

# Information and Communication Technologies for Women's Socioeconomic Empowerment

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# Foreword

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Information and communication technologies (ICTs) are profoundly affecting social structures. Farmers in rural areas use mobile phones to access market prices. Poor people who do not have formal identification documents obtain loans and credits through smart cards that store personal information such as fingerprints. In particular, ICTs are creating opportunities for women, enabling them to participate in political, social, and economic processes at unprecedented scale.

The role that ICT can play in enabling gender equity, however, is constrained by access, low literacy, and limited data for ICT usage by women. We commissioned this study to better understand the specific needs of women in developing countries as they seek to leverage the increasing availability of ICT in their countries. It is meant to guide the efforts of the development community and to support policy makers in setting priorities for investments in ICT infrastructure, skills, and education.

This paper is the first of its kind, and we hope that it will help to inspire policy debate and continued monitoring of progress made in ensuring that women in developing countries are equally able to harness the opportunities that ICT offers for improving their livelihoods.

Mohsen A. Khalil  
Director, Global Information and Communication  
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# Executive Summary

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The purpose of this report is to provide the reader with an overview of some of the issues relating to women and information and communication technology (ICT) in the developing world in contrast to the developed world. Where possible, men's engagement will be added also as a contrast, but the focus of this working paper is on women, not gender. This is not to suggest that a focus on gender is not of value—it is. But understanding the unique perspectives of women is the first step in addressing the larger issues of diversity and, specifically, gender, which has started to receive much attention from other organizations; many are referenced here.

This working paper is not intended to be the final document on the issue of women and ICTs, but a first opportunity to explore the issues with individuals less familiar with the ongoing discussions. To that end, experts in the field may not find the depth of this paper as useful as some of the publications in the reference section. Instead, this paper will serve to address the following points for the relative newcomer:

- There is an enormous need for research to fully understand the issues of women, gender, and ICTs as the issues are very complex and the research is thin. Much of the information presented here is anecdotal or country specific, making generalizations a common challenge. The reader should be cautious of assumptions that need to be verified, but until the indicators are developed for broad-reaching analysis, the authors are focusing on presenting concepts with the goal of encouraging exploration and discussion.
- The research that exists relating to ICTs is often country specific, is more prevalent from developed than developing countries, and is often not disaggregated by gender.
- The data source matters. According to most economists we interviewed for this report, data on Internet use from market research firms, national government statistics, and industry organizations tend to show wider gender gaps than household survey data.
- Gender differences are not apparent in all countries in all areas of ICTs; it is important to look at different contexts to tease out where barriers may exist (such as education, income levels, culture, human rights, and so forth.)
- When discussing gender digital divide, we refer to several divides: in access, in usage, in content's availability and utility, in information technology (IT) labor markets, in contribution to IT industry, and in access to ICT education at all levels, from primary to higher education, with focus on access to sciences and technology fields.
- Generalizations are useful for describing themes, but the reader should keep in mind that there is a great deal of variation in the opportunities and constraints among women in all countries. Women are not a homogeneous group and experience wide variations among and within regions, countries, rural, and urban contexts.
- ICT does not mean the Internet alone. It includes radios, wireless phones, computers connected (or not) to the Internet, electronic brail writers, and a wide variety of software, hardware, or tools such as operating systems,



databases, email or office productivity applications, networks, and so forth. They are not to be used instead of other tools, but complement what exists to achieve a goal, be it better food distribution or health care access, eLearning, entertainment, and so forth. In today's world, the most prevalent ICT device is the mobile phone, with almost 3.5 billion users around the world.

- ICT usage and consumption may simply mirror preexisting gender differences that have been engrained for centuries and will likely need to be addressed in other areas of reform before ICT equity can be addressed fully. Accounting for the usage, consumption, and production of ICTs through gender-disaggregated indicators also mirrors the importance of the ICT sector and of gender equity to the country or agency collecting such indicators.

This report will provide an overview of major themes for women and ICTs, including issues of access and education for girls versus women, inclusion in the ICT workforce, qualifications, and appetite for ICT career adoption, and opportunities versus the threat of ICTs for women's lives. The following policy recommendations will be drawn in Section V:

- The economic opportunities women can bring to development through ICTs will not be realized unless policies for all mainstreaming efforts take gender considerations into account.
- Policy makers should host forums that allow gender experts to debate the issues and arrive at a diversity of perspectives and recommendations that recognize the complexity of the issues.
- Policies are needed to ensure that investment in ICTs contributes to more equitable and sustainable development for all.
- Policy is critical to produce and maintain local content for women, to make this content's access and usage women-friendly within the local culture, and to create capacity for women and men to maintain and enrich that content.



*Two girls thrilled to have built their own working phones in an after school program for girls (MDWIT, 2009).*

Suggested recommendations for action are as follows:

- Implementation efforts should refrain from transforming models and studies into "formulated approaches" or "prescriptive measures" if we are to ensure that the innovative character of ICTs remains in the hands and control of the users themselves.
- Nontraditional patterns of education, entrepreneurship, and business development are needed to develop opportunities that reach beyond traditional culture.

- Women should not wait for policy making alone to bridge the “digital divide” but rather take action through ICTs to access information sources and engage in the communication processes to achieve their socioeconomic development goals.

This document will serve to complement the World Bank report, *Information and Communication Technology 2009: Extending Reach and Increasing Impact*, launched on June 30, 2009, to gather additional voices and continue the ongoing conversation for the years ahead.



## CHAPTER 1

# Overview

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Information and communication technologies permeate every aspect of our lives; from community radios in the most rural parts of the globe to cellular phones in the hands of women and men in every community on earth, to computers in almost every medium to large organization. The advancement of ICTs has brought new opportunities for both knowledge sharing and knowledge gathering for both women and men. To the extent that the global community can reach heretofore unconnected individuals, families, and populations to better understand their needs and challenges, ICTs can provide unlimited opportunities for economic development and social engagement through new, innovative thinking and tools. However, a basic assumption is that all members of our global community benefit from and are part of



the growing knowledge society. ICTs have been compared to a double-edged sword—advancing the knowledge society on one hand, and deepening gender and social divides based on pre-existing social divisions on the other. Leaving large portions of the global community both underserved and unengaged remains the largest determinant of success for current development efforts. Specifically, without a thoughtful policy, strategy, and execution plan to ensure women’s full engagement in the knowledge society, the places in which they

work, the families for whom they care, and the communities in which they live and serve will not thrive.

The belief that one policy fits all has clearly demonstrated a lack of effectiveness over the years with a loss of billions of dollars and millions of hours of labor leading to little achievement towards the millennium development goals. This paper will present both traditional examples of effective practices for women in developing regions and a new, bold model for development for consideration through a “female first” policy that sets as a requirement for all mainstream initiatives the insistence that projects take into consideration the impact and engagement of women. By asking how women will be affected and engaged, unresolved challenges can be addressed in areas including

e-government, agriculture, e-learning, business development, and entrepreneurship. Overcoming these challenges will benefit women, but will also benefit their families, their communities, and the developing regions.

Currently, in those countries with disproportionately lower income, women face greater constraints than men in four areas:

1. **Access and use of ICTs.** The work of Sophia Huyer and others has demonstrated that there is no correlation between the saturation of ICTs in a country and women's access to those ICTs.<sup>1</sup> Social and cultural factors limit women's access to shared ICT facilities such as cybercafés, or telecenters,<sup>2</sup> which often become meeting places for young men, and hence deter women's absorption and adoption of ICTs to access information and knowledge. Because women and girls often do not control the finances of the home or do not have sufficient personal income, they may lack the financial resources to purchase radios, televisions, or computers or to pay Internet service providers (ISPs) for monthly access to the Internet. Girls and boys may have differing access to computer skills training in primary and secondary schools. Anecdotal evidence suggests boys will often get priority access where computers are equally available, but this needs to be better measured and understood in developing countries before generalizations can be made. Finally, for the large numbers of women employed in the informal sector, there is no possibility for using office computers to access the Internet, a possibility that is more accessible for formal economy employees.
2. **Usability and literacy.** Access to education continues to be a greater barrier for women than men; an estimated two thirds of the world's illiterate people are women.<sup>3</sup> Education in science and technology is considered a male domain in many cultures.<sup>4</sup> Training in ICT skills is rarely gender sensitive or tailored to women's needs<sup>5</sup> and is sometimes delivered by a male trainer who has embedded perceptions about women's capabilities inconsistent with a research-based understanding of women's competencies and contributions in these fields<sup>6,7,8,9</sup>. Familiarity with basic computer use, including the ability of the user to establish an email account, communicate via email, navigate the Web, understand the basic etiquette of using the Web, download useful and sometimes life-saving information, use CDROMs and other interactive materials, and the ability to use electronic forms of communication for distance education are basic learning and communication skills needed for workplace tasks by women as well as men.
3. **Development and design.** Much of the content on the Internet has not been developed to address the needs of women and girls in developing and developed countries nor is it available in the languages they speak. Digital technology has also been used for harassment and sexual exploitation of women and girls in the form of pornography, trafficking, and predatory e-mails<sup>10,11,12</sup>. While gender-sensitive men have done much to promote gender-equitable content design, fully addressing these issues can only be done when more women become software engineers, content producers, and entrepreneurs filling the large need for these resources. There is a growing commercial market, yet significantly underserved in the developing world, to be supplied by women entrepreneurs and employees who can both capture women's knowledge for the marketplace and develop knowledge and resources to serve women, their families, and communities in ways in which the male-dominated field has not yet considered.<sup>13</sup> This content by women for women will provide an excellent economic opportunity through the development of niche markets currently underserved. Concurrently, women

can help fill the large demand for skilled labor needed for growth by major multinationals, as well as national and local workforce needs.

4. **Leadership and power.** In both developing and developed communities women make up a small percentage of the top leadership on boards of directors and "C" level business leaders. This has a significant impact on economic development as suggested by the work of Catalyst,<sup>14</sup> a research organization that studied women's participation at the top level of leadership for Fortune 500 companies in the United States against a number of factors:



Photo by Bill Lyons/World Bank

- a. *Return on equity:* Companies with more women representatives on boards of directors outperformed the others by 53 percent.
- b. *Return on sales:* Companies with more women representatives on boards of directors outperformed the others by 42 percent.
- c. *Return on invested capital:* Companies with more women representatives on boards of directors outperformed the others by 66 percent.
- d. The link between women on boards of directors and corporate performance holds across all industries.

While developing countries may find their performance outcomes differ from U.S. companies, the effective policy maker will set standards for policies and implementation based on good practices demonstrated through rigorous research. These outcomes meet these criteria and suggest policies that integrate women into the top level of every organization—not because they are women, but because organizations can no longer afford to ignore their best and brightest minds, including women's.

On the positive side, there is a growing body of evidence that demonstrates that women's use of the Internet and cell phones has had a strong and powerful impact on their participation in the knowledge society—from e-banking to safely secure family income to connecting to medical experts for health-care advice in ways never believed possible (See Case # 4 below).

