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# Building Resilient Communities through Empowering Women with Information and Communication Technologies: A Pakistan Case Study

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**Abstract:** In the contemporary world, a revolution in digital technologies has changed our way of life—for better. The role of women is expanding in socio-economic, political and physical spaces; hence their empowerment will contribute toward resilience and capacity building that contributes to sustainability and disaster risk reduction in the long run. In developing nations, especially in rural regions, women empowered with information and communication technologies can enhance their capacity to cope in diverse situations. This paper addresses the vital role of information and communication technologies intervention and resilient communities with the help of a case study carried out in Pakistan.

**Keywords:** resilient communities; women empowerment; information and communication technologies; sustainability; disaster risk reduction

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## 1. Introduction

Disaster risk reduction and sustainable development are tightly linked with knowledge dissemination. Information and Communication Technologies (ICT) have a great potential for effective learning, knowledge dissemination, and development. They provide an overarching enabling platform for sustainable development processes. This paper is an attempt to demonstrate the role of

ICT in sustainable development through empowering women, and hence enhancing community resiliency in developing countries. The paper describes the meaning of ICT and issues around 'haves' and 'have-nots' in regard with ICT; analyzes the Community Technology Learning Centers (CTLIC), an innovative project commissioned by the Government of Pakistan to empower marginalized rural women in sixteen districts of the country, and the impact of the project; and compares the CTLIC project with a similar intervention initiated in Uganda in order to illustrate and validate the hypothesis that ICT greatly contribute to the process of women empowerment. All of the above is deeply connected with sustainable development, communities, their resiliency, and their ability to cope better in the event of disasters.

## 2. Information and Communication Technologies for Building Resilient Communities

Former Secretary General of the United Nations, Kofi Annan [1] made a remark during his tenure that said:

“New ICT are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, there is a real danger that the world’s poor will be excluded from the emerging knowledge-based global economy.”

Annan’s remark reflects both, optimism and scepticism about the role and impact of ICT. While optimists point to the surge of economic growth in developing countries associated with the emergence of digital technologies (methods for communication including communication protocols, transmission techniques, communications equipment, media), as well as techniques for storing and processing information (computing, data storage, *etc.*), pessimists worry about the possibility of unequal access to such technologies [2]. Many other thinkers express their concern over cost and benefit issues [3]. ICT could certainly produce greater freedom and social participation of masses, contributing to sustainable environment. For instance, ICT eliminate physical barriers and distances by allowing people to communicate freely with each other from inaccessible locations. In addition, the Internet and the worldwide web (abbreviated as www and commonly known as ‘The Web’, is a system of interlinked hypertext documents contained on the internet) have provided rural populations of the developing countries with unlimited access to rich resources around the world. People can now communicate through digital technologies regardless of their location, social class, age, gender, ethnicity, and religion—thus reducing social vulnerability and disaster risk as a result. It is also possible that different kind of social inequalities and new forms of concentration of power could be created in this process. So far, ICT have created gender disparity as women in the developing world often have far less opportunities to access to and benefit from digital technologies [3]. The gender disparity exists primarily due to women’s lower socioeconomic, cultural and political status in a patriarchal society, which is also rural and under-developed.

The Canadian International Development Agency (CIDA) describes ICT as compendiums of technologies that can be used to store, retrieve, exchange, relay and share information. The term refers to new (since the 1990s) technologies including Internet, cellular telephony, Geographic Information System (GIS), Cable TV, and multimedia. ICT also include the traditional technologies like

telecommunications, telegraphy, telephony and broadcasting which have existed for well over a century and have been catalysts for social and economic development in the past [4]. For instance, radio and television significantly helped in disseminating and promoting literacy, information on agriculture, health and socio-cultural networks. As ICT have changed our way of life, their role in the process of sustainable development, empowerment of women, and disaster risk reduction has come into the spotlight. They are increasingly penetrating all areas of economic and social activity while a new form of economy and information society is emerging [5]. The Internet and the worldwide web are not only used for provision of civic services through e-Government (online government), but also for promotion of education, effective communication, business/monetary transactions, and employment.

