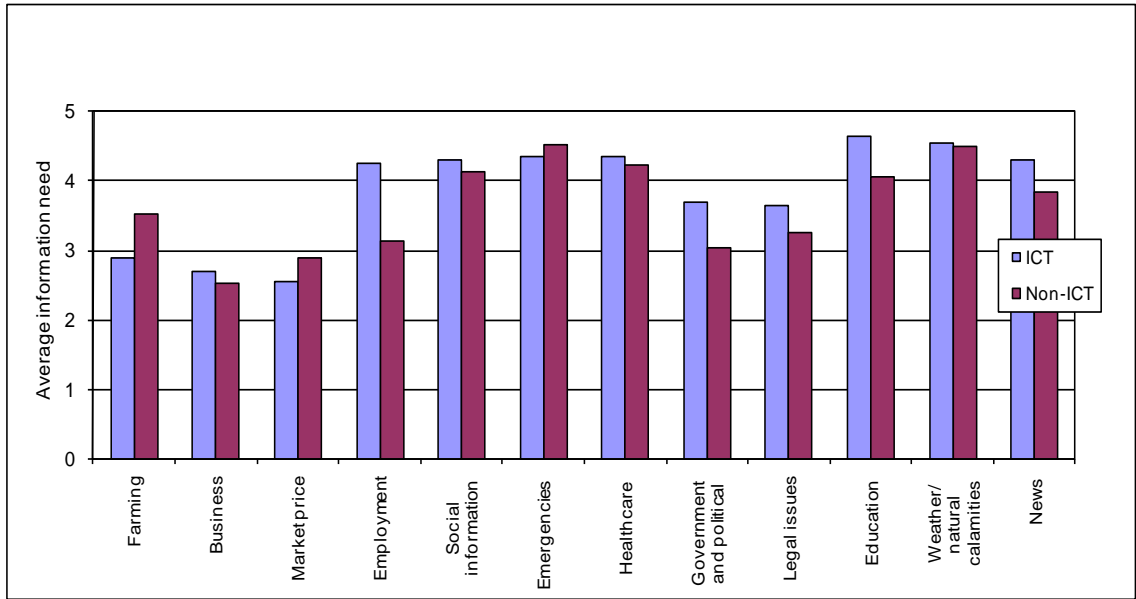
Figure 5.33 Comparison of average change in information need in ICT and non-ICT women (Boitpur).

In Srifoltala (Figure 5.34), it appears to be counter-intuitive that non-ICT women needed employment information more than ICT women, as non-ICT women tended not to have sufficient education to get a job outside home. However, it can be posited that since non-ICT women were more likely to have older children, they were aware of their children's education and employment needs.
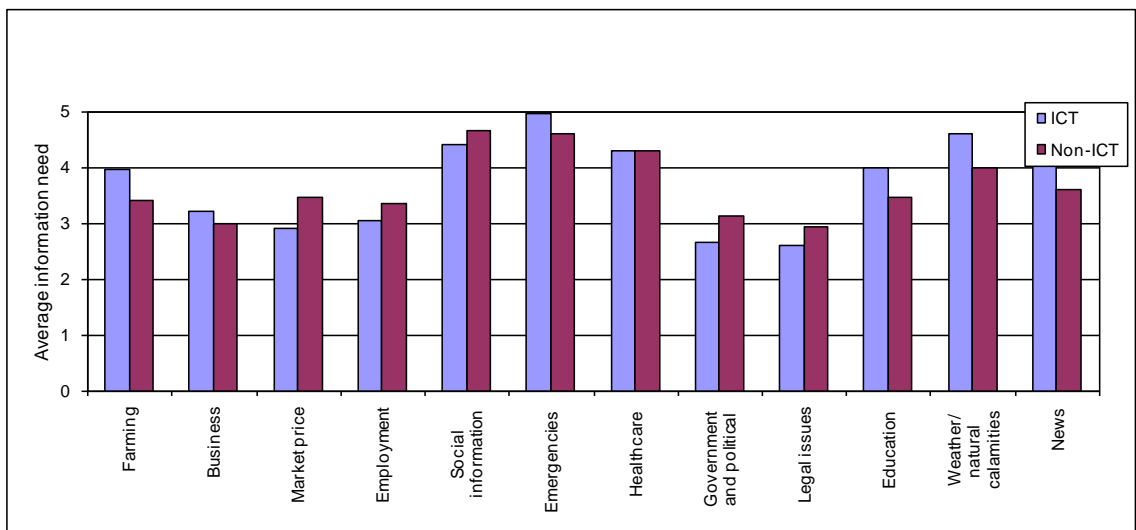
Figure 5.34 Comparison of average change in information need in ICT and non-ICT women (Srifoltala).

Overall, in most categories (i.e. farming, business, emergencies, education, weather or natural calamities and news), the information needs among ICT women were higher than among non-ICT women in Srifoltala. The fact that it was high across both groups is an indication of a positive technological change in rural villages.

It was interesting that some interviewees were enthusiastic about their information needs despite not using a wide range of communication services. Halima (S28N), aged between 21 and 30 and a mother of one child (5 years old), left school after class 9. She was aware of the need of ICT. She wanted to send her son to school and educate him as much as possible. At the time of interview, she was visiting her parents and helping her sick mother. She said:

> I think information about farming and market prices are important to know and I can know from my husband. Rural women can also know from TV and newspaper. I need to communicate with relatives through phone so I use phone kiosk sometimes more than twice a day. Village information system gives information on healthcare and legal issues. However, I think mobile phone has negative side. For example, a teenage girl in the village use mobile phone for making affair and gets married without their parents concern which is not a good practice for the society. Sometimes crimes take place using mobile phone, though village women are not related to these issues.

Even though Halima did not have ICT tools of her own, she realised the benefits of them and also the negative impacts of ICT tools on her community.

5.4.5.3. Summary of Technological Dimension

Increased knowledge about the benefits of technology, confidence and ease of use, skills, awareness, and understanding about new technologies reflect women's technological dimensional change. From the above analyses, it can be stated that increased use of television and mobile phones among ICT women, as a result of their affordability and economic solvency, made them more aware of how to use ICT and its benefits.

There was a variety of information needs among ICT women, except that their interest in farming information was low, as they were from solvent families where husbands or fathers were involved in other types of employment. Both ICT and non-ICT women had various information needs in their lives in the micro (such as communicating with family members), meso (communicating with friends and relatives and all other information need) and macro (government and politics, weather news, national news) environments. Their information needs reflect a shared focus (Hossain and Islam, 2012).

5.4.6. Overall Change

Summary type questions, Questions 11a-b (Appendix I), were asked to determine women's empowerment through ICT in terms of their confidence, security, political power and speaking power. When examining the overall change in women with regards to empowerment, both ICT and non-ICT women commented that they were unable to live without their husband's or parents' support.
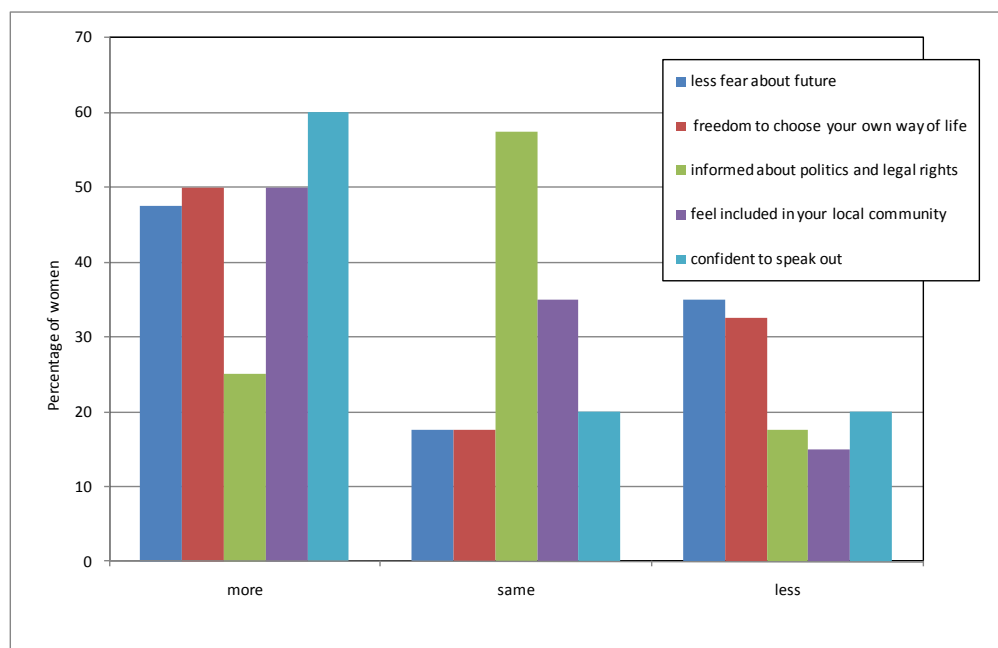
Figure 5.35 Overall changes in empowerment of ICT women (Boitpur and Srifoltala).

Responses to Question 11b (Figure 5.35) indicate that ICT women had higher positive changes in all categories (less fear about future, freedom, inclusion in community and confidence in speaking out). However, there was less change in how informed they were about politics and legal rights.

Figure 5.36 indicates that non-ICT women had higher positive changes as regards inclusion in community and confidence in speaking out.
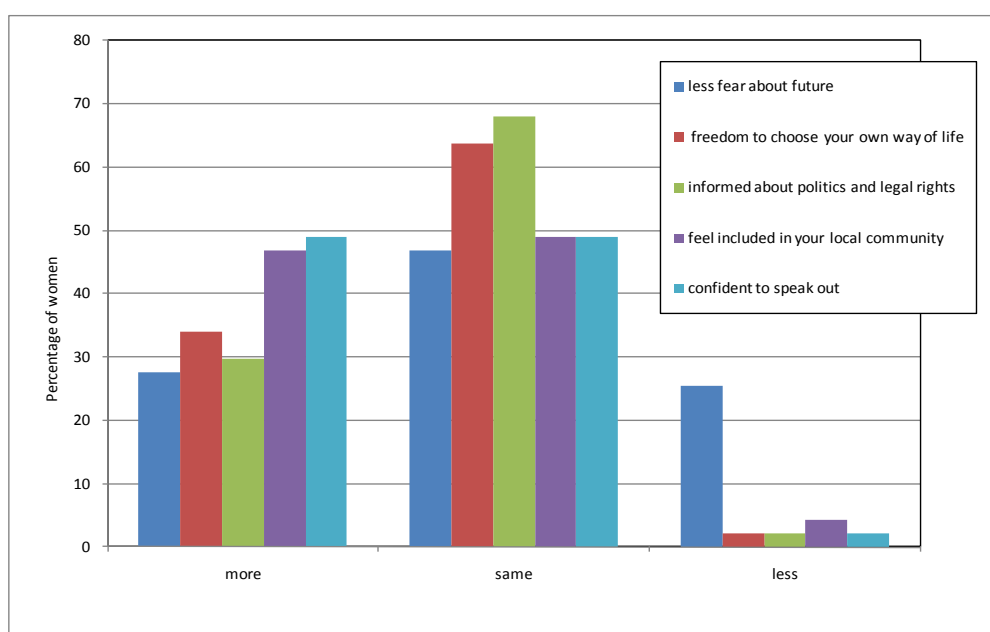
Figure 5.36 Overall changes in empowerment of non-ICT women (Boitpur and Srifoltala).

The overall empowerment measures in Boitpur showed more positive changes in women in all categories except politics and legal rights (less than 30%) (Figure 5.37). More ICT women (45%) felt less fear about future than non-ICT women (35%) who were in same position. Freedom to choose a way of life among ICT women (60%) could be considered an impact of ICT on rural women and an important indication of empowerment. However, more women (60%) indicated no change in regards to being informed about government and politics. In the category of inclusion in the local community, there were equal numbers of women who indicated more

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change (40%) and who were in the same situation (40%). Confidence to speak out was found in 55% of the women.
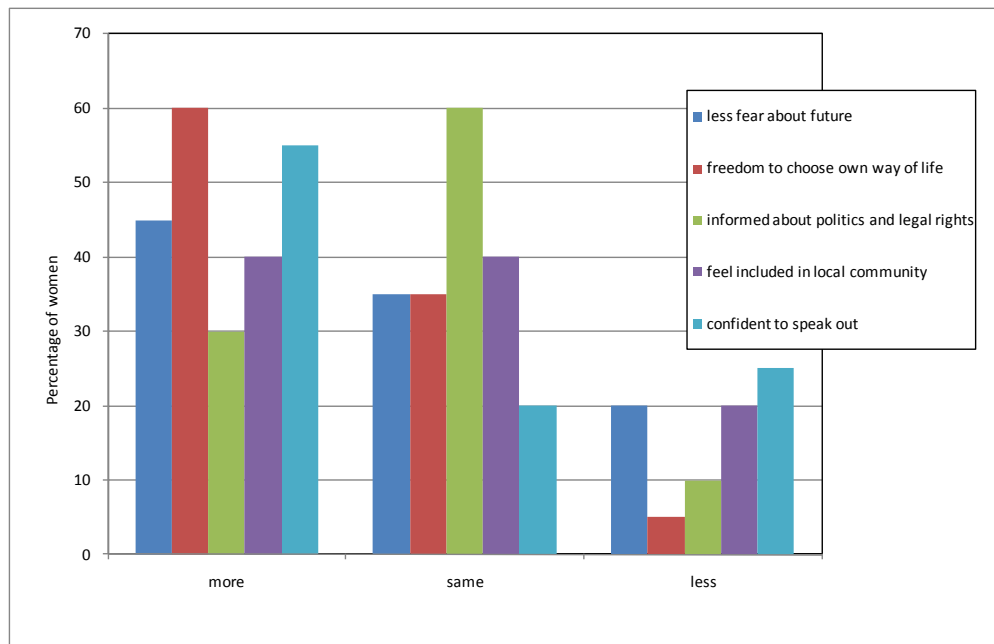
Figure 5.37 Overall changes in empowerment of ICT women (Boitpur).

Comments from an ICT woman in Boitpur supports the data regarding fear about future and their inclusion in local communities. Sheela (B3I), aged between 21 and 30, completed her bachelor degree and was working as an accountant in the D.Net ICT project. She was not married and lived with her parents. Her father encouraged her to study and undertake a job. She thought, in the modern world, ICT is the most important thing. She was earning and contributing to her family. She said:

> I know much information about health and education. Before doing this job I cannot talk to people, but now I can. I have good relationship with my family members and importance in the family. I have self-awareness and confidence in speaking out. Though, my family does not allow me to go out as I am unmarried. Village people respect me, but I never participated in village cultural or decision making activities. I used my voter power once. I can talk to higher authority if I need. I want to study further to improve my life. As I am unmarried, I have fear about my future.

So, even though she had economic security, Sheela was fearful about her future as she was afraid of living alone in the village.

Figure 5.38 indicates that there were no changes for non-ICT women in Boitpur except for an improvement in inclusion in local community (38%) and confidence in speaking out (40%). More than 55% non-ICT women had the same level of fear about future, more than 75% reported no change in choosing their own way of life and 70% reported no change regarding being informed about politics and legal rights. More than 55% of the non-ICT women felt same inclusion in the community and 60% with same speaking power. So, as a whole, these non-ICT women indicated little change in their overall empowerment level.
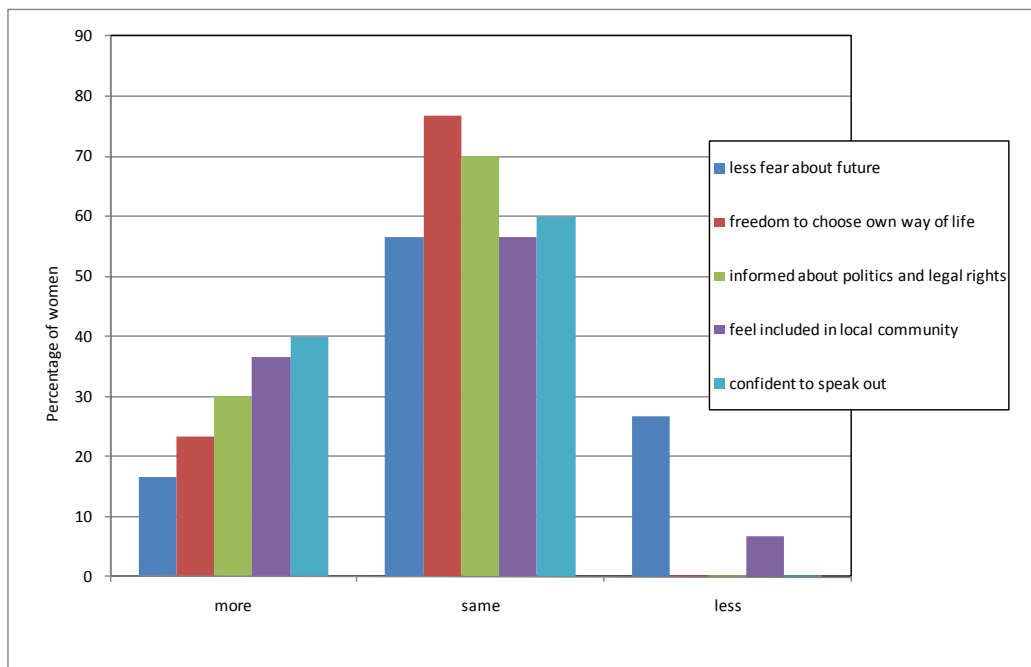
Figure 5.38 Overall changes in empowerment of non-ICT women (Boitpur).

From Figure 5.39, it is seen that ICT women in Srifoltala had more positive changes in the categories of less fear about the future (50%), freedom to choose own way of lifestyle (40%), inclusion in local community (60%) and confidence in speaking out (65%). However, fewer women (20%) indicated more change in how informed they were of politics and legal rights. It is interesting to note that half of the ICT women (50%) had a positive change in being fearful of the future and half had a

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negative change. The majority of women commented that they relied heavily on their husband's support, and only 20% reported being confident about living alone. Therefore, economic security or ICT have less influence on women in terms of their fear about the future
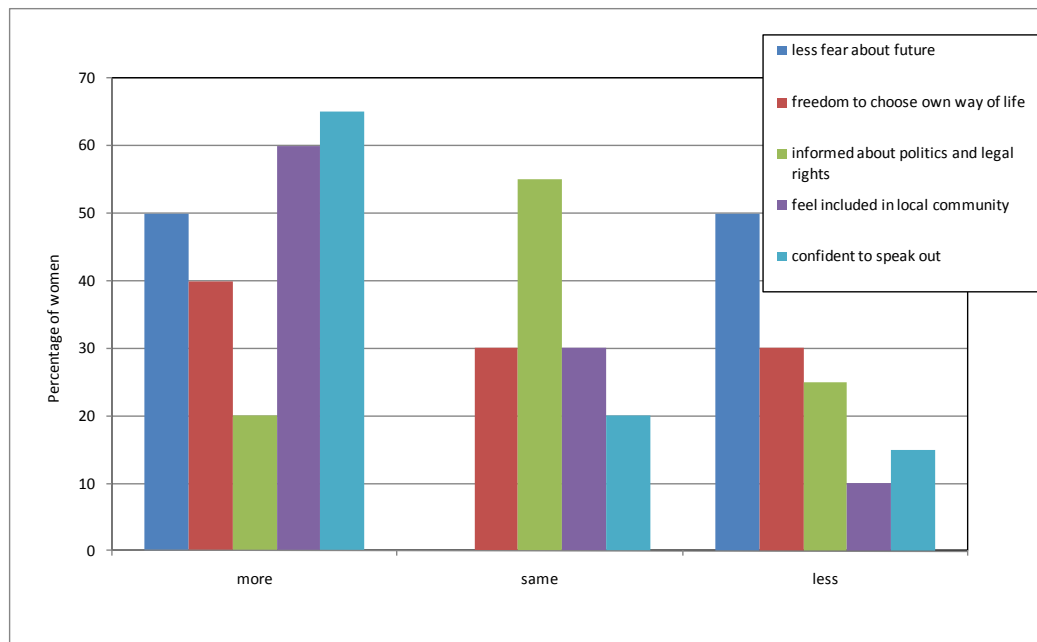
Figure 5.39 Overall changes in empowerment of ICT women (Srifoltala).

From Figure 5.40, it is seen that non-ICT women in Srifoltala had positive changes in relation to less fear about the future (48%), freedom in choosing own way of lifestyle (52%), inclusion in the community (63%) and confidence in speaking out (63%). However, fewer women (less than 30%) experienced positive change in how informed they were about politics and legal rights. These positive outcomes could be the result of participation of non-ICT Srifoltala women in other organisations, their older age and marital status. Also, positive changes in non-ICT women's overall empowerment could be an indication of the indirect impact of ICT. Non-ICT women benefitted indirectly from ICT projects by receiving information from other women involved in the ICT projects. They also used mobile phones for communication and

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information. In Srifoltala, awareness developing activities by ICT projects introduced new technologies to rural women, which helped them to understand the benefits of ICT and influenced their decision to send their children for ICT education.
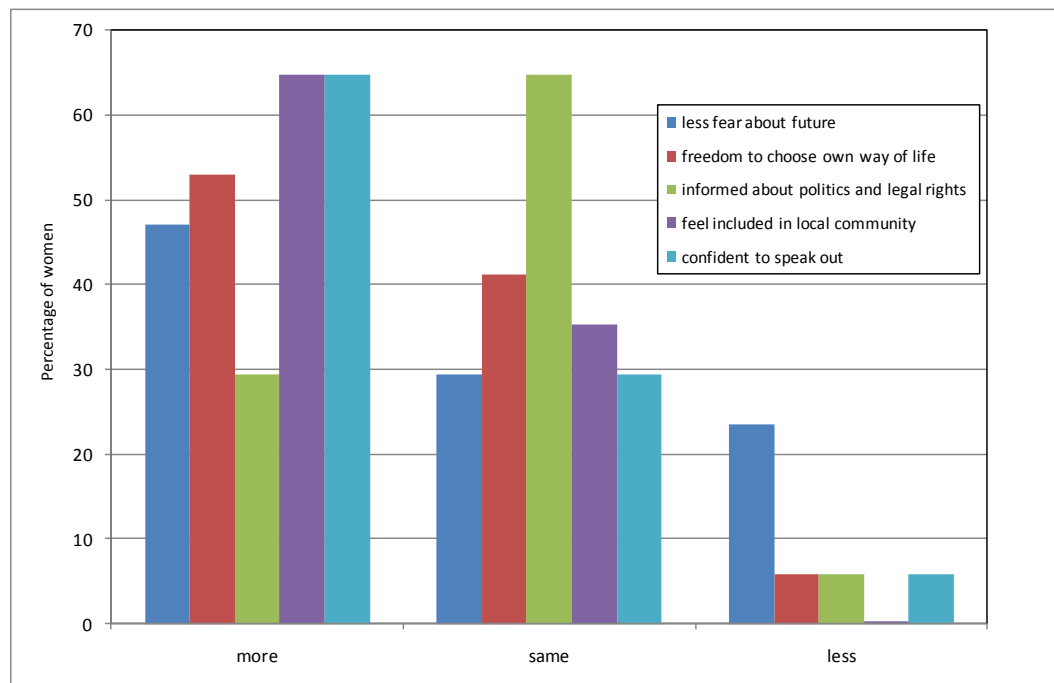
Figure 5.40 Overall changes in empowerment of non-ICT women (Srifoltala).

5.4.6.1. Summary of Overall Change

The overall change measures reflect women's empowerment through their increased confidence in the future, freedom of choice, political power, inclusion in the community and speaking power. However, rural women were busy with household work and caring for children and old people in their home, so they perceived that it was more important to think of earning a living than about politics. At election time, they were eager to cast their votes for the candidate who would be more likely to provide welfare for their country or village but they were also influenced by their husbands or sometimes by the candidate him/herself. Women also think that information about politics and government is related mostly to males.

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In Bangladesh, people do not easily accept that women live alone in society. People believe women should live with guardians such as parents and relatives or with their husband after marriage. Even after the death of their husband, women live with their in-laws or return to their parents. This suggests ICT intervention does not affect this aspect of their culture greatly.

Nevertheless, from the above analyses, it can be concluded that, overall, there were more positive changes among ICT women. There was evidence that ICT women were less fearful of future, felt increased inclusion in the local community (meso environment) and increased speaking power, which reflected the positive impact of ICT in their overall empowerment.

5.5. Conclusion

Even though ICT projects in developing countries like Bangladesh are claiming that they are changing the lives of rural people through ICT intervention (Global Knowledge Partnership, 2008), it can be seen from the analyses of this study that there is little overall improvement in rural women's (combined ICT and non-ICT) empowerment. The changes discussed in this chapter were based on qualitative analyses. As the economic conditions and ICT project activities were different in the two villages, it was more appropriate to draw a comparison between ICT and non-ICT women within the same village rather than comparing different villages. However, overall, there were positive changes among ICT women in both villages compared to non-ICT women. There was greater change in the *material dimension* among ICT women because of more job opportunities, economic security, fewer loans, and more economic contributions to the family.

In their *cognitive dimension*, overall, ICT women had improved knowledge and education, communication and social skills, and management and entrepreneurial skills. In their *perceptual dimension*, they perceived themselves as having more confidence, self-esteem, feelings of freedom, freedom from dominance by others, and independence than non-ICT women.

In the *relational dimension*, although there were mixed results for ICT women in decision making in the family and community, there were positive changes in decision making in maintaining the family income and their children's education. Moreover, they had some cooperation from their husbands within the house. In addition, ICT women were respected in the villages and used their voting power in spite of their lower participation in village decision making and in other organisations. A substantial difference was found between ICT and non-ICT women in applying their voting power in Boitpur. ICT women used their democratic rights more than non-ICT women, which is an indication of empowerment.

The greatest area of improvement was in the *technological dimension* among ICT women. These women used a variety of ICT tools (computer, email/Internet, television, SMS, phone kiosk and mobile phones) and used them more frequently (primarily mobile phone and television) than non-ICT women. Their information needs were higher in all cases, especially in employment and education. However, the *perception* of need for information was high among both ICT and non-ICT women, with both groups realising the need for communication technology in their lives. With regards to *overall change*, ICT women were more confident about the future, felt more included in the society and exhibited more speaking power.

However, it was revealed through the analyses and participants' comments that the impact level of ICT intervention was different for individual women due to

influencing variables such as education level, economic condition of the family or the village, depth of involvement in the ICT projects, age and marital status. There were also some common factors which affected women in achieving benefits from ICT such as their culture (e.g. freedom to go anywhere outside home or asking help from their husband in household work), cost of ICT tools and the foreign language barrier. Therefore, these influencing factors should be considered when analysing all five dimensions in women's empowerment.

Nevertheless, there were both positive and negative changes among rural women from ICT intervention. For example, by learning computer applications, women were obtaining more jobs and getting more information using ICT tools. On the other hand, due to little knowledge of how to use ICT tools, some women were not benefiting and not experiencing any change in their lives, even though an ICT project was active in the village. Rural women, in general, felt the need and benefits of ICT in their lives for quick and easy communication and to obtain information.

The following chapter, therefore, describes the changes among participants after two years to verify that ICT intervention is really making changes in women's empowerment in rural Bangladesh and to what extent.

CHAPTER 6

RESULTS OF STAGE II STUDY

As discussed in Section 2.7, women empowerment is a process which comprises three integral parts - agency, resources and outcomes. Women themselves must be involved in the process and use available resources that lead them to empowerment in order to achieve its outcomes. To measure any changes in the empowerment process as an impact of ICT intervention, a modified framework, described in Section 4.2, was applied. It focused on material, cognitive, perceptual, relational and technological dimensions in relation to the micro, meso and macro environments of women's lives. To re-examine these dimensions after a two years period, the student researcher returned to Bangladesh in November 2010. This Stage II study had similar numbers of participants, including some from the Stage I study. This chapter analyses the total 2010 cohort, while Chapter 7 discusses the data regarding the longitudinal component (i.e. those participants involved in both Stage I and Stage II) only.

In 2010 the D.Net project in Boitpur was still working with the S.N. Trust and providing three to six months ICT training in Microsoft Office applications, hardware and networking. Their services, though, had not improved as they occupied the same office space, with the same number of computers without any hardware upgrade. The solar panel, which had helped to provide a 24-hour power supply to the ICT centre in 2008, was not operational in 2010. However, the people of the village were more aware of the ICT project activities, whether they used them or not.

The Amader Gram ICT project in Srifoltala also had the same infrastructure in 2010 as in 2008. The project was working intensively for telemedicine in a breast cancer awareness program based in the Khulna regional office, located 30km from

Srifoltala. Although this program had been in place in 2008, by 2010 teleconferencing (available in the regional office) for breast cancer treatment was also included. The ICT activities previously discussed, such as computer training (three months), Computer for All program (one day) and annual knowledge fair (Section 3.1.2), were still active. Therefore, rural women in Srifoltala remained aware of the potential of ICT use.

In this chapter, the demographics of the women in Stage II are described and the results of each dimension with regards to women's empowerment are addressed. Comparative analyses of ICT and non-ICT participants are presented for Stage II and comments from the interviewees are provided for a broader and more in-depth understanding of any changes in the women's empowerment process.

6.1. Demographics of Stage II Participants

In 2010 the D.Net project was still active in Boitpur. Forty women were interviewed. Twenty of these women were student trainees (45%) or employees of the D.Net project (25%) and the S.N. Trust School and health clinic (30%). They are referred to as ICT women in this chapter. The other 20 women were not part of any ICT projects but were beneficiaries of the S.N. Trust health clinic and village information system, and included women whose children attended the S. N. Trust School. They are referred to as non-ICT women (Table 6.1).

In Srifoltala, where the Amader Gram worked, 37 women were interviewed. Twenty of these women were employees of the project (10%) and health clinic (5%) or student trainees (45%) or women (40%) participating in the project using ICT for education and knowledge (Computer for All program). The other 17 were non-beneficiaries and are referred to as non-ICT women.

Table 6.1 Number of Stage II participants (Boitpur and Srifoltala).

	D.Net	Amader Gram
ICT	20	20
Non-ICT	20	17

Table 6.2 Demographics of Stage II participants (Stage II) (N = 77).

Demographics		Boitpur (D.Net)		Srifoltala (Amader Gram)		Total
		ICT (N = 20)	Non-ICT (N = 20)	ICT (N = 20)	Non-ICT (N = 17)	(N =77)
Age group	< 20 years	7	2	5	1	15
	21-30 years	12	6	7	6	31
	31-40 years	1	9	6	9	25
	41-50 years	0	2	1	1	4
	>50 years	0	1	1	0	2
Marital status	Married	8	18	14	15	55
	Single	11	1	6	1	19
	Other	1	1	0	1	3
Level of education	Unable to read	0	2	0	2	4
	Non-formal schooling	0	1	2	3	6
	Primary school	0	6	2	1	9
	Lower secondary	0	6	10	10	26
	Secondary school	7	2	1	0	10
	Higher secondary	7	2	1	1	11
	Post-secondary	6	1	4	0	11
Employed	Yes	11	3	3	4	21
	No	9	17	17	13	56
ICT use	Mobile	20	19	20	15	74
	Computer	18	1	9	1	29
	Internet	8	0	4	0	12

Figure 6.1 is a comparison of younger and older women to show more clearly any generation gap for both ICT and non-ICT women in the Stage II study.

In Stage II of the study, data were collected using the same procedure as for Stage I (face-to-face interviews with a semi structured questionnaire, as discussed in Section 4.5.2). The demographics of Stage II participants are given in

Table **6.2.**
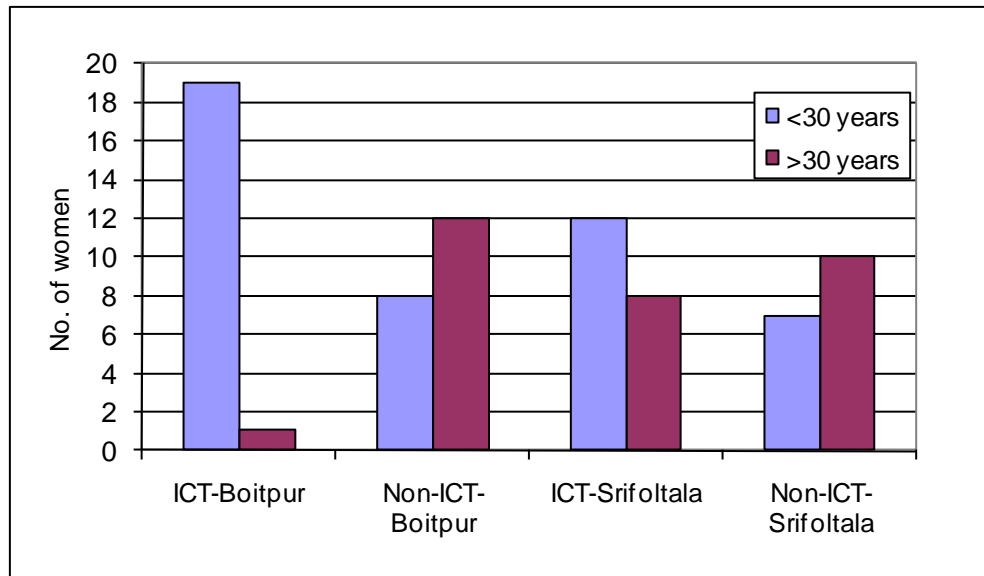
Figure 6.1 Number of younger (<30 years) and older (>30 years) women for both ICT and non-ICT participants at Stage II (Boitpur and Srifoltala).

From Figure 6.1 it can be seen that, in the non-ICT groups, there was a greater number of older women in both villages. As noted previously, the generation gap affects ICT use because the younger generation uses ICT tools more efficiently and confidently than the older generation (Prensky, 2001) Sections 2.10 and 5.2 describe this in terms of the literature and Stage I. It can be noted that there were many older women in the non-ICT groups in both villages.

6.2. Dimensional Changes Due to ICT Use

The questionnaire used in Stage I was also applied for Stage II. To explore changes in empowerment due to ICT in the women's lives two years later, each of the five dimensions (material, cognitive, perceptual, relational and technological) as well as

overall impact was investigated. The results are presented as a comparison between ICT and non-ICT women in each village and discussed in the following sections.

6.2.1. Material Dimension

As mentioned in Section 4.2.2, the material dimension of rural women is related to economic security in their lives, acquisition of assets, loans, savings and contribution to family expenses. The responses to the questions related to economic security (Appendix I Q.6a) were analysed and the results are shown in Figures 6.2 and 6.3 for both Boitpur and Srifoltala. A Likert-like scale of 1 to 5 was used where changes experienced by women are indicated as 5 for 'much better' and 1 for 'much worse'. The average value of each change was calculated and plotted.

The results of Stage II study basically confirm the outcomes in Stage I or discuss the shortfalls. It was found in Chapter 5 that ICT women gained improvement in the material dimension (Section 5.4.1.6) through their employment but they did not have much control over their earnings. These improved in Stage II. They also showed improvement in savings and financial contribution to the family in Stage II.

6.2.1.1. Economic Security

When changes in the material dimension were compared between ICT and non-ICT women in Stage II, it can be seen that ICT women were in a better position in all categories in both villages (Figures 6.2 and 6.3). Though repayment of debt was similar for both ICT and non-ICT women in Srifoltala, the ICT women's overall material gain was higher.

Figure 6.2 Comparison of average material changes in ICT and non-ICT women in Stage II (Boitpur).
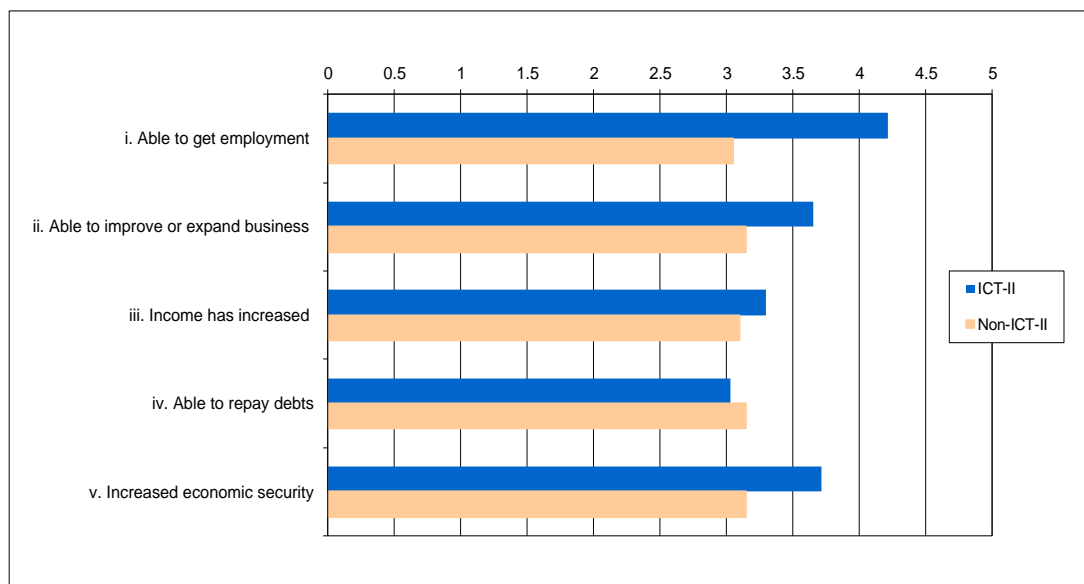
Figure 6.3 Comparison of average material changes in ICT and non-ICT in Stage II (Srifoltala).

Therefore, overall the improved material dimension for ICT women in both villages indicates the positive impact of ICT on women's lives after two years.

6.2.1.2. Acquisition of Assets

Questions 6.b-e asked women about their acquisition, sources and approximate values of assets. For Stage II, the data is incomplete as some women did not disclose this information. Table 6.3 shows assets in terms of number of responses.

Table 6.3 Acquisition of assets (N = 77).

Assets	Boitpur (D.Net)		Srifoltala (Amader Gram)	
	ICT (N=20)	Non-ICT (N=20)	ICT (N=20)	Non-ICT (N=17)
Family land	8	7	9	6
Family house	8	6	7	7
Jewellery	6	6	8	2
Cattle	1	1	1	0
Two-wheeler vehicle	0	2	1	0
Other	0	0	1	0

As can be seen from Table 6.3, there was little difference in acquiring assets between ICT and non-ICT women in both villages. In asset acquisition, cultural tradition works as an influencing factor, as discussed in Section 5.4.1.

6.2.1.3. Loan/Debt

It is interesting to see from Figure 6.4 that, in Boitpur, fewer ICT women had loans than non-ICT women. The reasons were the same as discussed in Section 5.4.1.3. Being economically solvent, these women tended not to take out loans. On the other hand, ICT women in Srifoltala were likely to have loans from micro-credit schemes outside the ICT project. These ICT women were more likely to be housewives or had a little income from small businesses, poultry or handicrafts. Therefore they used loans

to improve their family's economic condition. This is in keeping with the findings from Stage I.
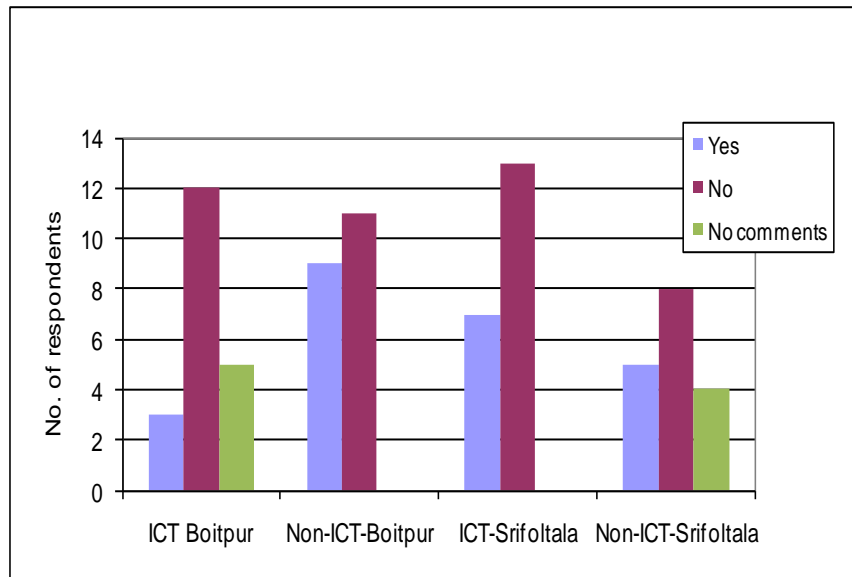
Figure 6.4. ICT and non-ICT women having loans or debts (Boitpur and Srifoltala).