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*“The question we have to ponder here is simply this: how does a society hope to transform itself if it ‘shoots itself in the foot’ by squandering more than half of its capital investment? The truth of the matter is that societies that recognize the real and untapped socioeconomic, cultural and political power of women thrive. Those that refuse to value and leverage women’s talent, energies and unique perspectives remain developmental misfits. And I daresay that it is not difficult to demonstrate this with a growing body of evidence.”*

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*President Kagame of Rwanda,  
February 2007*

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*Gender, Nation Building and the  
Role of Parliaments*

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Unfortunately, the reality today is the potential of women continues to be underutilized. Women are under-represented in all ICT decision-making structures<sup>15</sup> (for example policy and regulatory institutions, ministries, and boards of ICT companies). Within the ICT industry and the growing Information Technology Enabled Services (ITES) clusters, women are found in disproportionately high numbers in the lowest paid and least secure jobs at the lower end of the supply chain. They hold jobs as data entry, phone operations, clerk, and administrative positions with few benefits and the lowest wages.<sup>16</sup> On the other hand, the ICT and ITES industries do enable a better work/life balance for women as they continue to be the primary caretakers for children and the elderly. A 2007 UNESCO publication entitled, “Science, Technology and Gender: An International Report” addresses these issues in detail.<sup>17</sup>

New employment models enabled through technology, including teleworking, give women (and men) a wider range of employment options that can be combined with domestic responsibilities. This pattern is now being replicated in the developed world as a means for decreasing business overhead costs of infrastructure and decreasing workers’ carbon footprint. Yet it can backfire and exclude women (and men) from selected career trajectories where “in office” time is critical or mobility is essential. This remains a cultural issue as more and more executives around the world run companies from remote locations, suggesting that telecommuting provides more of an opportunity than an obstacle for personal and business growth. The current financial crisis, combined with growing interest in climate change, is reshaping debate around telecommuting and telework, and creating more supporters for the concept even amongst very conservative organizations.<sup>18</sup> It is expected the culture will change and with it the advancement possibilities for remote employment from home-based female workers—but we are not there yet. A similar ‘cultural shift’ can be seen in the adoption of distance learning and e-based teaching methods by established universities that previously shied away from using ICTs for high-standard course delivery.

Men predominate in higher paid work in hardware and software engineering and management. At first glance, this may appear to be because of the lack of women engaged in the field, but women’s stories from Ghana to Saudi Arabia to Italy to Dubai suggest that employer biases keep women graduates in engineering and computer science from gaining positions in these fields or rising in company hierarchies.<sup>19</sup> Lack of disaggregated employment data makes referencing these cases difficult. But any failure to employ skilled or educated women in developing regions in ICT businesses is a loss of capacity that has economic impacts well beyond the life of each individual woman. As seen below, by not hiring or training women software engineers to be employees or entrepreneurs, hundreds of people lose through the direct

impact of jobs not created and wealth left unrealized, hundreds of thousands may lose by the failure to develop innovative ICT solutions in countries that would benefit women and their families, and millions of dollars are lost from resources that could have better served the needs of the region.

In addition to the cost of lost opportunities, more women than men have been displaced due to increased automation and computerization of work places. Increased demand for more advanced skills, as the technology in the ICT sector rapidly changes, means that workers must continually upgrade their skills. Women are at a disadvantage given their multiple roles in work, family, and community and the cultural bias that tends to value an investment in men's education before women's.<sup>20,21,22</sup>

We expect the landscape to change slightly for women as increased efforts are being made by select governments to reduce the gender salary gaps in ICT jobs (which benefit from being in a new sector attracting young and entrepreneurial women) and develop policies to attract young women and adolescents to science and technology careers and on-the-job training. Research has indicated that positive role models often can have an impact on traditional mindsets and behaviors related to women's engagement in ICTs and science. Consequently, forward-thinking countries have



Photo by Eric Miller / World Bank

launched media campaigns to promote women's full engagement and socioeconomic empowerment through ICTs and have provided special funding for women-owned small and medium enterprises (SMEs) that provide ICT (for example, in South Africa, Qatar, Tunisia, and the United Arab Emirates.) But while role models are a necessary condition for women's engagement, they are far from sufficient and should be viewed as only the first step in career awareness. In addition,

women's entrepreneurship programs should not be simply men's entrepreneurship programs with women students, because research indicates that women both run their businesses differently and approach the field differently than men. Understanding the unique qualities of women's business, how to help them successfully manage what is usually a male-dominated space, and fully appreciating the value women bring to the business community are essential for long-term sustainability of women-owned ICT businesses. Asking women to behave more like men is a short-term plan for long-term failure. Creating a research-based appreciation of the unique and innovative business models women develop to serve both the mainstream and the underserved populations will add to the rich diversity of talent needed to ensure an economy thrives. The latter will also most likely increase the consumption and production of ICT devices, gadgets, and content for and by women (taking into account segmentation factors such as age, education, culture, language, and local context).

This paper presents how and why ICTs impact women and men differently and the implications of women's lack of engagement, participation, and leadership in the knowledge society through ICTs for business and development. Furthermore, the



paper will explore the impact of the ICT “gender gap,” a new and growing form of discrimination that offsets the benefits that ICTs provide to women. Additional policy development may support positive outcomes and mitigate negative ones.

The paper will also highlight examples of best practices and weaknesses in assumed best practices to provide opportunities for full scale execution of efforts to achieve measureable outcomes in achieving the Millennium Development Goals (MDGs). An important focus is the need to move many of the carefully incubated gender policies and initiatives, developed through thoughtful leadership in specialized women’s programs, into the mainstream. This will help ensure that well-designed initiatives do not inadvertently become “ghettoized” or ignored by the mainstream programs that desperately need the knowledge to enhance and achieve their outcome goals. The collaborative work of the World Bank, described in their recently released report *Information and Communication Technology 2009: Extending Reach and Increasing Impact*, which this document supports, serves as an example of such integration.

This paper’s main ideas and key messages should be used by the development community’s practitioners and policy makers to support broader discussions on the opportunities and challenges that exist in the ICT sector to benefit all people and ensure projects have provisions and incentives to include women’s participation at all levels. Suggested concepts will hopefully provide grounds for fruitful discussions among government leaders forming ICT policies, support good designs for ICT skills training and education programs, develop effective guidelines for good business practices including all talented workers, support entrepreneurship development customized to the learner (not expecting the learner to adapt to the training), and in general develop strategies to eliminate any negative impact a gender digital divide would have on development.

#### **Box 1: Introductory Notes to Keep in Mind**

- The paper examines a broad range of cases to provide a diversity of ideas.
- Web-based/online case studies on gender and ICTs are *not* reproduced in this document but are included as Web resources, references, or publications in Appendixes.
- While the review is predominantly focused on developing countries, projects, and policies deliberately targeting women in Australia, Canada, the European Union and the United States are included.
- Qualitative measurements on economic, social, and political impacts of ICTs are difficult to articulate for this study to allow conclusions. Comprehensive studies measuring the impact of ICTs generally do not disaggregate gender in data collection or analysis.

## Notes

<sup>1</sup> Huyer and Hafkin 2007.

<sup>2</sup> Common access facilities are called differently in the literature (Telecenter, Internet Café, CyberCafe, Internet kiosk, Internet Service Center, and so forth).

<sup>3</sup> UNESCO 2009.

<sup>4</sup> OECD 2009.

<sup>5</sup> World Bank 2009a.

<sup>6</sup> Kennedy, Wellman, and Klement 2003.

<sup>7</sup> Spender 1997.

<sup>8</sup> Tannen 1994.

<sup>9</sup> Kramarae and Taylor 1993.

<sup>10</sup> World Bank 2009b .

<sup>11</sup> Gurumuthy 2004.

<sup>12</sup> Tandon 2008.

<sup>13</sup> Spertus 1991.

<sup>14</sup> Joy et al. 2007.

<sup>15</sup> Cockburn 1985.

<sup>16</sup> European Commission 2004.

<sup>17</sup> Fernandez-Polcuch et al. 2007.

<sup>18</sup> Tahmincioglu 2007.

<sup>19</sup> University of Maryland Baltimore County 2005.

<sup>20</sup> World Bank 2009b.

<sup>21</sup> Gurumuthy 2004.

<sup>22</sup> Tandon 2008.

# Women, Gender, and ICTs: Why Does It Matter?

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In 1995, the United Nations Commission on Science and Technology for Development (UNCSTD) recognized the growing influence of ICTs in development and the importance of women's participation in discussions regarding its integration globally. To that end, they established a Gender Working Group to address the significant gender issues from access to control. The United Nations Division for the Advancement of Women (DAW), the International Telecommunication Union (ITU), and the UN ICT Task Force Secretariat released a report in 2002 that focused on ICTs as a tool to advance and empower women. When the World Summit on the Information Society (WSIS) was established, a Gender Caucus was created to ensure women had a seat at the table and a voice in the room.<sup>1</sup> The Commission on the Status of Women, during its 47<sup>th</sup> session in 2003, developed Agreed Conclusions that built upon the DAW report and urged WSIS leaders to integrate gender perspectives in every aspect of the Summit.<sup>2</sup> The first WSIS summit held in Geneva debated the issue of gender. In their final Declaration of Principles, the body stated that:



We affirm that development of ICTs provides enormous opportunities for women, who should be an integral part of, and key actors, in the Information Society. We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis on equality in all spheres of society and in all decision-making processes. To this end, we should mainstream a gender equality perspective and use ICTs as a tool....<sup>3</sup>

Yet despite the consistent agreement in policy, there have been challenges in the implementation of those policies.

Originally the focus on girls and women in ICTs was intended to address Millennium Development Goal 3, which targets the elimination of gender disparity in primary and secondary education, preferably by 2005 and at all levels of education by 2015. ICTs provide a new model for knowledge dissemination, diffusion, and creation that could, if developed correctly, address a long-standing, intransigent problem of education access and empowerment. To be able to benefit from the new

knowledge society, one must have the education and literacy needed to use the ICTs, as well as have access. However, “women and girls are poorly placed to benefit from the knowledge society because they have less access to scientific and technical education specifically, and to education in general.”<sup>4</sup> Often the Internet is provided in English and women, particularly in rural areas, do not speak or read English. The impact of having few women Web developers and software programmers, particularly working in the developing regions, may be a lack of local content relevant for women’s needs (the basic “how to” for health, nutrition, taking care of oneself, family, farming, husbandry, agriculture, and so forth) and interests, but the data on how this impact can be measured needs to be more specifically researched.

Education is generally recognized as a key ingredient for all forms of development, including economic. Educated women increase opportunities for their families and children. ICTs are an important tool for education delivery (e-learning), as well as a series of products about which one needs education. In other words, individuals need to be educated about the use of ICTs to use them, and once this education takes place, additional literacy and education can follow. Because the barriers to education delivery in many remote areas is so problematic, policy makers and development officials often make the mistake of focusing on these challenges alone and assuming simply getting power and technology access into the region or remote village is sufficient to address ICT education delivery for all. In fact, the continuing high percentage of women’s illiteracy compared to men’s suggests this assumption is false. Instead, mainstream policy makers and program developers should ask the question, “How will this project affect girls and women’s literacy in addition to men’s,” which would highlight a long series of issues left unaddressed for households. By disaggregating the questions as well as the data, many as yet unexplored issues emerge that remain barriers for economic development around the world. Addressing these barriers at the beginning of a project or policy effort will ensure digital gaps are addressed before they emerge and reinforce current knowledge, power, or image gaps.

Web 2.0 applications are an emerging area of interest to the world and to women because of their power to connect and lobby for socioeconomic concerns. Busoga Rural Open Source and Development Initiative (BROSDI) is an NGO that engages the rural community for sharing knowledge to reduce household poverty in Uganda. Despite issues of literacy and Internet access, the organization feels that Web 2.0 applications encourage collaboration and networking, even in rural areas. Women’s interest in community makes these tools of particular importance. The data to date has yet to clarify the extent women have access, use, and are developing these new tools.