A rapid growth in the development and distribution of ICT has been noticed within past two decades. However, disparities in accessing ICT around the world still exist. These disparities reflect broader socioeconomic divides, many of which exist within societies: for example, the divide between men and women, rich and poor, young and old, urban and rural, and literate and non-literate [4,6]. The gap between those who can access ICT and those who cannot is known as the digital divide. Unequal sharing of knowledge can lead to ‘information and knowledge poverty’ among certain groups. The current lack of access to the internet for people in the developing world is creating a new form of poverty—information poverty—which is making it harder for them to stay abreast and well informed of new knowledge. There is a consensus in the literature that the gap between the information-haves and have-nots will widen in the new digital age. Development practitioners/managers, academics, NGOs, international agencies and governments are engaged in mobilizing their efforts to reduce this digital divide.

With the emergence of ICT, there is now a strong correlation in the quest for an inclusive and equitable information society and the effort to achieve the Millennium Development Goals (MDGs). The MDGs are eight international development goals that 192 United Nations (UN) member states and at least 23 international organizations agreed to achieve by the year 2015. There are eight goals with 21 targets, and a series of measurable indicators for each target. They include reducing extreme poverty, reducing child mortality rates, fighting disease epidemics, and developing a global partnership for development. This paper addresses ‘Freedom from Want: The Development Agenda’, enunciated at the UN’s Millennium Summit in 2000. More specifically, it is about Building Digital Bridges [7,8]:

“To review their policies in order to remove regulatory and pricing impediments to Internet access, to make sure people are not denied the opportunities offered by the digital revolution. Private Sector: to develop strong partnerships with the private sector, at both national and international levels, to combat poverty in all its aspects.”

The ICT literature divides countries into three different categories: (a) innovators or leaders, (b) adopters, and (c) excluded or latecomers [2]. Developing countries fall into the last category, as rural women of developing countries are yet to find their place in newly formed socioeconomic and information networks. Digital exclusion may have far-reaching consequences against these women so they should be included in the communication processes [6]. A sizeable gender gap exists between women’s and men’s participation in the information and knowledge society [9] in which the creation, distribution, diffusion, uses, integration and manipulation of information is a significant economic,

political, and cultural activity. Henwood's [10] initial focus was on increasing female participation in the use of technology but he, later acknowledged that women need to be producers of the technology as well as users [11]. Women have been robbed of the history of female technical initiative, imagination and invention [12]. During the industrial revolution, women made significant contributions to technological developments. Women have been largely excluded from the field of technology, and they are under-represented in digital technology jobs and over-represented in auxiliary jobs [6] like data entry operators. While evidence suggests, that globalization has given some employment opportunities to skilled and educated women, generally its impact on the gender division of labour in developing countries has been negative. Women continue to be assigned the jobs with the lowest skilled level of work and lowest remuneration [13]. ICT could turn the situation around and instead end gender inequality and bring about empowerment.

The concept of empowerment is difficult to define [14]—it is a process that is becoming a tool for analysis [15]. The process of empowerment is dynamic and multidimensional in nature, and various approaches and frameworks have been developed by academics and practitioners to assess it. Increased women's access to and control over productive resource and greater participation in decision making process will bring about empowerment for them. The question of choice is fundamental to measuring women's empowerment. Her comprehension of choice comprises three interrelated components: *resources*, the conditions under which choices are made; *agency*, which is at the heart of the process through which choices are made; and *achievements*, the outcome of choices [16]. Perceptions, relationships, and power are also vital elements of empowerment [17]. Empowerment is a process whereby constraints that obstruct equal participation are reduced so that inequality starts moving towards becoming equality.