6.2.1.4. Savings
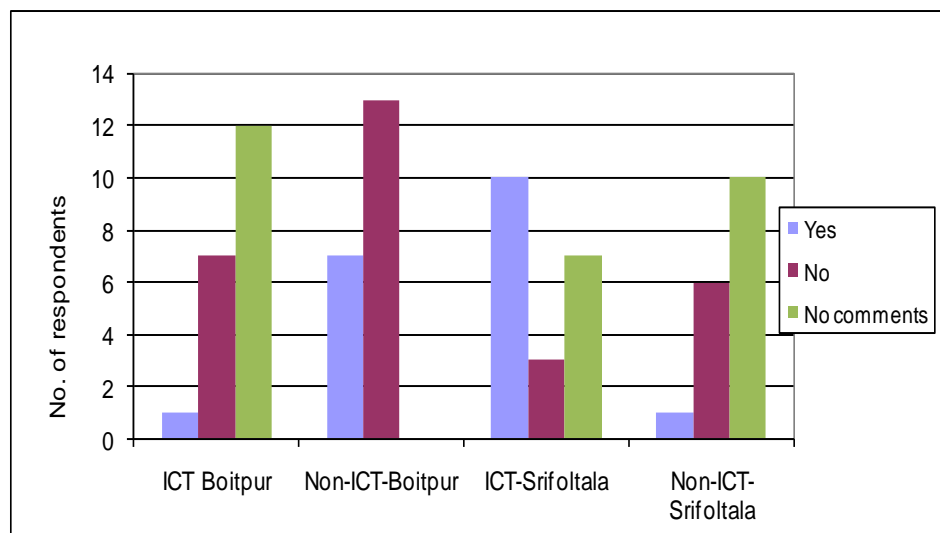
Figure 6.5. ICT and non-ICT respondents having savings (Boitpur and Srifoltala).

Figure 5.8 shows Boitpur non-ICT women had more savings than ICT women which is similar to the situation in Stage I (Section 5.2.1.4). However, 60% of the ICT women did not comment, so the result is questionable. On the other hand, in Srifoltala,

more ICT women reported they had savings similar to Stage I. The reasons were the same as discussed for Stage I.

6.2.1.5. Financial Contribution

Figure 5.9 shows that ICT women in both villages had the ability to contribute more to the total family income. As most of non-ICT women in Srifoltala had no employment (

Table **6.2**), they could not contribute anything other than their non-monetary services. However, some were able to contribute through their income from handicrafts, small businesses or investment of micro-credit loans.
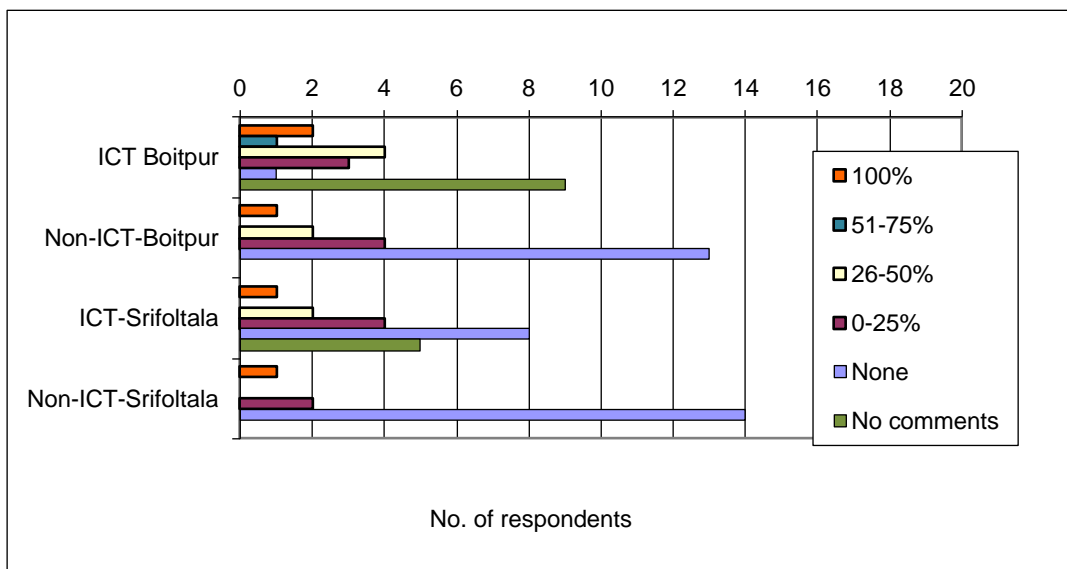
Figure 6.6. ICT and non-ICT respondents' contribution to total family income (Boitpur and Srifoltala).

Comments from the participants also support the results of the material dimension. In Boitpur, Rupa (B10-10I), aged under 20, was single and involved with the D.Net ICT project through computer training. She was in secondary school and had income through her private tutoring of younger children. She said:

I live in our own house with my parents. I earn money from private teaching primary school kids in the village. I give 50% of my income to my family and use rest of the money for my education and to buy clothes for myself. I have no loans or savings.

Shamima (S5-10I), in Srifoltala, aged 31-40 and a mother of a 12 year old son, was a teacher. She had completed her bachelor degree. She had also taken part in the computer training program in the Amader Gram ICT project to improve her employment opportunity. She lived in their own house with her husband and son. She said:

I have some jewellery which I acquired by myself. I have loans (between 100000 - 150000 Tk.) from a NGO and which my husband invested in fish cultivation. We earn from there and repay loan. I save some money from my income for my son's future education.

Sharmin (B5-10N) in Boitpur, aged under 20, was married and doing higher secondary studies. She had no children and lived with her husband in their own house. She was also working for a NGO as a loan officer who looked for suitable recipients of micro-credit loans and collected repayments from creditors. She said:

I have jewellery which I got, during my marriage, from my parents. I have savings which I acquired from my job. Luckily, I do not have any loan. I do not have to contribute to family expense.

In Srifoltala, Jahanara (S3-10N), aged 31-40, had no formal education. She was divorced and had no children. She was a maid servant working in other households in the village. She said:

I live with my parents and contribute most of my income to my family. I am saving money for my future. I have no loans.

Therefore, these comments indicate that, though ICT women were in a more favourable position in obtaining a job and contributing more to the family's income, non-ICT women were also able to contribute through their micro-credit loans and other earning sources.

6.2.2. Cognitive Dimension

The cognitive dimension is a psychological process involved with the acquisition and understanding of knowledge, formation of beliefs and attitudes, decision making and problem solving attitudes. This section examines whether there were any changes in women's awareness, skills and knowledge of the wider environment in various issues such as health, education, legal rights, management/entrepreneurial and communication skills.

In the cognitive dimension, ICT women in both villages had improved awareness in the meso environment (Section 5.4.2) in Stage II. However, some Srifoltala non-ICT women's improvement in cognitive dimension did not persist from Stage I to Stage II due to their un-involvement with other NGOs later in Stage II.

When cognitive changes of participants in Stage II were compared between ICT and non-ICT women, it can be seen that ICT women were in a better position in all categories in both Boitpur (Figure 6.7) and Srifoltala (Figure 6.8).

Noticeable positive changes were found among ICT women in their knowledge and education, communication skills, importance in the family and relationship with family and friends. These confirm the results in Stage I.

Comments from the participants also support the results of the cognitive dimension. In Boitpur, Sultana (B1-10I), aged 21 to 30, was unmarried and living with her parents. She completed her bachelor degree and was involved with the D.Net ICT project through computer training. She was a teacher in the S. N. Trust School and had income which she contributed to her family. She said:

> Since I contribute to my family, I feel free from dominance from other family members. Though I don't know much about children's health, I have knowledge from my experience as a teacher that children's education is important.
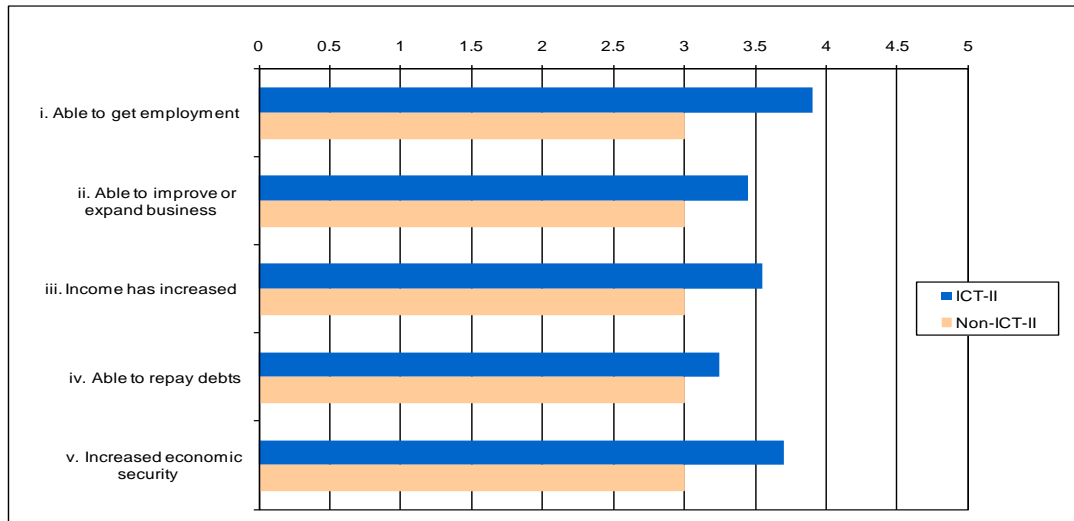
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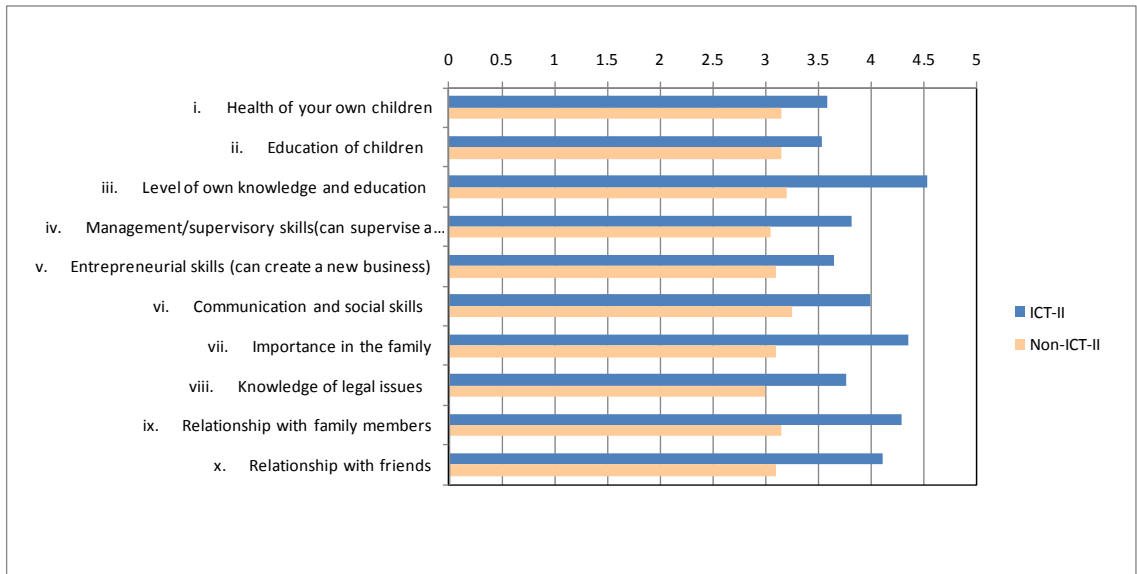
Figure 6.7 Comparison of average cognitive changes of ICT and non-ICT women in Stage II (Boitpur).
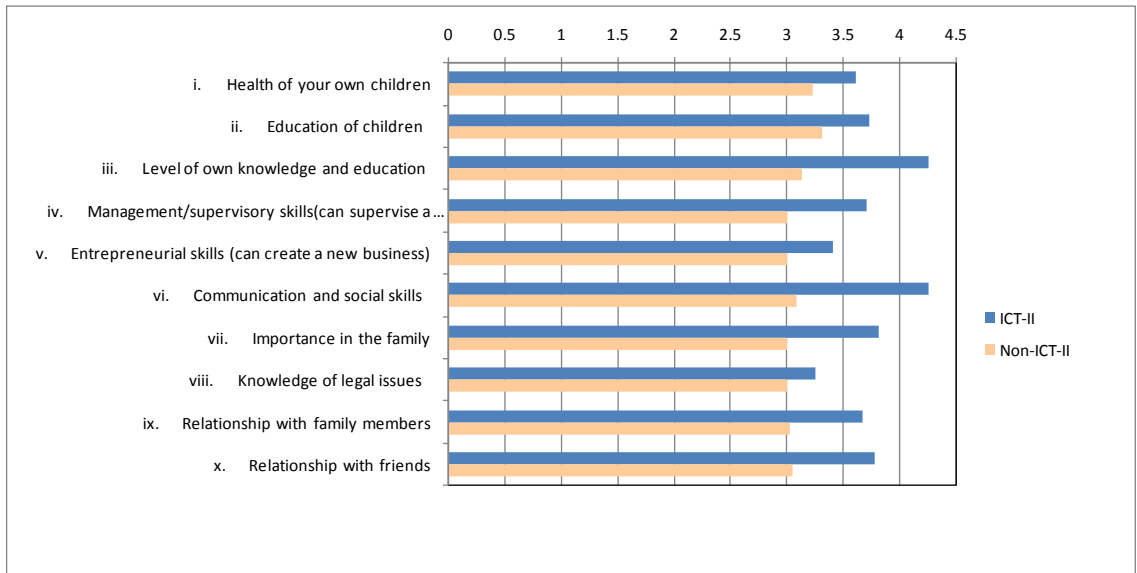
Figure 6.8 Comparison of average cognitive changes of ICT and non-ICT women in Stage II (Srifoltala).

Shikha (S7-10I), aged under 20, was a student in secondary school. She had taken part in the computer training program in the Amader Gram ICT project to improve her employment opportunity. She lived in their own house with her parents. She said:

> I am confident in acquiring my own knowledge and education and I hope to get a job after finishing my study. I think mobile phones or the Internet help us to improve our education and employment opportunity and thus, improve our lives.

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Thus, it is evident that ICT women were experiencing positive changes in cognitive dimension because of their direct involvement in the ICT projects through training and learning.

6.2.3. Perceptual Dimension

The responses to the questions exploring the perceptual dimension (Appendix I, Q.8a) in the women's mental spaces, such as the level of confidence, self-esteem, self-awareness, dignity, freedom and independence, are plotted to compare ICT and non-ICT women in Stage II in both villages.

In Stage II, ICT women's perceptual dimension continued to improve compared to that of non-ICT women. As mentioned in Section 5.4.3.1, the reasons for their improvement were length and types of ICT projects activities, economic condition of the village and education level of women. For these positive factors, Boitpur ICT women were in better position than Srifoltala ICT women in 2008. However, though the gaps become narrower, Boitpur ICT women were still leading Srifoltala ICT women, for the same reasons, in Stage II.

Comparisons between ICT and non-ICT women are shown in Figure 6.9 (Boitpur) and Figure 6.10 (Srifoltala), which depict the improved perceptual change among ICT women.

The greatest change was in speaking confidently and having self-esteem. Going to ICT centres and learning new technology were leading factors in increasing self-esteem for rural women.
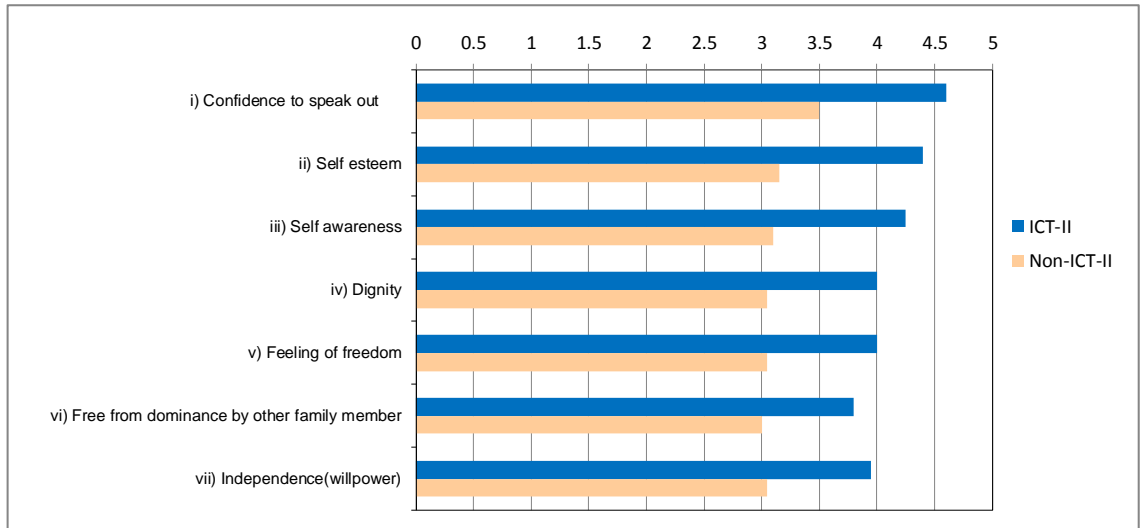
Figure 6.9 Comparison of average perceptual changes between ICT and non-ICT women in Stage II (Boitpur).
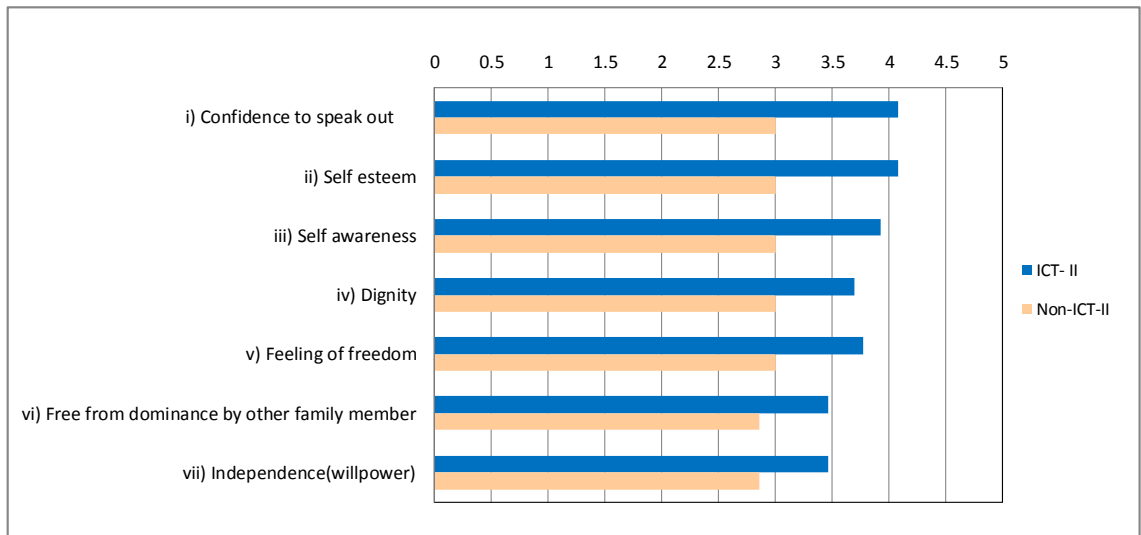
Figure 6.10 Comparison of average perceptual changes between ICT and non-ICT women in Stage II (Srifoltala).

Additional comments from ICT women Sultana (B1-10I) and Shikha (S7-10I) reported in the section on the cognitive dimensions above can be re-presented to support women's improved perceptual dimension in speaking power, self-confidence, self-esteem, self-awareness and freedom.

> ….I have mobile phone which I use for communicating with my friends. I can also use email and the Internet. I am confident and can live my life with my own choice. Sultana (B1-10I).

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….I have confidence in speaking out in front of other people. Shikha (S7-10I).

Therefore, the results and comments confirm the positive impact of ICT on rural women's perception, enabling their progress towards empowerment after two years.

6.2.4. Relational Dimension

The relational values for both ICT and non-ICT women were investigated and compared. Women's decision making power, their husband's co-operation within the domestic environment, and participation at the community level, were analysed for Stage II as for Stage I (Section 5.4.4). Any improvement in women's relationship with their husband with regards to decision-making power and their husband's co-operation in the house can be regarded as micro-level empowerment. Furthermore, women's participation in the village community and any other organisations reflect their meso-level empowerment. The responses to the questions on the relational dimension were analysed to determine any impact of ICT in these environments.

In the relational dimension of the questionnaire (Appendix I, Q.9), each item in decision making power (for example, Figure 6.11) have five values ranging from 1 to 5. The highest decision making power is 5 (I decide). The other values are 4 (I consult and decide), 3 (we consult and decide), 2 (I am consulted) and 1 (I am not consulted).

When changes in the relational dimension are compared between ICT and non-ICT women, it can be seen that there were differential results in the villages. Boitpur ICT women were in better position than Srifoltala ICT women in Stage II, but in both villages the husbands' control of their movement was related to the traditional culture and custom of Bangladesh. Though Srifoltala non-ICT women's participation in the community was better than Boitpur non-ICT women in Stage I, as they were mature

and had involvement with other NGOs, in Stage II this participation in the community decreased. The reason may be the result of lessened involvement with other NGOs in Stage II.

Figure 6.11 shows that ICT women in Boitpur had greater improvement than non-ICT women in several areas only, especially in decisions on bank accounts/savings, non-budgeted expenses, control over personal salary, decisions on health care, and helping their own maternal family. As discussed earlier (Section 6.2.1), and also in Stage I (Section 5.4.4.1), women who were involved in the ICT project through employment benefited with income, added financial contribution to the family and more decision making power.
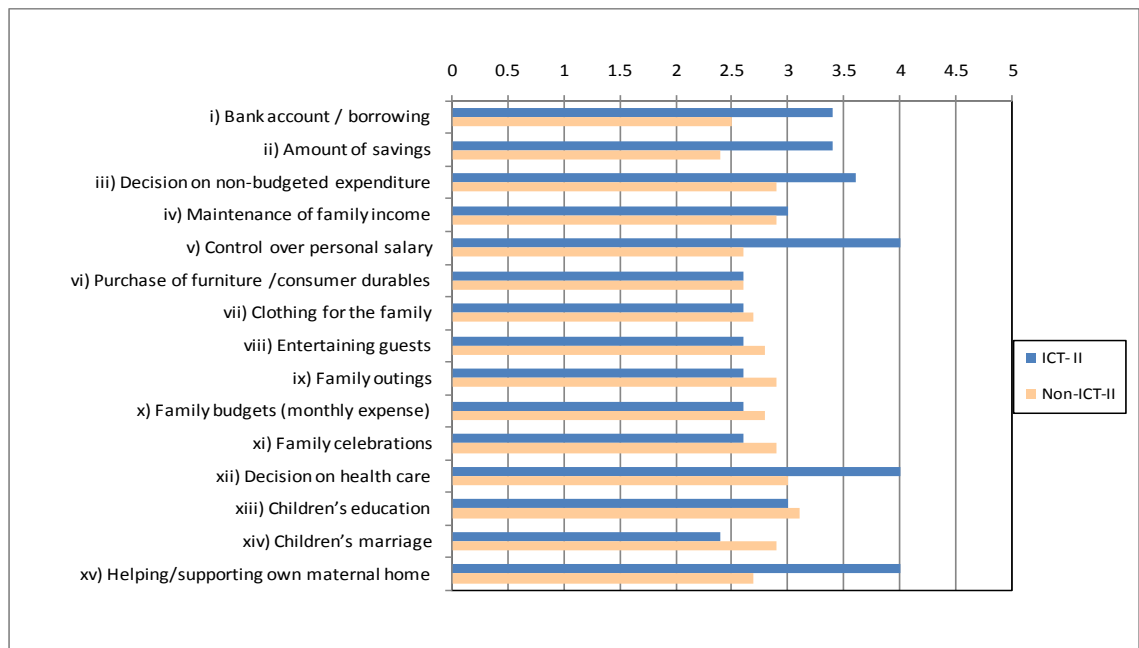
Figure 6.11 Comparison of average relational changes in decision making between ICT and non-ICT women in Stage II (Boitpur).

In comparison, ICT women in Srifoltala had greater improvement than non-ICT women in all categories of decision making (Figure 6.12). This is in line with the empowerment found among ICT women in Stage I (Section 5.4.4.5).
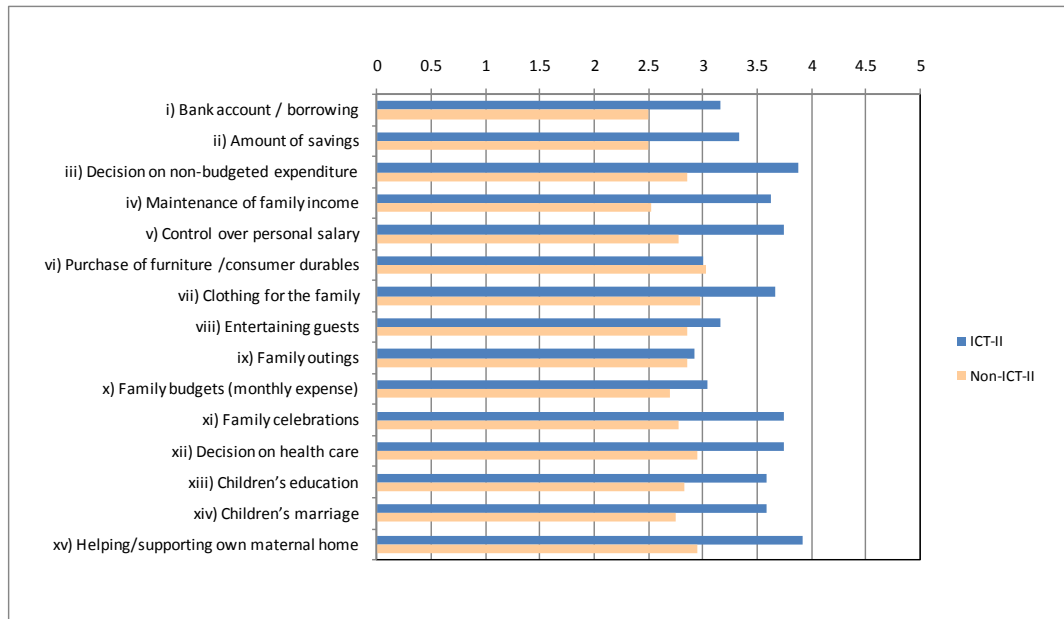
Figure 6.12 Comparison of average relational changes in decision making between ICT and non-ICT women in Stage II (Srifoltala).

Boitpur ICT women had more cooperation from their husbands in all areas except in being able to go anywhere and anytime without their husband's knowledge (Figure 6.13). Srifoltala ICT women also had more cooperation except they had less freedom to buy and wear a dress of their own choice (Figure 6.14).

At the community level, a comparison of ICT and non-ICT women (Figure 6.15 and 6.16) showed that ICT women had positive changes in most categories. Non-ICT women's participation in community decision making, which was little higher in Stage I, is not supported by data in Stage II. Although many women did not comment on their involvement with other organisations during Stage II (and therefore those results were not analysed because of inadequate data), it appeared to be less among Stage II women than Stage I women. This is expected to have impacted on community decision making.

The results of the relational dimension data between ICT and non-ICT women confirmed the same differential results reported in Stage I (Section 5.4.4.3). However, ICT women were in better situation in spite of the culture and tradition of the village.
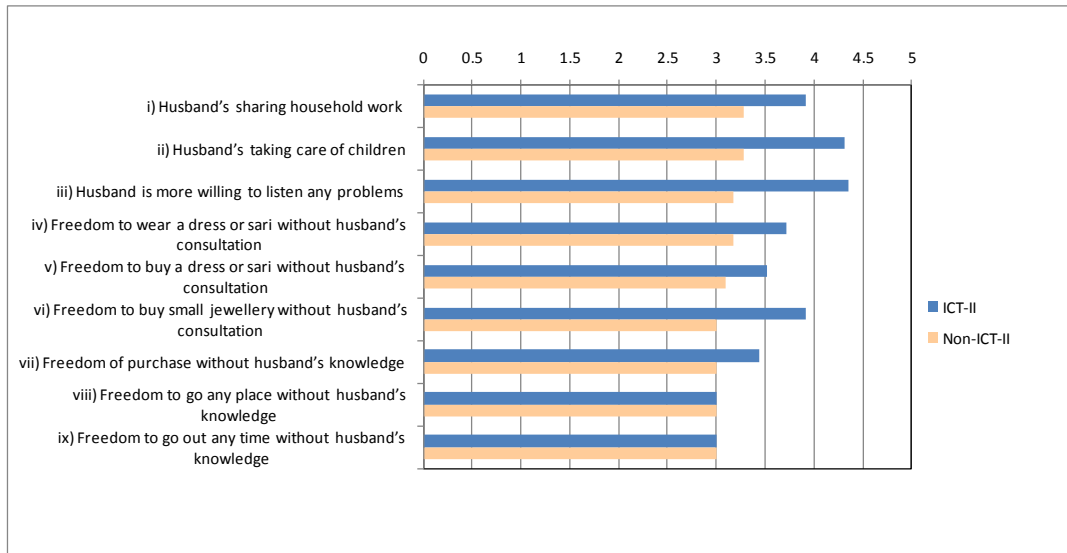
Figure 6.13 Comparison of average relational changes in husband's cooperation between ICT and non-ICT women in Stage II (Boitpur).
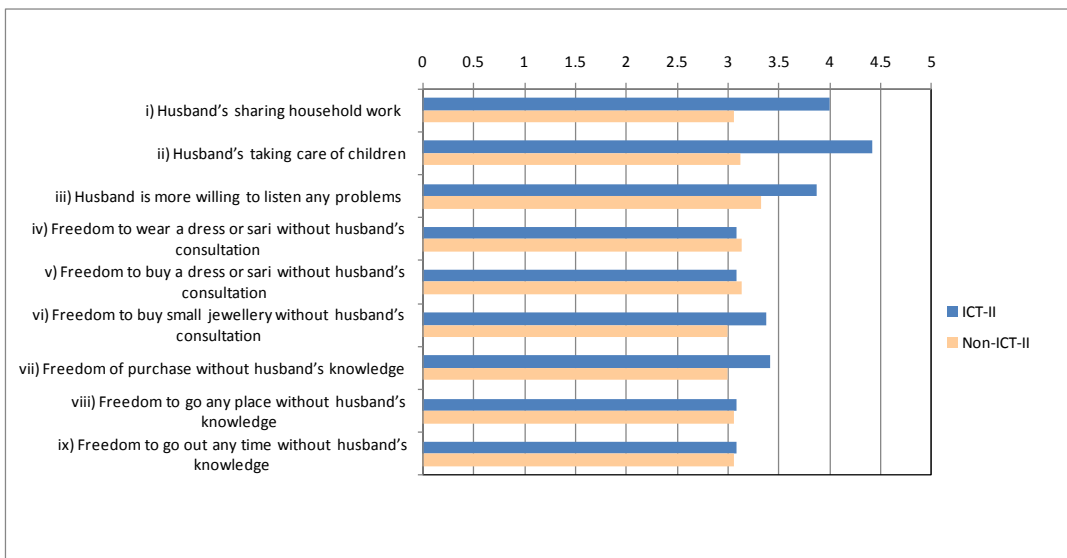
Figure 6.14 Comparison of average relational changes in husband's cooperation between ICT and non-ICT women in Stage II (Srifoltala).
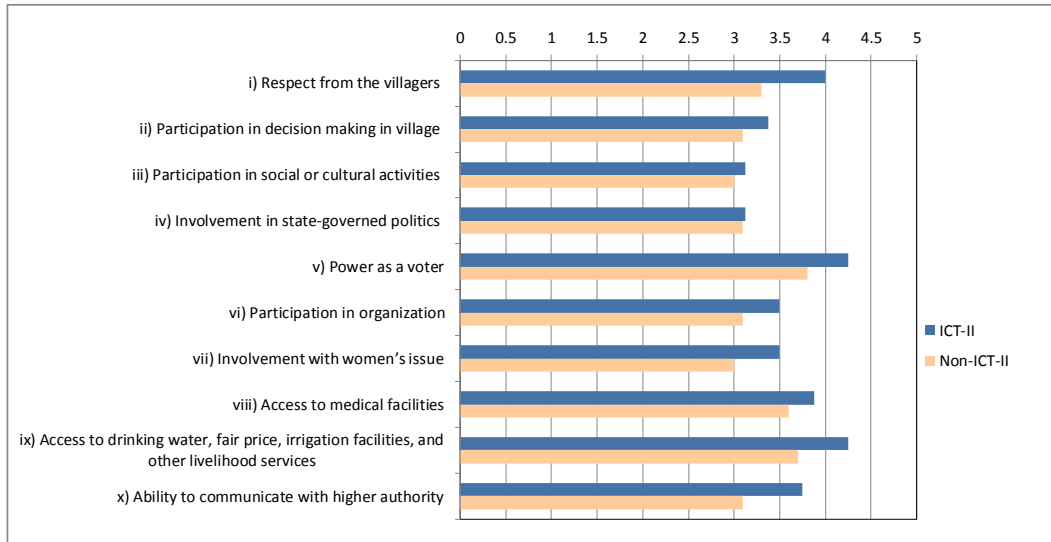
Figure 6.15 Comparison of average relational changes at community level between ICT and non-ICT women in Stage II (Boitpur).
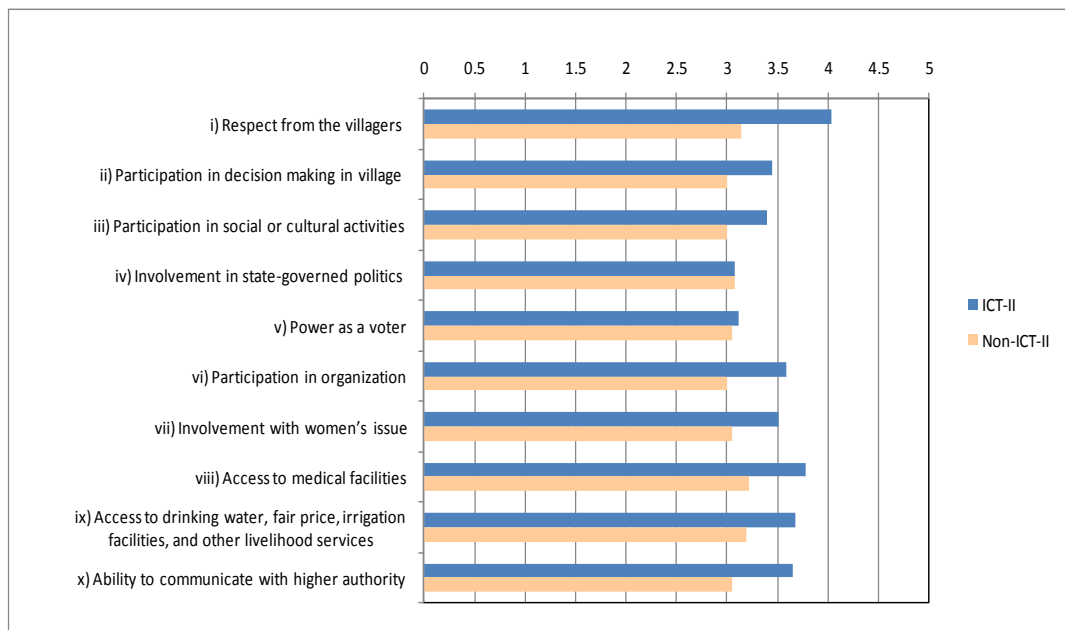
Figure 6.16 Comparison of average relational changes at community level between ICT and non-ICT women in Stage II (Srifoltala).

6.2.5. Technological Dimension

It is important to examine the technological dimension in relation to rural women's empowerment as a result of ICT in their lives. The responses to the questions on the technological dimension (Appendix I, Q.10a-i) depict the level of acceptance of

technology, the level of understanding and the benefits of ICT, and the information needs of women in their daily lives. The items regarding communication services (Q.10a) asked women about how often they used these services. Answers were plotted on a Likert-like scale with values ranging from 1 to 5. The values are 5 (more than once in a day), 4 (more than once in a week), 3 (more than once in a month), 2 (less than once in a month) and 1 (not used). To assess the information needs of rural women, answers to questions (Q.10b) were also plotted on a Likert-like scale. The values were 1 (not important), 2 (not very important), 3 (no opinion), 4 (important) and 5 (very important).

The use of ICT tools improved ICT women's technological dimension in Stage II though use of radio decreased. However, the same shared focus was found for information needs among ICT and non-ICT women.

When Stage II ICT and non-ICT women in both villages were compared in regards to their communication services uses, it was found that Boitpur ICT women used different kinds of ICT tools more frequently, especially television and mobile phones (Figure 6.17) similar to Stage I (Section 5.4.5.1).