### **Girls and ICTs**

Throughout this report, references to both girls and women are used together to illustrate a continuum of impact. For those who might suggest that the differences between girls and boys may be a result of competence or capability, a recent research-based report by the OECD ends the debate with performance indicators for boys and girls over time. The report highlights the achievement of girls in school in both science and mathematics (including computer science). Specifically the authors note the following:

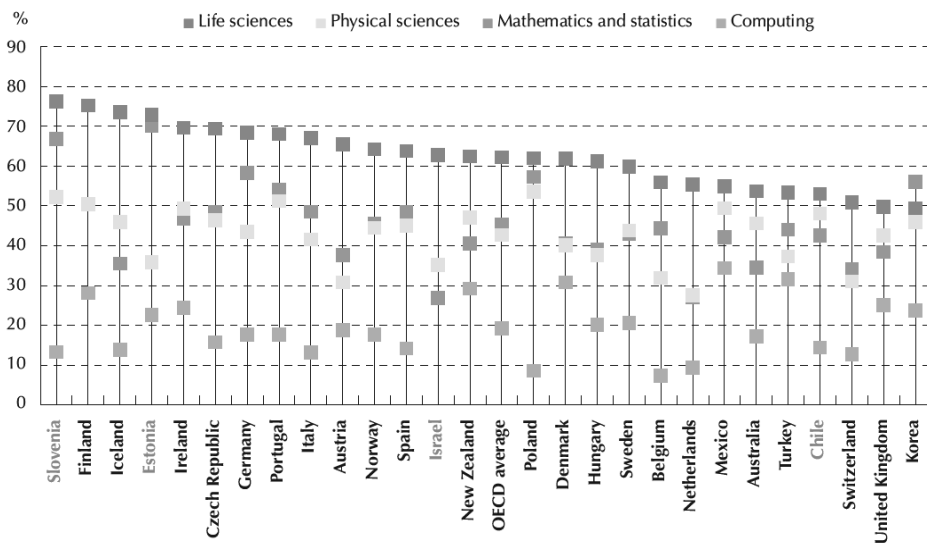
- ∞ In primary education, there are few gender differences apparent in science or mathematics, although girls excel in reading even at this early age.
- ∞ In secondary education, females had higher average achievement than males in mathematics and science.
- ∞ In tertiary education, while traditional gaps have been narrowing, graduation rates for computer science and mathematics are lower for females than males.<sup>5</sup>

The authors go on to conclude, “where education and human capital accumulation drive innovation and competitive advantage, increasing graduation rates among female students is for many countries the most immediately available opportunity for increasing the output of graduates in these critical areas.”<sup>6</sup>



Photo by Ghemadiy Ratushenko/World Bank.

**Figure 2.1: Proportion of Females in New Entrants at Tertiary Level by Field of Education**



Source: *Education at a Glance 2008 - OECD Indicators* (OECD, 2008).

This research is supported by a meta-analysis of 5,000 individual studies, which found that boys and girls have similar psychological traits and cognitive abilities when it comes to mathematics and science education, suggesting a focus of efforts is needed to help encourage girls to persist in these areas, such as eliminating gender bias about girls' abilities and interest.<sup>7</sup>

In other words, by engaging more girls and women in the development of ICTs, the world can better ensure there is quality content, products, and services that meet the needs of girls and women as well as their families, communities, and countries. Concurrently, girl's passive participation with ICTs leaves them vulnerable to predators<sup>8</sup> and less likely to engage in ICTs for knowledge gathering, sharing, and eventually business development and careers. There is little known about the intersection of the girl child and ICTs in the developing world other than some pilot studies that provide a glimpse as to their value in education for girls as well as boys. But the lack of disaggregated data and indicators make these issues difficult to discuss, like most other aspects of gender and ICTs. What we do know is from the work of Margolis and Fisher in their book, *Unlocking the Clubhouse: Women in Computing*; the lack of exposure to IT from a young age can lead to an erosion of confidence, which in turn leads to an increased attrition rate among young women in the IT field.<sup>9</sup> This is a trend we observe in most sciences and areas of technology: earlier exposure, usage, and experimentation is always a plus, especially for girls – for whom science and technology are heavily associated with cultural stereotypes, even in the developed countries.

The good news is that lack of data has not kept advocates around the world from working on the issues. Programs like Microsoft's DigiGirlz™ program gives high school girls the opportunity to learn about technology careers, connect to Microsoft employees as role models, and participate in hands-on activities.<sup>10</sup> The program, which started in the United States, has recently been hosted in Dubai, United Arab Emirates, with over 200 girls participating and more interest developing for next year's expansion (see Case Example 9 on p. 35).

Another program, Computer Mania Day for Girls™, is an internationally award-winning event that targets younger girls ages 10–12 for similar experiences using role models, hands-on activities, and an electronic puppet for the keynote speaker to demonstrate high-tech applications that are both fun and raise awareness. The program also has a side event for parents and teachers to educate them on how to better encourage girls' preparation for technology careers.<sup>11</sup> Some highlights of comments from girls from an impact study conducted on Computer Mania Day for Girls™ attendees after several years are as follows:

*I was thinking about designing clothes, but now I think I'd like a technology career. I want to do something with aviation and GPS. I want to be able to tell the plane where to go. – Shuaquia, age 15*

*"It's important for girls to have Computer Mania Day because you have to learn how to avoid the predators online. They're there all day." – Shania, age 12*

*"Computer Mania Day is really important to show girls' different opportunities and paths they can follow. Girls need role models." – Katie, age 14, attended twice*

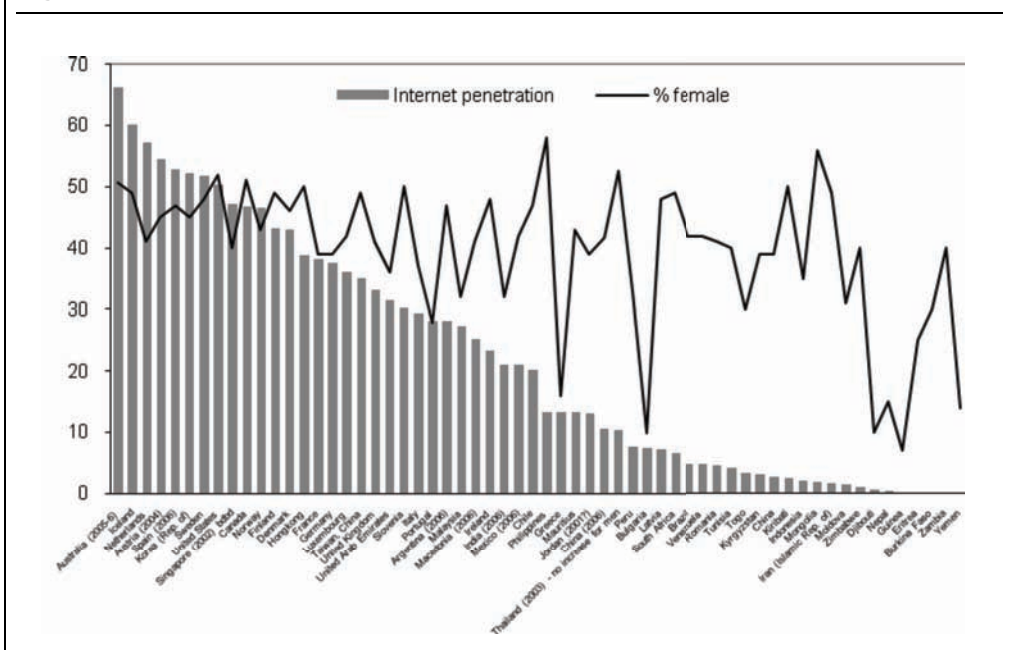
The Kofi Annan Centre in Accra, Ghana hosts a number of technology courses including the Cisco Learning Academy classes for youth, which has equal numbers of girls and boys enjoying the course and preparing themselves with twenty-first century workforce skills.

In all cases (and there are many more) the goal is to create both an awareness of the opportunities for the girls if they choose to study in these fields and also an understanding as users of technology of the many current and emerging applications of technology. Once awareness and interest is created, more needs to be done to encourage that interest in schools and in homes and communities where ICTs are accessible and safe. Additional considerations are as follows:

- Ensure educational content and curriculum is developed for girls' interests as well as boys', but avoid gender stereotypes to achieve this goal.
- Create safe times and spaces for girls to access ICTs where they will not be in competition with boys as research shows boys' aggressive behavior tends to push girls out.
- Educate parents and teachers about girls' capabilities in ICTs, highlighting women's many contributions to date, such as the first software developed was created by six women mathematicians called "computers."
- Educate girls and their families about online predators and child safety though cell phones and the Internet.

### **Women and ICTs**

Women have been engaged in ICT development since its inception. It was a woman who developed the compiler, identified the first computer bug, and created the first programs. Today, example after example highlights the value of women's voices and the importance of their contributions. Women's participation in economic development through microloans to build SMEs has been well documented and publicized. Women's business incubators are emerging through the developing world in recognition of the need to provide business opportunities for women as well as men to enhance, grow, and quicken the pace of economic development. The full scale and power of many of these SMEs are yet to be fully realized, but there is a growing awareness of women's ability to use ICTs to expand their work across regions and around the world. Highlighted in this document are a few women-initiated ICT projects that touch every aspect of development from improving access to health care to promoting peace.

**Figure 2.2: Women and Internet Access**

Source: Huyer and Hafkin 2007.

Women from the grass roots are using ICTs to expand their mission and drive their passion to improve the world. There is a growing reality that women's engagement in ICTs is important for multiple forms of development, including social and political justice<sup>12</sup> as well as economic development. But we do not understand well how women access, use, develop, and/or design technology compared to men. This is in part because of the lack of indicators as well as disaggregated data available. This lack of information is of growing concern and organizations such as the ITU are doing a better job of gathering household data that looks at gender as a variable. What Huyer and Hafkin found in their work is that there is little correlation between Internet penetration in a country and the percentage of female Internet users (figure 2.2).

Women's full participation in the knowledge society is indeed a necessary condition for development to take place. Conversely, the lack of participation by women will slow progress and negatively impact families and communities.

*The current position that one mainstream policy for ICTs fits all is not sufficient to engage women (and many men) in the knowledge society. The consequence of failing to disaggregate the data by gender, to have mainstream policy makers understand gender issues fully, and to create policy and implementation strategies that acknowledge and assuredly engage women's and men's unique needs and contributions is to design a plan for failure – one with which we are all too familiar.*



## Notes

<sup>1</sup> United Nations Division for the Advancement of Women Department of Economic and Social Affairs 2002.

<sup>2</sup> United Nations Forty-seventh Session of the Commission on the Status of Women 2009.

<sup>3</sup> World Summit on the Information Society 2009.

<sup>4</sup> Huyer and Westholm 2005.

<sup>5</sup> OECD 2009, pp. 9–12.

<sup>6</sup> Ibid, p. 12.

<sup>7</sup> Hyde and Linn 2006.

<sup>8</sup> APC WNSP, accessed July 11, 2009.

<sup>9</sup> Margolis and Fisher 2002, p. 80.

<sup>10</sup> Microsoft Digigirlz, <http://www.microsoft.com/about/diversity/programs/digigirlz/default.aspx>.

<sup>11</sup> Computer Mania Day for Girls, <http://www.computer-mania.info>.

<sup>12</sup> Gurumurthy et al. 2006, pp. 35–41.