Women are not simply a group amongst several disempowered groups such as, poor, ethnic minorities, disable individuals *etc.* Social relations such as, household power relations are central to women's disempowerment. Therefore, policy actions must be defined at the household level [18]. Dr. Akhtar Hameed Khan, the inventor of micro-credit, emphasizes the need for improving skills through training, as he refers to a well-known proverb "Give a man a fish and you feed him for a day—teach a man to fish and you feed him for a lifetime". Training in ICT has contributed to expanding income generating opportunities by providing new forms of employment opportunities [19]. For example, the Credit Society of Medchal (Andhra Pradesh, India) have been training its women members on digital literacy and encouraging them to start computer training centers as business propositions [20]. These efforts will eventually lead to more resilient and sustainable households, and would be better equipped in the face of disasters as well.

A typical Pakistani woman grows up in a fairly sheltered environment, where most of the decisions concerning her life are made by others [21]. Feminist notions of empowerment do not see women as beneficiaries and/or participants but as acting agents. The notion of power can be understood as follows [22,23]:

- *Power over*: control over someone and/or something (response: compliance, resistance, or manipulation);
- *Power to*: power that creates new possibilities without domination;
- *Power with*: generating a feeling that action as a group is more effective; and

- *Power from within*: sense of inner strength.

The term empowerment has many definitions and it may mean different thing to different people. Cultural and geographical environments play a vital role in defining and understanding empowerment, but it is best when self generated. The concepts of women empowerment, gender equality and gender equity are separate, although closely related to each other. The efforts to bring about sustainable development through empowering women must integrate conventional approaches with innovative technologies including ICT. The impacts of ICT-based enterprises should be considered in relation to women's role in income generating as well as their childcare responsibilities along with community roles that are often unpaid [10].

### 3. Community Technology Learning Centre Project

Pakistan government was one of the first in the world to set up the National Commission for Human Development (NCHD) devoted to achieving the Millennium Development Goals (MDGs) in year 2002. NCHD is a public sector human development organization established in 2002 through a presidential ordinance. It was mandated by the government of Pakistan to promote human development activities in the country by supporting local governments, NGOs, and other actors in developing primary education, literacy, income generating activities, and basic health care services, particularly for women. Keeping in mind that ICT projects can unintentionally marginalize women further [6], the NCHD, in collaboration with local governments and Microsoft Corporation commenced the Community Technology Learning Centers (CTLC) project as a pilot intervention. The project aimed at two goals enunciated at the United Nations Millennium Summit in 2000—to promote gender equality and to empower women—by making available the benefits of new technologies, particularly ICT. In 2004, sixteen CTLC in sixteen remote districts were established across the country (Figure 1), particularly focusing on improving the living conditions of rural women. The local governments provided their buildings/spaces, financial grants, and political and moral support. Microsoft supplied the hardware, software and a curriculum designed to promote digital literacy. With many objectives both implicit and explicit, the CTLC project aimed to do the following for its female participants:

- To impart quality ICT training in labs equipped with state of the art facilities;
- To reduce the digital divide and lessen the gender disparity;
- To inculcate life skills among women allowing them to acquire marketable skills,
- To enable underserved women to avail ICT opportunities for decent livelihoods.

For the purpose of sustainability and accounting for the needs of rural women, the curriculum was taught by local women trained as master trainers. While imparting basic digital skills, the master trainers were also engaged in various activities to inculcate necessary life and employment skills among the participants. The concept of 'access to resources' [24] can be seen here in applied form, validating the theory of disaster risk management.

**Figure 1.** The sixteen remote districts shown in white spots where the Community Technology Learning Centres (CTLTC) were established across Pakistan.



After completing the above described course, the women received training in data transcription and were engaged (paid work) in a data entry project, which not only provided them with an opportunity to earn a decent livelihood, but also offered an extraordinary chance to put their skills to practice. The CTLTC project also imparted training to the female school teachers of the local governments. In three years, over 2,500 women were successfully trained. A follow up study was conducted by the first author to assess the impact of the intervention. The data was collected during 2006 and analyzed in 2009.