Similarly, in Srifoltala, it can be seen that ICT women used different types of ICT tools more frequently than non-ICT women (Figure 6.18). However, there was a decreased use of radio among ICT women. It was discussed earlier (Section 5.4.5.1) that radio was not a popular communication tool among the younger generation and the ICT participants were mostly younger. Also those household which had radio in Stage I did not have them in Stage II. When the radios were out of order, the households did not repair them.
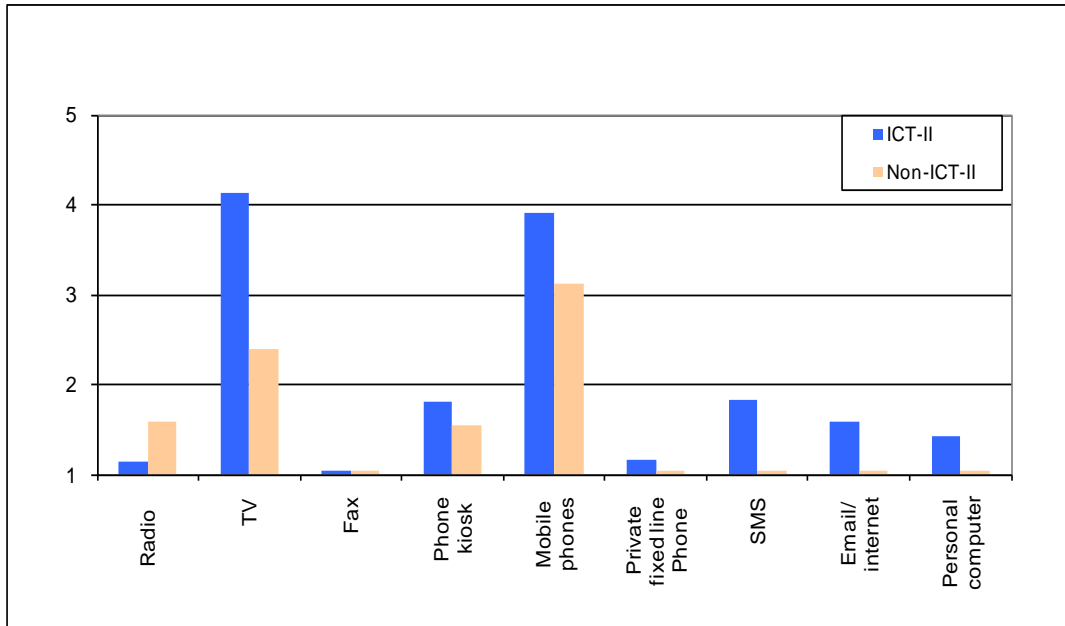
Figure 6.17 Comparison of average level of use of communication services between ICT and non-ICT women (Boitpur).
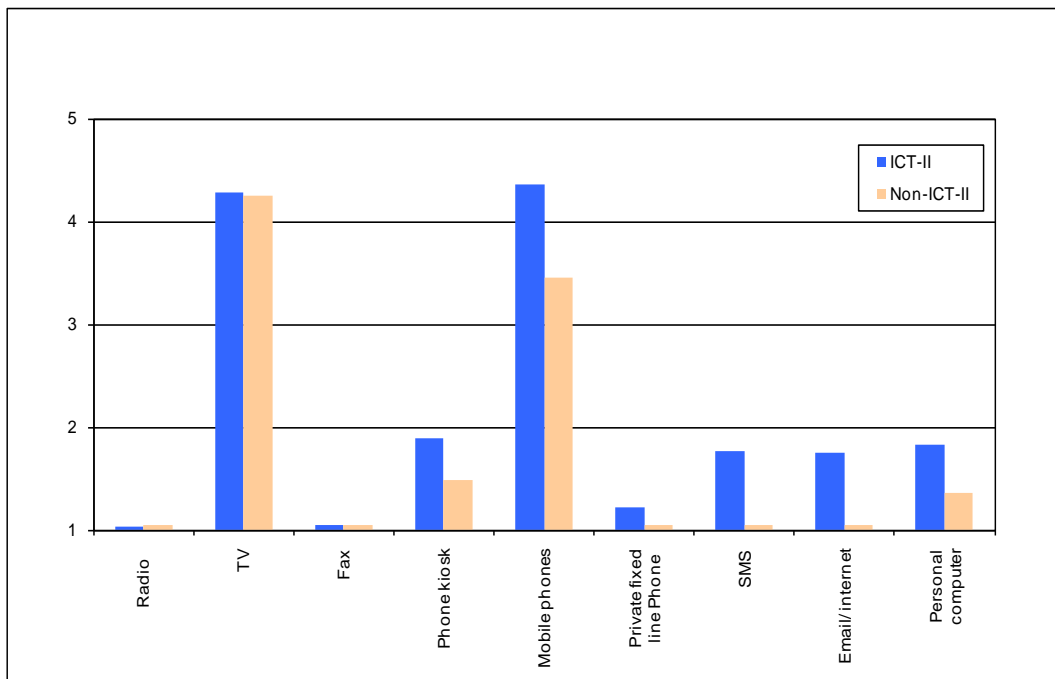
Figure 6.18 Comparison of average level of use of communication services between ICT and non-ICT women in Stage II (Srifoltala).

A comparison of average information needs in both villages shows that almost all information was in high demand among ICT women (Figure 6.19 and 6.20). There was a clear difference in need of employment, social, and educational information between ICT (with higher need) and non-ICT (with lower need) women in Boitpur. By comparison, emergency, social and healthcare information were highly needed by both ICT and non-ICT women with a little difference between the two groups.
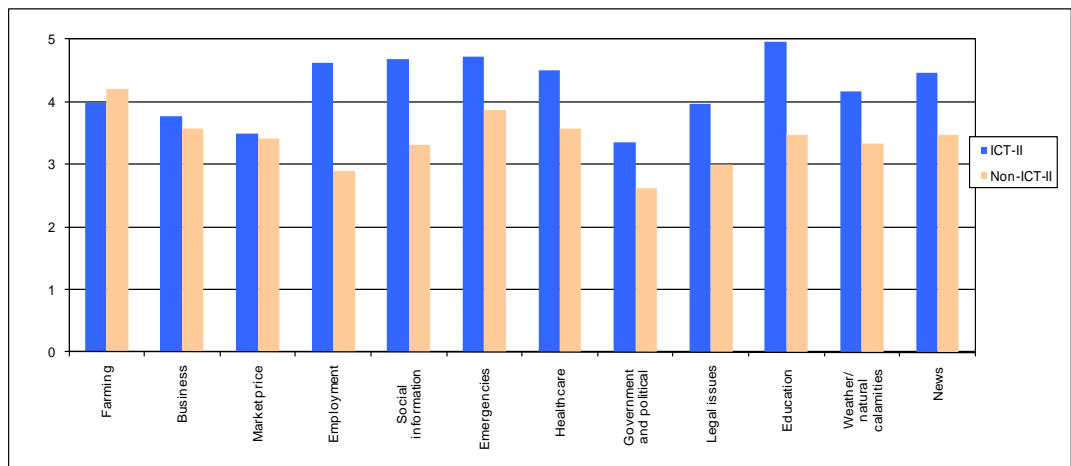
Figure 6.19 Comparison of average change in information need between ICT and non-ICT women in Stage II (Boitpur).
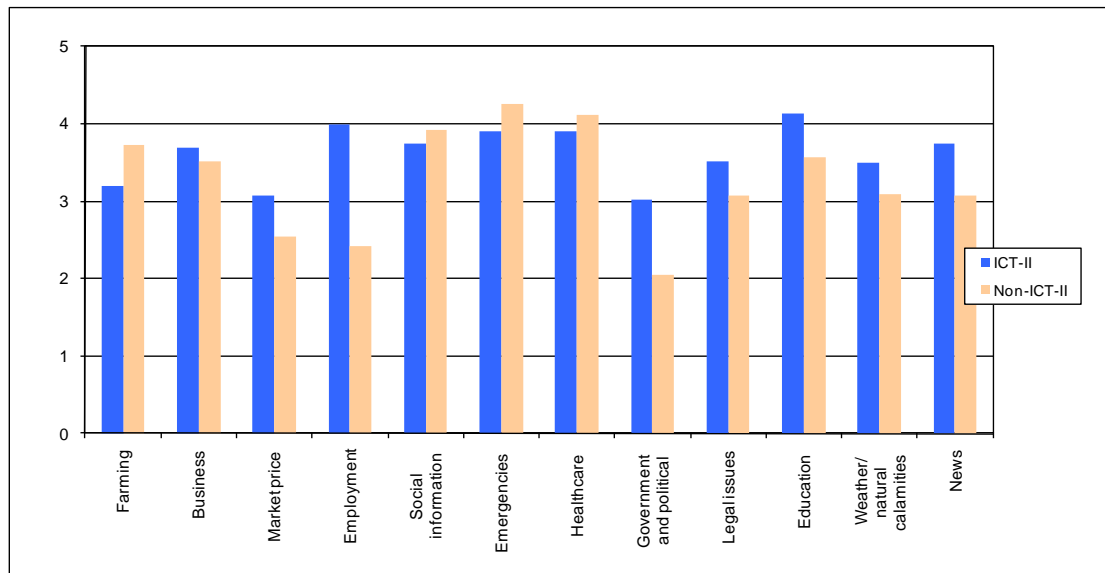
Figure 6.20 Comparison of average change in information need between ICT and non-ICT women in Stage II (Srifoltala).

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Though it was expected that rural women would understand and accept new technologies to improve their lives and lead to empowerment, the results showed different scenarios. Rural women used technologies like mobile phones and television, which were available and easy to use. Other communication services, such as SMS, email/Internet or personal computers, were not easy to use and were often unavailable to them. Nevertheless, overall, it can be found that both ICT and non-ICT women need information related to their daily living.

6.2.6. Overall Change

Several summary-type questions (Q.11) were asked in order to determine women's empowerment through ICT regarding their vision about their future, confidence, security, political power and speaking power. When examining the overall change leading to empowerment, it was found from the responses to Q.11a (Appendix I) that most of the ICT and non-ICT women commented that they were unable to live without their husband's support or support from their parents. In fact, job security, economic security and ICT have less influence on rural women because they do not live alone or without guidance from parents or husbands. It is a matter of security, status and cultural tradition. Nevertheless, any positive changes in these dimensions affect women's personal lives (micro level) in terms of overall empowerment.

Comparisons were drawn to find the overall change between ICT and non-ICT women after two years in both villages. A Likert-like scale is used where the values are -1 for less change, 0 for no change and +1 for more change. It was found that ICT women in both villages had more positive changes compared to non-ICT women (Figures 6.21 and 6.22). Therefore, it can be concluded that ICT had an impact on rural women in changing their lives in the process of empowerment.

As mentioned earlier, in general, ICT women were employees and student trainees. Therefore, being economically solvent, they had less fear about future. With more job opportunities, ICT women perceived themselves as free or expected to be free to choose their own way of living (despite the cultural expectations noted above). As they could use ICT tools (such as mobile phone, the Internet and email) more efficiently, they were more informed about government and politics even though they showed less interest in these issues, supported by Stage I results (Section 5.4.6).
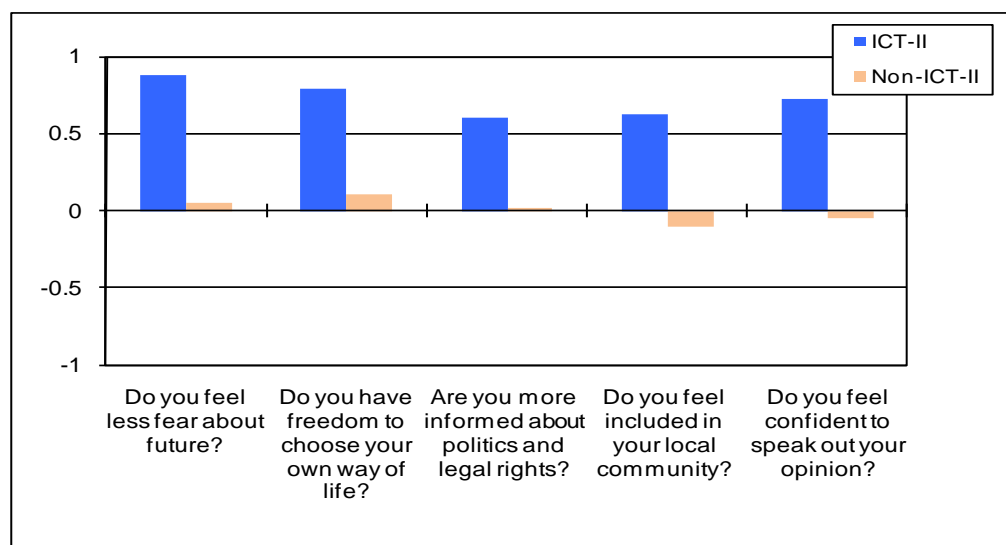
Figure 6.21 Comparison of overall change in empowerment between ICT and non-ICT women in Stage II (Boitpur).
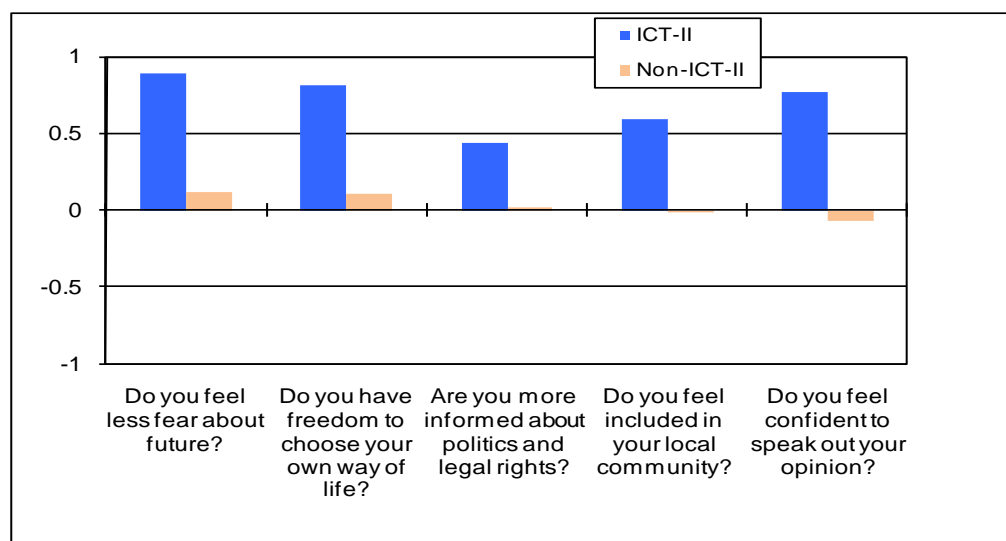
Figure 6.22 Comparison of overall change in empowerment between ICT and non-ICT women in Stage II (Srifoltala).

Though improved inclusion in the local community may seem to conflict with the results obtained in the relational dimension, where ICT women showed little involvement in village decision making activities in Stage I, they actually felt included in their community because they interacted with people and gained the confidence to speak out through their increased cognitive skills and positive perception in Stage II.

On the other hand, non-ICT women were less educated and many of them were unemployed. So, they were more fearful about the future due to their economic situation. For the same reasons, they did not perceive they could choose their own lifestyles, as they depended on their husbands or sons. As they had fewer opportunities to use communication tools, they were less informed about politics and legal issues. As non-ICT women had little involvement in activities outside the home in general they felt less included in the community. Moreover, due to their lower education and lower awareness level, they had less speaking power. However, there were some exceptions to this: those non-ICT women involved in awareness programs with other NGOs felt included in the community, and expressed a perception of speaking power. Despite this exception, it can be concluded that ICT had more positive impact on rural women, which helped them to be empowered to a greater extent.

6.3. Conclusion

The Stage II study demonstrated that the changes amongst both ICT and non-ICT women after two years were ongoing across all *dimensions*. Therefore, it can be concluded that there is an important role for ICT in rural women's empowerment in developing countries. In addition, rural women's information needs can be fulfilled through ICT project activities. However, women themselves need to be made more aware of their needs. Their active participation is an important factor in this process.

The following chapter analyses the results of the data collected from longitudinal women who participated in both Stage I and Stage II. These analyses give a broad and in-depth understanding of temporal changes in the same participants after a period of two years.

CHAPTER 7

RESULTS OF STAGE II LONGITUDINAL STUDY

As discussed in Chapter 2, women's empowerment is a process that develops over time. Since this study investigates the changes in empowerment among rural women who participated in ICT projects compared to non-participants, it is also interesting to investigate changes in the same ICT and non-ICT participants that occur over time between Stage I and Stage II. In Chapter 6, the impact of ICT on a mixed cohort of 'old' and 'new' participants in 2010 was analysed. In this chapter, the analyses focus on women who participated in both Stages I and II (referred to as 'longitudinal' participants).

The Table 7.1 below shows the matrix of comparing groups for both stages and both ICT projects. This chapter compares longitudinal ICT women between Stage I and Stage II and longitudinal non-ICT women between Stage I and Stage II for both villages.

Table 7.1 Matrix of comparison for both the ICT projects for Stage I and II.

	Stage I ICT	Stage II ICT	Stage I non-ICT
Stage I ICT		Chapter 7	
Stage I non-ICT	Chapter 5		
Stage II non-ICT		Chapter 6	Chapter 7

As mentioned in Chapter 6, the same questionnaire instrument was used for both Stages I and II. The instrument explored the impact of ICT on women's empowerment in each of the five dimensions described in the research framework -

material, *cognitive*, *perceptual*, *relational*, and *technological* – as well as an overall dimension.

7.1. Demographics of Longitudinal Participants

In 2010 (Stage II of the study), in the village of Boitpur, where the D.Net project has been active, 20 women were interviewed, of whom 8 participants were from Stage I, and referred to as longitudinal ICT women. They were mainly employees of the project. Another 20 women in the village, who were part of S. N. Trust or ordinary village women, but not part of any ICT project, were also interviewed. Of these 20 women, 10 were from the Stage I cohort and are referred to as longitudinal non-ICT women.

Table 7. 2 Number of longitudinal participants in Boitpur.

	Stage I and II (longitudinal)
ICT	8
Non-ICT	10

In Stage II, 20 women were interviewed in Srifoltala, where the Amader Gram ICT project has been active. Among them, 13 were longitudinal ICT women participated in both stages. Of the 17 non-ICT interviewees in Stage II, 7 women were longitudinal interviewees (see Tables 7.2 and 7.3).

Table 7.3 Number of longitudinal participants in Srifoltala.

	Stage I and II (longitudinal)
ICT	13
Non-ICT	7

The demographic background of these 38 longitudinal women is provided in Table 7.4.

Table 7.4 Demographics of longitudinal participants (Stage I and II) (N = 38).

Demographics		Boitpur (D.Net)		Srifoltala (Amader Gram)		Total (N = 38)
		ICT (N = 8)	Non-ICT (N = 10)	ICT (N = 13)	Non-ICT (N = 7)	
Age group	< 20 years	1	0	0	0	1
	21-30 years	6	2	6	2	16
	31-40 years	1	6	5	4	16
	41-50 years	0	1	1	1	3
	>50 years	0	1	1	0	2
Marital status	Married	4	9	12	7	32
	Single	3	0	1	0	4
	Other	1	1	0	0	2
Level of education	Unable to read	0	0	0	1	1
	Non-formal schooling	0	1	2	3	6
	Primary school	0	2	2	0	4
	Lower secondary	0	5	5	3	13
	Secondary school	0	1	1	0	2
	Higher secondary	5	1	0	0	6
	Post-secondary	3	0	3	0	6
Employed	Yes	6	2	2	1	11
	No	2	8	11	6	27
ICT use	Mobile	8	9	13	6	36
	Computer	8	0	6	0	14
	Internet	5	0	2	0	7

Figure 7.1 is a comparison between younger and older women to indicate more clearly any generation gap for both ICT and non-ICT women. It shows that, in the non-ICT groups, the women were older in both villages. As noted previously, the generation gap affects ICT use because the younger generation uses ICT tools more efficiently and confidently than the older generation (Prensky, 2001).
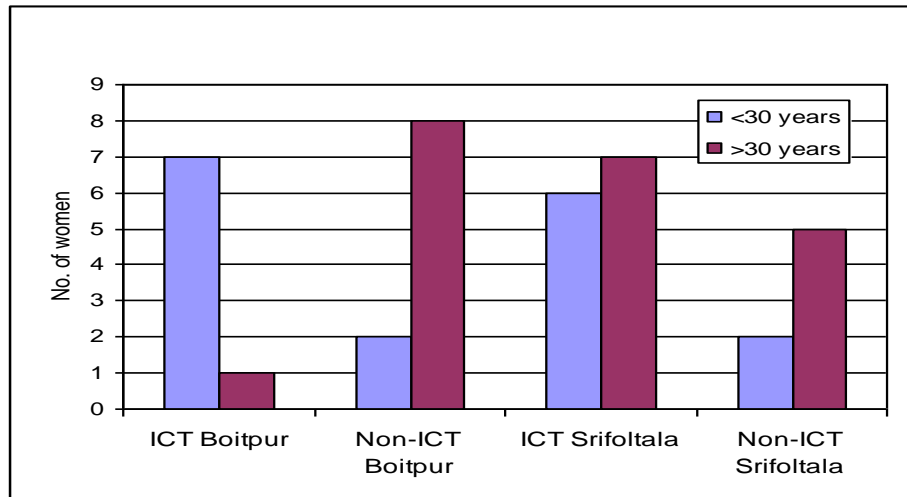
Figure 7.1 Number of younger (<30 years) and older (>30 years) women for both ICT and non-ICT longitudinal participants at Stage II (Boitpur and Srifoltala).

7.2. Material Dimension

As mentioned in Section 4.2.2, the material dimension of rural women is related to economic security, acquisition of assets, loans, savings and contribution to family expenses. It was a common scenario in Stage II that many women, both ICT and non-ICT, reported 'no change' or the 'same' situation in their lives since the Stage I interview. Therefore, in some dimensions, Stage II data exhibited a lower average value than in Stage I. However, though the average value decreased, it could be claimed that they experienced the same positive impact of ICT intervention as reported in their Stage I interview.

7.2.1. ICT Women

Figure 7.2 shows that there was some improvement among women in terms of business expansion and loan repayments. All other items decreased. One reason for these decreases was that those who had employment in Stage I had the same job in Stage II, and thus the question about getting employment was inappropriate for them. Another reason was that some women reported that they had not been able to obtain a

job since they completed their training two years previously, so reported 'no change'. Thus, the overall economic security remained more or less the same for these ICT women.
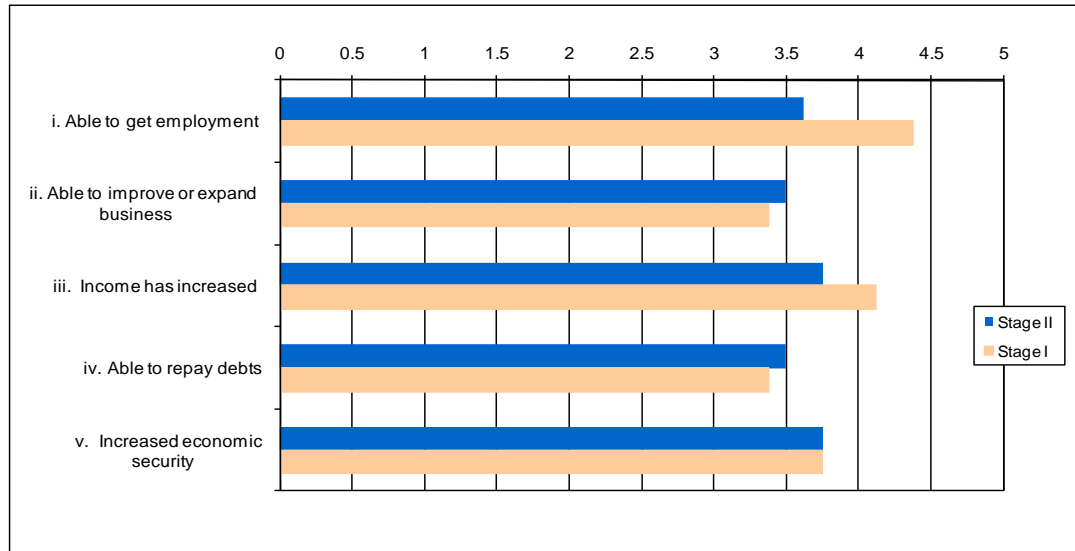
Figure 7.2 Comparison of average material changes in longitudinal ICT women between Stage I and Stage II (Boitpur).

It can be seen from Figure 7.3 that there was a small improvement among Srifoltala ICT women with regards to their economic security. In Stage I, most of the women who were involved in the Computer for All program were housewives, while some ICT women were student trainees of the ICT project. Involvement in the ICT project two years previously had not led women to improved material prospects in Stage II as they were still either housewives not seeking employment or students still studying or waiting for job opportunities.

Therefore, it can be summarised that there was only minor material gain among longitudinal ICT women, as many reported their situation remained the same. Nevertheless, Boitpur ICT women showed a little more positive changes than Srifoltala ICT women because of their employment status.
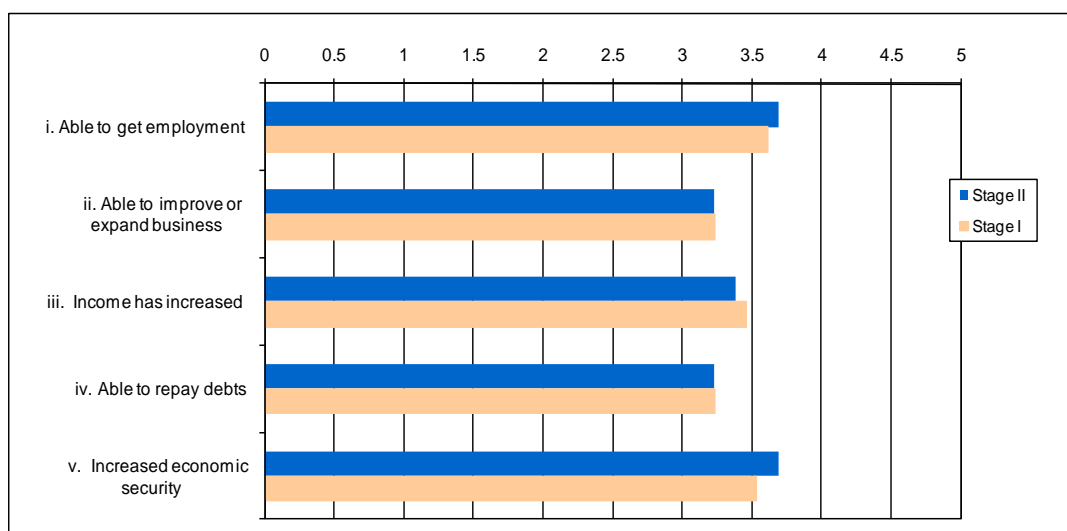
Figure 7.3 Comparison of average material changes in longitudinal ICT women between Stage I and Stage II (Srifoltala).

7.2.2. Non-ICT Women

From Figure 7.4, it is evident that there was no improvement in non-ICT women's economic security in Boitpur. Since most of the women had no employment apart from a little income generated by handicrafts, poultry or small businesses, there was a slight decrease in their material/economic life, with average values of items reported as 3 (no change). As longitudinal non-ICT women were from an older age group with little education; their ability to not use technology effectively to improve their economic situation had not changed.

A similar result was found for non-ICT women in Srifoltala in Stage II (Figure 7.5). Most of the non-ICT women reported that their economic situation was the same as before; they had very little income except from handicrafts.
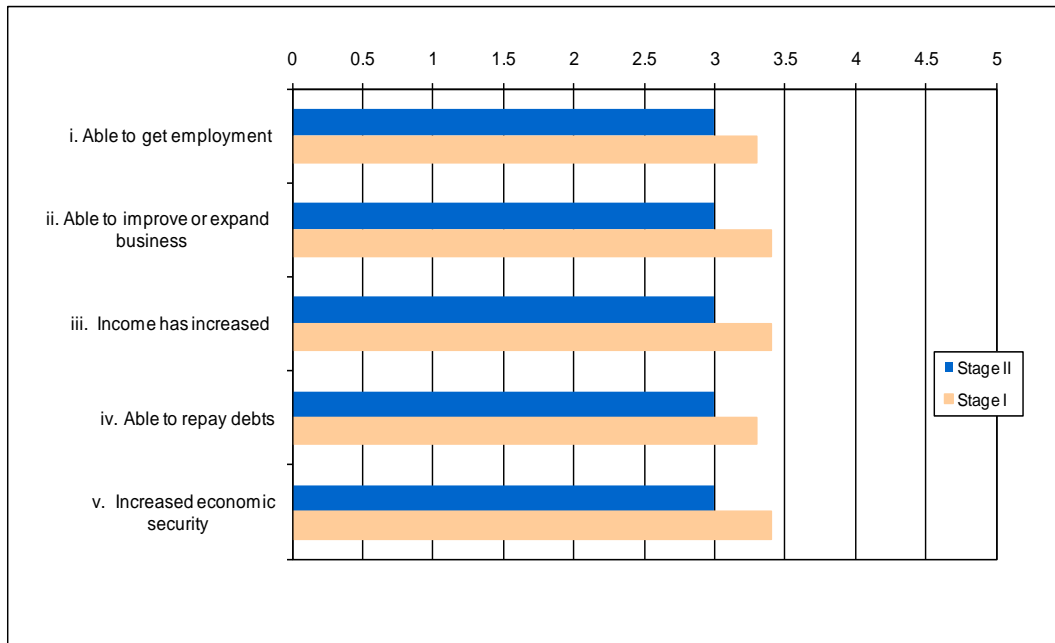
Figure 7.4 Comparison of average material changes in longitudinal non-ICT women between Stage I and Stage II (Boitpur).
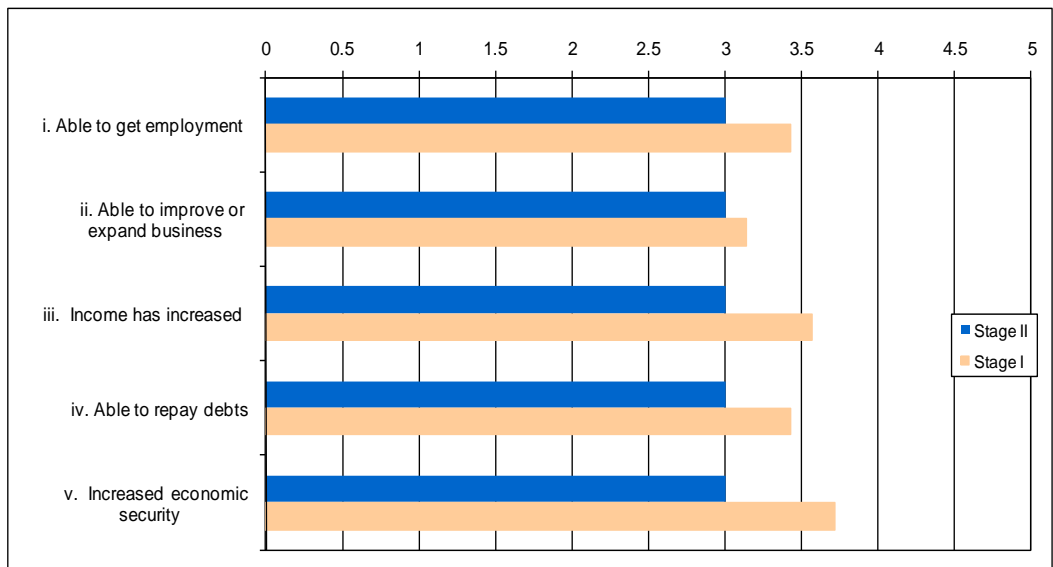
Figure 7.5 Comparison of average material changes in longitudinal non-ICT women between Stage I and Stage II (Srifoltala).

In summary, there was no substantial difference in terms of economic security after two years, as the employment status of both ICT and non-ICT women was unchanged. Nevertheless, ICT women had been able to gain some control over their income and a little more economic security in their lives.

7.3. Cognitive Dimension

Any changes in women's awareness, skills and knowledge of the wider environment on various issues such as health, education, legal rights, management or entrepreneurial and communication skills are referred to as relating to the cognitive dimension (Section 5.4.2). Five questions were asked to participants and answers were plotted using Likert like scale.

7.3.1. ICT Women

It can be seen from Figure 7.6 that the overall cognitive awareness of ICT women in Boitpur with regards to the level of their own education and knowledge, management/supervisory skills, importance in the family, knowledge of legal issues and relationship with family members, was greater in Stage II than in Stage I. The item on education and health of children shows a slight decrease because 63% of the married women in Stage II still had no children; therefore, some of these women reported no change.
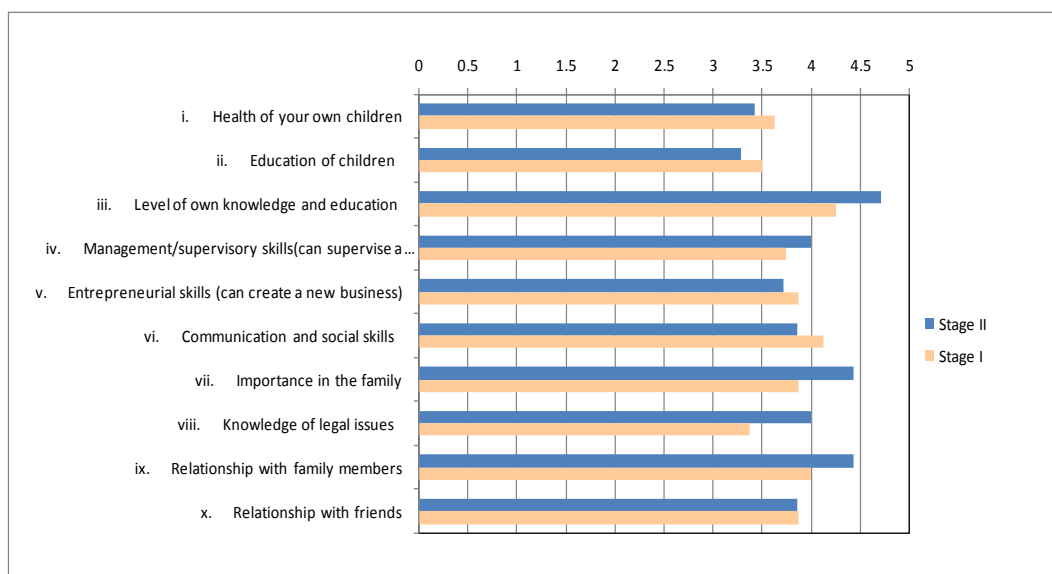
Figure 7.6 Comparison of average cognitive changes of longitudinal ICT women between Stage I and Stage II (Boitpur).

However, overall, there was a trend of improvement despite the lack of adequate data: it appears that ICT intervention in Boitpur was slowly developing women's knowledge, skills and awareness through education and learning.

Comments from longitudinal participants support this finding. Tonima (B14I), aged 21-30 and a mother of one-year old son, had completed her higher secondary education and worked as a teacher. When interviewed in 2008 she had completed three months computer training through the D.Net ICT project for the development of her teaching profession. As a new mother, she was more aware of children's health when she was interviewed in 2010:

> I am now aware of all kind of knowledge specially health and education of children. My own education and knowledge have also improved. As a teacher, I am not afraid of speaking in public and also can manage a group of children in school which is a communication, management and supervisory skill as such. My importance in the family improved as I contribute to the family financially. My relationship with friends and family is also improved as I can communicate with them easily through mobile phone.

Another example of an ICT woman was Sonia (B18I). Sonia, aged 21-30 was single. After completing her higher secondary education, she had been working in the S. N. Trust health clinic since 2008. She had received three months computer training from the D.Net project. Even though she was single, as a health worker she gained knowledge about children's health. Due to her financial contributions, she had a good relationship with family members. She said:

> I get more respect from the villagers as a health worker. I helped people who comes to the clinic and also visit door to door as part of awareness program such as washing hands with soap (hygiene program), children's vaccination, safe pregnancy, anti-natal and post-natal care and so on. Therefore, my communication skills have improved.

Thus, it is evident that longitudinal ICT women were experiencing positive changes in the cognitive dimension because of their direct involvement in the ICT projects through training and learning.

Therefore, it is evident that, in the D.Net project, even though some data showed a decrease, ICT women were experiencing more positive cognitive changes by 2010, as they were still involved directly in the ICT project through training and learning.

On the other hand, as can be seen from Figure 7.7, ICT women involved in the Amader Gram project were experiencing less change in the cognitive dimension than in Stage I, except for being slightly more aware of children's education and of entrepreneurial skills. Since most of the participants were married and had children (in both stages), they saw a need to be aware of children's education.

In summary, as most of the Boitpur ICT women were young and single, they showed some improvement in their cognitive dimension. On the other hand, in Srifoltala, the reasons for the lack of positive change could be as mentioned in Section 5.4.2: not having in-depth involvement in ICT projects (i.e. the purpose and length of involvement in the project by the participants); age; and marital status.
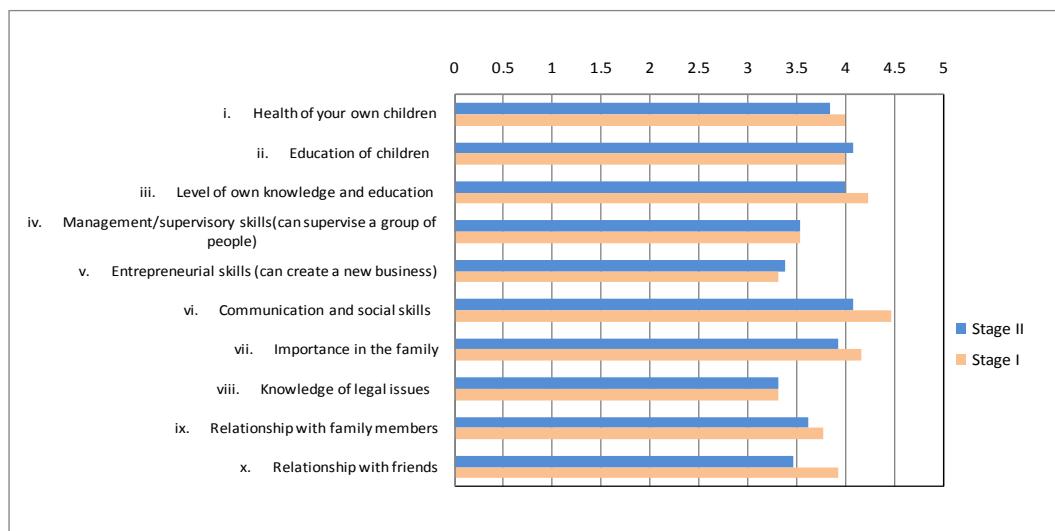
Figure 7.7 Comparison of average cognitive changes of longitudinal ICT women between Stage I and Stage II (Srifoltala).

7.3.2. Non-ICT Women

It can be seen from Figure 7.8 that the overall cognitive awareness of non-ICT women in Boitpur in most aspects (children's health and education; level of own education and knowledge; management/supervisory skills; entrepreneurial skills, importance in the family; knowledge of legal issues and relationship with family and friends) appears to have declined in Stage II. However, these women in Stage II reported 'no change' and therefore showed a lower average values in all cases. One reason for this result could be that the reluctance to use new technologies (Figure 7.1) had not changed since Stage I.
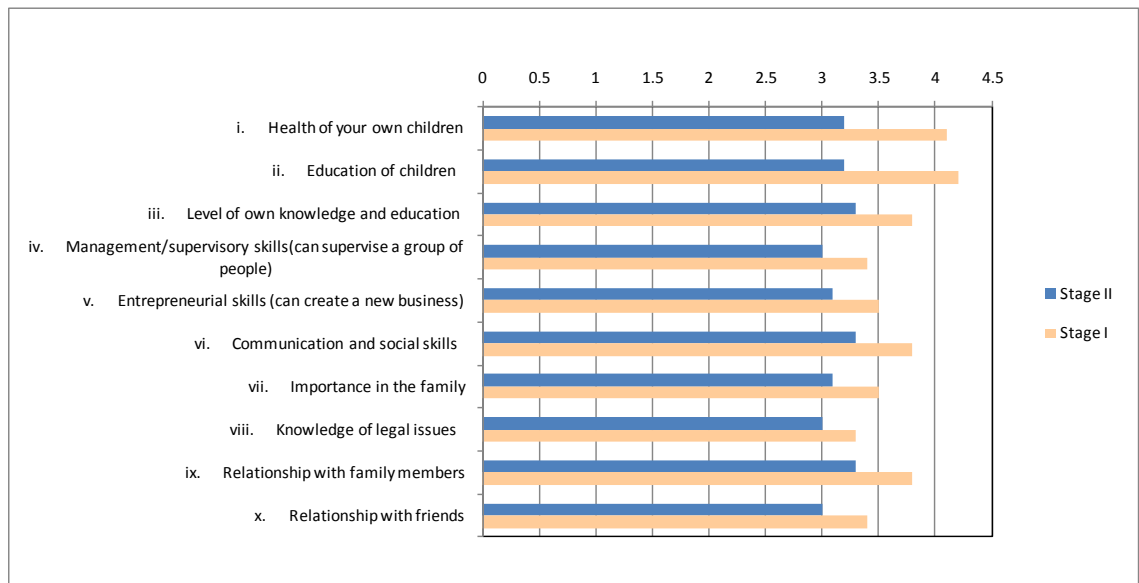
Figure 7.8 Comparison of average cognitive changes of longitudinal non-ICT women between Stage I and Stage II (Boitpur).