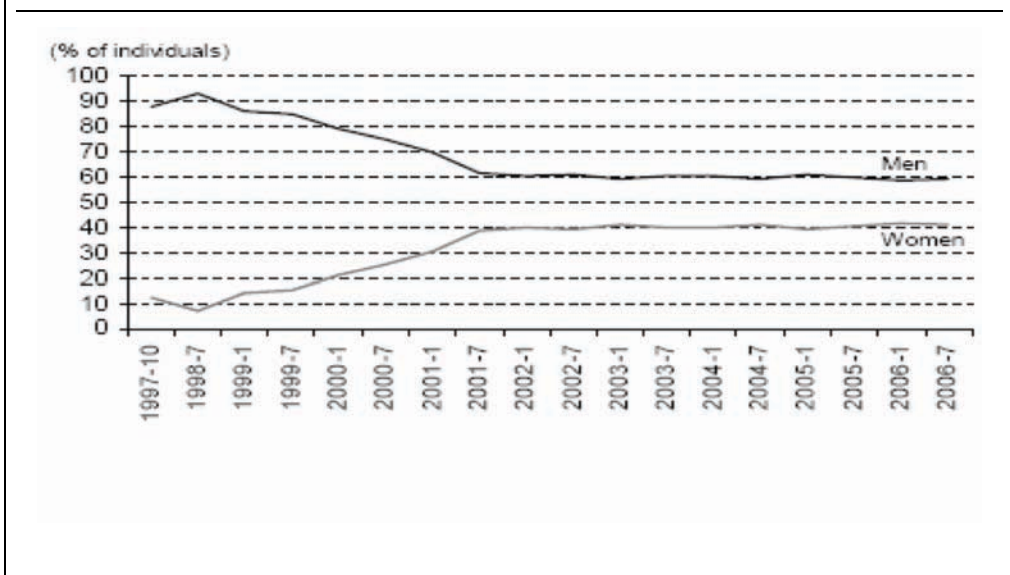
# Outcomes and Impacts of ICT Policies and Projects for Women

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There is a dearth of literature systematically evaluating the impact of ICTs on women's overall welfare. Even among major recent studies evaluating ICT impact on business development or e-government initiatives, data is not disaggregated by gender. Michael Minges, an expert on gender and ICT data, explains that the lack of disaggregated data is a result of many government organizations' failure to collect national ICT statistics at all. Of those government agencies that compile statistics, most do not provide a breakdown by gender. Second, traditional ICT statistics are either obtained from telecommunication organizations (for example, telephone usage) or estimated based on shipment data (for example, sales of personal computers). These organizations have their own operational or analytical reasons for maintaining the data; unfortunately gender does not factor into their considerations.<sup>1</sup>

Existing statistics relating to gender and ICTs are most likely to be found in usage data by sex. Socioeconomic status as a factor in access is less likely to be found. Internet penetration data is relatively easier to obtain through the use of Web-based surveys and is available through national agencies as well as market research companies. For example, the China Internet Network Information Center (CHNIC) compiles a breakdown of Chinese Internet users by sex every six months.<sup>2</sup> The number of Internet users multiplied by a factor of 200 in eight years, from an estimated 620,000 Internet users in October 1997. By mid-2006, the estimated number of Internet users in China was 123 million. The gender gap declined from about 80 percentage points in 1998 to about 20 percentage points in 2001 but appears to have remained more or less constant since then (see figure 3.1).

The 2002 World Bank publication "Information and Communications Technologies: A World Bank Group Strategy" notes evidence that gender inequalities are increasing in developing countries as they move toward competitive market economies and new technologies and states that "unless this regressive process is controlled, the knowledge-based economy will not only be incomplete but will also widen the gender gap and perpetuate some of the worst obstacles to social change."<sup>3</sup> Among the factors set forward for prioritizing different types of information infrastructure assistance is ensuring that "minority ethnic groups, women and the disabled should be a focus of network access and applications support."<sup>4</sup>

**Figure 3.1: Internet Usage in China by Gender**

Source: China Internet Network Information Center, <http://www.cnnic.cn/en/index/>.

At the same time, anecdotal evidence is plentiful and varied suggesting ICTs may play a key role in the economic opportunities of disadvantaged men and women around the world. Some of these are facilitative—such as the uses of ICTs in credit and loan access and management, or online training opportunities that would otherwise be difficult for women to access.

There has been some research on the impact of accessing ICTs on women's socioeconomic conditions—from saving lives (early warnings in times of natural disasters) to improving human development and health (through access to information on health and nutrition, disease and infection preventions, and access to clinic locations) to improving competitiveness in the job market (ICTs open new employment sectors for women in new fields and in a wide range of self-employment possibilities).

One growing opportunity that is being recognized in many countries is the need for more qualified workers to fill gaps in the engineering and IT workforce. Increasing human resources in science and technology, for instance, is one of the key targets of the Lisbon agenda in order to boost competitiveness and increase growth. According to the European Commission, the ICT industry alone contributes to one fourth of European Union's total growth and 4 percent of its jobs. Yet the sector is set to face a skills shortage of some 300,000 qualified engineers by 2010. In an attempt to boost numbers of qualified computer engineers in the European Union and recognizing the relatively low numbers of women engineers compared to men, the Commission, together with leading technology companies, is trying to get more young women interested in ICT careers.<sup>5</sup>

### Case Example 1: Women Creating Global Peace through ICTs

Peace is a necessary condition for economic development. Understanding this, Patricia Smith Melton founded Peace X Peace, an international women's peace organization that uses the power of leading-edge technology tools to connect women across all cultures for mutual support and concerted action through "women's circle relationships" and "sister to sister relationships" that together help to shatter barriers, including language, culture, intolerance, and conflict. Current technology tools include Drupal, CiviCRM, and Roundpoint's Cerkle platform to host their Global Network: a secure, profile-based matching system that connects individual women and groups into egalitarian online Circles. The technology platform helps members connect, build mutual support, advocate for change, and mobilize to take action. Nearly 20,000 members in more than 100 countries connect from their personal computer or mobile phone and participate as equals in programs that highlight women's peace-building actions, promote women's leadership in peace processes, and spark specific peace actions at multiple levels and in multiple languages (removing language barriers for English, Arabic, Spanish, and French speakers with real-time message translation). Women in remote locations or those without access to computers can participate through the cell phones. The Website allows women to highlight their stories from the frontlines of conflict and engage and connect women peace builders through their virtual classroom, a multimedia archive, blogs, and best-practice resources for women's circles and connections. Their technology approach helps their members overcome linguistic, geographic, political, and cultural isolation to connect for peace building.

Source: Peace X Peace: Connecting Women for Peace, <http://www.peacexpeace.org/content/>.

### Box 2: Key Collections on Gender-Sensitive Policies and Programs

A few key collections of best practices and project summaries have been compiled recently that offer some insights into the implementation of relevant gender-sensitive policies and programs. The foremost are listed below:

- *Gender and ICTs for Development: a Global Sourcebook: A Collection of Case Studies on How ICT has Influenced Women in Developing Countries*, KIT Royal Tropical Institute, Netherlands and Oxfam (UK) 2005.
- "ICT for Development Success stories by the Global Knowledge Partnership," <http://www.apdip.net/resources/case/misc/gkp01032004.pdf/view>.
- *Profiles and Experiences in ICT Innovation for Poverty Reduction*, UNESCO 2004.

"It is unacceptable that Europe lacks qualified ICT staff. If this shortage of computer scientists and engineers is not addressed, it will eventually slow down European economic growth," said Information Society Commissioner Viviane Reding, addressing a conference<sup>6</sup> exploring the potential for women in the ICT sector. The conference, held on March 6, 2008, two days before International Women's Day, launched a joint initiative by the European Commission and a number of leading IT companies "to give young women a taste of what a job in ICT would be like."

"We need to overcome common stereotypes which describe ICT careers as boring and too technical for women," Reding told the conference, which also discussed best practices on how to get girls and young women interested in taking up ICT careers as well as possible educational barriers. Encouraged by the experience, the European Commission, together with the private sector, is to draft a "European Code of Best Practices for Women in ICT" by next year's Women's Day.<sup>7</sup>

## **The Role of Women's Use of ICTs in Sustainable Rural Poverty Reduction**

Women around the globe play an important role in food production and distribution. Improving women's access to price and product information, increasing their supply chain options for exporters and freighters, and strengthening women's connections to any knowledge that helps increase their competitive power and improve earnings will lead to increased personal wealth and economic development. Examples of successful cases where access to information helped rural women increase their income may lead to an appreciation of the value of improved policies that will allow both increased ICT access to women and ensure that training is provided to build women's capacity to manage the information they receive as effectively as possible. In the book *Gender and Digital Economy: Perspectives from the Developing World*,<sup>8</sup> case studies from Argentina, Morocco, India, Malaysia, and the Philippines showcase how economic opportunities through ICTs can change the position of women within their families and workplace and give them better choices for their livelihood.

However, women farmers and agricultural producers have unique challenges that their male counterparts do not face. Specifically, access to the Internet in rural areas can only be possible through common access points, called telecenters or cybercafés. These specialized centers are usually not open for women and several cultures frown upon women who mingle with men in these locations. Policy makers and practitioners alike need to consider this when implementing their plans. Special provisions need to be created, such as women-only telecenters or women-only capacity-building operations. This will allow women to benefit equally from information access and to reduce the impact of the ICT gender gap on rural development.

ICT-delivered knowledge then becomes a two-way vehicle for both informing women about the potential for their participation in development and better informing agencies and their officers about the impact of engendering ICT policies as a strategy for rural poverty reduction.

## **The Development Benefits for Communities that Provide Broadband Access for Women**

Access to reliable and affordable broadband provides women and men with an opportunity to access the immense sources of knowledge and learning material available online. While much of what is available has been developed by men for men and specifically for English speakers, there are still resources that allow women to learn new skills and to perfect their existing skills. They can join online professional networks or, where none exist, create them and meet women in the larger community in ways the current culture or deficit of women will not provide. Electronic mail provides safe means to communicate with support networks, family members, and potential business contacts. Broadband networks are improving and transforming the health services delivery as can be seen in Case Study 2 of nurses in Kenya. Several examples are also outlined in Appendix 2.

**Box 3: Considering ICTs as General Purpose Technologies**

Like electrical power before it, ICTs have been recognized as a “general purpose technology” (GPT) that transforms economic relations, enhances productivity, and creates new services and markets. GPTs have the following three characteristics:

**Pervasiveness:** GPTs spread to most sectors. This suggests that impacts should be measured at a higher level than the firm or disaggregated sectors. Higher levels of aggregation internalize the externalities or spillover impacts that arise at low levels of aggregation.

**Improvement:** GPTs get better over time and, hence, should keep lowering the costs of their users. In fact, one of the problems associated with the study of ICTs is that it is constantly evolving. Apart from making quality adjustments for improvements in current technology, new technologies will emerge. ICTs are a moving target.

**Innovation spawning:** GPTs make it easier to invent and produce new products or processes. That is, they allow us not only to do things better but to do better things. New possibilities are created and specialization raises productivity.

Source: ITU 2006, p. 18.

Women's economic opportunities are linked directly to women's access to land, labor, financial, and product markets. By allowing women to benefit from new electronic-based services such as land title registration, women can fully participate as developers of economic productivity and wealth to support their families and their communities. Older, manual, paper-based processes did not make any provision for the female citizen and instead required male relatives to fill the paper forms for land and/or other titles. For many countries the process of automating and reforming registration processes has triggered a thought reform, which has worked to benefit women. By increasing their inclusion in the property-titling and asset-ownership activities of their localities, women's knowledge and expertise becomes another valuable resource in the community, bringing more thought leadership into the development conversation and enriching the knowledge contributed to solve development challenges.