#### 4. Research Methodology to Assess the Impact of CTLTC Project

In order to assess the impact of the project, two structured questionnaires were administered. Appendix A presents the list of questions asked in the two questionnaires. The first questionnaire was

directed towards CTLC graduates, while the second was developed to obtain responses from the graduates' parents/relatives/friends. To measure empowerment, the questionnaires incorporated a number of variables that were developed in accordance with the Empowerment Framework [17]. The framework measures empowerment by categorizing different variables into four conceptual pathways: the *material* pathway covers changes in access to or control over material resources such as level of income; the *cognitive* pathway is concerned with how far participants' skills, knowledge and awareness of the wider environment have changed; the *perceptual* pathway encompasses changes in self-confidence, self-esteem and vision of the future as well as recognition by other; and *relational* pathway refers to the impact that an intervention may have had in changing decision-making roles, dependence on others and mobility.

National language, Urdu was used to reduce language barriers, as different dialects and languages are spoken in the study area. For accuracy and consistency, the data was collected through personal interviews. Out of the total number of project participants (N = 2,500), a random sample of sixty eight (n = 68) respondents was selected from seven districts in four provinces for statistical analysis. The random sample of smaller number was chosen for the purpose of feasibility, and age and time constraints. Generally, the participants were between the ages of 16 and 40 years, with diverse socio-economic and cultural backgrounds and education levels ranging from middle school to postsecondary level. The authors, however, would like to expand this research and analysis to at least two more random samples. Analysis of data using the Empowerment Framework is presented below:

**Pathway-I Material:** empowerment is the expansion in people's abilities to make life choices in a context where this ability was denied to them earlier. While distinctions such as those between resources, agency, and achievements or sources versus evidence of empowerment seem clear at the conceptual level, it is not always easy to categorize real experiences while developing empowerment indicators [23]. A given variable may function as an indicator of women's access to resources (or an enabling factor) in one context and an achievement in another. In Pakistan, ICT micro-enterprises, NGOs, public and private sectors are engaged in providing training in computers and data transcription and work opportunities. Interestingly, women equipped with basic ICT skills are often preferred to men by potential employers due to the fact that women are considered as productive, hardworking and responsible.

About 87% respondents agreed that they got their work opportunities due to their ICT training they had received. Data transcription work was found to be in demand and paid a decent salary. The analysis provides ample evidence to suggest that the ICT skills assisted the participating women in expanding their economic independence, security, and resiliency. For instance, a trained woman received an ICT related job with the local government with a decent starting salary of 6,000 Pakistani Rupee (approximately US\$80) per month. She also found an additional part time work that paid her about US\$40 per month.

**Pathway-II Cognitive:** cognitive impact relates to the degree of change in a trainee's skills, knowledge and information as a result of their participation in the intervention [14]. To assess the impact, the following indicators have been analyzed:

- *Knowledge and information*: parents/relatives/friends of graduates were asked whether they had observed any change in the amount of knowledge and information held by their daughter/sister/friend after training. An overwhelming 73% agreed to high-very high increase in knowledge and information, only 27% observed a 'medium' level change, and interestingly, no one chose the 'low' option. The increase in amount of knowledge and information helped changing self-perception of the women. To some extent, it also brought awareness of the implications of coercion amongst them.
- *Life skills*: 83% CTLC graduates agreed that they significantly improved their lives, 11% felt that their lives improved just a little, and 6% thought that their lives were not at all improved. The findings of the study suggest that the life skills learnt by the women noticeably increased their sense of rights and duties, both as citizens and as members within their families, thus improving their social relations. The theoretical concept of coping capacity in disaster management literature [24] is validated here.

**Pathway-III Perceptual:** perceptual impact relates to the degree of change in a graduate's sense of *self-confidence* (Table 1), self-reliance, self-esteem and their vision of the future after the training [14]. About 40% responses from the parents/relatives/friends of the participating women suggested 'very high' level of positive change, 47% said 'high', and only 13% were a 'medium'. Two main causes for the enhancement of confidence level were the quality of the training and exposure to ICT. In regard with *capacity or ability* improvement, majority (88%) of parents/relatives/friends of the participating women said that they had observed 'a lot of change', only 12% reported 'little change'. Enhancement of capacity/ability contributed to participating women's economic independence, expansion of mental spaces, emergency preparedness, and empowerment.