Similarly Figure 7.9 depicts that the overall cognitive awareness of non-ICT women decreased over time for Srifoltala. It is evident from the data that the changes are about the average value (scale 3) which means that women in Stage II reported their situation the same as for Stage I.
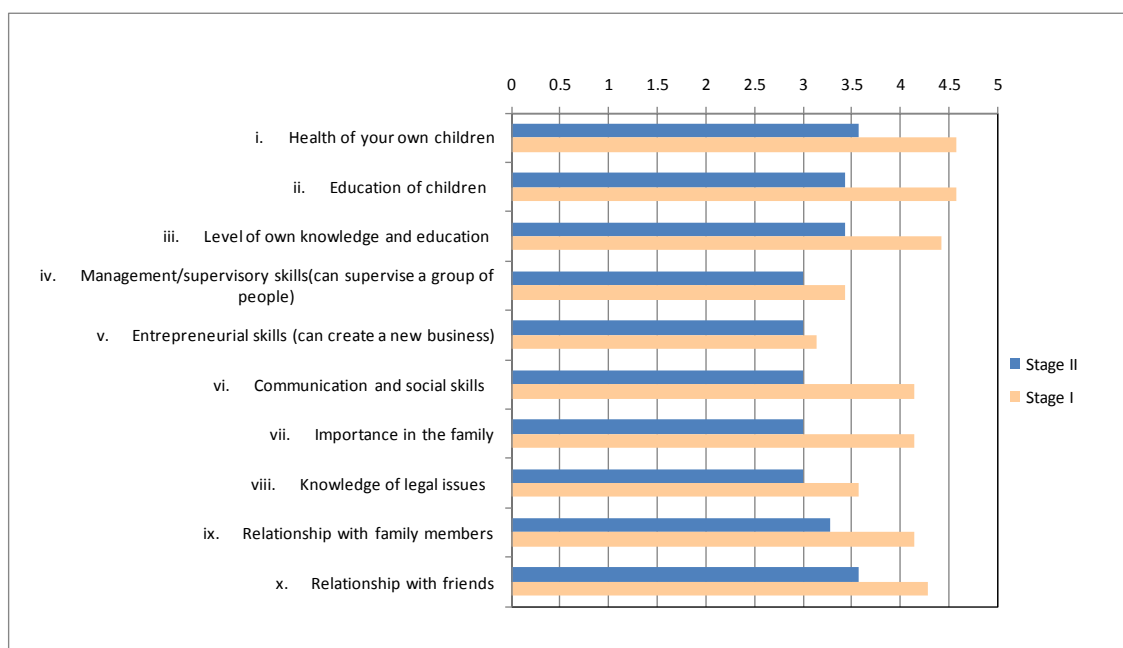
Figure 7.9 Comparison of average cognitive changes of longitudinal non-ICT women between Stage I and Stage II (Srifoltala).

In summary, changes in the cognitive dimension among non-ICT women were not notable in Stage II as these women were not using ICT. Another reason for this result could be that a number of non-ICT women were participants of other organizations or NGOs in Stage I (Section 6.2.2). Those organizations had helped to educate women in health, hygiene, education, legal rights and sustainable development before the Stage I interviews. However, these women were no longer involved with those organizations in Stage II. Therefore, their awareness level did not improve over the two years period.

Overall, in the cognitive dimension, ICT women in Boitpur and Srifoltala differed. Boitpur ICT women showed improvements in their own knowledge and education, importance in the family, relationship with family members and knowledge of legal issues. On the other hand, Srifoltala ICT women showed a negative trend, especially in terms of communication, social skills and relationship with friends. Though ICT women in Srifoltala used technology to improve their cognitive

awareness, the lack of in-depth involvement in ICT projects hampered them. These differential results in two villages could be because of socio-cultural factors which are discussed in Chapter 8. Non-ICT women in both villages showed no improvement in their cognitive dimension.

7.4. Perceptual Dimension

The level of confidence, self-esteem, self-awareness, dignity, freedom and independence in the women's mental spaces are considered perceptual dimensions, and are plotted to compare ICT and non-ICT women in Stage II in both villages.

7.4.1. ICT Women

It can be seen from Figure 7.10 that, by Stage II, ICT women in Boitpur had a higher confidence level, more self-awareness and dignity, were less dominated by family members and much more independent. Only their feeling of freedom was lower than before. As they were young women (see Figure 7.1), they possibly perceived no change in their feeling of freedom.
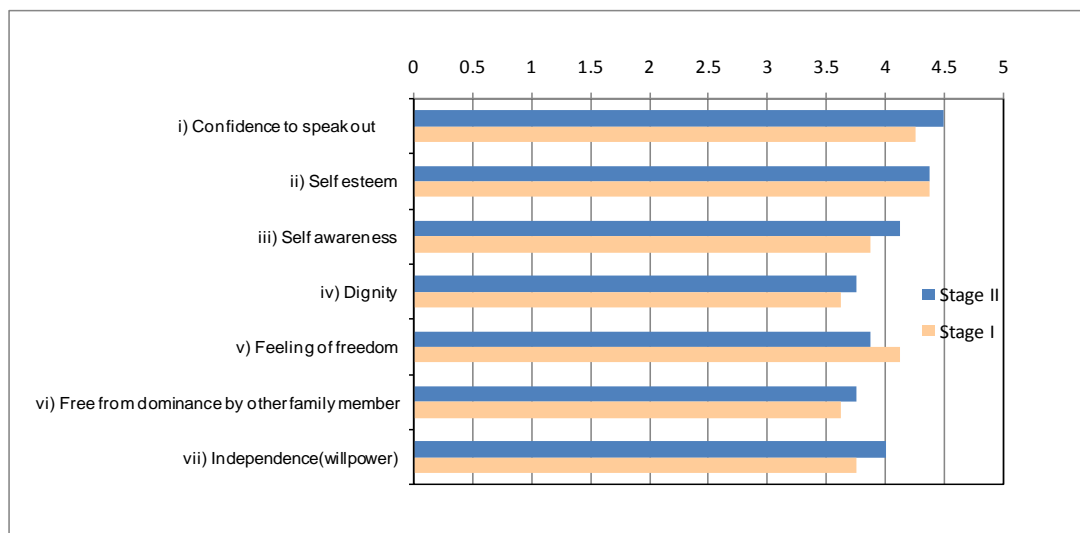
Figure 7.10 Comparison of average perceptual changes of longitudinal ICT women between Stage I and Stage II (Boitpur).

Nazma (B11I), aged between 21-30 and a mother of one daughter (6 years old), had completed her post-secondary education and worked as a clinical assistant in the S.N. Trust health clinic. Two years earlier she said that she had not experienced any perceptual change but now she could feel a change. She said:

> I am now confident to speak which I could not do before. My confidence level has also increased. However, I consult every family matters with my husband and therefore, depend on him for taking any decision.

By comparison, ICT women in Srifoltala showed an increase in dignity and freedom and a decrease in self-awareness and independence (Figure 7.11). The unanticipated decrease in self-awareness may be due to some women reporting their change as 'the same as before'. As was discussed in Section 5.4.3, the reasons for lower perceptual values included the participants' age and depth of involvement with ICT, which also apply in Stage II. However, these women showed improved perception in some items, possibly due to now being two years older.
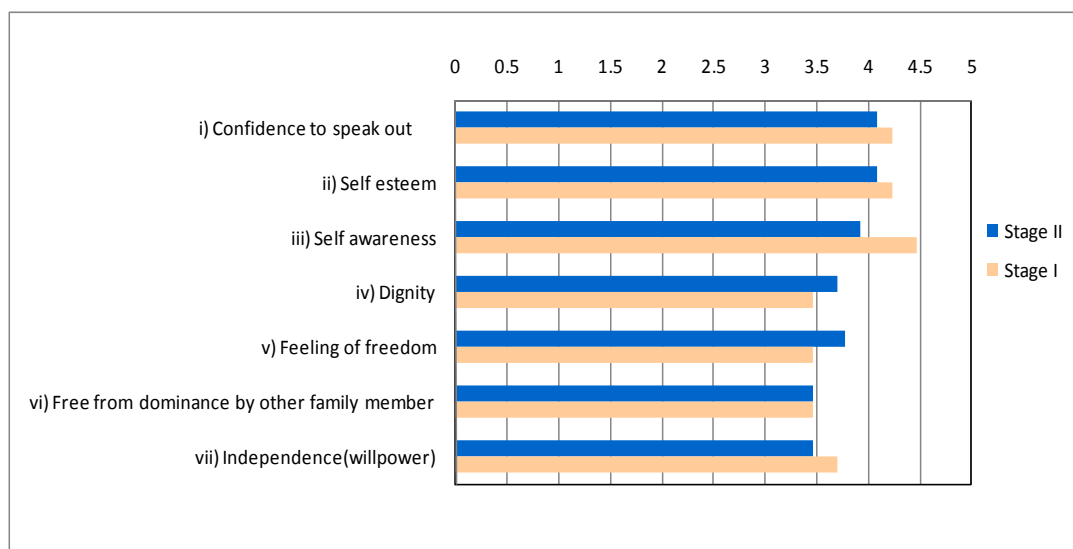

Figure 7.11 Comparison of average perceptual changes of longitudinal ICT women between Stage I and Stage II (Srifoltala).

In 2008, the comparison of perceptual values of ICT women in the two villages showed that Boitpur women were more perceptive (Figure 5.13). In Stage II, Srifoltala

ICT women were still lagging behind Boitpur ICT women but the gaps were narrowing (Figure 7.12). Srifoltala ICT women's improved awareness level in education might have helped them to become more perceptive than in Stage I.
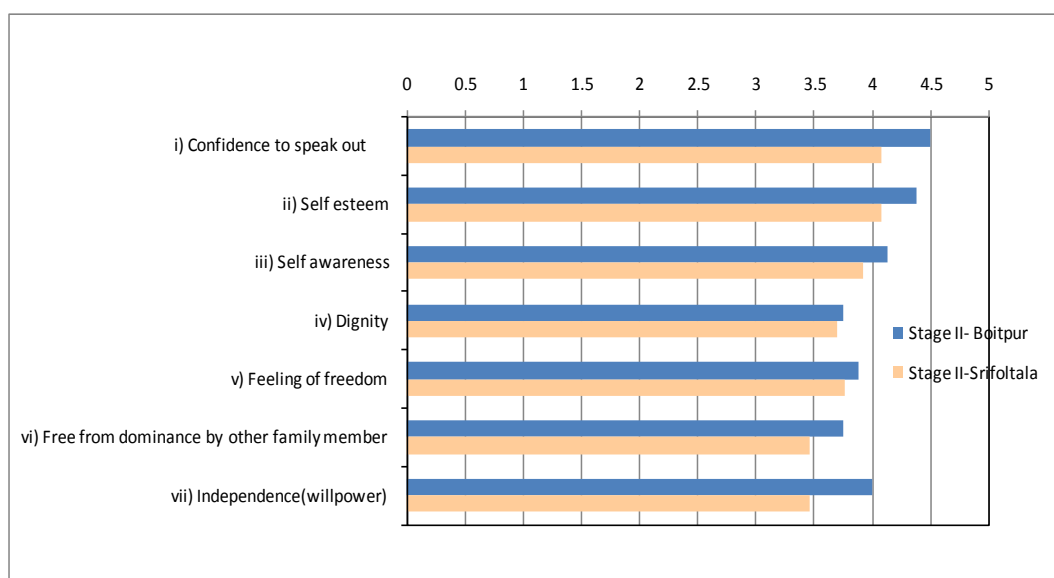
Figure 7.12 Comparison of average perceptual changes of between longitudinal ICT women (Boitpur and Srifoltala) in Stage II.

In the perceptual dimension, longitudinal ICT women showed improvements in will power or independence, which was a positive impact of ICT on women in Boitpur. ICT women who used a mobile phone, the Internet or computer for education and communication purposes gained more information and thus improved their perception.

7.4.2. Non-ICT Women

It is seen from Figure 7.13 and Figure 7.14 that non-ICT women showed fewer perceptual changes in both Boitpur and Srifoltala in Stage II. In most cases, values are below average. The reason could be that most non-ICT women were not educating themselves or benefiting from ICT projects. There was a clear gap between these

women and ICT women. This gap between ICT and non-ICT women illustrates the digital divide (Hongladarom, 2004).
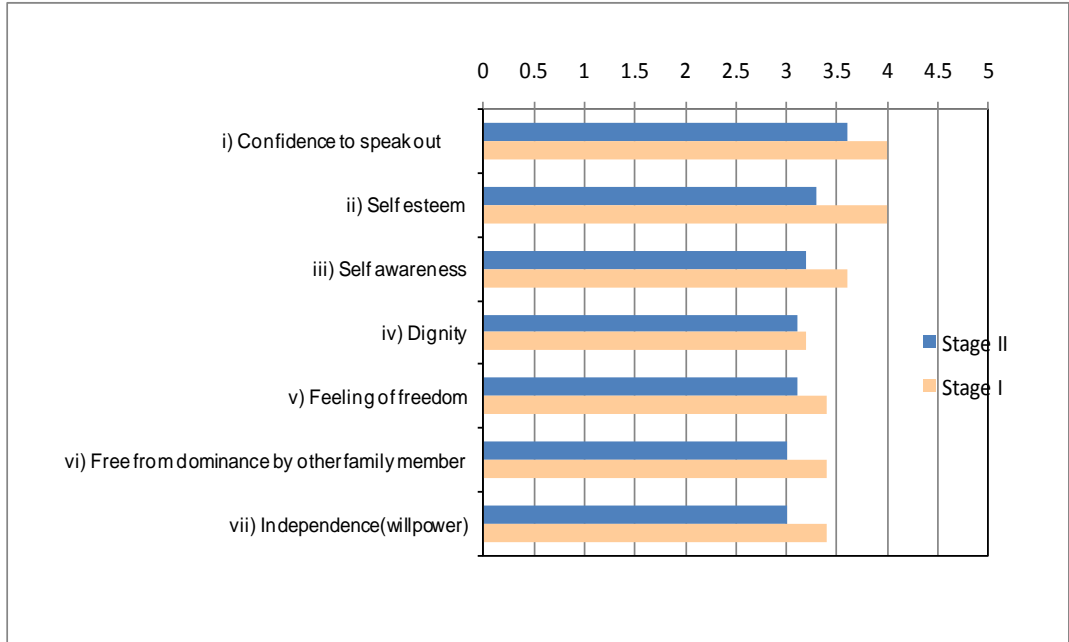
Figure 7.13 Comparison of average perceptual changes of longitudinal non-ICT women between Stage I and Stage II (Boitpur).
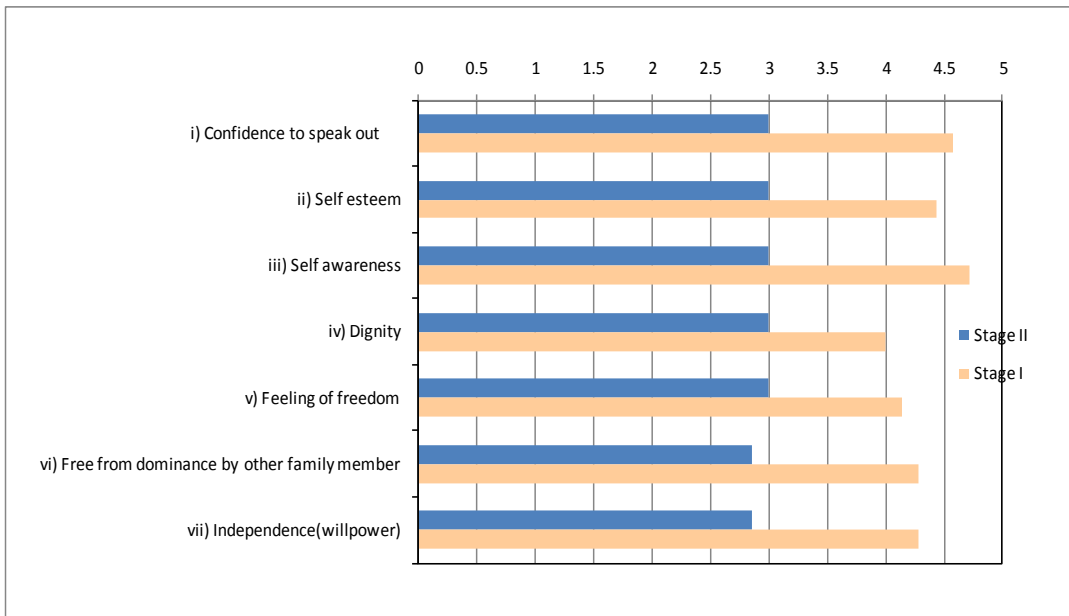
Figure 7.14 Comparison of average perceptual changes of longitudinal non-ICT women between Stage I and Stage II (Srifoltala).

However, among longitudinal non-ICT women, the perceptual dimension was about the same. Culture, maturity and awareness were influencing factors, which are discussed in Sections 8.3, 8.4 and 8.5.

7.5. Relational Dimension

The relational values for both ICT and non-ICT women were investigated and compared. From the data, it can be found that ICT women gained more control over their lives by exercising power in their everyday lives. In this section, women's decision making power, their husband's cooperation within the domestic environment, and participation in the community, were analysed as for Stage I (Section 5.4.4). Improvement in women's relational dimension reflects their micro and meso empowerment. Therefore, the results highlight any impact from ICT as a process.

As described previously, in the relational dimension of the questionnaire (Appendix I, Q.9), each item in decision making power has five values ranging from 1 to 5. The highest decision making power is 5 (I decide). The other values are 4 (I consult and decide), 3 (we consult and decide), 2 (I am consulted) and 1 (I am not consulted).

7.5.1. ICT Women

7.5.1.1. Decision Making Power

It can be seen from Figure 7.15 that Boitpur ICT women in Stage II showed more decision making power in all items except purchasing furniture/consumer durables and children's marriages. There were remarkable improvements in decisions about non-budgeted expenses, control over personal salary, decisions on health care and helping their own maternal family. It can be speculated that women were more confident and self-reliant (as seen in the perceptual dimension, see Section 7.4.1) and had more

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control over their personal lives. Consequently, they had control over their income, which helped them to support their own parents. Another possible reason could be that, being a little older, they had more experience and more 'say' in their familial issues. They were also more aware (also because of an improvement in cognitive dimension, see Section 7.3.1) of issues like health care. It should also be noted that the S.N. Trust health clinic was helping women with improved decision making on health care.

Figure 7.15 Comparison of average relational changes in decision making of longitudinal ICT women between Stage I and Stage II (Boitpur).

However, some items related to women's freedom in decision making (items vi-xi in Figure 7.15) generally depicted the same situation as previously. Women usually discuss and consult everything with their husbands, even though husbands take decisions without asking women's opinion, particularly in cases where expenditure is involved and the women had no income.

It can be seen from Figure 7.16 that, in Srifoltala, ICT women showed more decision making power in all cases except family celebrations, decisions on healthcare and children's education. However, these values indicated that women discuss

everything with their husbands and then make decisions. There were remarkably positive changes in bank account/borrowing, savings, non-budgeted expenses, maintenance of family income, control over personal salary, purchasing consumer durables, clothing of family, monthly budgets, children's marriage and helping own maternal family. Therefore, it can be seen that women were more confident in making decisions as they gained more control over their income.
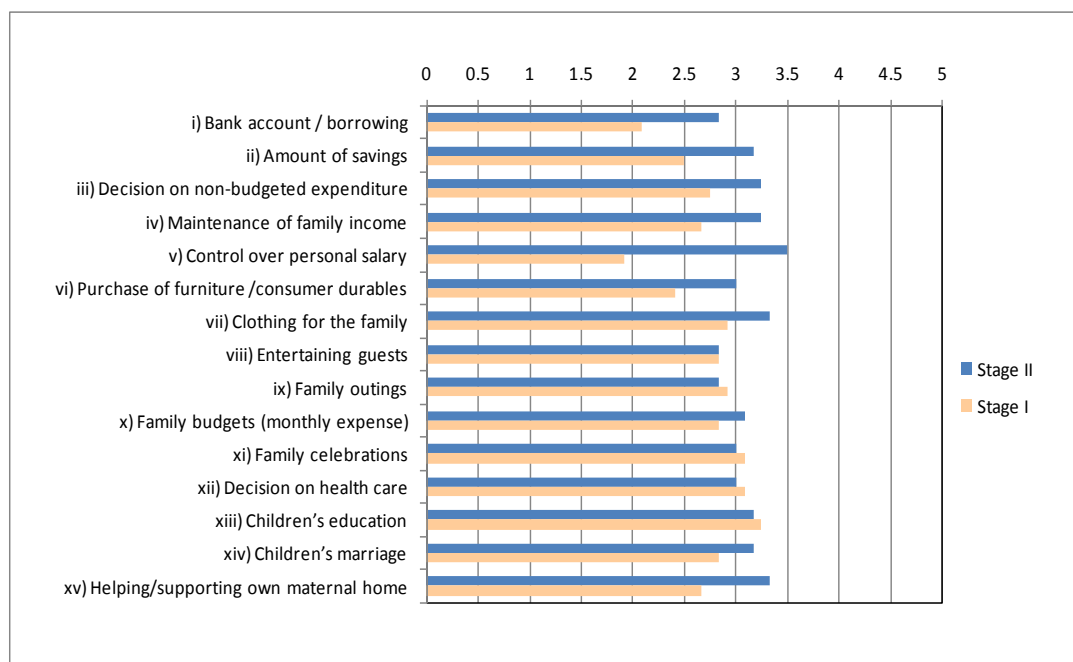
Figure 7.16 Comparison of average relational changes in decision making of longitudinal ICT women between Stage I and Stage II (Srifoltala).

7.5.1.2. Spouses' Cooperation

Married women were also asked to rate their husband's cooperation on a scale of 1 to 5 where 1 was 'much worse' and 5 was 'much better'. By examining their husband's cooperation in different domestic issues (Figure 7.17), it was found that Boitpur ICT women's positions had improved with their husband sharing household work, taking care of children, willing to listen to any problem and their freedom to buy small jewellery. This change could be related to ICT women's employment status and their financial contribution to the family. They work outside the home; therefore, husbands

had some understanding of their problems and shared the work at home and helped in caring for the children in the absence of their mother. However, freedom to go to any place any time without their husband's knowledge was not an acceptable tradition in the village. Thus, these items remained the same as previously reported.
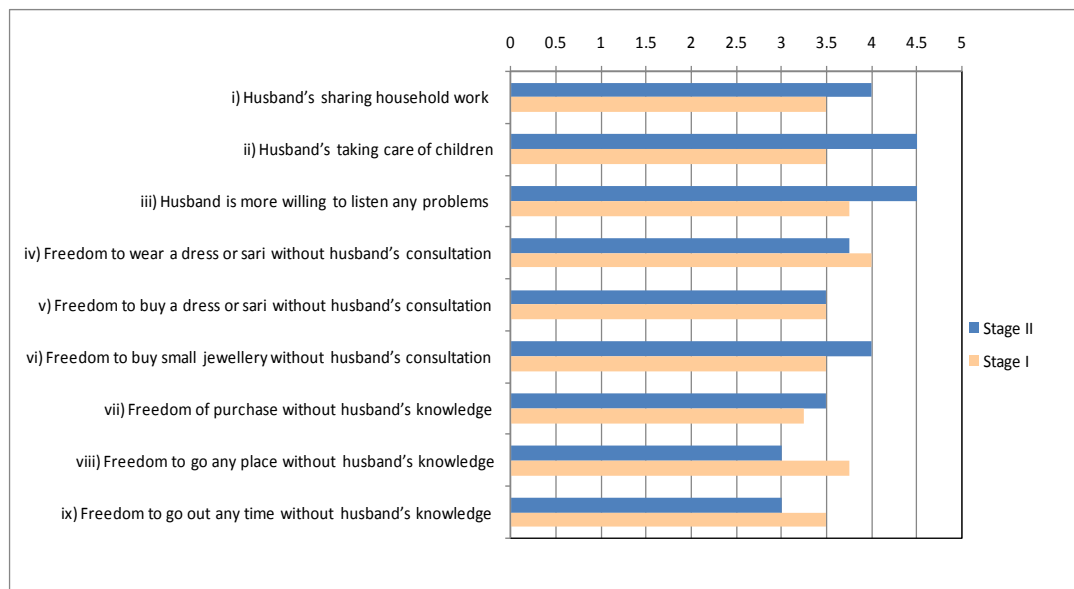
Figure 7.17 Comparison of average relational changes as husband's co-operation of longitudinal ICT women between Stage I and Stage II (Boitpur).

From Figure 7.18, it is seen that Srifoltala ICT women were also in an improved position, with the husband sharing household work and taking care of children. The item, 'husband is more willing to listen to any problems', remained the same, which is above average. The reasons were similar as for Boitpur ICT women: ICT women with employment contributed financially to the family and spent more time at work. As they could not do the entire household work alone, their husbands understood the problem and shared the work and took care of children at home. All other issues (items iv-ix in Figure 7.18), including freedom to go out and to go any place without their husband's knowledge, showed a decrease.

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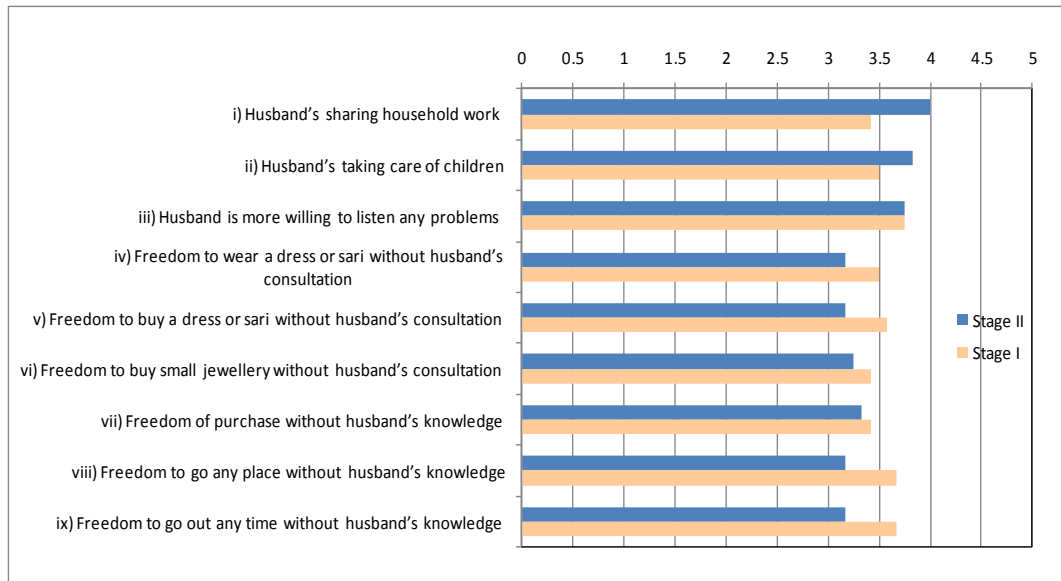
Figure 7.18 Comparison of average relational changes as husband's co-operation of longitudinal ICT women of Stage I and Stage II (Srifoltala).

7.5.1.3. Participation in the Community

It can be seen from Figure 7.19, that at the community or village level (meso environment) in Boitpur, there was noticeable improvement only in access to drinking water, fair prices, irrigation facilities and other services. This could be due to improved knowledge and awareness gained through ICT and the village information system. There was also some improvement in women's involvement in women's issues, access to the medical facilities and ability to communicate with higher authorities. Thus, involvement in ICT had helped women to be empowered to some extent. However, the women participated less in decision making in the village, in social or cultural activities and in state government politics. These results support the women's Stage I data that that they were not interested in politics, and therefore now report 'no change' or 'a little change'.

At the community or village level, ICT women in Srifoltala showed a negative change in all items except access to drinking water, fair prices, irrigation and other livelihood services and involvement in politics (Figure 7.20).

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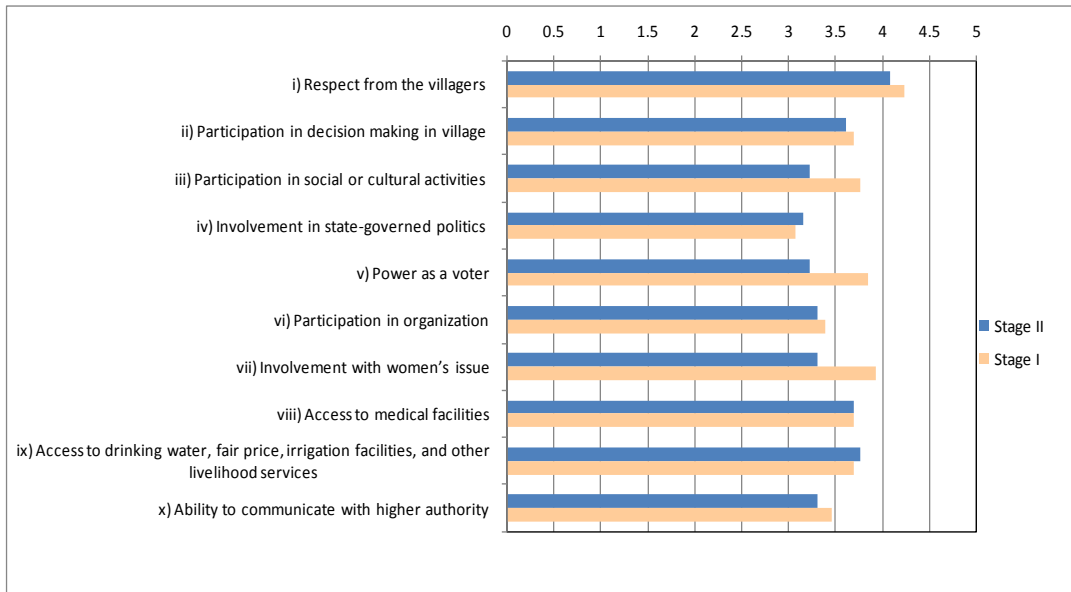
Figure 7.19 Comparison of average relational changes at community level of longitudinal ICT women between Stage I and Stage II (Boitpur).
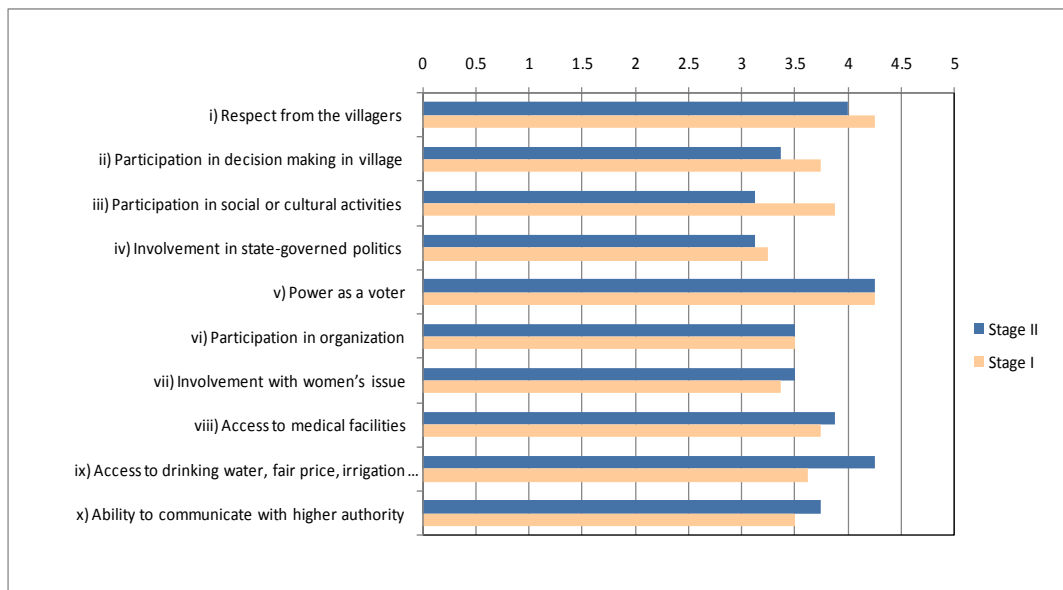
Figure 7.20 Comparison of average relational changes in community level of longitudinal ICT women of Stage I and Stage II (Srifoltala).

There was a considerable decrease in participation in social and cultural activities, power as a voter, and involvement in women's issues. Though the Amader Gram project had been working extensively with telemedicine and breast cancer (in 2008 as well as in 2010), their focus on knowledge and information sharing, training

and awareness development through ICT has been shifted and thus a decrease in cognitive awareness resulted among longitudinal ICT women which affected other dimensional changes.

Comments from ICT women in Boitpur provide a representation of the change in the relational dimension. Nazma (B11I), aged between 21-30 and a mother of one daughter (6 year old), completed her higher secondary education and had worked as a health clinic assistant in the S.N. Trust health clinic. When interviewed in 2008, she had completed three months of computer training through the D.Net ICT project and additional vocational training for the development of her profession. She thought computer training would help to get her a better job. She said in 2010:

> I have more control over my salary and even I can spend for my parents if they are sick. I discuss most of the family matters with my husband. My husband helps my daughter who is in class 1 in her study and listens to my problems which he did not do two years previously. My mother in law looks after my daughter when I am at work outside the home. As a health worker, villagers also know me and respect me. I have good relationship with other family members and my friends.

Laili (S2I), aged between 31-40 and a mother of one son (8 year old), had completed her higher secondary education. At first she worked as a volunteer for the Amader Gram ICT project and then obtained a job in the project when it was established 10 years previously. She maintained a poultry farm at her home. She completed two months of computer training and another two weeks training on non-primary education from an NGO in 2008. She said in 2010:

> I discuss most of the family matters with my husband. My husband does not help me in household work; I have to take care of everything at home. I live far away (8km) from my workplace and come to office by bus or van. I have freedom to go anywhere and wear clothes or jewellery of my own choice. On the other hand, I inform my husband if I go to town for my own security and trust. As a centre manager and trainer, students know me and respect me. I have good relationship with other family members and my friends.

Therefore, there were improvements for some women in the *relational dimension* in terms of husbands' cooperation and relationships with friends and family members. Moreover, outside the home, ICT women had more respect from the villagers because of their employment and educational qualification, interaction with people and participation in other organizations.

7.5.2. Non-ICT Women

7.5.2.1. Decision Making Power

There were improvements in most of the items of decision-making power for Boitpur non-ICT women except for bank account/borrowing and amount of saving (Figure 7.21). Women reported that they consult and discuss with their husband any decision making within the household.
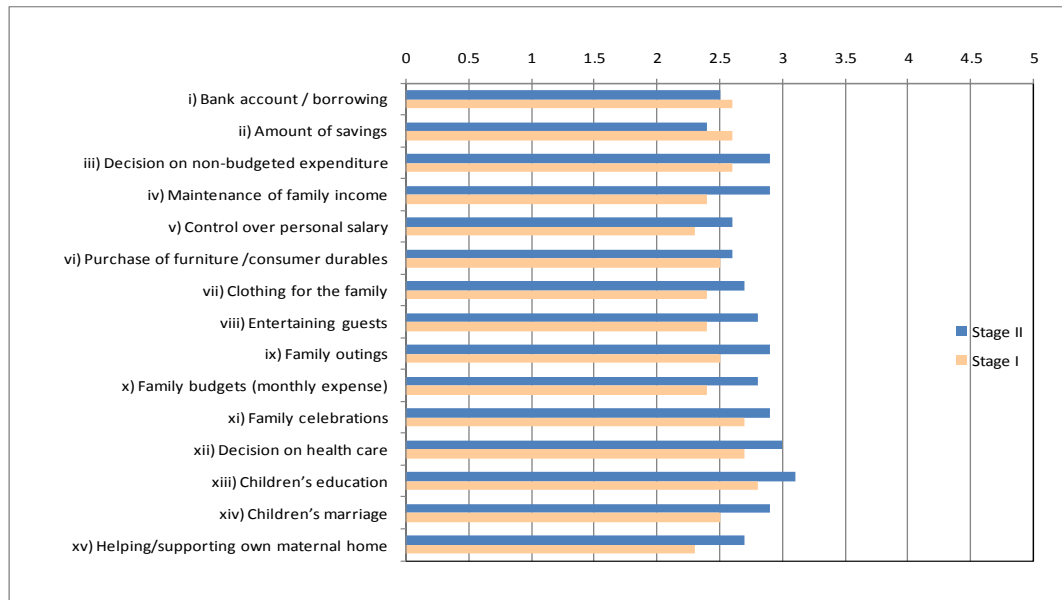
Figure 7.21 Comparison of average relational changes in decision making of longitudinal non-ICT women of Stage I and Stage II (Boitpur)

In this village, non-ICT women were involved in micro-credit loan schemes and seemed to have more decision-making power because of their financial contribution to the family through the loan. Though some women were no longer

involved in those programs, perhaps their built-up decision making power did not decrease two years later.

There was no notable improvement in non-ICT women's decision-making power in Srifoltala after two years (Figure 7.22). Decisions about children's education and helping/supporting their own maternal home remain the same. As most of the women in this group did not make any financial contribution to the family through employment, they had little decision making power. When interviewed in Stage I, it was found that these women contributed to the family through loans for their husbands and sons for fishing, farming and small business. Their decision making power decreased in Stage II, perhaps because many of them were no longer involved in micro-credit loan schemes. However, in Stage II, the values are above 2 (Figure 7.22) which indicate that husbands at least inform their wives before any decision is made.

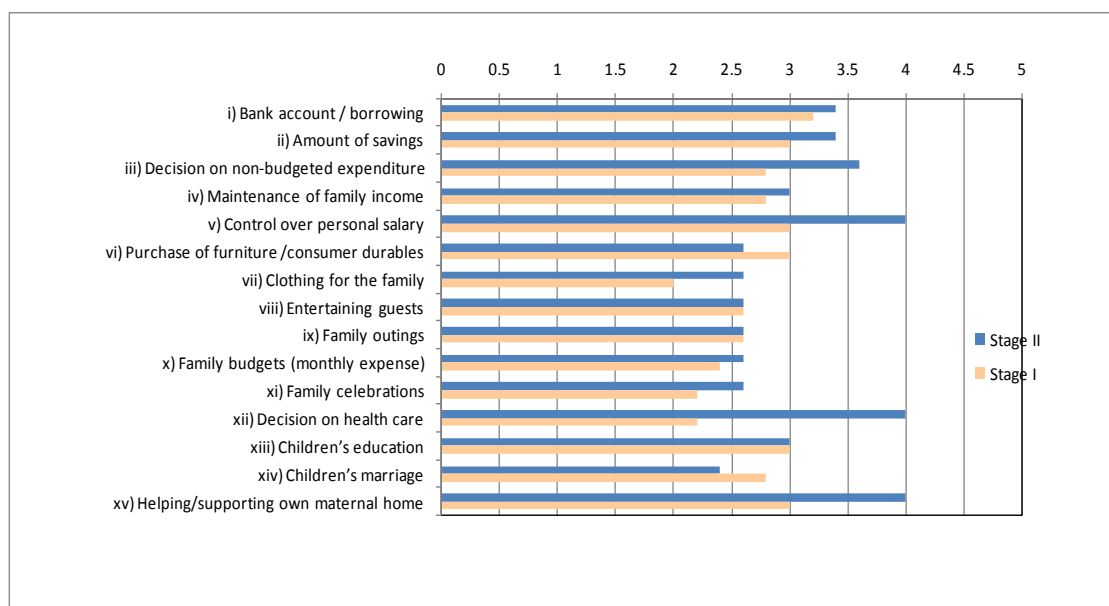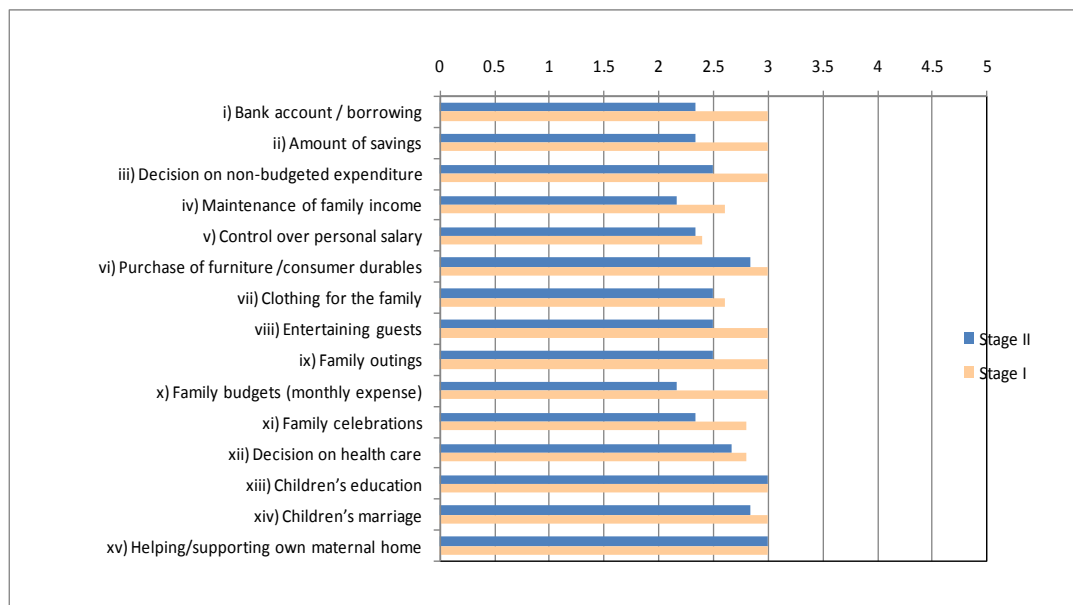

Figure 7.22 Comparison of average relational changes in decision making of longitudinal non-ICT women of Stage I and Stage II (Srifoltala).