With the exception of a few countries, not much progress has taken place. Some middle-income countries are strongly promoting women's education on ICTs (for example, Tunisia and Cape Verde) while others are focusing on empowering women entrepreneurs venturing in ICT sector (for example, Qatar, the United Arab Emirates, and Bahrain). However, these examples are limited and lack the ability to be achieved by a worldwide policy formulation. Governments have a critical role to play in reexamining policies for access, an enabling environment, and usability factors that can ensure equal opportunities for full productivity and benefits for men and women.

**The Transformative Impact of E-government Services for Women**

E-government services can target the needs of women, including up-to-date and cost-free public information and services about women's rights, inheritance and family laws, health care, or housing. For an example, see Case Study 3 on e-Seva in India.

While it is not easy to measure the impact of ICTs in the area of government, health, and education, the repercussions that information and communication technologies are having in these sectors are real and a number of studies and surveys have produced some concrete results. There are a number of impacts that can be identified with regard to e-government, including improved information flows, reduction of process time and cost, and an increase in efficiency and transparency. A 2005 European Union study confirmed that e-government services were producing real benefits for European Union citizens, governments, and businesses in terms of saving time and gaining flexibility. Online income tax declarations save European taxpayers an estimated seven million hours per year. When generally available and widely used in all member states, such e-services could save over 100 million hours each year. Compared to the same transaction completed offline, the average online transaction saves 69 minutes for citizens and 61 minutes for businesses.<sup>9</sup> (There was no gender analysis however).

An APC WBSP Europe member recently wrote about her experience preparing for an “ICT and Equal Opportunities of Women and Men” panel for an e-government conference with participation from the Czech Republic and other Visegrad countries (Hungary, Poland, Slovakia). She described the working environment of women



*Photo by Ami Vitale/World Bank.*

within the civil service, using her mother’s experience as an example. As a low-level officer playing an essential role in the practical application of e-government ideas, her mother noted that the key problem is the low level of skills amongst staff in the usage of new information and communication systems. Only heads of office were trained in the usage of software with the expectation that they

would pass on the training to other staff – but the skills transfer never happened.

Instead everyone was issued a 200 page manual to educate herself. Her mother stayed a couple of evenings at work to study the manual. However, there are many others who do not feel comfortable with emerging technologies and find it hard to self-educate. Others are not able to stay overtime as she did, because their children are still young. As a result, staff members are struggling with the increase in their workload and new technical requirements—to the point where some are even considering leaving their jobs despite the high level of unemployment in the region.

She writes:

We usually think about gender issues in e-government from the users' perspective only. The conversation with my mother brought me new insight to this issue and I left for Czech Republic, where the conference took place, with emerging questions in my head: *would the additional cost be so insurmountable for training all staff in local offices as part of a new system implementation? Especially considering the savings it will bring in terms of time effectiveness and human resources? Are there substantive reasons why the training of all members of staff was not considered an important priority? How does the dominance of men in policy-making processes, and in the ICT sector in general, affect the extent of e-government's effectiveness in addressing women's needs? What are the constraints? And finally, how are women able to benefit from e-government services that are top priorities of national ICT policy – and incidentally, are paid for by their taxes?*

The APC WNSP's panel "ICT and Equal Opportunities for Women and Men" showed gender to be an important issue to be placed on the e-government agenda. There are many ways in which e-government impacts on women's lives. As mentioned by several speakers, women are usually in charge of communication with public administrations at the level of households, and e-government services can mean less time needed for queuing up in front of doors of different departments. It may also bring the government closer to women and make it easier for them to monitor state activities and budget spending in their localities in order to influence the decisions that affect their lives. E-government can facilitate better access for Roma women and other marginalized groups to up-to-date and cost-free public information and services in areas that directly affect them, such as health care or housing.

Finally, women feature as a significant number of public administration staff, and the e-government programs may bring negative changes to their workload, working conditions, and their position in the labor market. For example, many women working as administrative staff in banks or insurance companies lost their jobs along with the introduction of ICTs. The panelists offered some good suggestions on next steps that can be taken to ensure that women and men take advantage of the national e-government programs. The assessment of women's information and communication needs, the support of networking, and the partnership projects development among women mayors are two illustrations. The panelists also highlighted the importance of enabling access of women from ethnic minorities to training.

E-government processes are invaluable for all individuals who generally lack information on their legal rights and procedures to obtain required services. ICT applications can be applied to land ownership/title data bases, procurement, and registration procedures to ensure accountability and transparency for women and men.



### Case Example 2: Online Learning for Health Professionals and Nurses in Kenya

The African Medical and Research Foundation (AMREF), in a classic public-private partnership with the Nursing Council of Kenya (NCK), Accenture, the Kenya Medical Training Colleges, several private and faith-based nursing schools, and the Kenya's Ministry of Health, pioneered a country-wide eLearning program for upgrading the skills of nurses. The program commenced in September 2005 with a pilot in four schools serving 145 students. The five-year goal was to upgrade the skills of 22,000 enrolled Community Health Nurses (KECHN) from "enrolled" to "registered" level. Enrolled Nurses (ENs) comprise 70 percent of nursing and 45 percent of the health workforce in Kenya. They are the first point of contact for communities but are inadequately skilled to manage new and reemerging diseases like HIV/AIDS. This has necessitated their Continuing Professional Development to improve nursing care standards, achieve the health related Millennium Development Goals (4, 5, and 6), and enable them to respond effectively to disease diversity and complexity. Electronic learning is the preferred mode due to its interactivity, cost effectiveness, ease of revision, and ability to achieve the goal in less time and at a lower cost than the residential program. It would also enable continued service provision, instant application of learning, and improved quality of care. For Kenya, a country with one registered nurse for every 27,000 citizens, the e-Learning program is revolutionizing healthcare by creating an electronic infrastructure for the accelerated education.

#### Program Progress

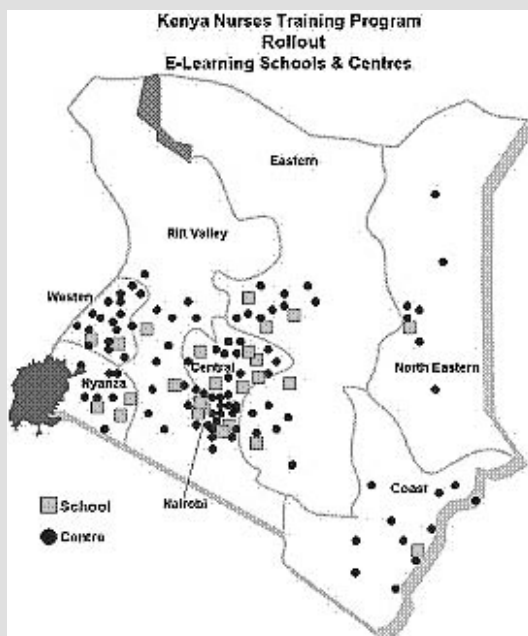
- 27 Medical Training Colleges and Nursing schools participating, including AMREF's Virtual Nursing School.
- Over 100 computer-equipped training centers in eight provinces, including rural, remote, and marginalized districts (for example Garissa and Dadaab refugee camps in the North Eastern Province of Kenya).
- Over 4,000 nurses enrolled on both e-Learning and print-based learning modes.
- Over 300 computers installed in training centers.
- Over 192 implementers trained in IT skills.

#### Program Benefits

##### *Program Structure, Curriculum, and Clinical Experience*

The ECHN Upgrading curriculum is designed to produce a well-rounded nurse who can handle new and reemerging diseases. It comprises four modules: General Nursing, Reproductive Health, Community Health, and Specialized Areas. The theory is provided through a blend of scheduled face-to-face sessions and self-paced computer-based material. In addition, students are required to complete 42 weeks of clinical experience. At the end of the four modules, students sit for their college finals and the NCK licensing exams at the end of the program. AMREF plans to use the program as a model for other African nations struggling with critical nursing shortages similar to Kenya.

Source: African Medical and Relief Foundation; <http://amref.org/>.



In June 2006, a workshop in ICTs, e-government, and gender took place in Tunis, where participants made a number of broad recommendations calling for national ICT policies, capacity building, and budget allocations in support of delivering comprehensive e-government services to women.<sup>10</sup> In May 2007, an online discussion took place on ICTs, Gender, and e-Government, leading up to a two-day meeting in Mozambique that reinforced the need for mainstreaming gender into ICT policy. On the African continent there are a range of e-government policies and initiatives developing but very few practical examples of how these are impacting women are available.

### **Women's Advanced ICT Education and Lifelong Learning to Ensure a Healthy Economy and Community**

As has been said many times, access alone is not sufficient. Education must complement ICT access in order to provide value to the technology. From classrooms to community radio to cell phones and family-friendly Internet cafes, technology itself provides multiple venues for women and men to learn. Further, lifelong learning provides a new formula to allow women to move out from the bottom of the career path (referred to as the sticky floor) and move to mid-level and top-level leadership positions.

There has been significant discussion about the importance of educating the girl child as well as the boy child to ensure they fully participate in the knowledge society of the twenty-first century. This is seen as both a basic right and a developmental need. This paper explores the role of ICT education to benefit the workforce development of women to allow them to benefit both as participants in the knowledge society and contributors to it.

Specifically, women need to develop skills beyond basic literacy and usability to become creators, developers, designers, and innovators using ICT as a tool in that process. There are two steps to consider.

- **Applied ICT skills:** the ability to use and apply generic ICT tools in workplace settings and to upgrade these skills in line with the requirements of business and industry. These skills include all aspects of information working such as Web design, call center consultant, analyst programmer, information technology manager, software project manager, desktop publishers, librarians, computerized sewing, and multimedia.
- **Professional ICT skills:** encompassing the specific skills required to design, develop, implement, and repair ICT tools (includes hardware and software creation and design, manufacturing, electronic manufacturing, network operating systems, cabling, and router programming).

In the United States, an award-winning program called ACTiVATE<sup>11</sup> brings together educated women in science, technology, or business with technologies developed at federal labs and universities. The training program funded by the National Science Foundation has exceeded all goals and is now being disseminated nationally. The program's success demonstrates clearly women's ability not only to work successfully at the entry levels, but also, given the opportunity, to excel at the highest levels of rigorous technology entrepreneurship.

For developing countries that have small numbers of highly educated women engineers who are unable to get jobs because they are women, this provides an opportunity for entrepreneurship training within country to develop the innovative solutions identified by women needed for their communities. This was the case for a

training program in South Africa for 12 women (who later became the Femtrepreneurs<sup>12</sup>) from a diversity of backgrounds including townships. The result is a model whereby one woman started a business that yields employment for 10 that care for their families touching 50 who help distribute the wealth generated to hundreds. As the company grows and thrives, the impact can reach thousands, as in the case of Isabelle Rorke with Anamazing.<sup>13</sup>

In developing countries today, ICTs jobs can be provided through the booming mobile phone industry. Women have job opportunities in call centers and in sales and repair services, as can be seen in the Cameroon case. Access to information and knowledge in rural areas has a significant impact on women's social and political participation and women's economic empowerment as agricultural producers. Women can use ICTs and the Internet to access the agri-business supply chain and promote their products for better sales, as can be seen in Case Study 4 on Burkina Faso.<sup>14</sup>

Women can also be national, regional, and international change agents through ICTs. Dr. Shahida Saleem, who chairs Sehat First, has brought together her medical knowledge with ICTs to create a customized national health care system that meets the needs of Pakistanis in their communities.