**Pathway-IV Relational:** refers to the impact that an intervention may have had in changing decision-making roles, dependence on others and mobility [14]. Self-perception brings awareness of the implications of coercion amongst the women. In the context of awareness and sensitivity, parents/relatives/friends were asked whether they observed any change in their daughter/sister/friend after the training. About 81% said that she was more conscious and sensitive to her rights, and 19% indicated 'little change'.

The finding suggests that easy access to information through the Internet and worldwide web played crucial role in reducing women's physical barriers. Another indicator in this category was mobility acquiring opportunities. In this context, participating women were asked whether they would be allowed by their parents/husband/guardian to move to another town to avail a job opportunity. Only 17% said that they would accept the job offer in another city, while 28% indicated that they would accept the job but could not move to another city, and 55% said that they would accept the job offer but they would not be allowed to move to another city alone. Contrary to other variables, the finding suggests that women were not able to significantly break the physical impediments, primarily due to the socio-cultural predicaments. However, there is some evidence suggesting that the ICT did help some graduates in acquiring jobs in nearby towns. The women who commuted from nearby villages to the CTLC while travelling 2–3 hours daily to attend the training reflects their keenness to learn new technologies and the travelling in itself was an expansion in their physical space.

**Table 1.** An illustration of the statistical analysis showing parents' responses on *confidence-attitude change* relationship for the random sample population (7 districts in 4 provinces) using SPSS 15 (<http://www.spss.com/software/statistics/>).

Province	District				Attitude change		Total
					Yes	No	
Punjab	Attock	Confidence	Very high	Count		3	3
				% within confidence		100%	100%
		High	Count	5		5	
			% within confidence	100%		100%	
		Medium	Count	2		2	
			% within confidence	100%		100%	
	total	count	7	3	10		
		% within confidence	70%	30%	100%		
	Gujrat	Confidence	Very high	Count	4		4
				% within confidence	100%		100%
		High	Count	5		5	
			% within confidence	100%		100%	
Medium		Count	1		1		
		% within confidence	100%		100%		
total	count	10		10			
	% within confidence	100%		100%			
NWFP	Mansehra	Confidence	Very high	Count	1		1
				% within confidence	100%		100%
		High	Count	6		6	
			% within confidence	100%		100%	
		Medium	Count	1		1	
			% within confidence	100%		100%	
	total	count	8		8		
		% within confidence	70%		70%		
	Mardan	Confidence	Very high	Count	2		2
				% within confidence	100%		100%
		High	Count	6		6	
			% within confidence	100%		100%	
Medium		Count	2		2		
		% within confidence	100%		100%		
total	count	10		10			
	% within confidence	100%		100%			

Table 1. Cont.

Province	District			Attitude change		Total	
				Yes	No		
Sindh	Thatta	Confidence	Very high	Count	7	1	8
				% within confidence	87.5%	12.5%	100%
			High	Count	1		1
			% within confidence	100%		100%	
		Medium	Count	1		1	
			% within confidence	100%		100%	
		total		count	9	1	10
				% within confidence	90%	10%	100%
	Badin	Confidence	Very high	Count	4		4
				% within confidence	100%		100%
			High	Count	5		5
			% within confidence	100%		100%	
Medium		Count	1		1		
		% within confidence	100%		100%		
	total		count	10		10	
			% within confidence	100%		100%	
Balochistan	Pishin	Confidence	Very high	Count	5		5
				% within confidence	100%		100%
			High	Count	4		4
		% within confidence	100%		100%		
	Medium	Count	1		1		
		% within confidence	100%		100%		
	total		count	10		10	
			% within confidence	100%		100%	

Note: Confidence \* Attitude Change \* District \* Province Crosstabulation.