7.5.2.2. Spouses' Cooperation

While examining spouses' cooperation on various household issues and women's freedom in purchasing or movement, it was found that there was decrease in most of

the items (Figure 7.23) among Boitpur ICT women. Due to the same traditional and cultural values (Section 5.4.4.2), little educated or uneducated married women without any employment never ask for their husband's cooperation in household work sharing or freedom to purchase any items on their own or to go to anywhere by themselves. These women reported their situation as the same as before and thus indicated 'no change' and the value was about 3.
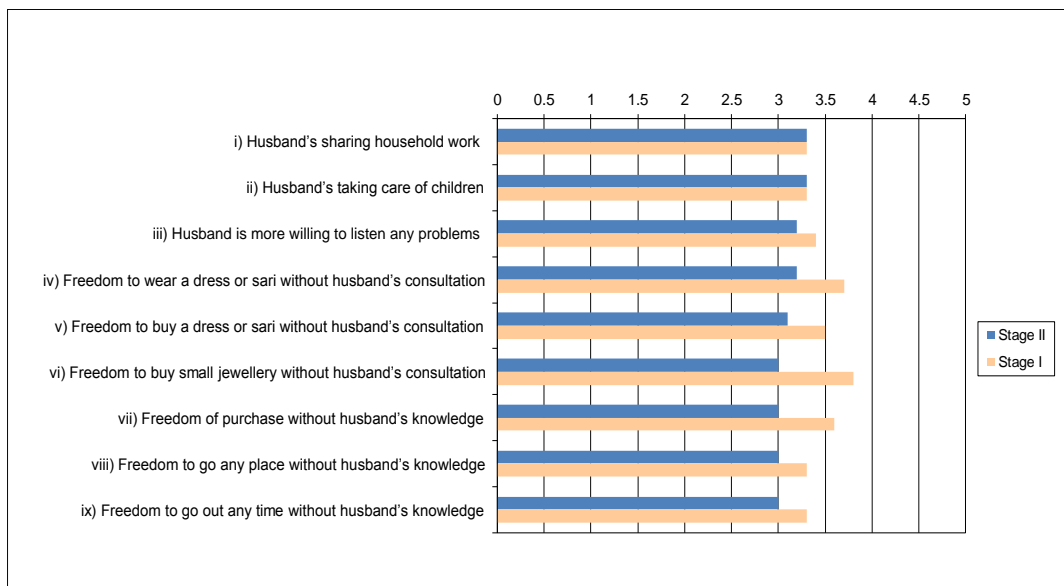
Figure 7.23 Comparison of average relational changes as husband's co-operation of longitudinal non-ICT women of Stage I and Stage II (Boitpur).

While examining spouses' cooperation on various household issues for Srifoltala non-ICT women, it was found that there was no improvement in Stage II (Figure 7.24). As is the norm, the women informed their husband when they went outside the home for safety reasons and to avoid their husband's mistrust. They also reported that they did not ask for any help from their husbands in household chores as part of cultural tradition.
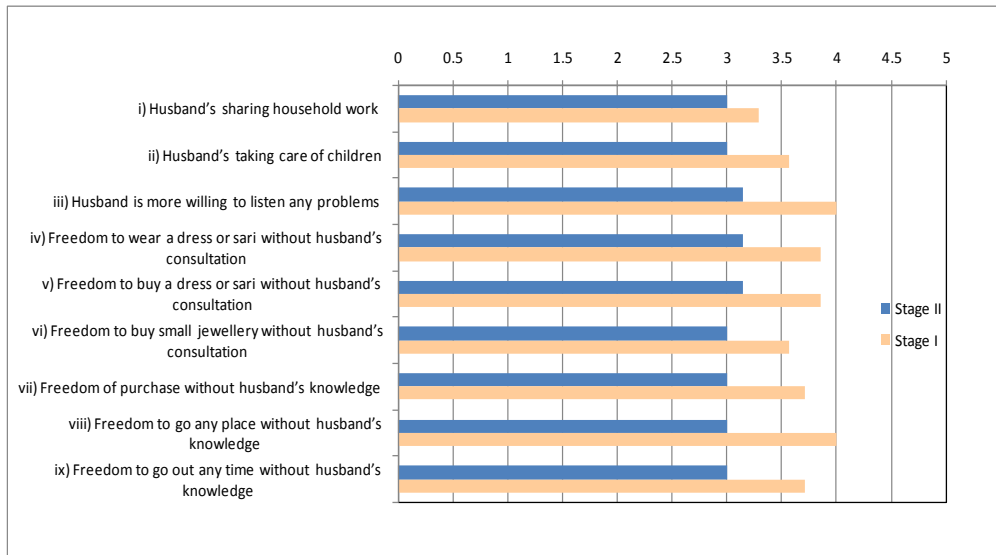
Figure 7.24 Comparison of average relational changes as husband's co-operation of longitudinal non-ICT women of Stage I and Stage II (Srifoltala).

7.5.2.3. Participation in the Community
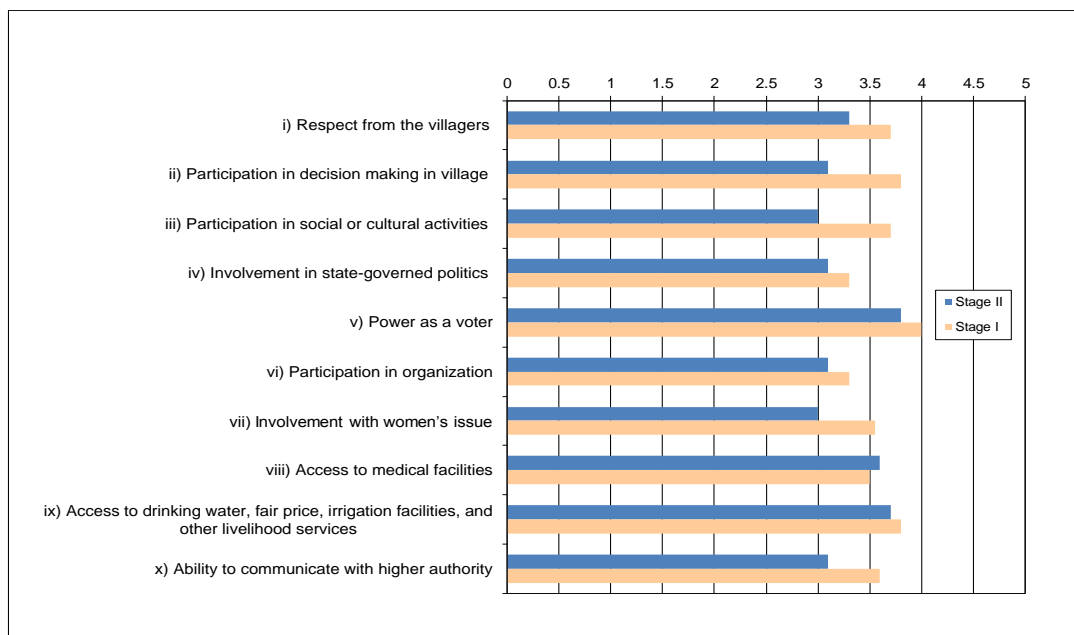
Figure 7.25 Comparison of average relational changes at the community level of longitudinal non-ICT women in Stage I and Stage II (Boitpur).

In Stage II, Boitpur non-ICT women showed a decrease in most of the items of the relational dimension at the community level except their access to medical facilities (Figure 7.25). In Stage I, these women reported more than average change and it was claimed that perhaps the change was due to their being older and the impact

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of the ICT project in the village as well as other NGOs was high. However, in Stage II, most of these women reported 'their situation was the same as during Stage I'.

Srifoltala non-ICT women showed a decrease in the rest of the items in the relational dimension at the community level except a little improvement in their involvement in state government politics (Figure 7.26). This improvement was because of one woman who reported an increase.
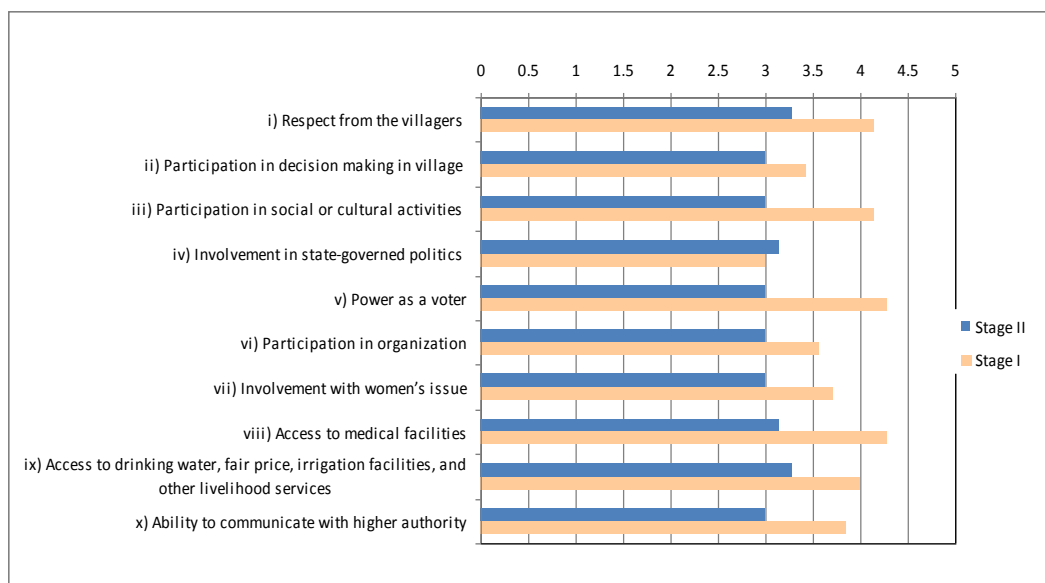
Figure 7.26 Comparison of average relational changes in community level of longitudinal non-ICT women of Stage I and Stage II (Srifoltala).

Therefore, in summary, non-ICT women's relationships within the family and outside the home showed very little change across the time between Stage I and Stage II.

7.6. Technological Dimension

The responses to the questions on technological change (Appendix I, Q.10a-i) depict the level of acceptance of technology, the level of understanding the benefits of ICT, and the information needs of women in their daily lives. The items regarding communication services (Q.10a) asked women about how often they used these ICT

services. Answers were plotted on a Likert-like scale with values ranging from 1 to 5. The values were: 5 (more than once in a day); 4 (more than once in a week); 3 (more than once in a month); 2 (less than once in a month) and 1 (not used). To assess the information needs of rural women, answers to questions Q.10b were also plotted on a Likert-like scale. The values were: 1 (not important); 2 (not very important); 3 (no opinion); 4 (important) and 5 (very important). The results were compared between Stage II and Stage I for ICT and non-ICT women separately in both villages.

7.6.1. ICT Women

From Figure 7.27 it can be seen that the use of most communication services decreased among Boitpur ICT women in Stage II. The only exceptions were phone kiosks and mobile phones. Some technologies like radio, fax and private phone lines were not used frequently by villagers, and their popularity continued to decrease. In fact, the private fixed phone line did not exist in individual houses in the village; it was only used by government or NGO offices. People tended to use mobile phones and phone kiosks because they were cheaper.

The increased use of mobile phones among ICT women was also due to increased mobile phone ownership. The women used a phone kiosk if their phone needed recharging or they did not own a mobile phone. Texting was not frequent in Stage I, and decreased further in Stage II. Even if they understood English, they did not feel comfortable writing in English. They used mobile phones primarily to make and receive calls.
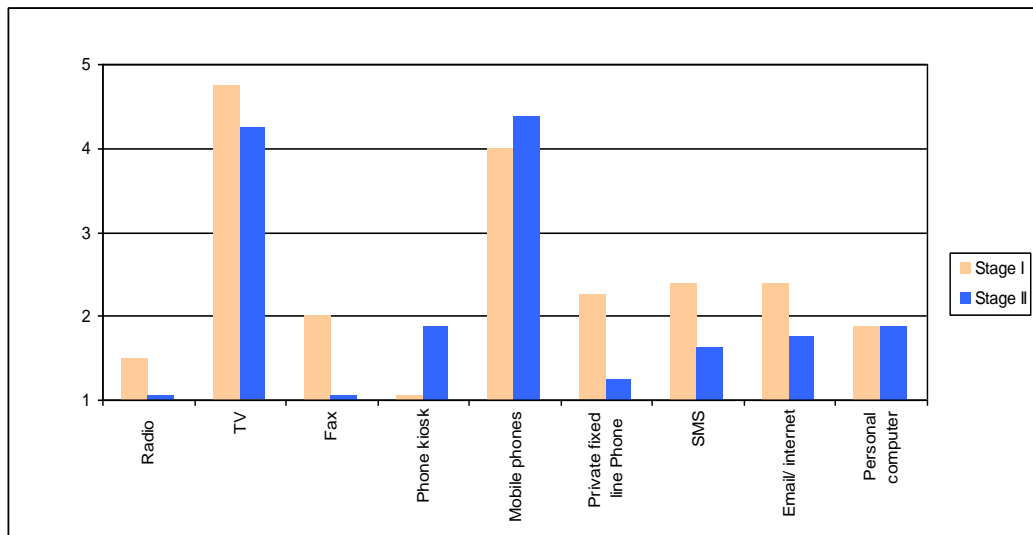
Figure 7.27 Average level of use of communication services by longitudinal ICT women in Stage I and Stage II (Boitpur).

The frequency of email/Internet use decreased as the student trainees who had access to the Internet during their training period in Stage I did not have access in Stage II after the training was completed. Even though the use of personal computers remained the same, the frequency of the use is very poor at less than once in a month. Computers were only used by trainees and ICT project employees.

From Figure 7.28, it can be seen that the use of communication services among ICT women in Srifoltala in Stage II did not improve except for the use of radio and television. The slight increased use of radio could be because one woman reported she had a radio in her household in Stage II.

The reason for an increased use of television could be that most of the ICT women in Stage I were students who had to spend much time in study. Since they had completed their studies two years later, most of them stayed at home and watched television more frequently. Mobile phone use remained almost the same. The increased SMS use could be because some students or employees could text more comfortably than previously as they were more familiar with mobile phones after two

years. As they were educated, they used text messages of Bangla words using the English alphabet.
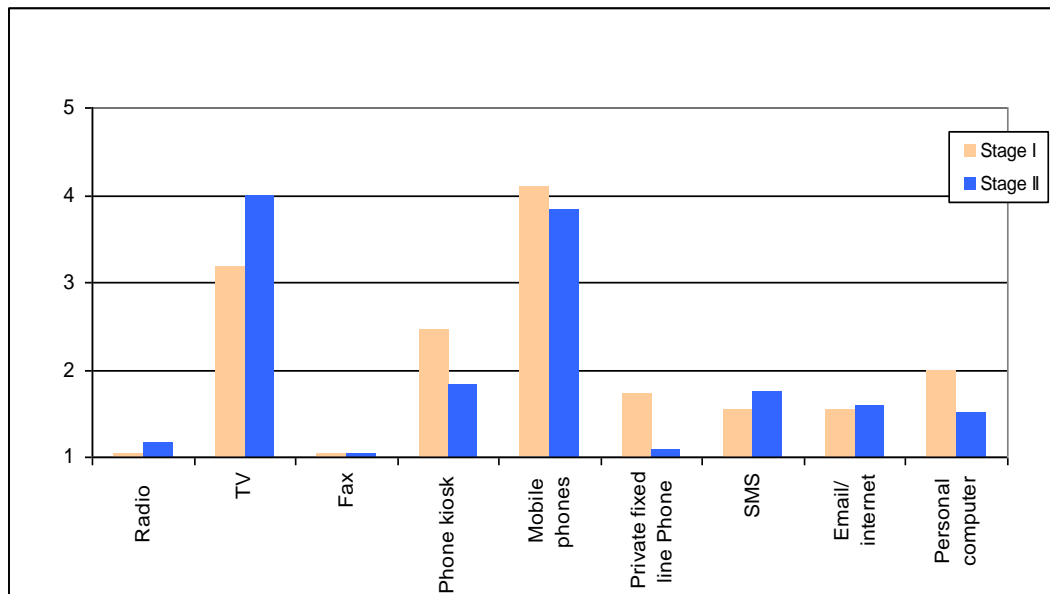
Figure 7.28 Average level of use of communication services by longitudinal ICT women in Stage I and Stage II (Srifoltala).

In summary, there was not any substantial difference in terms of communication services use after two years in ICT women in both villages except improvements in two tools: mobile phone (in Boitpur) and television (in Srifoltala). Longitudinal ICT women were not using technology for developing their lives to the extent to which they were expected due to a continuing language barrier, being away from ICT centres after completing training, and lack of many ICT tools (unavailability of computer or the internet at home).

To assess the information needs of rural women in the two villages, the level of importance of various types of livelihood information in their lives were plotted using a Likert-like scale with 1 being not important and 5 being very important.

In Stage II, Boitpur ICT women reported the importance of information in all areas of their lives such as farming, business, market price, employment, social information, emergencies, health care, and education (Figure 7.29). They were less

interested in information about government and politics. The importance of information about legal issues and news remained the same, but the need for weather news decreased. However, overall, the information needs were similar in both Stage I and II. The remarkable increase in the need for information about farming, business and market price in Stage II indicates that ICT women in rural areas may have become more aware of their need for information even though their ICT use was limited as indicated in Figure 7.27.
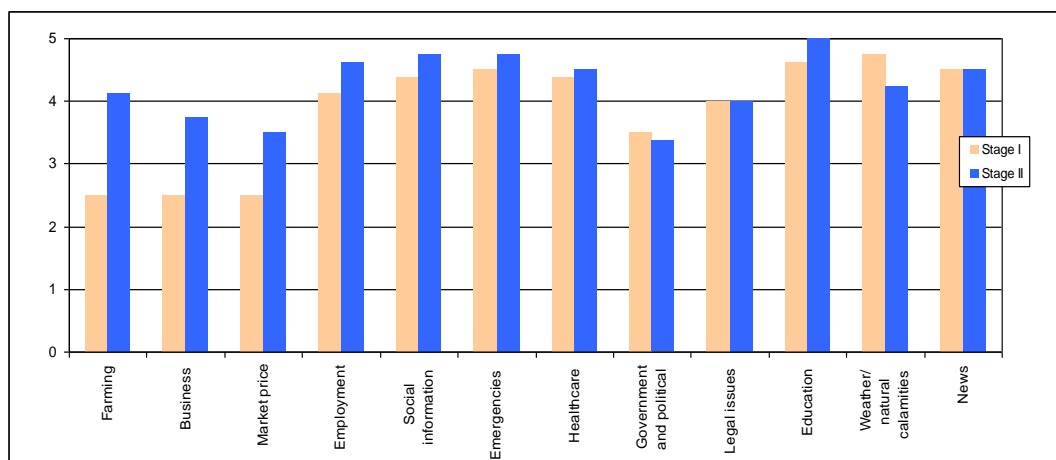
Figure 7.29 Comparison of average information needs for longitudinal ICT women in Stage I and Stage II (Boitpur).

ICT women in Srifoltala showed increased importance of information on items such as business, employment, government and politics, and legal issues (Figure 7.30). There was an increase in the need for information on employment because most of the ICT student trainees in Stage I were searching for jobs in Stage II. An important finding is that Srifoltala ICT women were more interested in information about government and politics and legal issues, even though in the relational dimension they showed less interest in them (Section 7.5.1.3). This may suggest an increase in awareness of the importance of such information. An increased interest in business and market price information might be an indication that most of them might have

planned to develop small businesses as they did not have employment. This could be an indication of their increased level of empowerment.
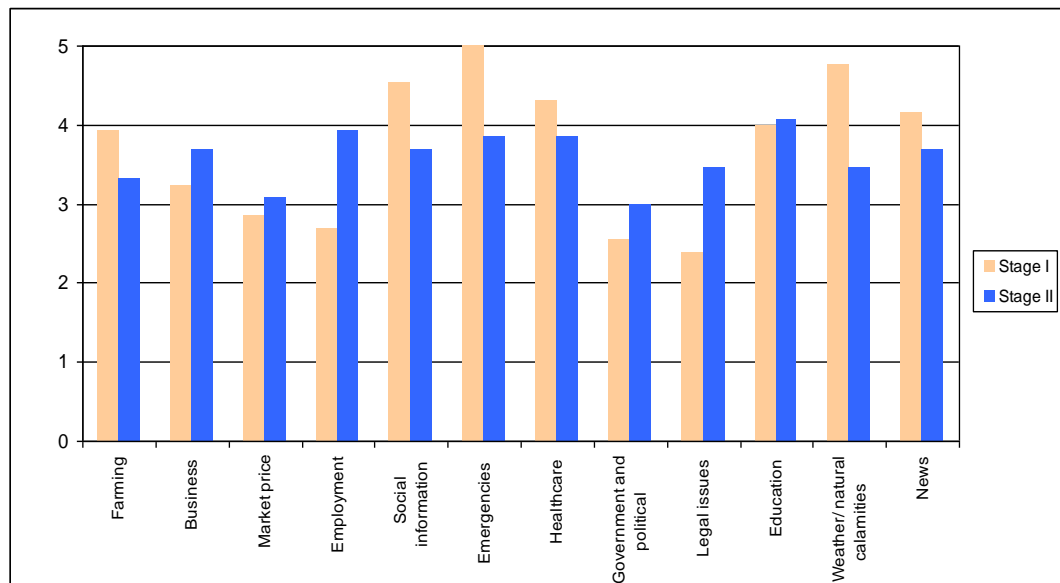
Figure 7.30 Comparison of average information needs for longitudinal ICT women in Stage I and Stage II (Srifoltala).

Therefore, although there were decreases in some information needs in Stage II, the level of importance of those items was still high, which was a positive sign.

7.6.2. Non-ICT Women

From Figure 7.31, it can be seen that the use of most communication services for non-ICT women did not improve except for television, which they used more than once in a week. The decrease in the use of radio could be due to it becoming a much older technology and women were more interested in watching television. The use of phone kiosks decreased, possibly as most of the households owned a mobile phone in Stage II, although it was usually owned by the husband or son in the family. Other technologies, such as fax, private fixed line phones, mobile phones, SMS, and email/Internet remained the same.

The non-ICT women who responded positively about using a personal computer in Stage I were involved indirectly in the ICT project through the village

information system, and thus they reported the use of computer in Stage I. However, in general, the information lady working with the project delivered information to them. Therefore, as a whole, there was no change in communication technology use among non-ICT women in Boitpur., As discussed previously (Section 5.2), due to being older, these women did not accept technology at a pace at which the younger generation did. Moreover, lower education and a foreign language were barriers for them to learn and understand technology.
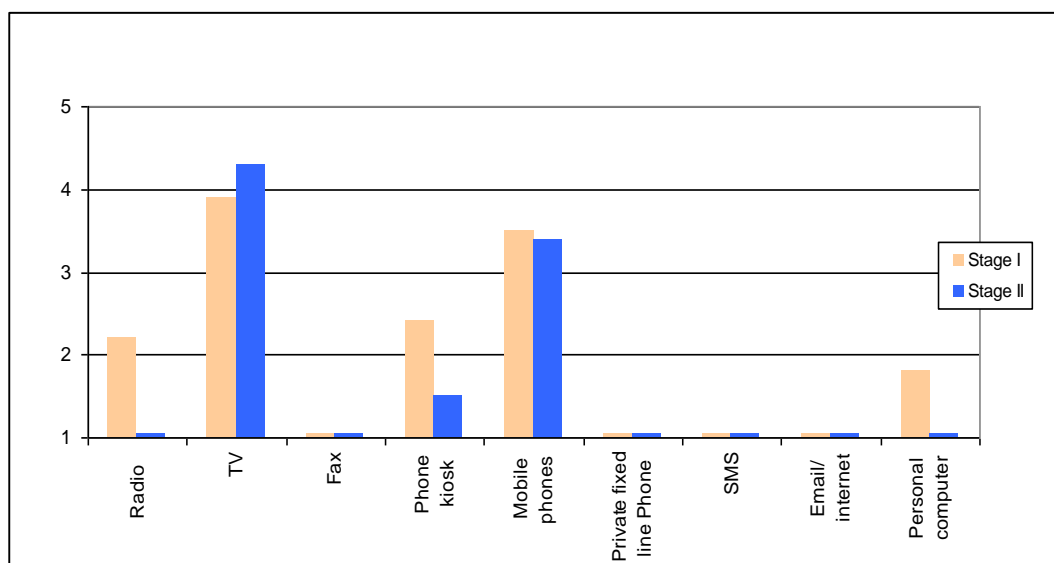
Figure 7.31 Average level of use of communication services by longitudinal non-ICT women in Stage I and Stage II (Boitpur).

Similarly, in Srifoltala, the use of most communication services remained the same for non-ICT women except for an increased use of radio and a little decreased use of television (Figure 7.32). As noted previously, the increased radio use could be due to the reason that just one woman reported she had a radio in the household in Stage II. The mobile phone use is very similar to that previously reported.

Other technologies, such as fax, private fixed line phone service, SMS, email/Internet and personal computer had not been used by non-ICT women. Therefore, there was no change in communication technology use among non-ICT

women in Srifoltala. Most of the non-ICT women were underprivileged and lived hand to mouth, so the use of these communication services was a luxury for them. As discussed for non-ICT women in Boitpur, the older age and lower educational level was also a barrier here[6].
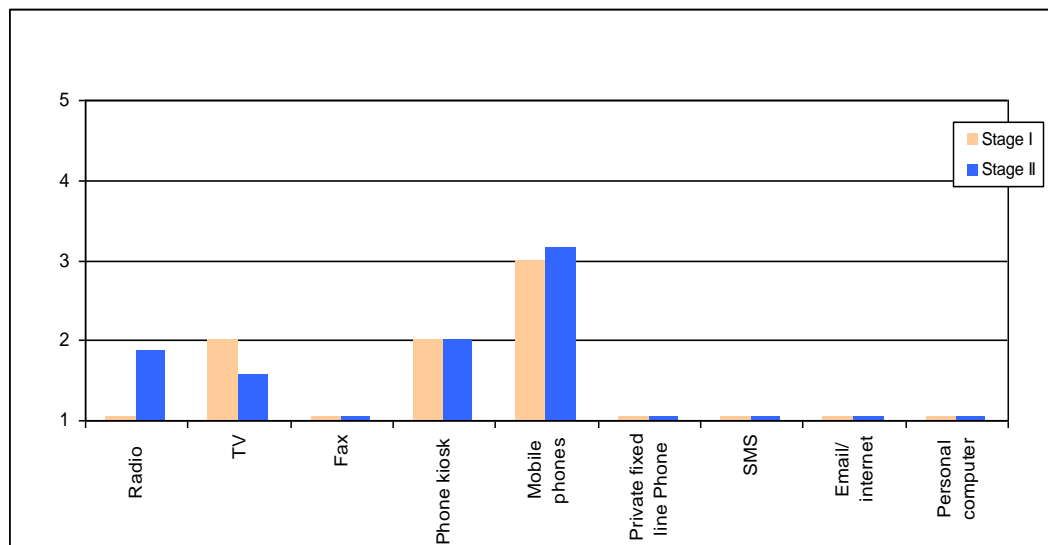
Figure 7.32 Comparison of average level of use of communication services by longitudinal non-ICT women in Stage I and Stage II (Srifoltala).

Non-ICT women in Boitpur showed a decrease in their needs of information in most areas except information on farming, business and market price (Figure 7.33). Information about farming was important as their husbands and sons earned their living from farming. Since some women had handicraft, poultry or fruit selling businesses, they were also interested in market prices and other business information. The importance of other information decreased, indicating the same situation as the responses reported in Stage I.

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[6] In both villages there were more non-ICT women from an older age group (Figure 7.1)
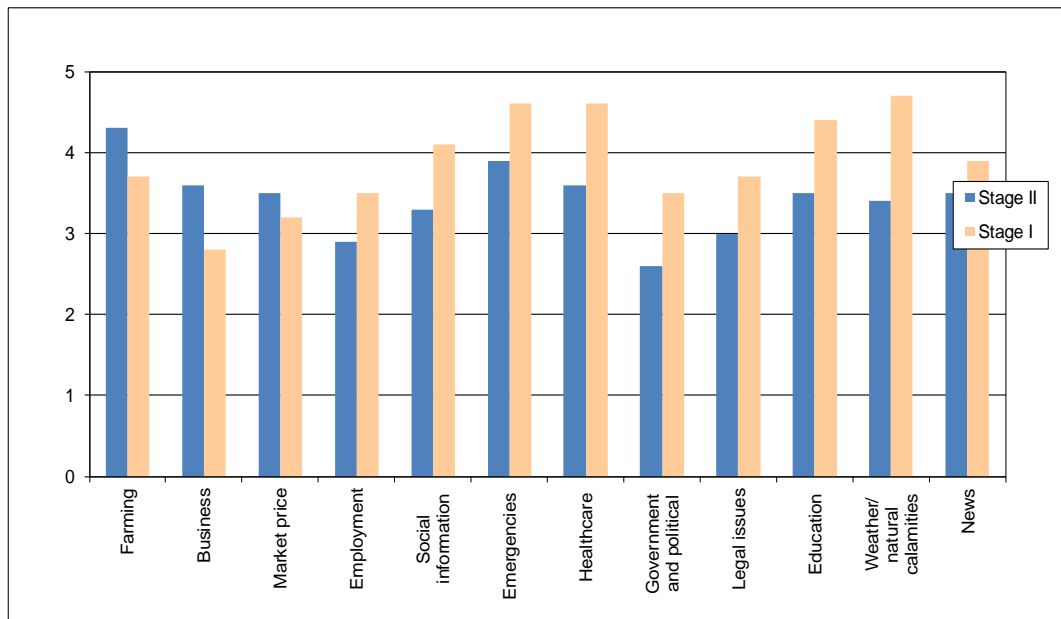
Figure 7.33 Comparison of average information needs for longitudinal non-ICT women in Stage I and Stage II (Boitpur).

The results in Figure 7.33 show that the effectiveness of the ICT program (i.e Village Information System) in Boitpur was not as high as expected since the projects should be enabling non-ICT women to also become more aware of their information needs. Checking the responses of participants at the data level, it was found that 37.5% indicated 'no opinion'. It can be argued that, even though the values decreased for some items, rural non-ICT women perceived their information needs were the same as in Stage I. Non-ICT women in Srifoltala showed a decrease in their need of information in almost all items except farming, business and education (Figure 7.34). This is a positive sign in that, despite their poor education, they felt education may provide a better future for the next generation. As most of the non-ICT women's husbands and sons were engaged in farming and small business, they were interested in information about those areas. The decrease in government and political issues and weather/natural calamities could be because there was no election or change of government and no severe cyclone or flood after 2008. Nevertheless, the level of

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information need for social information, emergencies and health care remained at a high level.
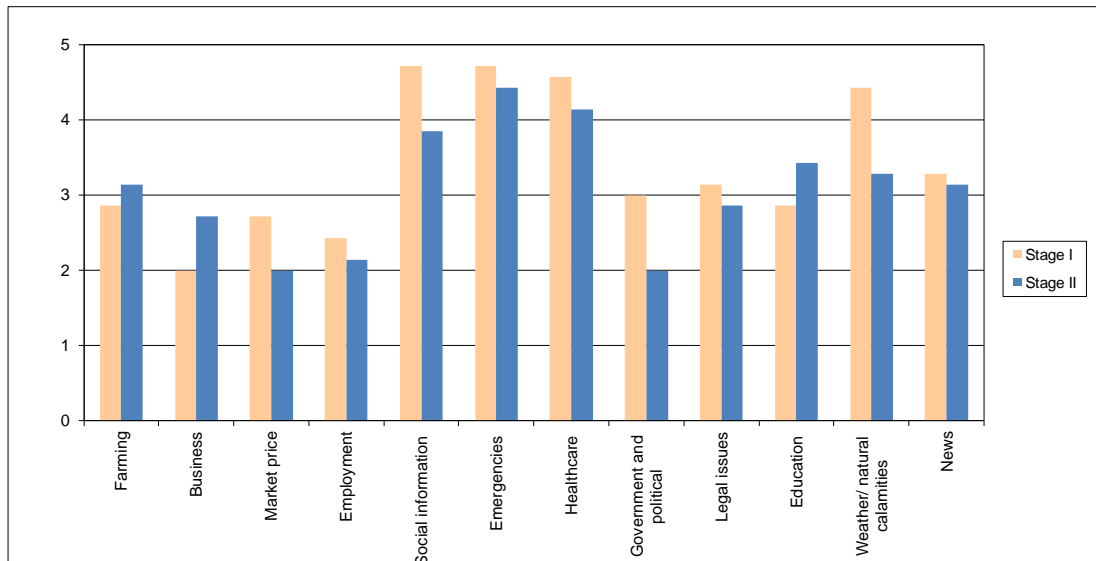
Figure 7.34 Comparison of average change in information need in longitudinal non-ICT women of Stage I and Stage II (Srifoltala).

Therefore, though non-ICT rural women were from older age group and had little education, overall, they were aware of the importance of information in their lives.

7.7. Overall Change

Summary-type questions (Appendix I, Q.11) were asked in order to determine women's empowerment through ICT regarding their vision about their future, confidence, security, political power and speaking power. Most of the ICT and non-ICT women commented that they were unable to live without their husband's support or support from their parents. In fact, job security, economic security or ICT had less influence on rural women because, as mentioned previously, they could not live alone without guidance from parents or husbands.

In the following sections, comparisons are drawn to find the overall change between longitudinal ICT and non-ICT women in both villages after two years. A

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Likert-like scale was used where the values are -1 for less change, 0 for no change and +1 for more change.

7.7.1. ICT Women

Responses to Q.11b indicate that ICT women in Boitpur had experienced higher positive changes in all categories of overall empowerment. The largest improvements were less fear about the future and more confidence in speaking (Figure 7.35). Less fear may be because most of the Boitpur ICT women had employment and their economic independence helped them to become more confident.
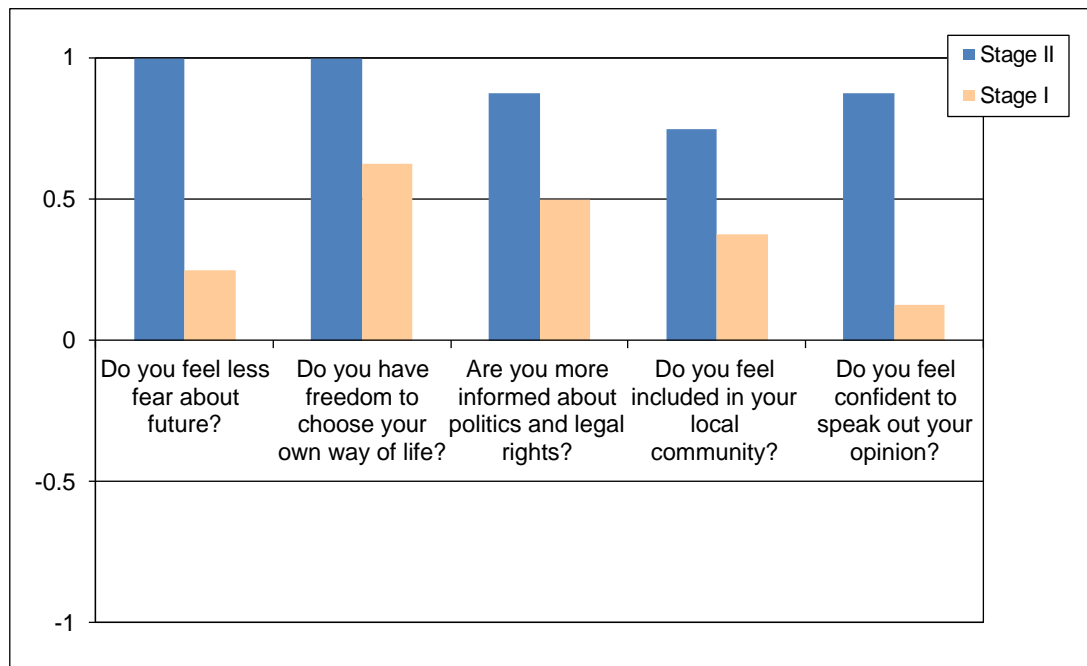
Figure 7.35 Comparison of overall changes in empowerment among longitudinal ICT women between Stage II and I (Boitpur).

Freedom to choose a lifestyle and confidence to speak out can be considered as two important signs of empowerment. In Bangladesh, people do not easily accept that women live alone in society, as discussed in the previous chapter (Section 6.2.6). Although women perceive that information about politics and government is related to males in the society, they were more informed about those items through

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communication technologies in Stage II, and therefore indicated more confidence to speak out.

A comment from an ICT woman in Boitpur supports the above results. Sonia (B18I) (whose example was given in Section 6.2.2) completed her higher secondary studies, was aged less than 30 years and was single. In Stage I, she was a health worker in S.N. Trust health clinic and had obtained two months of computer training with D.Net project. She learnt computer applications so that she could obtain a better job. She stated:

> As I have job and income, I have less fear about future. After getting a better job, I will choose my own life, maybe I will get married or live alone. As a health worker I have interaction with villagers. I feel less confidence in speaking out because of my little knowledge and experience. If my knowledge is increased, I can speak more confidently.

So there was an improvement in *overall empowerment* in terms of fear about the future, choosing their own way of living and more inclusion in local community. ICT women were being more included in the community because of their interaction with people as a teacher, trainer or health worker.