Public policy participation has a defining role to play in building up a country's human capital and knowledge endowments through promoting quality education, lifelong learning, innovation, and creativity in its workforce. By consolidating national and sector policies, women can more effectively contribute to economic growth as well as serve as agents of change for political moderation and productivity. A review of a



*Photo by Bill Lyons/World Bank.*

variety of best practice frameworks in ICT implementation calls for a supporting regulatory and policy environment and a participatory mode of working with women.<sup>15</sup>

ICTs fundamentally change modes of organization, management, production, and distribution, and by extension change modes of employment. In sum, the proliferation of ICTs has six main impacts on women's work in the context of increased competition:

- A shift from manual labor to intellectual labor minimizing the need for brute strength as a workplace criterion.
- A shift from automation to computerization in the manufacturing sector through the use of computer-aided design and computer-aided manufacturing.
- Adjustments to dis-intermediary and intermediary<sup>16</sup> trends in the service sector.
- The "computerization" of back-office functions.

- The development of products and services (including education) needed to participate and compete in the workplace available online or through traditional technologies (such as radio).
- The introduction of the technologies themselves as a means for business opportunity development (mobile phone operators for instance)

### Case Example 3: e-Seva Centers, Andhra Pradesh, India

The e-Seva project, which is run by the West-Godavari District Administration in Andhra Pradesh State, has established Web-enabled rural e-Seva Centers run by self-help groups of women from the poorest segments of society. The aim is to help the women achieve economic independence and replace the traditional form of governance and its accompanying deficiencies with a modern, more open, transparent, and responsive service delivery system.

Initially the project started in all 46 mandal (block) headquarters in the district, with the first women's e-Seva Center opening in June 2002. More centers were then established in over 200 small villages, large villages, or towns in Andhra Pradesh, delivering services to citizens.

The project is cost effective for both government and beneficiaries as the centers work offline and access the Internet as required. Statistics suggest that citizens are able to save around US\$0.10 per house as consumers of e-Seva services, which would lead to district-level savings of over US\$100,000 per month (US\$1.4 million per year). To further improve communication, wireless technology was adopted and 85 nodes were networked. Adopting wireless technology also enabled the project to reach more citizens.

The actual number of computers at each center varies from place to place based on local needs. In a small village an e-Seva Center will operate with one computer, a scanner, Xerox machine, digital camera, and printer. In a town there would be more computers, provision of Webcams, and so forth. Each center has an Internet connection—in villages they use dial-up; in towns they use a leased line connection. A very wide range of services is provided, including bill payments, issuance of land/birth certificates, Internet browsing, tele-medicine and tele-agriculture, access to online auctions, the filing of complaints and grievances, and matrimonial services.

In January 2002 there were 46 centers involving 92 member/partners. By January 2004 this had grown to 200 centers with around 292 member/partners. There are currently 384 women running e-Seva Centers, carrying out over two million transactions per year. Income and transactions are increasing month by month and were much higher in 2004 than in 2002.

The major costs for the women running the centers are loan repayment, stationery and consumables, salaries of other staff, and electricity. The service that provided most income was utility payments, used by at least 6,000 people per month who are charged about US\$0.03 per payment. Bigger centers make about US\$320 per month excess of income over direct expenditure (from which the women member's salaries are drawn), while smaller centers can expect an excess of income over direct expenditure of about US\$90 per month.

#### Primary Benefits for Women

- *Social respect.* As the women's incomes increase, they become well trained, educated, and better respected. Villagers coming to centers take their advice and use their services.
- *Employment in their village.*
- *Self respect.* Working with technology makes them feel proud.
- *Monthly income.* Currently the monthly net income for each of the larger e-Seva Centers averages US\$300. This is shared among the two to ten women in that center with an average of US\$45 per month per woman.

Source: Veldanda and Jaju 2005.

#### Case Example 4: Shea Butter Sales Increase for Rural Women in Burkina Faso

When the women of the Songtaaba Association, an organization manufacturing shea butter skincare products in Burkina Faso, started using ICTs, their profits more than doubled. ICTs, including cell phones, computers, and technologies such as global positioning systems (GPS), have helped them to run their businesses more efficiently. The association currently provides jobs to more than 3000 women in 11 villages in the country. To provide the women with regular access to ICTs and improve marketing and sales of their products, the association set up telecenters in two villages, which are entirely managed by the rural women trained by Songtaaba. The organization also set up a Website that the women manage. This has been particularly successful in boosting the visibility of the producers. After the site went online two years ago, orders climbed by almost 70 percent. The women also have access to information about various promotional and sales fairs where they can promote and sell their products.

Source: Buiten et al. 2007.

#### Notes

<sup>1</sup> M. Minges 2003.

<sup>2</sup> Ibid.

<sup>3</sup> World Bank (2002), 76.

<sup>4</sup> Ibid, p. 32.

<sup>5</sup> European Commission 2008a.

<sup>6</sup> European Commission 2008b.

<sup>7</sup> This was completed and released in March 2009.

<sup>8</sup> Ng and Mitter 2005.

<sup>9</sup> ITU 2006, p. 25.

<sup>10</sup> "Epolafrica 2006.

<sup>11</sup> *Activate News*, <http://www.umbc.edu/cwit/activate2.html>.

<sup>12</sup> Innovation Hub 2009.

<sup>13</sup> Anamazing Workshop, <http://www.anamazing.co.za/main.html>.

<sup>14</sup> Buiten et al. 2007.

<sup>15</sup> Human Rights in America by Civil Society Institute, <http://www.hra.am/eng/?page=organization&id=70>. Gender and ICT Awards, [http://www.genderawards.net/gict\\_pr\\_db\\_result.shtml?x=19983&ayear=2003](http://www.genderawards.net/gict_pr_db_result.shtml?x=19983&ayear=2003).

<sup>16</sup> Disintermediation is the process of cutting out the middle agent. When companies bypass traditional retail channels and sell directly to the customer, traditional intermediaries (such as retail stores and mail-order houses) are no longer employed.

# The Threat of ICTs for Women

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At first glance, ICTs have had an overall positive impact on women's work, livelihoods, and overall opportunities, but this is not easily quantifiable and there have been opportunity costs incurred. Unless gender considerations are incorporated into employment policies, ICT diffusion strategies, or national policies, strategies may inadvertently result in negative unintended consequences that compound gender and income disparities. These negative consequences include the following:

- *Maximum flexibility, minimum protection:* ICTs and the digitization of information enable businesses and companies to locate and manage production away from the main site. This has implications both for employment of women and for their personal investments in ICT tools as well as for the growth of clusters of small enterprises and new forms of social production. In theory, ICTs should offer women the possibilities of both flexible locations and flexible hours through telecommuting and/or self-employment. Conversely, women's "flexibility" may also result in casual, part time, piece-rate, and seasonal employment, with little long-term protection or security of income.
- *Supply chain competition:* Networks and communications infrastructures have intensified competition in unpredictable ways through facilitating decentralization of many aspects of supply to manufacturing and service industries. The miniaturization and modularization of products, intermediation, and disintermediation of processes, combined with cheap mobile capital, has an enormous impact on value-added specialization in the supply chain.

## Case Example 5: Middle East Women in Technology Initiative

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Women in Technology (WIT) is a partnership program between Microsoft, the Middle East Partnership Initiative of the U.S. Department of State, Women in Technology (WIT), and local partners in nine countries: Bahrain, Iraq, Jordan, Lebanon, Morocco, Oman, Saudi Arabia, the United Arab Emirates, and Yemen. The program expands women's participation in the workforce by providing local partner organizations, and the women they serve, with essential ICT skills through Microsoft's Unlimited Potential program. These skills include business planning and professional development skills training. Since its launch in 2005, WIT has trained 3,500 women and built the capacity of 50 local women's organizations in the Middle East. By 2010 WIT will benefit more than 10,000 participants, creating a strong base of women with vital IT and professional skills, allowing them access to new careers and increasing their role in shaping their societies.

Source: Heather Ramsey WIT Program Director, hramsey@iie.org.

### Case Example 6: Addressing Human Development Issues in Pakistan through ICTs

Pakistan is a developing country with contrasting geographical and economic features. The country has an annual population growth rate of 1.9 percent; 65.1 percent of its population lives in the rural areas. The country also suffers from the unavailability of efficient healthcare infrastructure and inadequate clinical services. The complexity of the situation is further increased by the high rates of poverty and illiteracy, thereby placing Pakistan in the low human development zone.

According to the *Human Development Report 2007/2008*, the public sector health expenditure in Pakistan is 0.4 percent of the GDP, which is not equitably distributed across the population. There are only 74 physicians per 100,000 people with a concentration of healthcare facilities in the urban areas. The situation in the rural areas is worsened by factors such as scarcity of qualified doctors, unavailability of specialists, delays in the administration of proper treatment, and unavailability of appropriate medications in close proximity. A median availability of 40 percent of essential generic drugs renders simple illnesses, such as gastroenteritis, fatal. Lack of diagnosis and medicines for treatable ailments such as malaria, typhoid, and meningitis further add to the mortality rates.

Patients have reported up to 22 individual visits (with 22 transport costs, 22 patient records, etc) to obtain appropriate care. That is an enormous waste of resources, human and financial, in a country that can ill afford it. Some nonprofit organizations have made serious attempts to fill in these gaps. However, these initiatives themselves are not sustainable.

The only way to overcome the challenges at hand is to utilize technology as a means of maximizing the available human resources combined with an effective private sector pharmaceutical distribution network. Dr. Shahida Saleem set up Sehat First, a unique social enterprise aimed at providing access to basic health care and pharmaceutical services across Pakistan through self-sustainable franchised tele-health centers. Founded in 2008 with an equity investment from the Acumen Fund, Sehat First has served over 4,000 patients, most of whom are women and children.

Sehat First aims to set up 500 Sehat First Health Centers across Pakistan by 2012 and has already established 5 self-sustaining pilot centers in the first year. The centers are set up as franchises by local entrepreneurs employing local men and women. The healthcare providers at these centers are women.

A unique component in this model is the tele-health consulting service, which supports the local clinic staff with videophone consultations with a qualified physician. The simple IP-based phone has enabled access to specialists to which these patients would otherwise not have access. Open-source based Medical Records System (OpenMRS) is also being used to manage patient records to ensure availability of medical records throughout the healthcare system—a facility currently not available in Pakistan.

Source: Sehat First, <http://www.sehatfirst.com/#>.

- “The presence of new supply alternatives with radically different economics now take the traditional ‘supplier squeeze’ to a new level”.<sup>1</sup> Where one is situated within the supply chain is directly linked to one’s skill set and ability to negotiate—that usually leaves women at the lower end of the value-chain with a low chance of upward mobility.

The International Labor Organization report on *Work in the New Economy* makes the following observations about the ICT sector:

Patterns of gender segregation are being reproduced in the information economy where men hold the majority of high-skilled,

high value-added jobs, whereas women are concentrated in the low skilled, lower value-added jobs. As traditional manufacturing industries that previously employed women gradually disappear, the women finding jobs in the new, often ICT-related industries are rarely the same ones as those who lost their jobs in the traditional sectors. New inequalities are therefore emerging between women with ICT-related jobs skills versus those without.<sup>2</sup>

### **The Impact of ICTs on Gender Social Relations**

Most examples in this report have been selected because of their value in highlighting the positive impacts ICTs can have when coupled with the latent potential of women. However, one example illustrates how mobile phones can have a negative effect on development by reinforcing unequal gender and power relations in Zambia. A three-year study in Zambia compared relationships between husbands and wives to mobile phone access and use. For many women there was a benefit from faster, cheaper communication and a strengthening among family, friends, and business-related social networks. However, mobile phones also provided a new focal point for social conflict between spouses and led to the reinforcement of traditional gender power differences. In some cases husbands determined how wives used their phones, and even whether or not the women were allowed to continue owning a mobile phone. Interviewees consistently reported problems of insecurity, insensitivity, mistrust, and jealousy, which sometimes resulted in physical and/or verbal abuse by men towards their wives.