## 5. Comparison of the CD ROM Project in Uganda and the CTLC Project in Pakistan

A CD ROM project entitled ‘Rural Women in Africa: Ideas for Earning Money’ was developed as part of the national policy agenda and was made a governmental priority in Uganda. The project was a response to the need for and access to information. The government of Uganda began implementing an ICT policy in 2002, and offered rural women direct access to information they badly needed to improve their productivity and socio-economic status. The project consisted of one introductory and three content sections. The introductory section comprised of a guide to using the computer and the CD-ROM; Section one, entitled ‘Starting with what we have’, emphasized the need to identify what they have and what they can build on; Section two was about making money from a product or service; and Section three was about expanding business opportunities. The CD ROM project was conceived of with a focus on broader issues having national priority [25]. In contrast, the CTLC project had very limited scope and did not enjoy the essential financial, political and institutional support at a larger scale. The project was not a national policy initiative, but a pilot by NCHD with a limited 0.5% budgetary allocation. Table 2 describes a brief comparison of both initiatives.

It is noteworthy that both the projects adopted the approach of ‘women in development’, indicating that empowerment of women is imperative to sustainable development and disaster preparedness. Neither CTLC project nor the CD-ROM project questioned the sources or nature of women’s subordination and oppression, while accepting existing social structure in a society. Encouraging an understanding and implementation of the concepts of social relations and structure of domination seem to have taken precedence over strategic integration of women into development. Women always have been important economic actors in their societies and that the work they do both inside and outside the household is central to the maintenance of those societies [26]. There were some limitations in assessing the impact of the project on the empowerment of the women. First, the dataset used was 3 years old; second, the questionnaires used might not have been essentially designed to assess the impact of ICT on women’s empowerment; and third, no pre-test assessment of the women before the intervention. Therefore, a comparison between pre-test and post-test assessment cannot be presented to measure the degree of change, if change indeed occurred. To minimize errors in data collection, the master trainers personally collected the data. Effort was made to reduce the human bias factor.

**Table 2.** Comparison of the CD ROM Project in Uganda and the CTLC Project in Pakistan.

Similarities	Differences	
	CD ROM project of Uganda	CTLC project of Pakistan
<ul style="list-style-type: none"> <li>• Similar objectives: to impart ICT training to empower and underserved rural women with localized sustainable content</li> <li>• Rural women were provided with access to ICT</li> <li>• Few ICT training facilities with low coverage</li> <li>• Lack of basic English language skills required to learn digital technologies</li> <li>• Women are keen to learn digital technologies</li> <li>• Trained women were found to be training fellow women</li> <li>• By employing ICT skills, the women of both projects have improved their living conditions and earnings through ICT jobs and enterprises.</li> </ul>	<ul style="list-style-type: none"> <li>• Broader scope and funding base</li> <li>• Differed strategies were employed to achieve similar objectives</li> <li>• Encouraging small business and increasing food productivity, thus promoting sustainable development</li> <li>• Did not rely on the internet and web applications</li> <li>• Attempted to engage women in telecentres</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot project by NCHD</li> <li>• Focus on imparting quality ICT skills and life skills</li> <li>• Relied primarily on the Internet and multimedia technologies</li> <li>• Aimed at data transcription</li> </ul>

## 6. Concluding Remarks

Resilient communities are an essential component for sustainable development and disaster risk management. Households being the smallest unit of communities, sustainability will arise from empowering the women folks. Empowerment is a process and not the endpoint. With the development and globalization of Information and Communication Technologies (ICT), the notion of women’s

empowerment has acquired new dimensions. Generally, access to ICT for women in rural environment of developing nations is a progressive thing. ICT certainly contribute to the process of expanding rural women's socio-economic, political and mental spaces.