From Figure 7.36, it is seen that ICT women in Srifoltala showed positive changes in overall empowerment. They had less fear about the future, experienced more freedom to choose their own way of life, and were more informed about politics and legal rights. Though most of the married women reported that they were not able to live without their husband's support, they reported a positive change in choosing their own lifestyle. Interestingly, they were more informed about government and legal issues even though they had little interest on them. Moreover, they were little more included in community and felt little more confident about voicing their opinion though they did not show much improvement in the relational dimension at the community level.
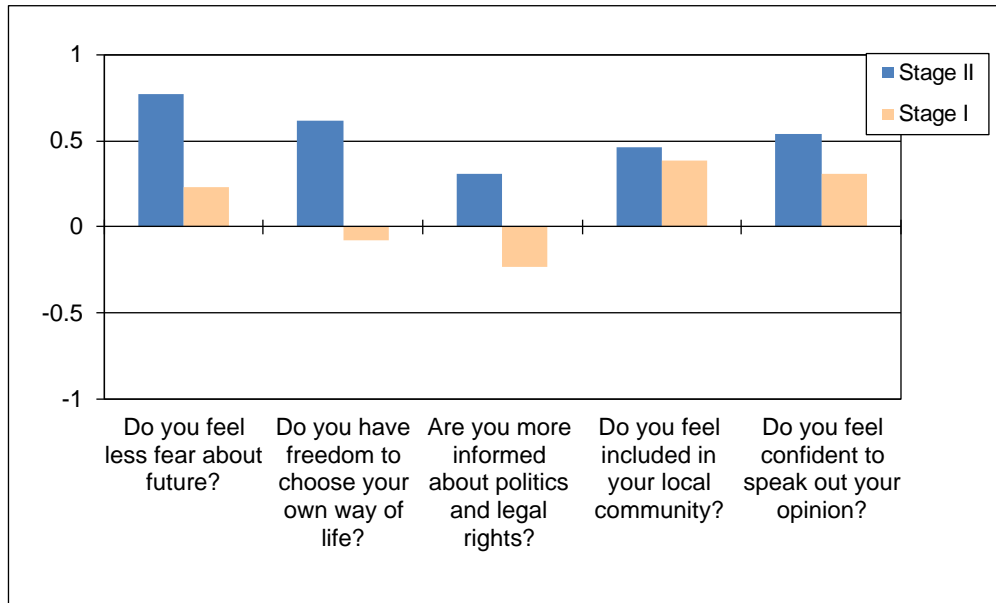
Figure 7.36 Comparison of overall change in empowerment among longitudinal ICT women between Stage II and Stage I (Srifoltala).

Therefore, from the above figures, it can be stated that the improvement in overall empowerment among longitudinal ICT women in both villages may be due to their increased knowledge, cognitive and perceptual awareness through ICT use.

7.7.2. Non-ICT Women

Figure 7.37 indicates that Boitpur non-ICT women had little positive changes in almost all categories except for being free to choose their own lifestyle and more informed about politics and legal rights in Stage II. Though decreased, non-ICT women still showed that they had less fear about future.

With a 3 point scale (more +1, same 0, less -1), inclusion in the local community and confidence in speaking averaged at 0, which means that their situation had not changed. The reasons could be that most of the non-ICT women were unemployed, less educated and married (dependent on their husbands). Thus, their overall empowerment level was unlikely to have improved.

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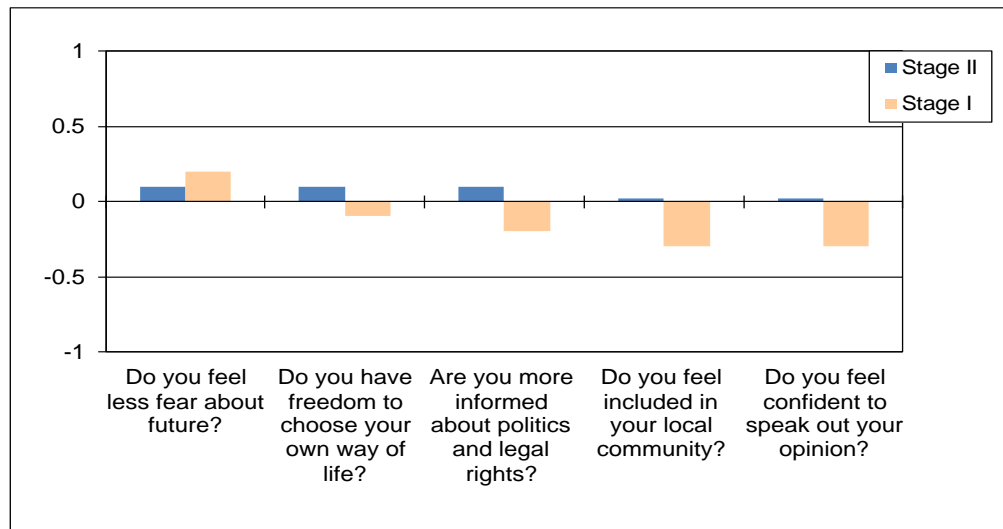
Figure 7.37 Comparison of overall change in empowerment among longitudinal non-ICT women between Stage II and I (Boitpur).

From Figure 7.38, it is seen that non-ICT women in Srifoltala had decreased values in all categories. This outcome could be due to the same reasons as for Boitpur non-ICT women, as well as due to decreased participation in other organizations than previously noted.
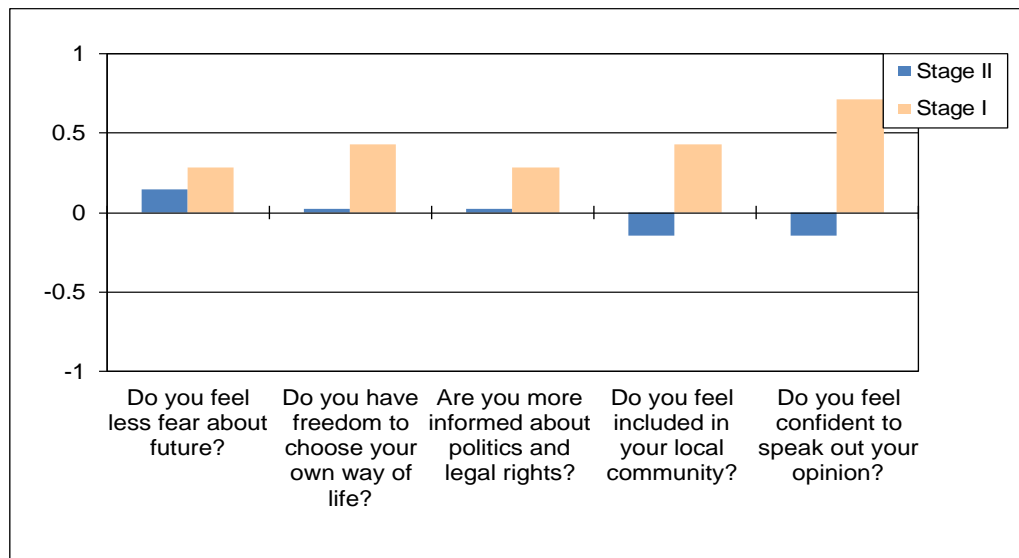
Figure 7.38 Comparison of overall change in empowerment among longitudinal non-ICT women between Stage II and I (Srifoltala).

So, altogether, non-ICT women in both villages were in the same situation or below the previous overall change in Stage II compared to Stage I. It appears that the

less educated rural women were less aware about the potential of ICT to improve their lives.

7.8. Conclusion

The analyses in this chapter focused on the women who participated in the study in both 2008 and 2010 and therefore provided insight into changes in empowerment over a period of two years. These analyses demonstrated that, over time, there were improvements in both ICT and non-ICT women in each dimension. However, longitudinal ICT women in both villages experienced more change in empowerment because of their employment and control over income (material); knowledge, awareness and education (cognitive); self-confidence and self-esteem (perceptual); decision making (relational); more use of mobile phones (technological) and less fear about future and speaking out power (overall). It can be concluded from this chapter that ICT has impacted rural women's empowerment in developing countries like Bangladesh and rural women's information needs can be fulfilled through ICT projects. However, women themselves need to be more educated and aware of their needs through their active participation. In the next chapter the results of Chapters 5, 6 and 7 are discussed to explore the underlying reasons and the factors affecting the outcomes.

CHAPTER 8

DISCUSSION

In spite of great steps in terms of socio-economic development, developing countries continue to lag behind economically advanced nations in research on the developmental impact of information and communication technology (ICT). Although developing countries are embracing ICT for socio-economic development, mainstream information systems research remains focused on the issues related to ICT in developed and mature economies in North America and Europe (Roztocki and Weistroffer, 2008). Increased understanding of the possibilities and limitations of ICT, and how to promote its adoption and use in developing countries, should be of vital interest to researchers and practitioners.

World organizations like the UN and the World Bank, with Government and Non-Government Organizations (GOs and NGOs) in Bangladesh, view ICT as a potential means for development (Ashraf, Hanisch and Swatman, 2006). Many GOs and NGOs, in particular, have seized the opportunity to attract donors for ICT development projects and have initiated activities targeting rural disadvantaged people, especially women (Huyer, 2005; Huyer and Sikoska, 2003). Researchers have found that the cultural and behavioural aspects of technology acceptance are of vital importance (e.g. Gefen and Straub, 1997; Hofstede and Hofstede, 2005). However, the positive impact of technology in a society is not only through cultivating a fresh source of knowledge, but also empowering individuals by improving their sense of self-efficacy, confidence and responsibility through using that technology (Foley, 2004).

It was anticipated by NGOs working in rural Bangladesh, where women suffer severe discrimination, that ICT could help women become empowered through gaining knowledge and information as well as achieving economic benefit through training and employment (e.g. Alam, 2006; Amader-Gram, 2015; D.Net, 2007; Kishor and Gupta, 2004). However, the reality is not so simply stated. The patriarchal society and cultural norms of Bangladesh are barriers to women achieving the economic benefits expected from such projects. Women do not usually benefit from intervention activities, such as ICT projects or micro credit loans programs, because of the community perception that, if women have a superior position in the family, they may not conform to cultural norms and not perform their family duties (Deshmukh-Ranadive, 2006; Kabeer, 2001).

The aims of this research were to investigate the issues raised by these assumptions, to: provide insight into how ICT would enable women's empowerment in rural Bangladesh through both information flow and the development of knowledge and skills; identify problems and barriers for such interventions; and present women's empowerment outcomes based on the socio-cultural and economical context of rural Bangladesh.

Women's empowerment is a fundamental social requirement to eradicate gender-based discrimination and achieve gender equality (The World Bank, 2008; UNESCO, 2005). Therefore, an understanding of power, knowledge, gender, domestic power relations and culture was required as a precursor to investigating empowerment. Empowerment processes develop women's self-esteem, confidence, ability to verbalise their needs, awareness, and perceived inclusion in the world outside their homes (Section 2.7.1). When they achieve mental strength, women can raise their voices against discrimination and mobilise to protest the unequal/discriminatory

behaviour towards them that prevails in their society. By analysing success stories of ICT for development around the world, it could be assumed that ICT has the potential to change women's lives through dispersing information and creating job opportunities.

Empowerment is a process through which changes happen and, as agents, women themselves must have significant involvement in the process (Kabeer, 1999). Any model developed to measure empowerment, therefore, needs to span all the environments in which women function with acknowledgement of the cultural context. These environments include the macro, meso and micro aspects of women's lives, which are represented as the national/global, community/village, and domestic/personal levels respectively. These environments derive from Chen's (1997) model, which was developed in the South-Asian context and adapted for this research. The changes in women's lives were measured in terms of the four dimensions discussed by Chen - *material, cognitive, perceptual* and *relational* - as effects of micro credit loans in her study. However, since specific ICT intervention was the subject of interest, and women's empowerment through ICT investigated, a further dimension - *technological* (from Lennie's (2002) study) - was added to Chen's model. Women's mental (cognitive, perceptual, relational) and non-mental (material and technological) spaces are also impacted in the empowerment process. These spaces were integrated into the (now) five broad dimensions that depict women's empowerment and included in the instrument (a questionnaire) so that changes could be identified.

Based on the analyses in this study the following sections discuss the findings that are affecting ICT as the trigger for the empowerment process in rural Bangladesh.

8.1 Overview of the Results

Due to Bangladesh's high-density population and small geographical area, improvements in mobile connectivity (100% coverage) have been reported (Hasan and Islam, 2009; Hasan, 2006). However, because of poor electricity supply, load shedding (power system disconnected on a regular basis to prevent system failure caused by more demand than the supply of electricity), and lack of up-to-date ICT services, rural people's ICT use, and access to the full advantages of ICT, are limited. Also, a digital divide exists between urban and rural people due to their respective economic conditions (Ashraf et al., 2011).

An analysis of the data obtained from the interviews shows that a number of themes influence women in gaining the potential benefits of ICT: *context* of the village; *culture* of the country; women's *maturity*; their *awareness* of different issues and their *engagement* in ICT. Each of these themes has sub-themes that are interrelated in the empowerment process (Figure 8.1). For example, it is a cultural practice that, after marriage, women live with their in-laws and depend economically on their husband. Even if women have their own income, they contribute much of it to their family and occasionally to their maternal home. Therefore, economic dependency and marital status are interrelated and can be barriers to the empowerment process. The following sections discuss the interrelationships of these themes and their impact on women's lives in the micro, meso and macro environments. This approach of thematic analysis has been used in qualitative research (Braun and Clarke, 2014; Sara Victoria Alvarado, Tonon and María Dilia Mieles, 2012).
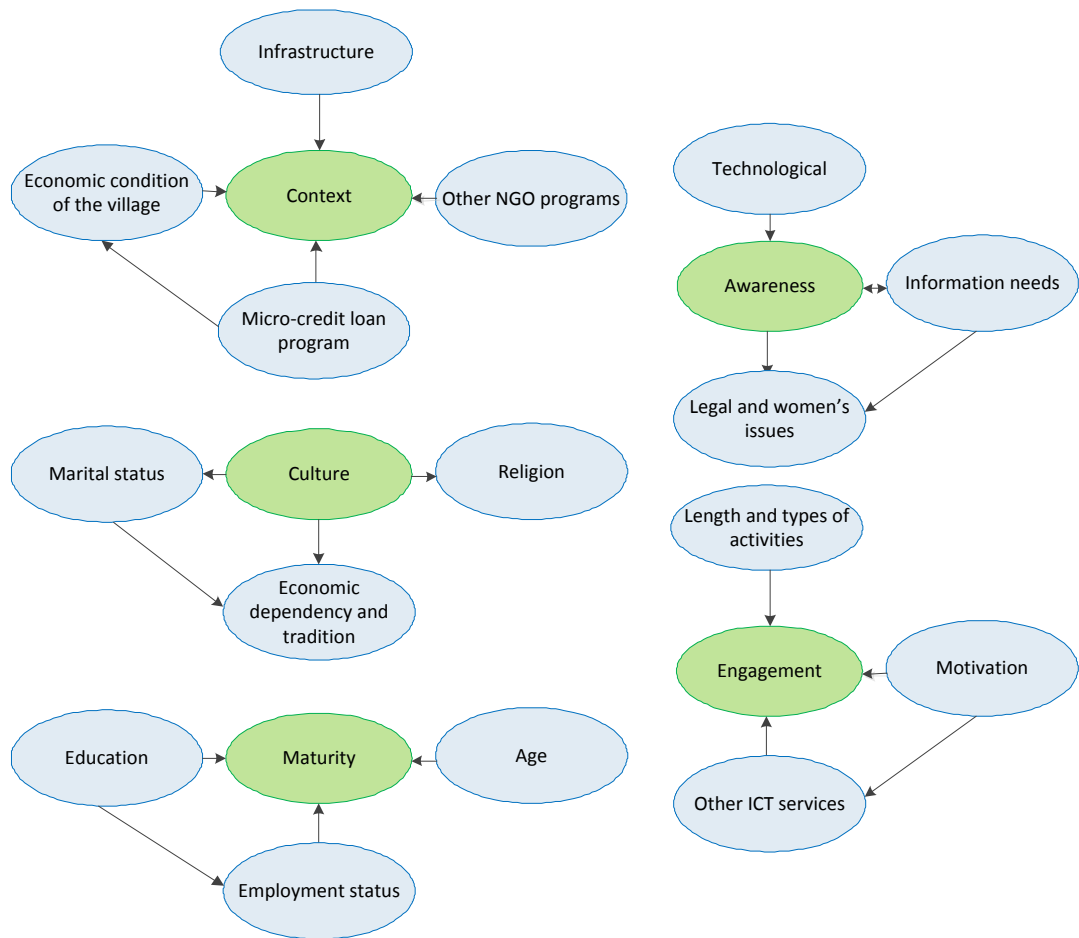
Figure 8.1 Interrelations between themes affecting women's empowerment.

8.2 Context

The two villages where the research was conducted (Chapter 3) were typical of the overall infrastructure and lifestyle of Bangladeshi villages, where women are bound to live within their homestead and have limited mobility to nearby farm areas and neighbours' houses. After the analyses of results (Section 5.4), it was found that the context of the two villages in terms of *infrastructure*, *economic conditions*, *micro-credit loan programs* and existence of *other NGO programs* had a huge impact on women's lives and the process of empowerment through ICT both positively and negatively. These subthemes are discussed in the following sections.

8.2.1 Infrastructure

Participants were asked about the infrastructure of their village. They explained that, as Boitpur was located near Bagerhat (the main town where the college, court, government offices and public hospital were located), it had a good road network, various means of transportation, schools, health clinic, an ICT centre and a nearby market. The electricity supply had only a short period of load shedding in the evening. Therefore, participants from nearby villages were able to go to ICT centres by bus or rickshaw-van and gain the benefits of the services. It was also easy for the ICT project field workers to reach their beneficiaries, as the roads do not flood during the rainy season.

The D.Net ICT centre in Boitpur was a semi-paka[7] (brick wall and tin-shade roof) building and had a village information system, the Internet, email, photocopier, mobile phone and fixed phone services which villagers could use with payment. Therefore, women beneficiaries were able to get access to different kinds of technologies at the ICT centre in addition to available technologies in their homes (radio, television or mobile phones) and in the village market (phone kiosk). Interviewees also mentioned that the D.Net project had a solar panel for uninterrupted power supply. However, in Stage II of the study, the solar panel was found to be inactive. Approximately 10 computers were housed in the centre with two participants sharing one computer during the training session. The project had both male and female staff who were trained at the D.Net head office in Dhaka, the capital of Bangladesh.

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[7] A semi-paka does not have a strong structure (concrete roofs or base). This type of house may be damaged by storms or floods and need regular maintenance such as changing the roof if it is built with Neepa palm leaves. Usually, they are used for temporary purpose.

The second village, Srifoltala, was located some distance from the main town of Bagerhat. There was a school in the village but the village market was located 4 km away. The roads were semi-paved or paved with bricks, except for the bitumen-paved main road connecting the village to the nearby market. Electricity supply was available in the village with regular load shedding of 1-2 hours every 2-3 hours (more than Boitpur village where 1-2 hours load shedding was reported in the evening). Some women in Srifoltala reported that they did not have any electricity supply to their houses, as they could not afford it.

The Amader Gram ICT centre in Srifoltala was also a semi-paka building but only partially accessible during the rainy season. It did not have a solar panel. The centre had only five computers with access to the Internet, email and a village information system. With only three employees, trained at the Amader Gram main office in Dhaka, and some volunteers from the village, the centre was failing to serve the women of the entire village. However, there were occasional visits from divisional office staff to Srifoltala, which did not improve the ICT centre's efficiency as the focus had shifted from ICT for development to a breast cancer awareness program.

Therefore, Boitpur was in better situation than Srifoltala in terms of its infrastructure and the efficiency of the ICT centre. These were not barriers to women having access the ICT centre and gain benefit through that intervention.

8.2.2 Economic Condition of the Village

It was found that Boitpur was in a better economic condition than Srifoltala (Section 4.3). Because of the good road network and educational level of the population (Section 8.4.1), the villagers were engaged in occupations other than farming and fishing. Therefore, Boitpur women were more likely to have come from solvent

families. Solvent families are able to fulfil their daily needs, have access to education and other facilities (e.g. healthcare), and could afford mobile phones, television and/or radios. As a consequence, women of solvent families acquired more assets of their own, such as jewellery, cattle and other assets, by inheritance or through marriage or employment. However, it is not feasible for most of the ICT women to buy their own computer because of the expense and women's lack of decision making power to buy such expensive commodities (Section 5.2).

As Srifoltala's economic conditions and infrastructure were poor, many people in the village were unable to afford basic needs and the women were less likely to have come from solvent families. In this situation, women's position within the family is less stable as the male head in the family could become frustrated and become aggressive against the women by demanding dowries from in-laws. It was also found that younger males were often lacking in moral values when they had no work and committed disturbing acts like bullying school girls (Section 3.2.2).

It can therefore be inferred from the data and supporting literature that the economic condition of the village or the family affected women directly in their material dimension (asset acquisition) and indirectly in their relational dimension (violence against women). Thus, their total empowerment process was influenced by this contextual element of the village.

8.2.3 Micro-Credit Loan Program

The micro-credit loan programs were provided by NGOs as an investment in sustainable development. Beneficiaries were expected to use the loan to create a small business in farming, hatchery, poultry or any other sustainable means of living and to repay the loan regularly (Section 5.4.1.3). Most of the NGOs only provided micro-

credit loans to poor women to empower them and because of their honesty in repaying loans. Most of the non-ICT women in both villages took loans from such NGOs although it was more evident in Srifoltala. The Amader Gram ICT project in Srifoltala was a micro-credit program when it started activities in 1997 and changed to an ICT for development project 10 years later in 2007 (Section 3.3).

Micro-credit loan schemes in both villages benefitted women through an ability to contribute financially to the family while simultaneously burdening them with loans that were difficult to repay. It was evident from the interviews (Section 5.4.1.5) that sometimes women were compelled to take the loans under their own name and give the money to the male head in the domestic power hierarchy (their husband or son). Males often used that loan for their own small businesses, farming or fisheries (without the acknowledgement of NGOs) and gained financial benefit, leaving women in their same deprived condition. This is supported by Kabeer (2001) who found that, due to intra-household power relations, conflicts over micro-credit loans affected women in their empowerment opportunities.

Transparency between the micro-credit loan programs and the recipient women was absent. Underprivileged women, in particular, took several loans because, when one venture failed, they took a loan from another NGO to try to recover the loss, thereby worsening their situation. Transparency could be ensured if a common data repository was used for loan recipients in a particular village.

Most of the women who had ICT related jobs did not have loans because they had income from their employment. Women without loans felt more secure economically and mentally than a loan bearer and had an improved material dimension. This economic security made them confident about the future.

8.2.4 Other NGO Programs

Along with micro-credit loan schemes, some NGOs offered awareness development programs on healthcare, hygiene, legal issues and human rights for women (Section 5.4.2). Some women who engaged with these NGO activities gained knowledge, education, communication and social skills. For example, one NGO in Srifoltala was spreading information about legal awareness programs through group meetings, workshops and leaflets. These programs improved women's knowledge and awareness of legal issues in their cognitive dimension, irrespective of ICT project involvement.

Usually, NGOs work and train their beneficiaries as a 'target group' for their social and economic empowerment. NGOs help these disadvantaged beneficiaries to develop a sustainable life to eradicate poverty as well as educate them (Rahman, 2012). Participation in the community through other NGO programs improved women's awareness in many ways. Women members of NGO groups cooperated with each other and helped each other in time of need. Other women in the village also respected them as they represented and expressed their problems to higher authorities. There were a few examples in both villages that, as members of other NGOs, a few women worked as a representative for other disadvantaged and oppressed women in the village. Thus, development of awareness about the wider (meso) environment was enhanced by the presence of NGOs and rural women's involvement with them.

As was discussed in the literature (Sadan, 2004), when women participate in groups they become empowered. The group environment helps women in consciousness-raising, developing social skills, exercising problem-solving and experiencing interpersonal influences. Thus, participation in any NGO groups facilitates women's empowerment.

Although individual women gained information from village information systems, they would gain greater benefit from group activities. In the ICT projects in Boitpur and Srifoltala, these group activities were absent. This shortfall of ICT-based NGOs could be overcome if there were more group meetings and interactions with the beneficiaries to improve their social lives as well as teaching ICT skills and education.

8.3 Culture

It is asserted by scholars (e.g. Hofstede, 1983; Meso and Musa, 2008) that when design and development processes of ICT do not take culture into account, under-utilized or even failed interventions are likely to result. It was discussed in the literature review that cultural attitudes towards technology acceptance may enhance or restrain women's ICT use (Huyer, 2005). In Bangladesh, ICT projects were implemented in villages to educate rural people, to eradicate the digital divide, to empower women by enriching their knowledge through information, and to encourage people to understand the benefits of ICT for socio-economic development. The underlying cultural aspects that affect women's empowerment are gender discrimination, patriarchy and cultural norms (Sections 2.5 and 2.6).

Rural women in Bangladesh are isolated and deprived. Cultural norms are based on asymmetrical assumptions regarding what is appropriate to each gender and what roles they are entitled to perform. Women learn to accept dependency and deprivation from their childhood. Often, education is considered unimportant for girls. Patriarchal systems and religious regulations sometimes interact to make women subordinate to men and isolate them from public spheres in order to maintain the social status of the family to which they belong. Their restricted mobility is often enforced by using security as a reason. Some of these cultural issues in rural

Bangladesh were confirmed in the findings of this research. *Marital status*, *economic dependency*, *tradition* and *religion* were influencing factors in the ability of women to benefit from ICT intervention.

8.3.1 Marital Status

The marital status of women had a huge impact on empowerment, particularly in the relational dimension. Women are usually manoeuvred into an arranged marriage at an early age. Young new brides are expected to behave in a shy, obedient manner, and they are under pressure to prove their capacity to produce children as well as provide service. When a woman gets married, there is a shift in her physical and mental space (Deshmukh-Ranadive, 2005). A married woman is not only transferred physically to her husband's house but she also fears not being able to cope in the new situation. As the husband's house is an unknown environment with unknown people and rules, a new bride initially fears making mistakes and not being able to satisfy other family members with her service.

Moreover, if a young bride's mother-in-law is at the top rank in the women's hierarchy, she may treat the daughter-in-law badly in the early years of her entry into the family. Inexperience makes the new bride feel vulnerable and stressed mentally and, if her parents are unable to pay a dowry, even more disadvantaged (Bates, Schuler, Islam and Islam, 2004; Chowdhury, 2010). At this stage in her life, she is unlikely to make independent decisions related to her own welfare. Thus, women's empowerment is restricted in terms of decision making, cooperation of husbands and relationship with other family members.

An increase in family responsibilities after marriage might also have a reductive effect on women's ICT use since a husband can forbid his wife's perceived

liberation through involvement in extra-domestic activities, such as going to ICT centres. If women spend time at ICT centres (e.g. for training, jobs or other purposes), they have to leave their children at home under someone else's care (husband or parents) and do their housework after coming home. These problems accelerate relationship crises. Being unable to perform home duties on time, women feel stressed and can be reluctant to get further involved in ICT projects (Kelkar et al., 2002). It was common that married women used ICT tools and ICT centres only with the sanction of their husband and mother-in-law.

However, marriage did improve some women's economic situation, particularly those from solvent families and those who had been married for a longer period. These women were less fearful about the future and had more familial decision-making power.

8.3.2 Economic Dependency and Tradition

Economic dependency and tradition influenced women's empowerment in terms of decision-making power in the micro and meso environments as described in Section 5.4.1. There is an adverse dependency ratio in Bangladesh where a male in the family is the only person with income and, therefore, has to support other family members who depend entirely on him for food and shelter (Davis, 2007). Family power dynamics, discussed in Section 2.4, are the relationships between family members where everyone ought to follow rules and regulations within the family and obey the head of the family (Deshmukh-Ranadive, 2005).

In this study, most of the women were from a nuclear family (i.e. husband, wife and children), and depended on their parents before marriage and on their husband after marriage. The results in Section 5.4.1 supported the norm that decision-

making power was mostly exercised by the head male in the family. Due to tradition, even married employed women who were not dependent on their husband economically and contributed their income to the family, had to discuss any familial issues with their husbands to avoid any clash and to live in peace. They did not raise their voices for equal rights or for a fair share of assets. Unmarried employed women also did not have decision-making power and freedom to choose their way of life, as they had to obey their father or elder brothers. Although they contributed up to their full income to the family, parents usually married off their teenage daughters to maintain family status and tradition.

Therefore, economic dependency and tradition influenced women negatively in their empowerment process (micro) as they could not independently decide on their involvement in the ICT intervention.

8.3.3 Religion

The differential influence of religion on women's ICT use was not revealed by the data as almost all of the participants were from the same religious group, Islam. However, Islam influenced women in their use of ICT or any other technology to some extent by controlling their mindset and mobility. Religion does not always inspire and empower people to follow justice, and be righteous and compassionate because of some unlawful values of cultural, economic and political situations within a country (Lennie, 2002). For example, in Bangladesh, religious leaders have been silent when patriarchal systems legitimise violence and the exploitation of women.

In a Muslim country like Bangladesh, religious leaders and elders in the community control women's free movement in public spheres (such as in educational institutions, ICT centres, phone kiosks and market places). In rural Bangladesh,

because of the purdah system (covering heads and bodies with long clothes, as per religious rules), women are generally confined to the homestead and the area immediately surrounding it, and their contacts with the world outside the family are limited. This isolation constrains their potential to generate income, and makes it difficult for them to take advantage of ICT, legal, health, and other services that may be available, unless these services are brought to their doorsteps. Without purdah and a male escort, women's free mobility is restricted. This controlled movement influenced women's overall empowerment process due to their lack of introduction to available resources and lack of active participation in the economy (Sultana et al., 2009) and village and community activities (meso).

However, as discussed by Hussain (2010), women can exploit the use of purdah to have a little more freedom. It is easier for a woman to go to nearby public places without a male escort (husband, son, brother or father) or attract the rage of religious leaders in the community if she is wearing purdah. Nevertheless, it was also observed in this research that many women who used purdah to go to public places like schools or ICT centres still needed their guardian's permission (Section 2.7.3). The results in the relational dimension (Section 5.4.4.2) supported that being free to go anywhere at any time without their husband's concern was rare among rural women.

Although religious leaders are strict in following religious rules, compared to other Islamic countries, Bangladesh is relatively open and tolerant towards the practice of rituals of Hindus, Christians and Buddhists (Rozario and Samuel, 2010). An open-minded political government also supports women's education and their participation outside the home. Therefore, in a country with a majority population of Muslims, Bangladeshi women are moving forward gradually to obtain education and embrace technology for their development.

8.4 Maturity

According to Wechsler (1950), maturity is a psychological term used to indicate how a person responds to circumstances or the environment in an appropriate manner. This response is usually learned rather than instinctive, and is not determined by one's age. Though age helps a person to learn from experience, maturity encompasses being aware of the correct time and place to behave and knowing when to act appropriately, according to the circumstances and the culture of the society lived in (Wechsler, 1950). Therefore, the maturity of a person is developed through knowledge, education, learning, awareness and experience in that person's life (Section 2.2).

It was found in this study that the *education*, *employment status* and *age* of women were causal or underlying factors in their maturity and empowerment process through ICT. This psychological maturity affects women in their micro, meso and macro environments.

8.4.1 Education

In much of the world, especially in developing countries like Bangladesh, there is discrimination against women in terms of literacy, professional and technical education (Francis and Skelton, 2006b; Parpart et al., 2002). The discourse on gender and literacy is predominantly around the issue of access to resources and the public arena. Education stimulates recognition and respect for knowledge leading to increased awareness and the ability to address issues related to empowerment. Educated women are expected to be knowledgeable, aware of the needs of their children's education and healthcare, have spousal harmony and enjoy their legal rights. Highly educated women are also expected to have a higher level of confidence due to their exposure to wider knowledge and awareness in life (Sridevi, 2005;

Stromquist, 2015). Illiterate and little educated women would not have such privileges.

In this research, education was considered an influencing factor in the proposed model to measure empowerment at the individual level (Section 3.2.1), because education is the key determinant of women's ICT use to enhance their position through knowledge, decision-making power, exposure to and control over resources (Kishor and Gupta, 2004). Formal education is the most influential factor for developing women's individual knowledge, skills and employment opportunities through ICT education and use of ICT tools (Beena and Mathur, 2012).

This study explored the expectation that educated women who had exposure to ICT intervention would gain job opportunities, confidence in using ICT tools, and be respected in their community and village because of their knowledge and contribution. It was found from the Stage I demographics (Table 5.1), that most of the educated ICT women were employed in various professions in the villages. Further, student trainees were involved in ICT projects (Section 5.3) and were keen to achieve good scores in their computer-related subjects to prepare themselves for future job opportunities. Thus, education had a direct influence in women's material dimension.

Basic literacy and ICT go hand-in-hand because operating ICT tools needs a minimum literacy. Women's personal use of ICT tools was associated with education (being competent to use them). Therefore, most of the non-ICT women, were not benefitting from ICT because of their low level (uneducated and less educated) of education. Many women could use mobile phones for communication, but only a few women could make a call or use SMS services. Uneducated women could only receive calls. Nevertheless, they were able to benefit from the ICT projects' village

information systems, irrespective of their educational level, as information field workers conveyed the information to them.

In this study, although educated ICT women did not show much improvement in their relational dimension (e.g. familial decision making and community participation) because of cultural tradition (see Section 8.3.2 and 8.3.3), they achieved gains in their cognitive (e.g. knowledge and skills) and perceptual (e.g. self-esteem, confidence and vision of future) dimensions. Thus, the villagers and family members respected these educated women for their knowledge and contribution to the society. This level of respect was enhanced where the educated women were also older. Less educated women could benefit indirectly from the next generation as they sent their children to ICT centres for ICT education.

8.4.2 Employment Status

According to Chen (1997), improvements in women's material lives lead to a gain in resources (assets, property and income), satisfaction in their basic needs (quality and quantity of food, medical treatment, and so forth), completion of their further education, increase in non-traditional work outside home and finally in feeling more secure about the future. These changes are indications of women's socio-economic empowerment and mental development (maturity).

Different kinds of employment opportunities were available in the villages, such as schoolteachers, ICT project employees, NGO employees, nurses, health workers, as well as self-employment in farming, handicrafts, small business, poultry and livestock. Through the ICT intervention in the villages in 2007, more job opportunities were created, including trainers, project officers, accountants, and information field workers. In this study, women's pre- and post-ICT employment

provided a visible improvement in the material dimension through increased income and savings, acquisition of assets, and fewer debts. These women could satisfy their basic needs and contribute to total family income. After two years, women in both villages who were directly involved in ICT projects through jobs and income, gained even more stability in their material dimension than they had in Stage I.

Employed ICT women who had control over their own income also felt more secure. Improvement in the material dimension was linked with women's mental space in their freedom and feeling of security, which made them more confident about the future than in their previous situation. Moreover, women's ability to contribute financially to their family increased their respect and status within the family and in the community (meso environment).

ICT women's communication and social skills improved through their jobs. Through ICT related jobs, women in both villages were linked to their workplaces such as the village community, schools, ICT centres, and NGOs (meso environment). Exposure to the outside world through their work also created a positive image of women as valued persons in meso environments.

Therefore, women experienced a direct impact of their employment status through income and indirect impact through psychological maturity by gaining economic security, confidence about the future, communication skills and social status.

8.4.3 Age

Though age does not always make a person mature, it was an important factor for gaining maturity for rural women in this research. It was found from the results that older women had some positive empowerment aspects in their relational dimension as

they had more decision-making power due to the domestic power hierarchy, possession of assets, and stronger relationships within and outside the family, regardless of ICT intervention. However, age helped younger women in gaining technological benefit due to their enthusiasm.

Women usually occupy the head position in the women's hierarchy as they become older; that is, the wife of the head of the family (Section 2.4). As was found in the literature, possession of power changes the behaviour of a person and thereby enables or restricts another person to be empowered (Dahl, 1986). The older mother-in-law makes many household decisions, whereas younger daughters or daughters-in-law obey their mothers or mothers-in-law. They are bound to listen to the elders in the family and, therefore, the chance of empowerment amongst younger women is less.

In the case of asset acquisition, the results (Section 5.4.1.2) showed that older married women received jewellery from their marriage, acquired small assets from their savings or income and sometimes possessed assets (land or property) from their maternal home after the death of their solvent parents. Thus, their improved asset acquisition helped them to become empowered in the material dimension. In this case, ICT could only help employed women directly in their asset acquisition through their income.

Participation in the community through other NGOs improved older women's awareness in health, hygiene, children's vaccinations and other health care issues through a community clinic or other group activities (Section 5.4.4). These older women also had a good relationship with family members and friends. In this regard, younger women's maturity was relatively low. However, the data showed that unmarried young women provided services unconditionally and gained experience in

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housework. They even took care of their younger siblings and helped them in their studies.

An age-related digital divide was found in the technological dimension, though comments from participants revealed that the use of mobile phones for communication was available to women of all different age groups (Section 5.4.4). Younger women were advantaged in using ICT (i.e. for gaining information, for communication, improving ICT skills, for job opportunities and for education) as they were more likely to be educated and, therefore, more enthusiastic in embracing new technologies than their counterparts (Prensky, 2001). As was discussed in the literature, technology acceptance depends on culture, demographics and social practices (Simon, 2006; Van Belle and Stander, 2005). In this study, younger women were able to overcome the technology gap with their enthusiasm, self-esteem and self-efficacy in using technology easily due to their appropriate education and knowledge.

8.5 Awareness

It was discussed in literature review (Section 2.2) that knowledge is a prerequisite for appropriate decision-making power and that without it, women can never be empowered (Obayelu and Ogunlade, 2006; Whitehead, 2002). This knowledge of self and surroundings is their awareness. Expressing it another way, awareness is the key factor for gaining knowledge that leads to empowerment.

When women are aware that they are oppressed in many ways and need to improve their situation, they engage with available opportunities to improve their situation and thus begin the empowerment process. Therefore, developing awareness through ICT among women regarding issues related to their lives and applying the technology for improvement might help women to become empowered. It was found

in this study that the issues of *technological awareness*, *awareness of legal rights* and *women's issues* and *information need* were of vital importance in the rural women's empowerment process as awareness leads them to seek knowledge on these issues and take necessary actions.

8.5.1 Technological Awareness

Mobile phone, radio and television were the primary communication tools in rural areas, although mostly available to solvent families. ICT intervention in villages introduced new communication tools such as computers and the Internet. Women's technological dimension was influenced in terms of the use of different ICT services that reflected their technological awareness. In this case, women's solvency, education, and behavioural issues (experience and perception) influenced this dimension.

Among all women, the mobile phone (owned or borrowed) was the common tool for communication and transferring information about family and friends. As discussed in Section 8.2.2, along with possessing mobile phones, economically solvent ICT women gained access to computers, email or the Internet through their employment and ICT training. Therefore, economic solvency influenced women in increasing their technological awareness through their affordability in accessing ICT. Underprivileged rural women were deprived of such opportunities.

Education affected women's technological awareness, which is discussed in Section 8.4.1. Educated women used mobile phones, village information systems, the Internet, televisions and radios, whereas uneducated women only used mobile phones for receiving calls and the village information system to gain information from field workers. There were a few examples of women using radios that were not seen later,

in Stage II of the study. The women's effective ICT use reflected their technological awareness, which was influenced by education.

Women's improved experience and perception in using technology is also connected to their behaviour (Brown et al., 2009). Due to lack of experience in how to use tools properly, most of the participating non-ICT women could not benefit fully from mobile phones or other ICT services (computer or the Internet) available to them. However, if women perceived that ICT had the potential to improve their status and mitigate their needs, then they used that technology intentionally. In this case, their friends and families also influenced them. For example, most of the student trainees in this study were motivated by families and opted to use ICT for an improved lifestyle through job opportunities. Awareness among rural women about the benefits of technology was growing and they were using technology more for their livelihood needs.

8.5.2 Awareness of Legal Rights and Women's Issues

Traditionally, women in Bangladesh are ignorant about or not interested in issues like legal rights, women's health, gender equality and empowerment. This lack of awareness increases the persisting gender inequality in the Bangladeshi society (Sections 2.3 and 2.5). According to Lennie (2002), empowerment of women is linked to their increased knowledge of and involvement in women's legal rights and women's issues, which were absent among women in this study.