- Some husbands accused their wives of infidelity, thinking they used their mobile phones to communicate with lovers. They inspected call records on the mobile phones for proof, and some ordered their wives to sell their phones.
- In a widely publicized case in the Zambian media, a man reportedly beat his wife because he suspected her of having an extramarital affair after she refused to let him check her calls and text messages.
- Men often demanded that their wives make and answer calls in their presence, although they refused to do the same.
- There are popular songs referring to the social difficulties that mobile phones have introduced between men and women. They are lighthearted but carry an important message about the way this new technology is adversely affecting gender relations.

These findings suggest that new technologies can become another aspect of oppression of women by men and a source of inequality between them. These inequalities are not just social: mobile phones can also reinforce economic gender differentials. Handsets and airtime are still expensive, and women may be less able than men to afford their use.



#### **Box 4: Public Policy: Gender-Transformative Strategies**

Gender-transformative strategies are about change of existing inequalities as opposed to gender-neutral or gender-specific policies that target one gender over another to achieve goals, and in doing so, leave the gender division of labor and resources intact. For example, providing women with the enabling resources which will allow them to take greater control of ICTs; to determine what kinds of ICTs they would need; and to devise the policies to help them reach their goals. The development and implementation of ICT policies could be evaluated by asking the following questions:

- Do these policies address gender needs?
- Will they lead to the transformation of gender relations and gender roles?

If women and men are to benefit from ICT interventions, mainstreaming the perspectives and concerns of women is one of the important tasks to be undertaken. Two types of strategies are offered to support this task: top-down and bottom-up. Top-down strategies aim to change the ICT institutions and agencies to promote women's equality and empowerment in ICTs. Examples include:

- Using political pressure at international conferences and consultations to demonstrate the importance of gender-sound policies and interventions
- Serving as a watchdog that monitors ICT impacts on women
- Conducting research and gathering data on gender concerns as central to ICTs for more effective lobby work
- Promoting the use of gender analysis tools such as frameworks, guidelines, checklists and rosters of women, and ICT and gender experts
- Working within structures to effect change through gender training, financial allocations, staff appointments, and obtaining internal legal mandates.

Bottom-up strategies are aimed directly to support women's entry into the mainstream of ICT. They include:

- Removing legal or social barriers that limit women's access to ICTs
- Enabling women to take initiatives in their involvement in ICT planning and policies
- Extending financial or technical assistance to women to facilitate access to and control of ICTs by providing credit, training, and education.

Source: APC WNSP: Women's Network Support Programme, [http://www.apcwomen.org/gem/en/understanding\\_gem/genderanalysis.htm#jump63](http://www.apcwomen.org/gem/en/understanding_gem/genderanalysis.htm#jump63).

However, insufficient official statistics on a range of gender concerns relating to technology mean that these new developments are difficult to analyze. For women, the social and economic advantages of accessing and using a mobile phone far outweigh the disadvantages. But those promoting and making policies for mobile phones must understand that these new technologies create problems as well as solutions. These problems must be recognized if they are to be addressed through a more active effort at gender awareness and concrete, measurable policies and projects.<sup>3</sup>

### Case Example 7: Access for Rural Women, Armenia

In Armenia, war and the subsequent transitional period left deep economic and social wounds, particularly in rural communities. The focus on survival made the rural-urban divide more acute in terms of educational and technological development. Youth, and in particular young women, lacked education and work. Zartonk-89, an NGO with a mandate to create workplaces for needy families, women, and refugees and to help women solve their health, educational, and social problems, spearheaded an initiative to address these challenges.

The Network and Capacity Building for Rural Women in Armenia project was implemented in rural communities of Syunik region. The project aims were threefold: 1) to improve the livelihoods and status of rural women and to support gender equality in the local community through empowering women and teaching them ICT and its usage, 2) to contribute to the establishment of a women's club that would act as a center for networking and information exchange among rural women as well as disseminate up-to-date information and knowledge, and 3) to strengthen existing ties among various agencies and rural women through improving access of women to using ICTs. The project design reflected the First Mile Principles, in particular through its solicitation of local women's problems and needs. The initiative was guided by two equally important concepts: ICT education and ICT for education.

Fifty rural women, including 20 jobless refugees aged 16 to 20 living in poverty, participated in the ICT training courses. The women gained new computer and Internet skills, which opened up opportunities in the job market. They created contacts, discovered ways to continue their learning through online distance education, and broadened their perspectives with access to current information and daily news. Digital literacy, access, mobility and control, and convergence of scattered communities were not the only benefits. Gaining marketable skills and working with other women has improved the women's self-esteem and better equipped them with knowledge to fight against discrimination, social injustice, and gender inequality.

Zartonk-89 has facilitated positive realities for rural women; however, its exclusive focus on women may alienate men and further increase women's burden to support household and community life. Rural men also need the skills and knowledge to enter the information age and to work alongside women to fight against discrimination, social injustice, and gender inequality.

*Source:* Human Rights in America by Civil Society Institute, <http://www.hra.am/eng/?page=organization&id=70>. Gender and ICT Projects Database, [http://www.genderawards.net/gict\\_pr\\_db\\_result.shtml?x=19983&year=2003](http://www.genderawards.net/gict_pr_db_result.shtml?x=19983&year=2003).

### Case Example 8: Cell Phone Repair Small Business Development for Women, Cameroon

Mobile phone penetration in Cameroon increased from 0.02 percent in 1999 to over 12 percent in 2005; by 2006 mobile phones represented more than 95 percent of all telephone lines. The number of mobile phone subscribers grew to over 2 million while fixed lines numbers dropped to below 100,000. A long established women's business association, ASAFE, identified this escalation in cell phone use as a viable and expanding business opportunity for young women in peri-urban and rural areas.

The program developed by ASAFE supports the creation of small-scale enterprise in rural and peri-urban areas for the maintenance and commerce of cell phones. Women are trained on how to repair cell phones, sell them, and run viable businesses. Women are provided technical and management training modules (which last for 14 days) and a loan to acquire 10 cell phones, pay for needed equipment, and rent a small space. So far 100 women have been trained. Twenty have already set up repair workshops and earn an average of US\$100 per month. Cameroon is made of 47 subdivisions and ASAFE is planning to get 50 women from each subdivision to be trained through the program.

*Source:* Email communication between Nidhi Tandon and Mme Gisele Yitamben, President, ASAFE, Douala, Cameroon June 26, 2008.

## ICTs as an Added Challenge for Women in the Workforce

While teleworking has certainly offered women a range of new employment possibilities, the downside is that women can be excluded from other, better, career possibilities. Instead of finding a balance, family responsibilities are combined with paid work, so that women end up acquiring new tasks on top of the old. Another common ICT employer of women is in the call-service sector. Effective call service often requires “client communication” or emotional labor, the latter tends to be considered an “inherent” skill to women, and they are usually financially undervalued.

Recent studies<sup>4</sup> of women working in call centers in Europe found that, contrary to notions about skill development and flexible career advancement, women’s data processing work is often routine, deskilled, and devalued. Women in these centers rarely advance beyond “team leader” roles to managerial positions. Research in India also confirms that employment of women in the software and IT-enabled services sector closely mirrors the prevailing tendency of the market to reinforce existing socioeconomic inequities.

### Box 5: Women Encounter Technology

Mitter and Rowbotham’s 1995 anthology *Women Encounter Technology* explores the impact of technology on women’s employment and the nature of women’s work in third-world countries. Some observations that are particularly relevant in gender analysis are given below.

Gender is one of many factors that determine the impact of IT on women’s working lives. Age, class, ethnicity, and religion can play even greater roles in defining women’s working position. Similarly, the degrees of exclusivity that arise from the information revolution sharply differentiate regions and communities.

Technological changes affect the quality and quantity of women’s work. Along with women’s employment benefits from new technologies there are associated health, environmental, and other costs. Employment issues of concern to women working in technology relate to contractual terms, intensification of workloads, wages, training, and health and safety such as video display unit hazards and repetitive strain injuries.

Increased job opportunities bring new tensions in women’s domestic lives. For example, Acero’s case study documents the typical life of a woman textile worker in Argentina: “My marriage started to break down when I started to work ... I had more chances than he did. So things started to go wrong.” Deeper insights are needed into the links between women’s status and role at work and at home. Women are rarely represented in the decision-making areas of technology. As a number of essays document, women are predominantly only in blue-collar jobs. In the next phase of the technological change these are precisely the jobs that will be vulnerable.

Upgrading women’s skills through a continuous learning process benefits women and society. Radical thinking about training is essential for utilizing women’s potential. In particular, training needs to take into account age, class, ethnicity, and religion.

Women’s sharing of experiences has proved rewarding at community, national and international levels. More international exchanges of experience in organizing around some of the new issues relating to the electronic era are needed in order to ensure that women’s employment benefits from new technologies are not outweighed by the associated health and environmental costs.

Source: APC WNSP, “Gender and Information and Communication Technology: Towards an Analytical Framework,” <http://www.aworc.org/went2001/tracks/joint/all-sr-wnsp-frame.doc>.

There is a risk, particularly in emerging knowledge economies, of regarding women's interface with ICTs solely in terms of upgrading their skills to make them employable in the ICT sector to the exclusion of the potentially deeper and long-term benefits that ICTs might have for women's overall social and knowledge-based development. *In other words we need to be alert to the reality that ICTs can either reinforce gender differences or can help to overcome them.*

### **Notes**

<sup>1</sup> Huyett and Viguerie 2005.

<sup>2</sup> ILO 2004.

<sup>3</sup> Wakunuma 2007.

<sup>4</sup> Alteri, Bertin, and Huws 2002.

# Implementation Issues for Women and ICTs

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For ICTs to have the broadest reach and the most powerful positive impact, all global citizens need to participate fully in the knowledge society from basic access through the top levels of leadership. But the opportunities women can bring to development will not be realized unless policies for all mainstream efforts take gender considerations into account. This requires not only women and men be present as part of mainstream discussions, but also includes at the table individuals who are fully educated on the research relating to the interaction of gender and ICTs.

Policy advocates sometimes fail to appreciate the diversity of opinion that arises from the study of gender as a discipline. As we accept that different economists have different strategies for addressing the global economic recession, so policy makers need to allow for a debate on the issues and arrive at a diversity of perspectives and recommendations. It is only through this natural discourse that we can hone the clear pathways needed to ensure all women and men benefit. To this end, policy makers should ensure they talk not only to the gender experts in policy, but also to practitioners, business developers, and educators that work daily with the population, as well as women themselves.

Today, many developing countries are turning to the ICT sector as a new opening for attracting foreign direct investment—primarily in data entry and call center facilities. These facilities, however, are currently located in a handful of countries—India, Israel, Ireland, Mexico, the Philippines, and increasingly China. Concurrently, many U.S. companies that outsourced their call centers are rethinking this option in the light of increasing international costs and rising unemployment that will keep internal expenses down.

The projected development of this aspect of labor-intensive, low-skilled ICT work seems to be not unlike the long-established garment and electronics industries: poor wages and working conditions, little to no skill or technology transfer, absence of career growth, and feminization of the low-end, low-pay jobs. But ICTs have also been seen as a means for the development of e-commerce based initiatives where women are producing crafts or hand made products to market on line. In some cases women have little direct control over ICTs per se and are often far removed from the decisions and the applications around ICTs, but there are other initiatives where ICTs are integrated comprehensively throughout an existing institution, such as in SEWA, where women learn to apply different kinds of ICTs to a wide range of activities.