The impact assessment of CTLC project suggests that rural women are keen to acquire innovative digital technology skills and significantly improve their lives. Women who participated in the CTLC project obtained jobs and started micro-enterprises. They are now more confident, better informed, conscious about their rights and surroundings, and interested in accessing virtual information sources. They have improved capacity and keenness to acquire new occupations in the avenues of ICT. They have therefore expanded their socioeconomic, physical and political spaces, realized their potential, and hence become more resilient. By utilizing the acquired ICT skills, they are improving their family lives. To help driving empowerment process, they have become multipliers by imparting ICT skills to other women in their communities. We would, however, recommend that there is a need to commence similar interventions on larger and sustainable basis ensuring equal opportunities, access to resources, and new possibilities to earn decent livelihoods for all women. In addition, we should also expand this research to examining how empowerment itself affected sustainability and resilience in Pakistan.

## References and Notes

1. Annan, K. *On the Digital Divide*; CNET networks: Washington, DC, USA, 2002; Available online: <http://www.un.org/News/ossg/sg/stories/articleFull.asp?TID=16&Type=Article> (accessed on 21 November 2009).
2. Banuri, T. *Asian Forum on ICT Policies and e-Strategies Session 1: ICT, PRSPs, and MDGs*; Asia-Pacific Development Information Programme—United Nations Development Programme: Kuala Lumpur, Malaysia, 20–22 October 2003.
3. Hellstrom J. *Tool for Poverty Reduction, Challenges for Development Cooperation*; Collegium for Development Studies: Uppsala, Sweden, 2005.
4. *CIDA's Strategy on Knowledge for Development through Information and Communication Technologies*; Canadian International Development Agency (CIDA): Gatineau, QC, Canada, 2000.
5. *Information and Communication Technologies and Rural Development*; Organization for Economic Co-operation and Development (OECD): Paris, France, 2001.
6. Wood, P. *Gender and Information and Communication Technology: Towards an Analytical Framework*; GEM: London, UK, 2009; Available online: [http://www.apcwomen.org/gemkit/en/understanding\\_gem/wood.htm](http://www.apcwomen.org/gemkit/en/understanding_gem/wood.htm) (accessed on 31 October 2009).
7. UN Millennium Summit. *Key Proposals*; September 2000; Available online: <http://www.un.org/millennium/sg/report/key.htm> (accessed on 29 December 2010).
8. *End Poverty 2015: Make It Happen*; United Nations Department of Economic and Social Affairs: New York, NY, USA, 2009.
9. Mósesdóttir, L. *Gender (In)equalities in the Knowledge Society*; Institute for Women's and Gender Research, University of Iceland: Reykjavik, Iceland, 2010.