As was discussed in the literature (Sadan, 2004) and also in Section 8.2.4, when women participated in any groups they become empowered. The group environment helps women in consciousness-raising, mutual help, developing social skills, exercising problem-solving and experiencing interpersonal influence. Lack of

group participation among women through ICT intervention was one of the reasons for not developing awareness regarding legal rights and women's issues. Therefore, it was evident that ICT centres were contributing to individual awareness but not group awareness. The ICT projects could help awareness development on legal rights and women's issues by creating group activities and proactively delivering and sharing information on these particular issues. An increase in awareness of legal issues is noted through the work of non-ICT NGOs (see Section 8.2.4).

Individual women, especially ICT women, had acquired the knowledge, education, communication and social skills, which indirectly helped them in developing awareness about their human rights. After gaining ICT skills, their confidence level increased, which enabled them to speak directly to people within and outside the home. The confidence of speaking in public places was a remarkable achievement by rural women and could be considered as a step forward in their empowerment process. When women have the confidence to raise their voice, they are able to protest against social discrimination and family violence (Carr et al., 1996; Deshmukh-Ranadive, 2006). In this study, though there were rare incidences of women contributing to women's welfare in the community as a whole (Section 5.4.2), individual women achieved improved awareness of the future which helped them to engage in future oriented activities such as self-education and knowledge or education of their children.

8.5.3 Information Needs

As discussed in the literature, information is the key requirement for gaining knowledge and awareness. As a consequence, information is the prerequisite of the empowerment process (Obayelu and Ogunlade, 2006). Although the perception of

need for different types of information in the micro, meso and macro environments were different for different women, the need was high among all women. However, participating women showed little improvement in empowerment after receiving this information because they could not apply the information for their own benefit.

The village information system only provided individual women with the information they 'wanted' not the information they 'needed' to know (Section 5.4.4.2). Therefore, there was a clear gap between gaining information and awareness development. ICT women perceived a need for information about education and employment whereas most of the non-ICT women asked for information on farming, market prices and weather. The common needs were for social information, information for emergencies and healthcare. Information on politics and government were the least important since women had the misconception that these issues were related to males. Therefore, rural women's overall technological awareness on their information needs was only partially developed.

Thus, it could be stated that the ICT projects had failed to identify which information was important to women and which could be delivered to address their requirements. It was evident that information on property law and legal issues available in the village information system database could be provided to beneficiaries, but women did not ask for that information. Though women showed improved knowledge about their voting power, they cast their votes according to their husband's advice. Thus, women's awareness was not sustained. Nevertheless, some women who worked directly with the village community (as health workers or infomediaries) reported improved awareness in their cognitive dimension.

Therefore, women's awareness about technology, legal rights, women's issues and information needs influenced their empowerment process, which was also

discussed in the context of other NGO programs that focused on women's awareness development on livelihood issues (Section 8.2.4).

8.6 Engagement

As discussed in Section 2.7, women should engage actively in any intervention opportunities as a part of their empowerment process. This engagement could be as an individual or in a group. In this study, women's engagement with ICT intervention was mostly at the individual level though ICT women participated in ICT training in a group. The *length and types of project activities*, *other ICT tools* available in the village, and *motivation* to use them, affected women's ICT engagement and their empowerment process.

8.6.1 Length and Types of ICT Project Activities

The D.Net project in Boitpur had a three-month computer-training program (Section 5.3). Student trainees and employees (ICT women) were beneficiaries of this program and were therefore engaged for more than 12 weeks and gained technological skills. Non-ICT women in Boitpur were beneficiaries of the village information system and used it from time to time when they needed any information.

The Amader Gram project in Srifoltala also had a three-month computer-training program for students and employees, a one-day Computer for All program and a village information system. Only a few ICT women in Srifoltala were directly engaged in the ICT training activities as staff, students and employees of other organizations. As was discussed in Section 3.2.2, the Computer for All was a computer awareness-developing program where women could experience a new technology, like the computer, by touching or looking at it, typing their names and listening to field workers talking about the benefits of the computer. Most of the ICT

women in Srifoltala were engaged in this one-day program. Thus, there was a lack of direct engagement with ICT for a reasonable period, which did not help women's ICT skill development. In addition, women's self-esteem, confidence, freedom and independence in the perceptual dimension were linked with direct participation in ICT. Thus, ICT women in Srifoltala were lagging behind those in Boitpur in these areas.

In both villages, women's active participation in ICT projects for a short period was not enough to impact on their empowerment process other than at the individual level for those who were engaged in training and employment.

8.6.2 Other ICT Tools

ICT women in this study generally used mobile phones, phone kiosks, televisions, radios, Internet or computers as ICT tools. The tools were available in ICT centres, in households, or in phone kiosks in the marketplace. Most of the women in the study understood that the mobile phone was an integral part in their lives for communication and social information sharing and for emergencies, but many could not use it effectively. The rural women in this study were reluctant to use some services because of the *language barrier*. Even educated women were reluctant to use a foreign language for SMS. Thus, apart from the employed ICT women, rural women's engagement with ICT was not adequate to change their lives and empower them.

8.6.3 Motivation

As mentioned in Section 8.5, the motivation behind women's ICT involvement was related to their need and financial solvency. Most of the ICT women in Boitpur were student trainees and had the economic solvency to be able to pay the training fees. Thus, education and financial capability were primary motivators in their ICT engagement. Also, student trainees expected to obtain a job after completing the

computer training and their studies, an additional motivation for them to be involved with the ICT project.

On the other hand, indirect involvement in the village information system needed no educational qualification or economic solvency. Here, cultural constraints such as mobility and attitude towards technology influenced women's ICT engagement. They rarely went to the ICT centres for information. Instead, ICT field workers came to their houses but could not deliver all necessary information (such as government, politics, legal rights, and so on), as women did not ask for that. However, women who did visit ICT centres for information were highly motivated, which could be recognized as a step forward in their empowerment process.

The five main themes that emerged from this study (context, culture, maturity, awareness and engagement) affect women's empowerment process as influencing factors in rural villages. Therefore, the WEM-ICT model that was developed for this study (Section 4.2), needs to be modified to assist in a clearer understanding of the impact of the themes. The following section briefly describes the modification that reflects this impact.

8.7 Modified WEM-ICT Model

The WEM-ICT model developed for this thesis to measure women's empowerment is presented again in Figure 8.2. As discussed in Chapter 2, Chen's (1997) consolidated framework includes four broad dimensions through which an individual experiences changes. To this is added a technological dimension (Lennie, 2002) to measure women's ICT engagement. Demographic information (such as, age, education) was collected, as this is considered influencing variables for women. Purpose and level of access, and type of information need are also considered in the model.
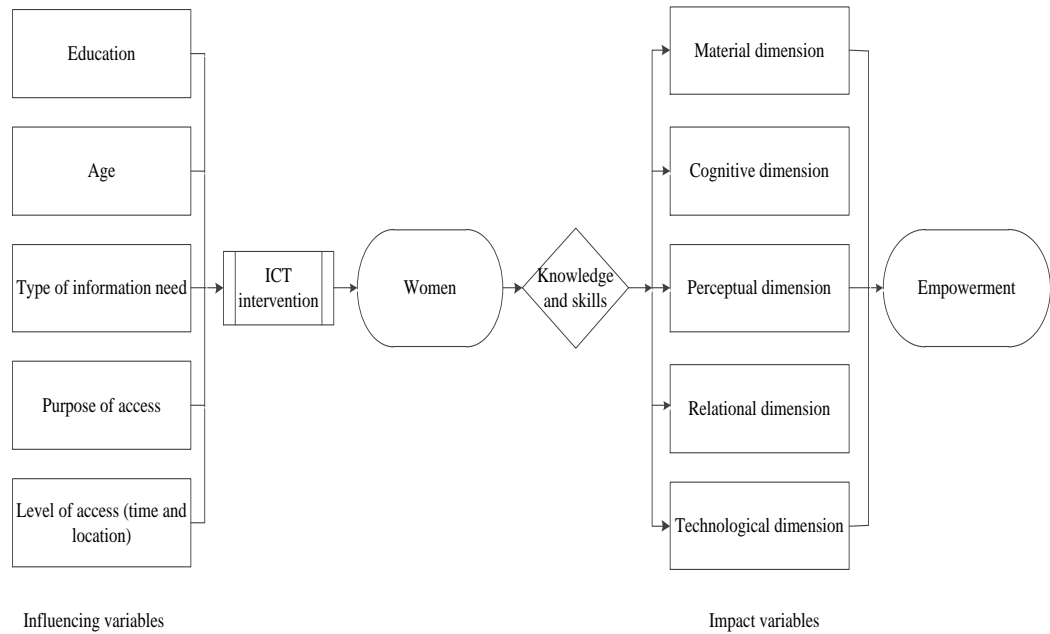
Figure 8.2 Proposed WEM-ICT model for measuring empowerment for ICT intervention
(based on Ahmed et al., 2006; Chen, 1997; Lennie, 2002)
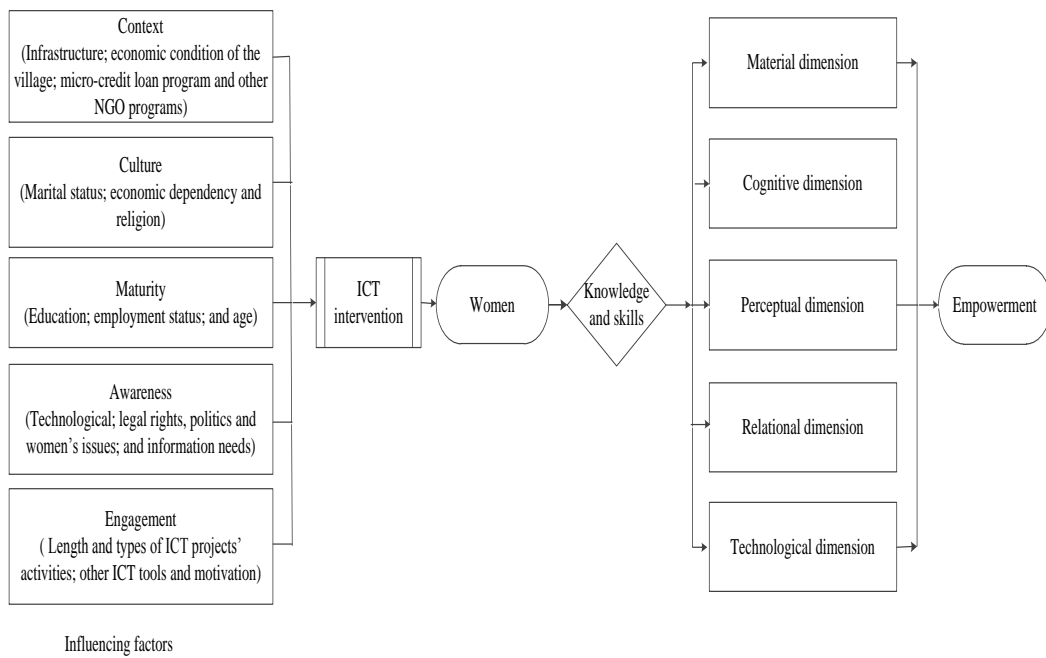
Figure 8.3 Modified Women's Empowerment Measurement through ICT (WEM-ICT) model.

In the modified WEM-ICT model (Figure 8.3), some influencing variables are
grouped together under the five main themes that emerged from this study. These

themes and the sub-themes discussed give a broader understanding for successful ICT intervention in rural women's empowerment. NGOs and GOs need to consider these themes for evaluating the success and failure of any intervention activities in Bangladesh.

8.8 Conclusion

Although information is one of the key determinants in women's empowerment, certain factors affected women's ability to gain that information. Theoretically, women should be able to gain information without going outside the home (e.g. using the Internet or the mobile phones and through passive ICT tools like television or radio), which was not the case in this study. Women could gain information either from ICT centres or from personal ICT tools. The impact of the ICT centres' ICT tools (computers, the Internet, the village information system) is different from the impact of the ICT tools used by women due to individual use and perception. This research found five main themes - *context*, *culture*, *maturity*, *awareness* and *engagement* - as the underlying enabling and disabling factors in rural women's lives in Bangladesh. These themes depend on different contexts and scenarios that influenced women's empowerment through ICT intervention differently.

Women's empowerment through ICT use was of a limited range and applied mostly on the personal level (micro). From the participant responses, it appeared that their empowerment was at the first stage, without challenging patriarchy or engaging more global elements of empowerment like politics and legal rights. Therefore, only partial changes in rural women's material, cognitive, perceptual, relational, technological and overall dimensions occurred through ICT intervention. Though the outcomes of the research sometimes contradicted the expectations and claims of the

ICT projects - that ICT empowers rural women in Bangladesh - it was found that the behavioural and cultural aspects caused such contradictions.

The following chapter concludes the thesis with an overview, research findings, limitations and further research directions.

CHAPTER 9

CONCLUSION

This concluding chapter provides an overview of the research and its findings. The aim of this research, as outlined in Chapter 1, was to explore whether ICT intervention helps rural women in Bangladesh to become empowered. This chapter discusses the implications for the relevant stakeholders (women, ICT projects, NGOs, rural villages, policy makers and researchers) of successful ICT intervention at the policy level by integrating the socio-cultural context and actual needs of rural women. It also addresses the strengths and limitations of the thesis, followed by an assessment of the study's contribution to an understanding of the subject area. Finally, the chapter evaluates the research findings and suggests possible areas for further research.

9.1. Overview of the Thesis

This research is based on the underlying assumption that ICT has the potential to improve the empowerment process of rural women through information sharing and skill development (Amader Gram Online, 2008; Huyer, 2005; Omole, 2013). Women in two villages were interviewed following ICT interventions initiated by two NGOs – D.Net in Boitpur and Amader Gram in Srifoltala. Women in two villages were interviewed following ICT interventions initiated by two NGOs – D.Net in Boitpur and Amader Gram in Srifoltala. Though S. N. Trust NGO was established in 2001, the reference period for the D.Net ICT initiation was about three years when the ICT centre was established in 2005, and the village information system was introduced in 2007, one year before this study was carried out in 2008.

The reference period for the Amader Gram ICT intervention is about five years as the Amader Gram ICT centre was established to engage young people with ICT activities and guide them in a moral direction in 2003. These NGOs were endeavouring to empower women by providing them with information through village information systems and ICT knowledge, as well as education and skills through training opportunities.

Empowerment is a multidimensional and complex phenomenon to explore as it depends on many factors in life. In this thesis, empowerment was measured by combining the impacts of three environments in a woman's life: micro (individual or domestic level); meso (village or community level); and macro (global, national or regional level). Considering the socio-cultural norms and context of rural Bangladesh, an interview instrument was developed based on the *Women's Empowerment Measurement through ICT (WEM-ICT)* model formulated in Section 3.2.

The initial data were collected in 2008 (Stage I of the study) from beneficiaries of the two ICT projects as well as some non-beneficiaries (a total of 87 women) to determine any changes in five dimensions in women's lives: *material; cognitive; perceptual; relational* and *technological.* The *material dimension* considered economic security, assets, loans, savings and financial contribution to the family; the *cognitive dimension* investigated knowledge and awareness of the surrounding environment; the *perceptual dimension* looked at independence, self-esteem, dignity, and vision about the future; the *relational dimension* examined decision making power within the family and participation in community or non-family issues and politics; and, finally, the *technological dimension* investigated how women used new technologies available to them to fulfil their information needs. The second data set

was collected two years later (Stage II) using the same questionnaire for 77 interviewees comprising 38 longitudinal participants and 39 new participants.

These two studies showed that the empowerment process of rural women through ICT intervention depended on many factors in their lives; the context of the villages, culture, awareness, maturity and engagement. These factors were described and discussed in Chapter 8. This thesis confirmed that women's empowerment is a fundamental social requirement in order to eradicate gender-based discrimination and poverty. Consideration of the socio-cultural context at the policy level of ICT intervention for women's empowerment was found to be the most important factor.

9.2. Impacts of ICT

The results of this research highlighted that information was one of the key requirements in women's empowerment, but barriers in obtaining information were found. The research illustrated how ICT interventions contributed to three environments in women's lives – micro, meso and macro – which are discussed in the following sections.

9.2.1. Micro Environment

The micro environment is considered to be the domestic or personal level of a woman's life. The data analyses indicated that there was considerable improvement in empowerment among rural women who used ICT for employment and education. There were also both positive and negative impacts in relation to education, age, awareness, economic situation and family.

9.2.1.1. Employment

After the ICT projects began their activities in rural areas, women employed in those villages benefitted economically (through economic security or ability to contribute to the family financially) and mentally (confidence or self-esteem) from ICT training. Their ICT skills helped them to improve their career and made them valued and confident in their workplace. The economic security through employment benefitted these women by enabling a mental space for household decision making and providing increased confidence about the future.

Through employment, ICT women interacted with their colleagues, beneficiaries and other people outside the home. These interactions improved their communication skills. However, women's personal economic empowerment through employment did not affect their interpersonal or social empowerment in the community. This is discussed further in Section 9.2.2.

9.2.1.2. Education

Since education is an enabling factor in women's empowerment process (Francis and Skelton, 2006b), it was also a key factor for successful intervention. A minimum level of education was required to understand ICT and to use it effectively. It was found in Boitpur that employee and student beneficiaries were enthusiastic about using technologies and participated in the Microsoft Certificate training delivered by the ICT project. The employees improved their skills which helped them in their current and future job prospects. The training helped students in future job prospects and also to improve their grades in computer-related courses. However, women with low or no education failed to benefit from ICT projects except indirectly through gaining information as beneficiaries of the village information system. From a study in

Malaysia (Hashim et al., 2011), the positive impact of ICT in rural areas on women had proved that, in spite of low level of ICT literacy, women can be empowered if they are trained well. Therefore, education as well as training is important for rural women's empowerment through ICT.

9.2.1.3. Age

Age was an influential factor for women using ICT in rural areas. It was found that younger women were empowered through their technological skills. However, even though older women were reluctant to use ICT tools, they were aware of the benefits of ICT in their daily lives. Being members of other NGOs, older women participated in programs outside the home, such as healthcare, education of children, politics and human rights. For example, the Computers for All program not only made some women aware of the benefits of sending their children to ICT education centres but they also understood that ICT would help future generations in employment opportunities and improved lifestyles.

9.2.1.4. Awareness

Most of the rural women (ICT and non-ICT, young and old) were highly aware of the importance of communication tools, especially mobile phones, in obtaining information. However, women with high ICT exposure (through ICT employment or training) were more confident about the future, had more freedom to choose their lifestyle, felt more valued, and exhibited more speaking power than other rural women because of their increased knowledge. For example, village information field workers gained knowledge about different issues while disseminating information. Their communication skills also improved through their work. Moreover, they helped other women in the village to gain livelihood information. Thus, directly or indirectly, rural

women were more knowledgeable after the ICT intervention and through using ICT tools.

9.2.1.5. Economic Situation and Family

Women from economically solvent families were privileged because most of them received both school and college education. They were sent to ICT centres for paid training by their parents or older brothers. They also owned mobile phones that helped them to use ICT tools for communication. These opportunities were seldom available to women from less solvent families.

ICT women received support from their family members as they worked or went outside the home. Married employed women with children left their children in their parents', in-laws' or husbands' care. Therefore, this cooperation improved their family relationships. The women's income also ensured a valued position for them within the family.

9.2.2. Meso Environment

As discussed in Section 9.2.1, ICT contributed to women's personal empowerment in the micro environment, but it had little impact on women's empowerment in the meso environment. The meso environment is related to village and community levels which also affects individual women in their economic, socio-cultural, political and mental spaces. Empowerment of women in the meso environment is linked to their increased awareness of their surroundings. For example, involvement in women's issues in the community was rare among most of the participating women in this study, although a few women commented that they voluntarily helped other women in need (e.g. family violence or emergencies) in the community. These were non-ICT women with little education who were involved with the NGOs that worked on developing awareness of

legal issues. The ICT intervention therefore did not impact on this aspect of empowerment.

As was discussed in Section 5.4.3, rural women are bound to their household duties due to tradition. Most have limited access to the public spheres of education, healthcare and employment. However, many non-ICT women in both villages participated in awareness-developing programs through NGOs, which was different from awareness development through ICT projects. Some of these non-ICT women also gained awareness about legal issues and women's rights. Thus, in the community, they were more helpful to other women in need than ICT women were. Participation in the community through other NGO programs improved women's social awareness. Development of awareness about the wider (meso) environment was enhanced by rural women's involvement with both NGOs and ICT projects. Therefore, ICT activities and NGO social development activities in a group environment will facilitate women's empowerment at a higher level than individual gain.

The impact of ICT projects, micro-credit schemes and other NGOs, and the changes in the villages and communities after the introduction of ICT intervention, are discussed in this section.

9.2.2.1. ICT Projects

In the literature review, brief descriptions of several ICT projects were provided to explain ICT intervention activities for human development in Bangladesh. For this research, two ICT projects (D.Net in Boitpur and Amader Gram in Srifoltala) were selected based on their activities, mission and vision.

This study revealed that, although ICT projects were at their door, rural women only partly benefitted from these projects. It was found that the types and length of the

activities affected women's empowerment both positively and negatively, while the infrastructure and coordination with donor NGOs (e.g. the relationship between D.Net and the S. N. Trust in Boitpur) influenced women's engagement with ICT negatively. The lack of culturally responsive policies, vision and pro-activeness were negative aspects in women's empowerment process.

Both ICT projects in this study had computer training programs, a village information system, computer awareness programs, and other ICT services such as computers, printers or the Internet. The types of project activities influenced rural women's achievements differentially. For example, in Boitpur, where information was delivered through field workers, women benefitted in obtaining information through the village information system whether they were using ICT tools or not. In Srifoltala, the ICT project was endeavouring to introduce computer awareness (a one-day program) to low educated and illiterate rural women, which proved to be unsuccessful except in a few cases where women sent their children to ICT centres to gain ICT education. So, there was a lack of suitable project activities in Srifoltala that could help women of all educational levels to fulfil their needs for information and awareness development.

The length or intensity of engagement in ICT projects affected women in achieving ICT skills. There were three-month training courses, long-term village information system involvement, and one-day computer awareness programs across the two villages. Women could use ICT tools whenever they needed, whether they were an employee of the project or not. However, of these different types of engagement with tools and projects, only employees of ICT projects and trainees demonstrated empowerment through their improved ICT knowledge and skills. While

other non-ICT women benefitted through village information systems, they did not gain any skills.

A study in Bangladesh found that transparency between donor organizations and ICT projects would ensure the improvement of ICT project infrastructure (new buildings or computers) (Ashraf et al., 2008). Both ICT projects in this current study had poor infrastructure, temporary buildings with temporary roofs, and interrupted power supply. It was observed in Stage II of the study that there were no noteworthy improvements in the infrastructure and technologies. The longitudinal study also revealed that employees of the ICT projects had not received further training or skills. An expansion of infrastructure to accommodate more participants would be a positive benefit as the number of trainees would increase. This would address the lack of skilled persons in remote rural areas - one of the reasons identified for ICT projects not achieving their goal (Deshmukh-Ranadive, 2006; Heeks, 2002).

One major finding in this research was that most of the time the ICT projects did not consider the underlying cultural aspects of the target population. It is essential that the policy makers understand the cultural contexts and connections between macro, meso and micro layers of ICT intervention activities (Kozma and Vota, 2014). For example, at the national level (macro environment), government bodies need to implement national strategies for NGOs working for disadvantaged people through ICT projects (meso environment). Also ICT projects have to implement policies for the development of individual people (micro environment) in the village (meso environment), considering their cultural background.

It was revealed from this study that the ICT projects' focus on their vision of women's empowerment had become distorted. For example, after a period of two years, one ICT project was working intensively with issues related to healthcare (i.e.

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breast cancer awareness), and had pushed the issue of women's empowerment through ICT aside. In the second stage of the study, ICT interventions had failed to empower rural women in both villages to the extent found during the initial stage, perhaps due to a lack of futuristic policies. ICT projects should identify suitable programs for women based on their socio-cultural contexts - a program appropriate for one community or village might not work for another. ICT projects could run short or long-term programs according to the needs and welfare of their beneficiaries and they could also enhance rural women's participation through increasing their awareness. For example, ICT educated employed women could motivate other rural women to send their daughters to school and explain how they could be economically independent and benefit the society. Hands on technology training could make rural women enthusiastic about ICT.

ICT project field workers could work proactively in disseminating information to beneficiaries to make them aware of some important aspects of improved life; for example, human rights, legal issues and property law. This study found that rural women were eager to gain information on farming, market price, healthcare, weather and other information related to their daily living but were not aware of the importance of information about politics, government and legal issues. As was found from this research, this lack of awareness had wider ramifications in relation to empowerment. For example, because many women were not aware of property laws, they did not claim or possess any property that they entitled to by inheritance or by law, impacting on a number of dimensions in their micro environment. Proactiveness on the part of the ICT projects could help them on these issues.

9.2.2.2. Other NGOs and Micro-Credit Loan Schemes

This research observed that other NGOs and micro-credit loan schemes had a significant impact on the social and economic lives of those rural women who were involved in them. It was found that some of the NGOs in the study helped women to be aware of different social issues (e.g. healthcare, hygiene, law or human rights) and some helped to empower them economically through investing micro-loans in small businesses or farming. Therefore, village women demonstrated empowering factors due to these NGO activities, which were separate from their empowerment through ICT projects.

However, some examples of non-ICT NGO activity that addressed empowerment through ICT have been discussed in the literature. Some micro-credit schemes invested in ICT (i.e. Village Pay Phone service), in which rural women were given mobile phones as part of a micro-credit loan and women repaid the loan by selling mobile phone services to the rural people who did not have mobile phones. This project empowered rural women economically and was successful in empowering women with ICT tools.

The ICT projects and NGOs need to focus on the issues of awareness development among women so that they understand their position in the community. Rural women largely do domestic work without financial benefit. The importance and necessity of their work are often devalued therefore their contribution to the economy and society must be realised and recognised. Women also must be able to value their own contribution. For example, even though ICT women in this study were valued for their economic contribution (see Section 5.4.1.1), they seldom owned assets. They used their income, assets or domestic services for the welfare of their family without any personal benefit.

Thus, this research highlighted rural women's lack of consciousness about their need for empowerment. Coordination between all the NGOs and schemes that impact on women's lives, as well as a coordinated approach to awareness raising among women, would be useful strategies with the potential to accelerate their empowerment.

9.2.2.3. Villages and Community

As mentioned previously, women's participation in non-family activities was not observable in the village and community. The data showed that many rural women (ICT and non-ICT) did not participate in village activities and decision making. Their activities were confined to their domestic environment, and sometimes in the nearest neighbourhood and among their relatives. Due to religious traditions (e.g. purdah) most of the women did not have the freedom of movement anywhere at any time (see Section 2.6). However, some women used 'purdah' to facilitate their free movement, discussed later in this section.

Women were not interested or enthusiastic in participating in village level activities due to their housework load. Also, due to culture and tradition, they perceived anything outside home as in the male domain. Though some employed ICT women had financial freedom, other women were economically dependent on their parents or husbands. Usually, this dependency determined their stereotypical mindset that they become a good mother and ideal wife in their life.

As was discussed in Sections 2.6 and 2.7, rural women in Bangladesh typically only think about their own family matters. They work to fulfil the demands of their husbands, raise children, care for elders in the family, cook and preserve foods. Sometimes they help in farming, poultry, and small businesses. Awareness developing

programs through NGOs and ICT village information systems could motivate women to participate in the village and community for their own benefit and empowerment (Section 9.2.3). Nevertheless, ICT intervention had impacted rural villages through job opportunities and economic solvency. It also impacted the lives of the villagers positively through livelihood information sharing and negatively by changing some cultural and traditional values as perceived by elders of the village.

Though women's participation in village and community activities was rare, their empowerment in the micro environment through ICT intervention impacted their meso environment indirectly. In both villages, ICT training and education created many job opportunities among educated women. Women in various occupations, such as teaching, accounting, nursing, health-clinic support, ICT project office and information field work, benefitted through improved ICT skills. Therefore, the presence of ICT projects in the villages had a positive impact by creating a skilled female workforce in the rural community. Also, women who were employed improved the economic condition of the family and consequently the economy of the village.

ICT projects benefitted rural women through livelihood information. The village information system served as a database of relevant information on farming, health, education and legal issues. Information sharing by women benefitted the entire village and community. For example, information on farming received by women not only benefitted them, but was also shared with their husbands, family and friends.

Family elders usually did not approve of women going to ICT centres as they assumed the women would not have sufficient time for their family duties and responsibilities. Village elders also disapproved because they may have violated the religious rules of 'purdah'. However, because it was possible for women to go to public places within the village compound wearing a veil, they were able to go to the

ICT centres and still conform to religious customs. Paradoxically, therefore, it was found from this research (see Section 8.3.3), that some women perceived 'purdah' or 'veil' as facilitating greater freedom.

The women in this study were enthusiastic about the ICT project activities in the village and most did not face any familial disputes. In fact, it was revealed that most of the villagers accepted ICT intervention positively despite some issues. However, some parents complained about school boys going to ICT centres or kiosks to play games rather than participate in sports or other physical activities. They thought that it was a waste of time and not healthy for the future generation. The traditional outdoor games of the villages were also disappearing, which was assumed to be a direct consequence of playing computer games.

Thus, this research suggests that awareness has to be developed among villagers about positive uses and benefits of ICT for future generations and for women through leaflets, seminars and/or group discussions. It is also recommended that ICT centres, NGOs, villagers and the communities coordinate to make ICT intervention successful in the meso environment (see Section 2.9).

9.2.3. Macro Environment

The macro environment is related to the national, global or regional level. As was discussed in the previous sections, women's empowerment at the micro and meso environments was hindered due to lack of education and awareness of their contribution to society as well as due to the patriarchal system. In Section 8.4.1, the importance of education was discussed as the key determinant for ICT use. In the micro environment, education had a positive influence with women gaining benefits

from learning to use technologies but this effect was less evident in the meso and macro environments.

This research focused on women's empowerment at the macro environment through education and awareness of the patriarchal system that hinders women's engagement in politics and legal issues. Empowerment through ICT in the macro environment is a sustainable development that could be applied not only in rural Bangladesh but also in other developing countries.

9.2.3.1. Politics and Legal Issues

The macro environment was investigated to ascertain if education and awareness of the patriarchal system would improve women's engagement in politics and legal issues. Because of the prevailing gender inequality and discrimination in the patriarchal society (Section 8.5.2), there was evidence that ICT contributed little to women's active engagement in legal issues and politics. Despite ICT intervention, women did not participate in any women's group as was seen with other NGOs (Section 5.2.4). Also, because of social constraints and stereotypical way of thinking, women were not aware of the political situation of the country. The Stage I study identified a high proportion of women voting in the election that was being held at that time, although women cast their votes according to their husbands' suggestions. The Stage II study showed a decreased interest in politics as there was no election being held. Thus, rural women usually perceive legal issues and politics as being in the male domain and did not see the importance of these issues in their lives (see Section 8.5). This research suggests that improving girls' education, changing the mindset of both men and women about gender equality, and implementing awareness development programs on legal issues and politics at the national level, could influence women's empowerment positively.

9.2.3.2. Sustainable Development

By improving knowledge and awareness, and applying ICT intervention as a mechanism to do so, empowerment of women is possible as part of a sustainable development program. A sustainable development program, where people have to utilize resources without affecting the environment and future generations, is essential to eradicate poverty in rural Bangladesh, as suggested by the United Nations (UN) and other development organizations (UNPAN, 2007; World Bank, 2004). It could help women to recognize their capability and to utilize their own potential.

In sustainable development programs, such as micro-credit programs, much emphasis is given to women because international development organizations consider that women's economic empowerment is essential to eradicate poverty in developing countries. However, in Bangladesh, though micro-credit programs are considered to be successful, they fail to empower women in most cases due to traditional cultural norms where males in the family acquire assets that belong to women (Kabeer, 2001). This situation could be changed by empowering women in their *mental space* through knowledge and education by means of ICT. Educating women with sustainable knowledge and awareness would expand their mental space that could not be seized by males.

Morrell and Sterling (2006) suggested that economic opportunity for women in ICT for development will not be realized until policies address the gender divide (with women and girls enjoying less access to ICT than men and boys) and the technological divide (great gaps in infrastructure in rich and poor countries) and ensure that ICT investment contributes to more sustainable and equitable development. Therefore, it is recommended that women should be included in the planning and development of

such sustainable programs through ICT to contribute to their empowerment and improved position in the community.

9.3. Re-visiting the Research Questions

This section revises and discusses the research questions in light of the findings discussed in previous sections. Chapter 1 outlined three main research questions addressed in this thesis:

- *What is the role of ICTs in women empowerment?*

- *What critical factors are needed to be considered while measuring rural women's empowerment through ICT interventions?*

- *What information is required for rural women to empower themselves?*

The first question was addressed by studying the relevant literature as well as communicating with NGOs working in ICT for development projects in Bangladesh. The literature review included background information on power, knowledge, culture, gender, empowerment, potential of ICT for women's empowerment in many countries, as well as measuring empowerment in the socio-cultural context of rural Bangladesh.

The findings relevant to the first research question are demonstrated as the positive impacts of ICT in women's micro, meso and macro environments. It was discussed in the previous sections that ICT training and education were creating more job opportunities among educated women in both villages. ICT helped empower educated rural women in their material gain and increased knowledge of information at micro environment. The meso environmental empowerment was gained primarily by non-ICT women participating in the community and awareness of women's issues and politics. ICT intervention did not play a role. However, even for these women,

macro environment empowerment was limited regarding awareness of legal issues, government and national politics. They demonstrated empowerment due to other NGO activities and micro-credit loan schemes that were separate from the ICT projects. Women not involved with other NGO activities or micro credit schemes, whether ICT or non-ICT, remained in the situation as they were previously, with the same lack of awareness of their human rights, decision making or speaking power.

The second research question addressed critical factors of measuring women's empowerment through ICT interventions. These factors, collected from data and comments, enhanced or hindered women's access to ICT to improve their lives. Despite the idea that information could be delivered to women without any physical barriers through ICT, certain barriers affecting women were found to exist. Women who were not trainees or employees of the ICT projects were mostly poorly educated and could not use the computer, the Internet or SMS. Therefore, even though ICT projects were available, women were not able to benefit because of these disabling factors. The outcomes of their ICT intervention experience (e.g. knowledge and skills) were also affected by intensity and types of activities, ease of use, language, infrastructure and, overall, awareness about information needs and the benefits of technology.

The last research question followed on from the previous two, as it was perceived that rural women's information needs could be fulfilled by ICT projects. Most of the women, whether educated or uneducated, expressed a daily need for information on social communication (e.g. information about their family members and relatives living far away), emergencies and healthcare. Generally, uneducated women recognised their need for information on farming, small business, market price and weather, which reflected their means of earning but were not always able to

access. Educated women, who were more aware, expressed a need for information regarding employment, education, politics and legal issues. While it was evident that women needed information in their everyday life, culture and lack of awareness hindered their access.

This research contributed to the knowledge of how ICT intervention could empower rural women in Bangladesh by enriching their knowledge and scope for economic gain. Women gained partial benefit which could be enhanced if they were educated, aware, inspired and supported culturally. If women were free to go to ICT centres, to gain ICT training, and were consequently valued for their social or economic contribution, then women would be more empowered.

9.4. Application of Outcomes

This research contributes to the literature on women's empowerment in developing countries by transmitting knowledge, ideas, application and resources for human development. To understand the need and motivation for women's empowerment, this thesis discussed empowerment in terms of domestic power relations and other aspects of the socio-cultural context (e.g. gender discrimination, patriarchy, religion) in Bangladeshi rural society. The study is a resource for researchers to understand the background phenomenon of women's empowerment. The relationships between power, knowledge, culture, gender, attitudes towards technology and information were depicted to ground the importance of women's empowerment (Sections 2.1 to 2.8).

The structured questionnaire used in this study was an effective instrument for collecting demographic data as well as life changing information after experiencing ICT intervention in villages. It gathered a rich set of information for qualitative analyses. The interviewees were cooperative and interested in sharing their thoughts

on different issues in their lives for the first time, and thus contributed their knowledge to be transmitted to the wider community.

To measure rural women's empowerment after ICT intervention, a model was developed that depicted changes in five broad dimensions (*material, cognitive, perceptual, relational* and *technological*) in women's lives, influenced by *influencing* (i.e. age and education) and *impact* (i.e. purpose, level of engagement in ICT, and information need) variables. The research model was based on the cultural context of rural Bangladesh, and was a modification of Chen's (1997) model with aspects of Lennie's (2002) model included. The WEM-ICT model presented in Figure 9.1 is a further improvement of the initial model (Figure 3.1) as a result of the findings of this research.
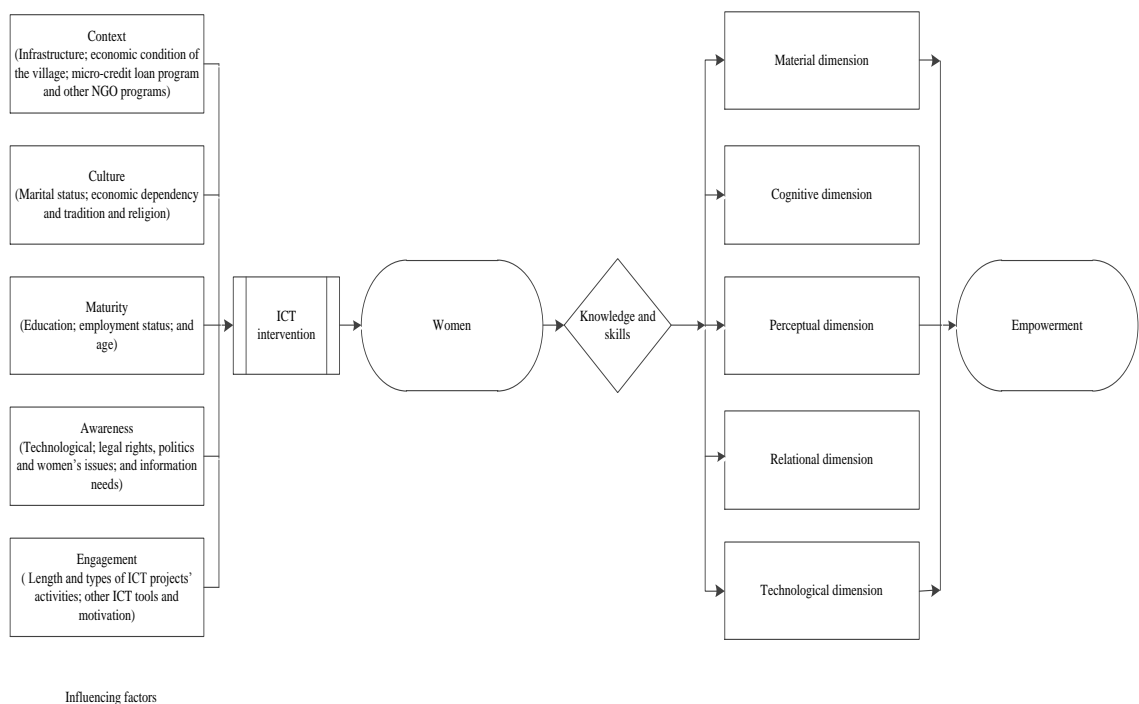
Figure 9.1 Recommended WEM-ICT model for measuring empowerment for ICT intervention (based on Chen, 1997; Lennie, 2002; Rabayah, 2010).

This thesis provides information and resources for NGOs working with ICT for development in Bangladesh. Specifically, the recommended WEM-ICT model provides unique guidelines for investigating and implementing ICT intervention in Bangladesh or other developing countries where socio-economic conditions and patriarchal cultural norms are similar. Intervention activities are still seen to fail to achieve their goals in rural areas of developing countries due to a lack of understanding of the cultural context of those countries (Omole, 2013).

9.5. Strengths and Limitations

This research revealed some interdisciplinary, cultural, methodological and theoretical strengths. Limitations pertaining to the sample process, instruments, and data collection procedure were also identified. As a consequence, generalisation of the findings is limited to groups that share a similar socio-cultural background. Limitations due to language difference, time constraint and grouping problems have been justified.

9.5.1 Strengths

This research was undertaken with an interdisciplinary perspective: a combination of sociology, culture, economics, gender, statistics and policy making needed to be considered. As a member of the same culture, it was an advantage for the researcher to build an instrument, interact with individual women in interviews, and investigate changes. One of the strengths of the thesis is its cultural context, which means the findings can be applied to similar cultures across the world, albeit with some modifications.

The qualitative approach with multiple tools for data collection and analyses was another strength of the thesis. Many underlying factors were revealed from the

qualitative analyses on responses to the questionnaire and from the recorded interviews. There was an acceptable number of interviewees (87 in Stage I and 77 in Stage II) across the two villages considering the time and location constraints. These interviews provided a strong foundation on which data collection and longitudinal analyses were based.

The longitudinal study, which was carried out two years after the first study, was a strong foundation to investigate the impact of ICT intervention in the development phase. When there is a new technology in a society, the impact on the people is most significant in its early stage (Hughes, 1994). In this research, ICT intervention in rural areas was investigated in the early stages of the development to determine, in particular, the influence of socio-cultural aspects.

A further strength of the thesis is that it will provide theoretical contributions to NGOs and policy makers at the national level for using ICT tools effectively for women's empowerment. These contributions highlight the enabling and disabling factors for women's empowerment, information needs and motivations. If ICT projects modified their activities with multimedia or by technologies according to women's level of education or their language, then women may not fear ICT tools as much.

It is recommended to explore strategies to integrate women's perspective into national ICT policies. Government bodies, NGOs, academic and research institutes, practitioners and civil societies should interact and communicate through the knowledge network. Engendering the knowledge network opens avenues for women to share their concerns, experience and knowledge with other people in their society. In this way, the ability and skills of women are increased and they gain insight into actions in social, economic and political processes and overall improvement of life.

Also, technology acceptance by women is needed to be addressed at the policy level based on women's needs and benefit.

9.5.2. Limitations

A number of limitations were recognised within this exploratory research. One of the limitations of the research was the sampling technique. Convenience sampling was used in the study instead of random sampling, which could enable greater generalisation of the results. However, obtaining a random sample for ICT intervention in rural Bangladesh was difficult. It was found that only a small number of ICT projects were working in rural areas. There were also restrictions in interviewing their beneficiaries. For instance, when several ICT projects were contacted, only a few responded positively leading to the selection of only two ICT projects.

Another limitation was the lengthy half-hour interview sessions with each woman. Sometimes interviewees became disinterested and responded with inaccuracies, because their actual behaviour and changed behaviour were different. For example, questions on decision making power within the house had many sub-questions. Some participants answered generally without going into detail about each item and gave similar responses. Answering the questions in the technological dimension was difficult as many respondents did not understand some terms (e.g. SMS or fax).

The interviews were conducted in Bengali, so the questionnaire had to be translated. Translating some English words to Bengali and applying them to the local context was also challenging. For example, when women were asked about their self-esteem, they asked for examples of what 'self-esteem' actually meant. The scale used

for levelling their answers also took a long time as different scales were used for different issues. Gaining consent from the interviewees, asking questions and noting their answers and comments were time consuming processes. However, despite limitations, the interview was the most effective method for collecting data, as the comments from participants provided strong support and added value to the findings.

It was found that the results were not overwhelming and sometimes contradictory because of the different types of ICT women participants, including students, trainees, ICT centre employees, field workers and village information system users. For example, the level of impact of ICT on employed women was different from that on student trainees as the students were financially dependent on their parents. Therefore, the impact of ICT in their material dimension was not high. This generalisation problem could be avoided if there were a large homogenous group of ICT women. However, since the study was undertaken at an early stage of ICT intervention, only a small number of women had such experience.

For this research, the use of convenience sampling poses limitations. Convenience sampling, which is a non-probabilistic sampling approach, was used because of the rarity of village women with ICT experience. This is a common approach for exploratory research work where less time and lower costs are involved for the selection of a sample. Therefore, the limitation in generalisation of results due to convenience sampling in this research is acknowledged.

9.6. Further Research Directions

Addressing the limitations discussed above, this section suggests potential future research directions.

Further research could use *sampling methods* other than convenience (e.g. stratified or random) to avoid bias and generalisation problems. In another few years, the number of ICT women in Bangladesh may be expected to have increased sufficiently to apply such methods. For this research, an interview was conducted at the individual level. It was evident that women sometimes did not feel comfortable in speaking about their familial issues. Specifically, this occurred in answering the questions regarding their relational dimension, where household decision making, husband's cooperation, and relationships with other family members were broached. Participants seemed reluctant to disclose familial information because of their shyness, fear and concern about defaming their family. Also it is difficult to address domestic level empowerment due to the rigidity of the domestic power hierarchy. To overcome such problems, interviewing women in a group could be a possible solution, so that they could express family restrictions, oppression or un-cooperation without being singled out.

It is evident from this research that some elements of women's empowerment took place in their *economic situation* as well as in their awareness, knowledge and skills. It was found that employed women showed improved economic security, which proved to be the most important issue in their lives. They became more confident about the future, and were able to lead their own lives and gain empowerment. As an improvement in the quality of life is an indication of empowerment for women, especially within their communities, further studies could compare women with and without economic security (employment or other source of income) with ICT intervention effect. An action research project could also be carried out to investigate the efficacy of village information systems in fulfilling rural women's information needs. Appropriate information needs to be life oriented and, therefore, able, not only

to improve life through developing sustainable knowledge and awareness, but also to generate income to alleviate poverty through developing skills.

Though information is assumed to be the key to women's empowerment through ICT, a contradiction was found between ICT and non-ICT women's empowerment in their *awareness* level. It was found that, though ICT women were gaining economic security through their jobs, they were unaware or ignorant of possessing property, politics and other issues related to women's rights. Investigations could include broad issues in the wider environment such as health, nutrition and sanitation, environmental protection, child labour, domestic violence against women, dowry and child marriage. Religious and traditional values, patriarchy, marital status and other socio-cultural factors affected women's empowerment process. Since the patriarchal system hindered women in their empowerment process, further research could focus on additional awareness issues such as men's attitude towards women's empowerment, women's attitude towards their own empowerment, and how to overcome disempowering issues. Men dominate women because women are economically and socially dependant on men. In this context, rural men could be interviewed in a group to investigate their reactions and views towards women empowerment through ICT and how the situation could be improved at the community level.

Through the course of the investigation, several notable contradictory outcomes were revealed due to the *lack of homogeneity* in women's grouping, such as level of education, employment status, economic security, awareness level, information need and ICT tools use. It is understandable that women with and without education are basically different in their mental spaces, which affects their knowledge, awareness and learning skills (cognitive and perceptual dimensions). Therefore,

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women with similar levels of education could be interviewed in further research. This requires a larger participation base than was available for this study. However, ICT penetration into rural Bangladesh has improved since the fieldwork reported here was undertaken. The potential for a more extensive study now exists. More elaborate studies could be undertaken based on the homogeneity of ICT tools. For example, as was found in Section 5.4.4.1, the mobile phone was the primary communication service used by rural women. Therefore, the impact of the mobile phone on women's empowerment could be studied separately. Additional research could investigate the impact of the village information system or the Internet.

The *model* used for this thesis could also be modified to consider other independent variables, such as women's marital status, economic condition of the family, and number and age of children. For that, socio-cultural constraints must be fully understood before assessing the impact of ICT on women. This research found that there was a lack of business and entrepreneurial endeavours for women through ICT projects. The factors affecting women's use of ICT for entrepreneurship could be social constraints, personal capability, opportunity recognition, decision making process in the community and support from ICT centres. Thus, in further research, the modified WEM-ICT model (Figure 8.3) could accommodate these and other issues to measure women's empowerment through ICT intervention both in Bangladesh and other countries.

9.7. Concluding Comments

The conclusion arising from this research is that, for the potential of ICT for women's empowerment to be harnessed to the maximum, there is a need for women to share their knowledge, strategies and situations in order to inform policy makers and

develop activities to address their needs. Support from NGOs and government institutions is essential to reach poor and vulnerable women to work together in disseminating appropriate information to the communities using ICT centres and village information systems. While this support is essential, it must be accompanied by a proactive involvement from the women that will be impacted in micro/meso/macro environments. It is crucial that the processes of empowerment are understood by women, including their position and power relations, participation, capacity building, and strengthening their knowledge base.

In Bangladesh there are many limitations and barriers to women using ICT. Through intermediary organizations such as health centres, NGOs, women's employment centres, schools, libraries, and community centres, awareness could be developed and women could be empowered through using ICT.

This study has shown that, in Bangladesh, women are increasingly deviating from traditional family power relations, developing aspirations, and challenging prevailing gender discrimination by exposing themselves to information and exercising behavioural changes. The participants demonstrated emerging awareness of female children's education, information on social and health issues, women's right and other livelihood issues. These changing attitudes are promising for the future of women's empowerment through ICT in rural Bangladesh.

APPENDICES

Questionnaire

ICT Indicators Individual Level Survey Questionnaire

(Information to be provided will exclusively be used for research purpose)

School of Information Technology, Murdoch University, Australia

General survey data (fill in questions 1 to 9 prior to starting the interview)

1. Date of interview _____

2. Name of interviewer _____

3. Name of village _____

4. Name of district _____

5. Level of telephone service coverage in the village (circle the appropriate item).

       i. No local access

      ii. Only mobile service provider

     iii. Low- only fixed line

     iv. Medium- fixed line + 1 mobile service provider

      v. High- fixed line +2 or more mobile service provider

6. Access to electricity of the village   Yes   No

If Yes, when it's available (circle the appropriate item).

       i. morning

ii. afternoon

iii. evening

7. Distance to main market centre from the village   _____   kilometres

8. Type and condition of road in the village (circle the appropriate item).

   i.   Paved ii. Unpaved   iii. Walking road iv. River bank v. other (specify)

9. Is the ICT centre accessible during rainy season?   Yes   No

The interviewee of the questionnaire is rural women who are the beneficiaries of ICT project

1. Demographic information

a. Code of interviewee _____

b. Name of ICT project if involved _____

c. Approximate age of the participant (circle the appropriate age range).

       i. <20

      ii. 21-30

     iii. 31-40

     iv. 41-50

     v. > 50

d. Do you know how to read and write?

        Yes   No (Why/Have you ever been to school?)

If yes, what is the highest level of education that you achieved? (circle only in one

number indicating the highest level of education mentioned)

     i. Non-formal schooling

    ii. Primary school (classes 1-5)

   iii. Lower secondary (classes 6-8)

   iv. Secondary school (classes 9-10)

    v. Higher secondary school (11-12)

   vi. Post secondary, diploma, degree

e. Other qualifications (i.e. training on farming, poultry, handicrafts or any small business).

_____

f. Marital status (circle the appropriate status).

    i. Single

   ii. Married

  iii. Widowed

  iv. Divorced

   v. Other (specify)

g. Religion

   i. Islam

  ii. Other(specify if you want to)

h. Employment (if any)

   i. Teaching

  ii. Farming

iii. Small business

iv. Poultry and livestock

v. Handicraft

vi. Other (specify)

i. What would give you more status in society?

    i. Money,   ii. Education   iii. Family background   iv. Other(specify)

j. No. of children and their age and sex _____

k. Total no. of family members.

   (Write in numbers of each age group)

          Children (<18)   _____

          Adults (>=18)   _____

l. How many of these people are:

   (Write in numbers for each)

          Depending on you for financial support   _____

          Supporting you financially _____

2. Details of involvement in the project

a. Length of period within the project _____years_____months
b. Purpose of involvement in the project_____
c. Involvement in the project
   i. Direct
   ii. Indirect (e.g. project people come to you and help with information)

d. Training obtained within the project

Type/name of training	
Length of training	

e. Level of satisfaction with involvement in project (Circle the answer)

    i. Very satisfied

    ii. Satisfied

    iii. No change (i.e. neutral or unable to judge)

    iv. A little satisfied

    v. Not satisfied

3. Are you involved in any other project

        Yes   No

a. If yes, Length of period within the project _____years_____months

b. Purpose of involvement in the project_____

c. Involvement in the project

    i. Direct

    ii. Indirect (e.g. project people come to you and help with information)

d. Training obtained within the project

Type/name of training	
Length of training	

e. Level of satisfaction with involvement in project (Circle the answer)

    i. Very satisfied

    ii. Satisfied

iii. No change (i.e. neutral or unable to judge)

iv. Little satisfied

v. Not satisfied

4. Reasons for using ICT (mobile phone/computer/Internet)? (tick all applicable)

Reasons for using ICT	Mobile phone	Computer	Internet
i. Increase income			
ii. For employment			
iii. To have higher status			
iv. To have financial independence			
v. To utilize/improve education			
vi. To communicate			
vii. To have security in life			
viii. To get more information about daily life			
ix. To enhance standard of living			
x. To serve the people/community			
xi. Any other, please specify			

5. Personal issues related to project involvement

a. Distance from house to ICT centre? (Circle approximate distance)

i. Less than 5 km

ii. 5 km–10 km

iii. 10km–15 km

iv. More than 15 km

b. Mode of transport (circle the answer)

   Public: Bus

   Train

   Shared auto

   Boat

   Private: 2-wheeler

   Rickshaw

   Dropped by family member

   Walk

c. In the family who encourages/ supports you in taking part in the project?

d. Any conflict faced by you in the family due to taking part in the project?

   Yes____ / No ____ / Prefer not to answer_____

   If Yes, would you like to share the nature and area of conflict/stress.

e. Time management:

   Usually, how many hours do you spend on housework? (e.g. cleaning, cooking, etc.)   0-4   5-8   9-12   Others   hrs/day

   How many hours do you spend in information centre?

   <1,   1-2,   2- 4,   >4   hrs/day

f. Do you spend time on formal education your children (e.g. helping homework?)

Yes   / No

If Yes, specify the amount of time/day spent on this activity.

                  <1,   1-2 ,   2-4,   >4   hrs/day

g.   Do you have a helper for child at home?   Yes   No

      If yes, is the helper paid?   Yes   No

      If yes, who pays?

h.   Have your children completed secondary education?

      Yes   / No

      If not, do you plan to send them to secondary education?

      Yes   / No

i.   Number of sons and daughters have completed secondary education

      Sons _____ Daughters_____

      or will be completing secondary education in future

      Sons _____ Daughters_____

6. Material Dimension

Some of the changes that are said to occur in women's lives since their involvement in the ICT project are listed below. Have any of these things changed for you? *Please tick on changes experienced by you such as much better (MB), better (B), No change(NC), worse(W) or Much worse(MW).*

a. Economic security

Economic security	MB	B	NC	W	MW
i. Able to get employment					
ii. Able to improve or expand business					
iii. Income has increased					
iv. Able to repay debts					
v. Increased economic security					

b.   Acquisition of assets

Do you personally own any of the below? (circle all applicable)

i. Land   ii. House   iii. Jewellery   iv. Cattle v. Two wheeler vi. Others

(please specify)

c. Where do your assets mostly come from (circle all applicable).

i. Own family   ii. Husband's family   iii. You have earned   v.

Others (please specify)

d. What is the approximate value of your assets?

i.   Less than 50,000 Tk

ii.   50,000 Tk-100,000 Tk

iii.   100,000 Tk–150,000 Tk

iv.   More than 150,000 Tk

e. Is the house/land you are living in:

i. Owned   ii. Mortgaged   iii. Rented   iv. Leased

f. Are you liable yourself for any loan/debt?

Yes   / No

If yes, amount borrowed:

   i. Less than 50,000 Tk

   ii. 50,000 Tk-100,000 Tk

   iii. 100,000 Tk–150,000 Tk

   iv. More than 150,000 Tk

g. Are you able to save any amount of money?

Yes   / No   If yes how much you can save approximately   _____/month.

h. What is your approximate individual contribution to the total family income (circle

  in approximate percentage range)

   i. 100 %

   ii. 76-99%

   iii. 51- 75 %

   iv. 26-50 %

   v. 0-25%

   vi. None

7. Cognitive Dimension (women's knowledge and awareness)

a. Could you indicate if the following issues have got better or worse since joining the ICT project? *Please tick on changes experienced by you such as much better (MB), better (B), No change(NC), worse(W) or Much worse(MW).*

Cognitive change	MB	B	NC	W	MW
i. Health of your own children					
ii. Education of children					
iii. Level of own knowledge and education					
iv. Management/supervisory skills (e.g. can supervise a group of people)					
v. Entrepreneurial skills (e.g. can create a new business)					
vi. Communication and social skills					
vii. Importance in the family					
viii. Knowledge of legal issues					
ix. Relationship with family members					
x. Relationship with friends					

8. Perceptual Dimension

a. Some of the changes that are said to occur in women's confidence level are listed below. Have any of these things changed for you?) *Please tick on changes experienced by you such as much better (MB), better (B), No change(NC), worse(W) or Much worse(MW).*

	Perceptual change	MB	B	NC	W	MW
(i)	Confidence to speak out					
(ii)	Self-esteem					
(iii)	Self-awareness					
(iv)	Dignity					
(v)	Feeling of freedom					
(vii)	Free from dominance by other family member					
(vii)	Independence(e.g. willpower)					

9. Relational Dimension

a. Area of decision-making:

Decision making power is an indication of women's empowerment. *Beside each of the statements presented below, please indicate whether you decide (ID), consult and decide (ICD), you discuss and decide together with your spouse (WCD), you are consulted (C) or you are not consulted (NC).*

	Decision making	ID	ICD	WCD	C	NC
(i)	Bank account / borrowing					
(ii)	Amount of savings					
(iii)	Decision on non-budgeted expenditure					
(iv)	Maintenance of family income					
(v)	Control over personal salary					
(vi)	Purchase of furniture /consumer durables					
(vii)	Clothing for the family					
(viii)	Entertaining guests					

(ix)	Family outings					
(x)	Family budgets (i.e. monthly expense)					
(xi)	Family celebrations					
(xii)	Decision on health care					
(xiii)	Children's education					
(xiv)	Children's marriage					
(xv)	Helping/supporting own maternal home					

b. Spouse's co-operation

Some of the changes that are said to occur in women's life in terms of husband's cooperation level are listed below, have any of these things changed for you?

Please tick on changes experienced by you such as much better (MB), better (B), No change(NC), worse(W) or Much worse(MW).

	Husband's cooperation	MB	B	NC	W	MW
(i)	Husband's sharing household work					
(ii)	Husband's taking care of children					
(iii)	Husband is more willing to listen any problems					
(iv)	Freedom to wear a dress or sari without husband's consultation					
(v)	Freedom to buy a dress or sari without husband's consultation					
(vi)	Freedom to buy small jewellery without husband's consultation					
(vii)	Freedom of purchase without husband's knowledge					
(viii)	Freedom to go any place without					

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	husband's knowledge					
(ix)	Freedom to go out any time without husband's knowledge					

c. At community level

Some of the changes that are said to occur in women's lives in community level are listed below. Have any of these things changed for you? *Please tick on changes experienced by you such as much better (MB), better (B), No change(NC), worse(W) or Much worse(MW).*

	Changes at community level	MB	B	NC	W	MW
(i)	Respect from the villagers					
(ii)	Participation in decision making in village					
(iii)	Participation in social or cultural activities					
(iv)	Involvement in state-governed politics					
(v)	Power as a voter					
(vi)	Participation in organization					
(vii)	Involvement with women's issue					
(viii)	Access to medical facilities					
(ix)	Access to drinking water, fair price, irrigation facilities, and other livelihood services					
(x)	Ability to communicate with higher authority					

d. Are you a member of any organization?

Yes / No

If yes, is it:

Government Organization / Non-government Organization

(Specify name(s))

1. . . . .

2. . . . .

10. Technological Dimension

a. How often have you used the following information and communication services since your involvement with ICT project? *(Indicate level of use in the corresponding box as not used (NU), less than once a month (LOM), more than once a month (MOM), once or more than once a week (MOW), once or more than once a day (MOD).)*

	Communication service	NU	LOM	MOM	MOW	MOD
(i)	Radio					
(ii)	TV					
(iii)	Fax					
(iv)	Phone kiosk					
(v)	Mobile phones					
(vi)	Private fixed line Phone					
(vi)	Short message service					
(viii)	Email/ internet					
(ix)	Personal computer					

b. Information needs of rural women

(Please indicate which information you need and the level of importance in your life such as not important (NI), not very important (NVI), no opinion (NO), important (I) and very important (VI))

	Information need	NI	NVI	NO	I	VI
(i)	Farming					
(ii)	Business					
(iii)	Market price					
(iv)	Employment					
(v)	Social information (family, friends and social events)					
(vi)	Emergencies					
(vii)	Healthcare					
(viii)	Government and political					
(ix)	Legal issues					
(x)	Education					
(xi)	Weather/ natural calamities					
(xii)	News					

c. Which means of communication you most commonly use to access the information above, please specify?

    i. Face to face contact

    ii. Local leaders

    iii. Radio

    iv. TV

    v. Newspaper

      vi.   Village information System

     vii.   Phone

    viii.   Internet

      ix.   SMS

       x.   Letters

d. When did you or someone in your household acquire a mobile phone?

       i.   More than 2 years ago

      ii.   2 years ago

     iii.   During last year

     iv.   Do not own a mobile

e. How do you communicate by mobile phone if you do not have your own mobile

   phone?

       i.   Borrow a phone and then use

      ii.   Ask a mobile phone owner to call a number and then talk

     iii.   Mobile phone kiosk

     iv.   Do not use mobile phone

f. How do you mostly use mobile phone?

       i.   Call back
      ii.   SMS
     iii.   Call

g. Do you have any email account?

   Yes / No.

h. Do you know how to browse internet?

   Yes / No / Never used

i. Do you think use of ICT (mobile/computer/Internet) is important in your life?

   Yes   No

   If Yes, then please explain why. And if No, you can also tell us the reason.

11. Overall Empowerment

a. If your husband were unable to support you, would you be able to support yourself

   and your children?

   Yes / No / Not sure

   If your answer is "No" is there someone else you could rely on for support?

   Yes / No

b. Please answer the following questions as more, same and less with some

   comments since your have been involved in the ICT project.

	Overall Empowerment	More	Same	Less	Comments (e.g. why or how)
(i)	Do you feel less fear about future?				
(ii)	Do you have freedom to choose your own way of life?				
(iii)	Are you more informed about politics and legal rights?				
(iv)	Do you feel included in your local community?				
(v)	Do you feel confident to speak out your opinion?				

Thank you very much for your time.

---- END OF QUESTIONS ---

APPENDIX II

Email Communication with D.Net

Date: Wed, 4 Jun 2008 11:53:36 +0600 [04/06/08 13:53:36 WST]
From: Meherun Nesa <meherun@dnet.org.bd>
To: 30744584@student.murdoch.edu.au
Subject: Re: [BULK] Research on Women empowerment using ICT tools

Dear Zebunnessa Laizu,

I am Meherun here from D.Net, Bangladesh. I am working as a law and human rights
expert in D.Net helpline. Take my warm greetings. D.Net is working with the
village community. Its main objective is to upgrade the life of whole Bangladeshi
community by using the ICT. To develop the rural women's life is also one of the
parts of D. Net's activities. Mobile lady collects the problems of the villagers
and she helps them to communicate with the helpline experts of D.Net. Mobile lady
are especially helpful for women and people of old ages. Women are not used to go
outside of home so, they are deprived of information. This is a great barrier for
their (women) development. Mobile lady performs a wonderful role to reach
information before them (women). In this way the backward section are getting
benefits of ICT. The Villagers also come to the Pallitathya Kendro (D.Nets, local
office in that relevant area). There they can use mobile phone or Internet to send
their queries to the helpline experts and helpline experts provide prompt solution
of their problems. We have pallitathya kendro in Bagerhat, Satkhira, Jhinaidoho
also. When you will visit Bangladesh you are invited to our Dhaka office. If you
come to our office we will try our best to support you. Do you meet or talked to
anybody from D.Net? Please inform me about this. Because, this is the first mail I
get from you. You are most welcome.

Thank you.

Sincerely

Mst. Meherun Nesa

Program Officer

D.Net (Development Research Network)

6/8 Humayun Road, Block- B Mohammadpur

Dhaka- 1207, Bangladesh.

----- Original Message ----- From: "info" <info@dnet-bangladesh.org>
To: <bably@dnet.org.bd>; <meherun@dnet.org.bd>
Sent: Wednesday, June 04, 2008 9:56 AM
Subject: Fw: [BULK] Research on Women empowerment using ICT tools

[Hide Quoted Text]

  ----- Original Message ----- From: "Zebunnessa Laizu"
  <30744584@student.murdoch.edu.au>
  To: <info@dnet-bangladesh.org>
  Cc: <zlaizu@yahoo.com>
  Sent: Wednesday, June 04, 2008 9:17 AM
  Subject: [BULK] Research on Women empowerment using ICT tools

Dear Sir/Madam,

I am Bangladeshi now staying in Australia.

I have came to know about your D.Net from website. i am doing my PhD research
on Bangladesh to see the impact of ICT(mobile, internet, computer) on the life
of rural women, and I found that your organization is working on this issue
such as mobile lady program in villages.

For the preliminary survey, i am coming to Bangladesh on November 2008 to
select the field area and suitable project. I hope you would support me
regarding this issue.

please help me with information and choosing projects. My hometown is Khulna
and my husband's home at tangail. is there any field or program nearby? After
coming home, I would surely visit your office. my Husband also worked in NGO,
called Action-aid Bangladesh for 5 years.

Is there anything related to policy or money related issues I have to do from
my University, please let me know?

Sincerely
Zebunnessa Laizu
PhD student
Murdoch University

Dear Zebunnessa Laizu,

I think you can conduct your study both in Mongla Upazila (intervention started from September 2005) and Baitpur, Sadar Bagerhat (intervention started from July 2007). During sampling, you may include those women who received livelihood information using ICTs, different IT based services, IT skills training from the Pallitathya Kendra (Rural Information Centre).

Following research articles, monographs, working papers may help your study. Please visit www.bdresearch.org.bd to collect the articles, monographs etc. You need to subscribe first to download full papers. You need to pay to download some of papers from the website.

Please click on "D.NET PUBLICATION" for the following articles.......

1. Pallitathya Help Line A Precursor to People's Call Center

2. Access to Information for Improvement of Rural Livelihood Experience from Nilphamari, Bangladesh

3. ICTs and Access to Information: How to Make it Work for Promoting Human Rights

4. Pallitathya: An Information and Knowledge System for the Poor and Marginalised Experience from Grassroots in Bangladesh

5. Computer Learning for Underprivileged Rural Youth: A Critical Reflection of D.Net's Intervention

6. Bridging Digital Divide for Rural Youth: An Experience from Computer Literacy Programme in Bangladesh

7. Accessing Finance and Women led ICT Enterprises : A Policy Agenda

You may hire rural youths or staffs of Pallitathya Kendra for the survey as well as for data entry. Please don't worry about their qualification. You will get lots of IT skilled youths in the rural area. Rural youths will get the opportunity to develop their skills from this kind of research. This initiative from you will add a value in the community as well as in your study. You may also include the Khulna University graduates especially from the social science discipline in your study. As far I know, Khulna University graduates have limited attachment in the field of ICT for development. So, your study would create a opportunity for KU graduates to learn from the ground.

Regards,

Md. Forhad Uddin

Deputy Director
D.Net (Development Research Network)
6/8 Humayun Road, Block B
Mohammadpur, Dhaka
Tel: 88 02 8124976, 88 02 9131424

----- Original Message ----- From: "Zebunnessa Laizu"
<30744584@student.murdoch.edu.au>
To: "Forhad Uddin" <forhad@dnet.org.bd>
Cc: <zlaizu@yahoo.com>; "Meherun Nesa" <meherun@dnet.org.bd>; "Mosharrof Hossain"
<mosharraf@dnet.org.bd>
Sent: Friday, June 27, 2008 7:54 AM
Subject: [BULK] Re: Research on Women empowerment using ICT tools

[Hide Quoted Text]

> Dear Sir,
>
> Thank you for your kind reply and very supportive information.
>
> Actually my Topic of research is, "Role of ICT and women empowerment in rural
> Bangladesh". It is evident from many success stories around the world that ICT
> has the potential to empower people through enrich their knowledge. Rural women
> in Bangladesh can also be benefited from ICT because it can help them to know
> all kinds of information of their livelihood and in the long run which can also
> help them leading to empowerment.
>
> Though ICT in rural Bangladesh is in early stage, how can such intervention be
> successful in terms of socio-cultural context of Bangladesh is also my research
> question. Another issue is information need of women in rural areas and how to
> fill the gap will also be investigated.
>
> So, the above mentioned 3 topics are my preliminary research questions which can
> be chnaged or modified if needed according to circumstances. Please inform me,
> which of your projects are suitable(for example, mature enough to measure the
> impact) for my research investigation irrespective to location.
>
> I hope, at least 3 villages with women beneficiaries will be surveyed with ICT
> intervention and will be comapered with similar group without ICT. Sample size
> could be 150 in each case depending on convenience sampling.
>
> Please give me suggestions since there is no prior literature I found in this
> research area. There is no problem to get formal letter from my Supervisors or
> university.
>
> Thank you so much.
>
> Sincerely
>
> Zebunnessa Laizu
> Phd Student
> Murdoch University
>
>
>
> Quoting Forhad Uddin <forhad@dnet.org.bd>:
>
>
>> Dear Zebunnessa Laizu,
>>
>> Thank you for your interest on D.Net's ICT based programme for your study.
>> Please visit www.pallitathya.org.bd to know detail about rural level ICT based
>> initiatives of D.Net.

Mongla and Baitpur village in Bagerhat is close to your home town. You may select those areas for your study. You may also consider Chancra, Jessore/Kaliganj, Satkhira as a complimentary field. You can find more locations from www.pallitathya.org.bd; where D.Net's initiatives are running. I think, it will help you to identify the better field for your study. If you want to prefer the location other than Bagerhat, please share with me.

Approximate number of villages covered in Mongla 33 and in Bagerhat: 20.

From Pallitathya Kendra, women basically receive livelihood information

using computer, internet, mobile phone, audio-visual content materials and face-to-face consultation with experts. They also receive photography, composing, DV application etc.... Let me know, what kind of sample you want to draw from the locality. This information will help us to share with you, the number of female beneficiaries in both locations.

Can you please share your study concept (summary), which will help us to tell about the location (i mentioned) is how much appropriate for you. Actually, I can share the story of each location, which will help you to select the better regarding your study purpose.

We just need a letter/email from your university/supervisor describing your purpose and assistance you are expecting from D.Net. This is just a official requirement.

Hope the environment will favor you.

Regards,

Md. Forhad Uddin
Deputy Director
D.Net (Development Research Network)
6/8 Humayun Road, Block B
Mohammadpur, Dhaka
Tel: 88 02 8124976, 88 02 9131424

----- Original Message ----- From: "Meherun Nesa" <meherun@dnet.org.bd>
To: <forhad@dnet.org.bd>
Sent: Thursday, June 26, 2008 2:41 PM
Subject: Fw: Research on Women empowerment using ICT tools

   ----- Original Message ----- From: "Zebunnessa Laizu"
   <30744584@student.murdoch.edu.au>
   To: "Meherun Nesa" <meherun@dnet.org.bd>
   Sent: Tuesday, June 24, 2008 8:03 AM
   Subject: Research on Women empowerment using ICT tools

   Dear Meherunnessa Apa,

   Assalamu alaikum.

   Hope you are fine and in good health.

I need information about the field area where I can do survey for my research. For example, if i want to measure women empowerment(using ICT) in the villages where you have projects, how many women are involved there in each of your project? I need to know approximate sample size and number of villages.

My pre-field survey on November will be the selection of sample area,sample population and pre-testing of the questionnaire. I need your help so much. please reply me and let me know, whether your projects are good enough to survey or I should contact any other NGOs side by side.

I am interested in Shatkhira and Bagerhat district as it is near to Khulna, my hometown.

Just for your information, I was teacher in Khulna University from 1997 to 2002 before coming to abroad.

Waiting for your reply.

Thanking in advance

Zebunnessa Laizu
PhD student
Murdoch University
Australia

Email Communication with Amader Gram

Date:	Sat, 11 Oct 2008 20:25:28 -0700 (PDT) [12/10/08 11:25:28 WST]
From:	Reza Salim <rezasalim02@yahoo.com>
To:	Zebunnessa Laizu <30744584@student.murdoch.edu.au>
Cc:	info@amadergram.org
Reply-To:	rezasalim02@yahoo.com
Subject:	Re: Research on ICT for women empowerment in Bangladesh

2 unnamed [text/html] 2.13 KB

You arte most welcome. The only thing you need is a letter from your University to endorse you to study with us. There
will be no problem to assist you in field work; my colleagues will help you. I shall be in Khulna region from 16 October
too. Please make a call when you are ready- 01552 316972
Kind regards.

Reza Salim

--- On **Sun, 10/12/08, Zebunnessa Laizu *<30744584@student.murdoch.edu.au>* wrote:**
From: Zebunnessa Laizu <30744584@student.murdoch.edu.au>
Subject: Research on ICT for women empowerment in Bangladesh
To: info@amadergram.org
Date: Sunday, October 12, 2008, 7:41 AM

Dear Sir/Madam,

I am Bangladeshi now studying PhD in Australia.

I have came to know about your Amader gram online project from website. i
am doing my PhD research on Bangladesh to see the impact of ICT(
mobile, internet, computer) on the life of rural women, and I found
that your project is working on this issue.

For the preliminary survey, i am coming to Bangladesh on 15 October
2008 to select the field area and suitable project. I hope you would
support me regarding this issue. i would interview rural women involved
in ICT project to see the Impact of ICT in their lives.

Please help me with information and choosing projects. My hometown is
Khulna. I was lecturer in Khulna University during 1997-2002 in
Electronics and Communication. After coming home, I would like to visit
your office at Bagerhat and would like to research on your
beneficieries.

Is there anything related to policy or rules - regulations which I have
to do from my University, please let me know?

Thanking in advance.
Zebunnessa Laizu
PhD student
Murdoch University
Western Australia

NB: Please forward this email to proper person (i.e. director or
program officer) if you are not concerned about this.

Letter to D.Net from Supervisors

Faculty of Creative Technologies and Media
School of Information Technology

www.murdoch.edu.au

South Street, Murdoch
Western Australia, 6150
Telephone: 61-8 9360 2521
Facsimile: 61-8 9360 2941
http://wwwit.murdoch.edu.au/
CRICOS Provider Code: 00125J
ABN 61 616 369 313

2 October 2008

Mr Forhad Uddin
Deputy Director
D.Net (Development Research Network)
6/8 Humayun Road, Block B
Mohammadpur, Dhaka

Dear Mr Uddin

Assistance for Mrs Zebunnessa Laizu with her PhD research:
The role of ICT and women empowerment in rural Bangladesh

Mrs Zebunnessa Laizu, a PhD student of Murdoch University's School of Information Technology has been in contact with you regarding assistance with her research on ICT for women empowerment in rural Bangladesh. She will investigate the impact of ICT intervention in the lives of rural women. As part of her studies, she plans to survey women who are using ICT tools available through programmes supported by D.Net.

Mrs Laizu would be pleased to receive whatever support your organisation is able to provide in terms of access to sites and participants of D.Net initiatives in rural Bangladesh. Your advice regarding suitable villages for her study, as well as any other information you consider relevant would be highly appreciated.

Yours sincerely

Research Supervisors for Mrs Zebunnessa Laizu:

Associate Professor Fay Sudweeks

Dr Jocelyn Armarego

CRICOS Provider Code: 00125J
ABN 61 616 369 313

Consent Letters

Consent Letters were sent to NGOs, D. Net and Amader Gram. Researcher kept a

copy of the participant's consent, in accordance with requirements of the ethics permit.

Faculty of Creative Technologies and Media

School of Information Technology

South Street, Murdoch

Western Australia, 6150

Telephone: 61-8 9360 2521

Facsimile: 61-8 9360 2941

http://wwwit.murdoch.edu.au/

CRICOS Provider Code: 00125J

ABN 61 616 369 313

Dear Sir/Madam,

My name is Zebunnessa Laizu, and I am a PhD student of the School of Information Technology at Murdoch University in Western Australia.

I am currently engaged in a research project entitled *"The role of ICT: women empowerment in rural Bangladesh"*. The objective of this research is to explore how the use of ICT has the potential to improve or change the life of rural women in Bangladesh through existing ICT projects. Your project D.Net (Polli Tathay Kendra) has given me permission to investigate how their projects have been working for you and have influenced your life. I believe that as you are actively involved in this ICT project, you may be able to provide information that would be useful for my study.

Participation in this study is voluntary. It will entail an interview of approximately 30 to 45 minutes in length. You may decline to answer any of the interview questions if you wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, the interview will be audio-taped for verification of findings and future analysis.

The direct benefit to you for participating in this study is that you will have the opportunity to have better cooperation and improved information from the ICT project. There are no potential risks associated with participation in this research.

Please note that all data collected in this research will be held in the strictest confidence through the assignment of a coded identification number. Any information obtained from conversations between yourself and the researcher will be used exclusively for research purposes only.

If you are willing to participate in this study, could you please complete the details below. If you have any questions about this study, or about participating in this study, you may contact:

- o   me, as researcher on +61 8 9360 2612 or by email at zlaizu@gmail,.com

- o   my supervisor, Dr Jocelyn Armarego on +61 8 9360 7351 or by email at J.Armarego@murdoch.edu.au.

If you wish to talk to an independent person about your concerns you can contact Murdoch University's Human Research Ethics Committee on +61 8 9360 6677 or by email at ethics@murdoch.edu.au

I sincerely hope that you will be able to participate in this study.

Yours sincerely,

Zebunessa Laizu

"Role of ICT: Women empowerment in rural Bangladesh"

Participation consent

I have read the information presented in the information letter about a study being conducted by Zebunnessa Laizu of the School of IT at Murdoch University.

I acknowledge that this interview session may be taped.

I understand that I am free to skip any question, or to withdraw this consent and discontinue participation in this interview at any time.

I understand that my individual responses are confidential, and will not be released by the investigator.

Participant's Name: Investigator's Name:

Signature: Signature:

Date: Date:

Ethics Permit

Research Ethics Office
Division of Research and Development

www.murdoch.edu.au

Thursday, 11 September 2008

Dr Fay Sudweeks
School of Information Technology
Murdoch University

Dear Fay,

Permit No.	2008/197
Project Title	The role of Information Communication and Technologies (ICT): Women's empowerment in rural Bangladesh

Thank you for addressing the conditions placed on the above application to the Murdoch University Human Research Ethics Committee. On behalf of the Committee, I am pleased to advise the application now has:

OUTRIGHT APPROVAL

Permits are granted for three years. You will need to submit an annual report to the Research Ethics Office. Please note you are required to report immediately any unforeseen or adverse events especially if they might affect the ethical standing of the project. Once the project has been completed, please submit a Permit Closure Report. All forms are available on the Research Ethics web-site.

I wish you every success for your research.

Please quote your ethics permit number in all correspondence.

Kind Regards,

Dr. Erich von Dietze
Manager of Research Ethics

cc: Dr Jocelyn Armarego
        Zebunnessa Laizu

HREC Approval Letter 221107

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