10. Henwood, F. Establishing gender perspectives on information technology: Problems, issues and opportunities. In *Gendered by Design? Information Technology and Office Systems*; Green, E., Owen, J., Pain, D., Eds.; Taylor and Francis: London, UK, 1993; pp. 31-49.
11. *Association for Progressive Communications (APC) Annual Report*; APC: Melville, South Africa, September 2003.
12. Symth, I. Gender analysis of family planning: Beyond the 'feminist vs. population control' debate. *Femin. Econ.* **1996**, *2*, 63-86.
13. Morgan, S. *Researching ICT-Based Enterprises for Women in Developing Countries: A Gender Perspective*; Institute for Development Policy and Management, University of Manchester: Manchester, UK, 2004; Available online: <http://www.womenicnterprise.org> (accessed on 30 October 2009).
14. Johnson, S. Gender relations, empowerment and microcredit: Moving on from a Lost Decade. *Eur. J. Dev. Res.* **2005**, *17*, 224-248.
15. Murthy, R. *Micro-Credit, Poverty and Empowerment: Linking the Triad*; Sage: Thousand Oaks, CA, USA, 2002.
16. Kabeer, N. *Bangladeshi Women Workers and Labour Market Decisions—In London and Dhaka: The Power to Choose*; Vistaar Publications: New Delhi, India, 2001.
17. Chen, A. *A Guide for Assessing the Impact of Microenterprise Services at the Individual Level*; AIMS, MSI: Washington, DC, USA, 1997.
18. Malhotra, A. *Measuring Women's Empowerment as a Variable in International Development*; World Bank: Washington, DC, USA, 2008; Available online: [www.icrw.org/.../Measuring Empowerment\\_workingpaper\\_802.doc](http://www.icrw.org/.../Measuring_Empowerment_workingpaper_802.doc) (accessed on 31 October 2009).
19. Nakafeen, A. *Women and ICTs in Uganda: Bridging the Gender Digital Divide. ICT—A Tool for Poverty Reduction, Challenges for Development Cooperation*; Collegium for Development Studies: Uppsala, Sweden, 2005.
20. Subrahmanian, E. *Information and Communications Technology for Sustainable Development: Defining a Global Research Agenda*; Workshop Based Reports; Caregie Mellon University, Pittsburgh and Indian Institute of Science: Bangalore, India, 2003.
21. Shah, N. *Pakistani Women: A Socioeconomic & Demographic Profile*; Pakistan Institute of Development Economics: Islamabad, Pakistan, 1986.
22. Aithal, V. Empowerment and global action of women—Theory and practice. Available online: [http://www.skk.uit.no/WW99/papers/Aithal\\_Vathsala.pdf](http://www.skk.uit.no/WW99/papers/Aithal_Vathsala.pdf) (accessed on 3 December 2009).
23. Kabeer, N. *Women in Development: Feminist Theory*; Verso Publications: London, UK, 1994.
24. Wisner, B.; Blaikie, P.; Cannon, T.; Davis, I. *At Risk: Natural Hazards, People's Vulnerability and Disasters*, 2nd ed.; Routledge: London, UK, 2004; p. 471.
25. Mijumbi, R. ICTs as toll for economic empowerment of women: Experience from the use of a CD ROM by rural women in Uganda. In *Proceedings of Division for the Advancement of Women, United Nations Conference*, Seoul, Korea, 11–14 November 2002.
26. Rathgeber, E. WID, WAD, GAD: Trends in Research and Practice. *J. Dev. Area.* **2007**, *23*, 407-419.

## Appendix: Questionnaires to Assess the Impact of the CTLC Pilot Project in Pakistan

### *Questionnaire for CTLC Graduates*

1. Which one of the following you will select?
2. Does the course help you in your daily life?
3. What do you believe about getting support from your family & friends in moving forward?
4. What was the attitude of your parents & friends when you told them that you wanted to do something for yourself and your family?
5. Select any one which you think is appropriate & suits your thinking:
6. Are you using computer skills in your daily life learned from this course?
7. If you are offered a job in another city what will be your reaction?
8. If you wanted to do anything to achieve something in your life and you think you are 100% right and your family discourages you, what will be your next step?
9. What is your opinion about getting support of parents/husband/brother for women to move forward?
10. You are helpful for girls like yourself; who don't have eagerness and potential to do something in life.
11. Has this course changed your personality?
12. Has this course changed your way of life?
13. Select any one which you think is appropriate.

### *Questionnaire for Parents/Relatives (as Respondents) of the CTLC Graduates*

1. Do you think that the level of confidence of your daughter/sister/relative has increased after this course?
2. What is the learner's level of confidence after this course?
3. Do you observe any change in her attitude & behavior?
4. Do you feel any change in her knowledge and information?
5. Can she now speak up and express herself? Select any one which you think is appropriate & suits your thinking:
6. Is there any change in her motivation and commitment towards her studies after this course?
7. Is she sensitive & demanding about her rights?
8. Can she take initiatives independently?
9. Do you think that without your support she can move forward & grow?
10. Do you think she can achieve her goals in life?
11. Is she utilizes her time productively & positively after this course?
12. Does she now motivate & guide her younger brother/sister after this course?
13. Is there any change in her capabilities, abilities, intelligence?

14. Has she become a source of inspiration for other girls in your surrounding/family after this course?
15. What do you think about C.T.L.C?

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