## **Creating a Supportive Environment as a Critical Success Factor**

Public policy has a defining role to play in building up a country's human capital and knowledge endowments through promoting quality education, lifelong learning, and

innovation and creativity in its workforce. In order to promote women's full participation and involvement with ICTs, national and sector policies need to be consolidated to support women's contribution to economic growth as agents of change.

Without careful planning and the development of appropriate policy measures, ICTs may exacerbate differences between the rich and the poor and men and women. In the absence of a deliberate policy, the diffusion and use of ICTs and their intended benefits tend to follow the existing contours of income and economic divides with the poor being further marginalized or excluded. Due to socio-cultural norms, there are persistent gender inequalities in men and women's access to ICTs. For example, women's mobility may limit their access to Internet centers, or ICT training courses may not advertise in places that women frequent.

"ICTs and policies to encourage their development can have profound implications for women and men in terms of employment, education, health, environmental sustainability and community development. Policy is needed to ensure that investment in ICTs contributes to more equitable and sustainable development as these technologies are neither gender-neutral nor irrelevant to the lives of resource-poor women."<sup>1</sup>

### **Providing Relevant Content for Women and Men**

Warschauer proposes that a better model for understanding access to ICTs is provided by the concept of literacy. The world has considerable experience in literacy acquisition that can also be brought to bear on ICT for development. Referring to the work of Brazilian social activist and educator Paulo Freire, Warschauer argues that "literacy instruction is most effective when it involves content that speaks to the needs and

#### **Case Example 9: Microsoft's DigiGirlz**

The objective of the Microsoft DigiGirlz program for the Arab region is to attract more high school students to Dubai Women's College (DWC) and increase the presence of female students in the field of science, technology, engineering, and math (STEM) programs. DWC partnered with Microsoft to bring this U.S. program to the United Arab Emirates as a first step in evaluating its ability to be customized for the region. The goal would be to prepare female school students for the challenges of working in a global environment and engaged them throughout the day with emerging technologies. The event was hosted for the first time in the Arab World in May 2009 and was fully integrated into a Year 2 IT marketing course. Prior to attending, the DWC students had to develop an intensive marketing plan that involved building creative ideas to attract the high schools to participate as well as engage them with meaningful technical activities.

The event met all expectations and attracted 200 students. Since then seven blogs were created, and seven new schools have expressed an interest in participating in the following year. In addition, multiple businesses beyond Microsoft offered to support the event through volunteers and sponsorships.

*Source:* Yousuf et al. 2009.

social conditions of the learners. As with ICT-related material, this content is often best developed by the learners themselves."<sup>2</sup> This has a particular resonance with women, who are usually intimately knowledgeable about their local contexts, issues, and solutions, and can use ICTs to share, consolidate, and represent their interests and perspectives. This also gives women an opportunity to lobby public bodies themselves.

They will also benefit by accessing information that can provide them with the information to better serve themselves, their families, and their communities.

### **Stakeholder Participation**

A common criticism of ICT for development projects is that they fail to build on existing systems of work in a participatory way and therefore do not achieve local input and local ownership. There is often a gap between the design of an ICT project and the reality of what can unfold on the ground and the long-term implications for women. To avoid the recurrence of these mistakes, the introduction of ICTs into the activities of a community needs to involve the full participation of women from its very inception. This means engaging women in decisions, implementation, governance, and in benefiting from revenues, profits, and cost sharing. All development interventions must work with both women and men stakeholders to ensure that women's opportunities to utilize technologies are not inhibited by cultural dictates on seclusion, restrictions on mobility, or the unequal division of labor. While there may be "lessons" to be learned, business models and case studies that suggest "replicability," in fact no two situations are ever the same. It is important therefore, to refrain from transforming models and studies into "formulated approaches" or "prescriptive measures" if we are to ensure that the innovative character of ICTs remains in the hands and control of the users themselves.

Finally, it is important to involve national and international leadership in broad-based programs, but the knowledge base must be from the grassroots in order for it to be successful. Networks or "collaboratives" have been shown to be successful in bringing multi-stakeholder groups together to both provide content and resources, as well as benefit from shared efforts and ensuring sustainability. TARAhaat of the NGO Development Alternatives in the poorest region Bundelkhand of India has lessons from which we can all learn. From micro-credit services to skill development to alternate energy sources to markets for rural products produced and procured by women, this organization has created a model of success for women to be economically independent in more than 50 villages. Kudumbshree in Tamil Nadu, also in India, is another such experiment in the applications of ICT for poverty reduction for women.

### **Contextual Factors**

Research has demonstrated that men and women approach technology differently. One study conducted at the University of Maryland Baltimore County highlighted the difference between men's and women's (or in this case girls and boys) interest in technology as one of toys versus tools. Boys liked to "play with technology."<sup>3</sup> Girls liked to use technology as a tool to achieve a goal. This has broad implications for education. It also suggests that while boys may be more familiar with the jargon and hardware of technology, girls will bring great value in thinking through the opportunities for innovative problem solving using ICTs.

This understanding of the nature of boys and girls approach to technology must also be weighted with an understanding of the countries or regions historical, cultural, political, and economic contexts. For instance, in the small enterprise arena, research has demonstrated that women's businesses are more successful if project managers are appreciative of the unique factors women contribute to business development and need in terms of support and services.<sup>4</sup> The value women bring to the

**Box 6: Bridging the Rural Digital Divide: Livelihood Approaches Policy Framework**

1. Adapting Content to Local Context
2. Building on Existing Systems and Working with Existing Policies
3. Addressing Diversity
4. Building Capacity
5. Ensuring Equitable Access and Empowerment
6. Building Partnership Networks with Two-way Flows of Information
7. Adopting Realistic Approaches to Technology
8. Information Costs

Source: FAO, "Bridging the Rural Digital Divide," <http://www.fao.org/rdd/doc/8pillars.pdf>.

business and education community will be lost if traditional patterns of entrepreneurship and business development are utilized without thought of industry and its culture. In fact, there will always be women who are successful at fitting into the traditional male models for professional development, but this speaks more to the women themselves and the broad diversity they represent. Having a "one size fits all" plan may be easier, but it is completely contradictory to the innovation and creativity that is needed in the development space.

Remaining current with changes in the economic, social, and political climates in different countries is important because they influence entrepreneurial ambitions in specific directions at different points in time.<sup>5</sup>

## Empowering Women through ICTs

Experience from recent policy efforts at the international level suggests that gender biases in the information society will persist for the foreseeable future. However, ICTs may give women the opportunity to be agents of their own development. Women are not "waiting" for access to ICTs, but rather using ICTs when they are available to get around the constraints they face in politics, society, and economy. There are case studies on gender and ICTs from around the world to highlight efforts by women and their organizations to negotiate the "digital divide" independently. This situation is apparent from the case studies introduced in this paper. ICTs are not "gender neutral" because they take on the gender of their developer from basic content to use to functionality to beneficiary. Many women know the importance of information and the power that these technologies hold in terms of breaking out of systematic discrimination and gender violence in the household, workplace, and village. They also see the new opportunities that ICTs provide for personal business development and growth. Like men, women are not waiting for policy making to bridge the "digital divide" but rather taking action as *agents of their own opportunities* using conventional ICTs such as radio to access information sources and communication processes to achieve their development goals, both for the good of their households and communities. In the papers written by Blythe McKay about the community radio station Radio Ada in south-eastern Ghana<sup>6</sup> and by Mercy Wambui of radio listening group projects in postwar Sierra Leone,<sup>7</sup> it is clear that the control of the ICTs and



radio tenure or usufruct rights (radio programs by and for women) are of central importance. This consideration must be emphasized in policy that calls for public access, which in itself may not be sufficient to provide a voice for rural, resource-poor women.

### **Box 7: Eight Habits of Highly Effective ICT-Enabled Development Initiatives**

1. Implement and disseminate best practice
2. Ensure ownership, get local buy-in, find a champion
3. Conduct needs assessments
4. Set concrete goals and take small achievable steps
5. Critically evaluate efforts, report back to clients and supporters, and adapt as needed
6. Address key external challenges
7. Make it sustainable
8. Involve groups that are traditionally excluded on the basis of gender, race, religion or age.

Source: [www.bridges.org](http://www.bridges.org).

ICT access statistics on their own, however, are not a true indicator of women's empowerment. Nancy Hafkin's brief "Are ICTs Gender Neutral? A Gender Analysis of Six Case Studies of Multi-Donor ICT Projects"<sup>8</sup> outlines how women's higher education, participation in small businesses, and ICTs access compared to men in the Philippines and in Thailand do not translate into women's equal representation in leadership or government positions. Similarly, the mere fact that more women are employed in the manufacturing sector facilitated by ICTs does not necessarily mean that these same women are benefiting from literacy or higher learning program or gaining leadership, communications, or negotiation skills.

Nancy Hafkin refers to Amartya Sen's argument for the centrality of women in the knowledge society, and writes, "knowledge is not only for economic growth but its foremost use should be to empower and develop all sectors of society to understand and use knowledge to increase the quality of people's lives and to promote social development. A socially inclusive knowledge society empowers all members of society to create, receive, share and use information and knowledge for their economic, social, cultural and political development."<sup>9</sup>

It is therefore an imperative from the perspective of gender and ICTs for development that focus be placed on gender relations in communication and learning rather than simply women and technology. To this end, we may see that the information society is not an end in itself, but rather, the innovation of ordinary people.<sup>10</sup>

**Box 8: Ways in Which ICTs Can Contribute to Women's Economic Opportunities**

1. An increased ability for women to work from home
2. Improved employment opportunities for women in the ballooning IT sector
3. Increased ability of informal sector women to shift to the formal sector
4. Improved global market access for craftswomen through e-commerce
5. Transformation of traditional gender roles
6. Improved access of women, especially rural women, to distance learning and distance work programs
7. Improved ability for the sharing of experiences among women's organisations concerned with the economic well being of women in the informal sector
8. Increased ability to avoid gender bias by having a gender-opaque medium.

*Source:* Online discussion on "Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women," June 17 to July 19, 2002, <http://www.un.org/womenwatch/daw/egm/ict2002/reports/week1.html>.

**Notes**

<sup>1</sup> Odame 2005.

<sup>2</sup> Mark Warschauer, "Reconceptualizing the Digital Divide," [http://131.193.153.231/www/issues/issue7\\_7/warschauer/index.html](http://131.193.153.231/www/issues/issue7_7/warschauer/index.html).

<sup>3</sup> Hou et al. 2006.

<sup>4</sup> Kepler and Shane 2007.

<sup>5</sup> There are a number of good sources of information to start with, such as "The Knowledge Wedge: Developing the Knowledge Base on Women Entrepreneurs." Further information available at [www.ilo.org](http://www.ilo.org).

<sup>6</sup> McKay 2005.

<sup>7</sup> Wambui 2005.

<sup>8</sup> Hafkin 2002.

<sup>9</sup> Hafkin 2002.

<sup>10</sup> Odame 2005.

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## Selected Web Resources

### *ICT4D portals and knowledge bases to find case examples and projects*

Bridges.org case studies

[http://www.bridges.org/case\\_studies](http://www.bridges.org/case_studies)

Development Gateway

<http://topics.developmentgateway.org/ict>

Digital Dividend Project Case Studies

- <http://www.digitaldividend.org/case/case.htm>  
Digital Opportunities: ICT Case Studies  
<http://www.digitalopportunity.org/article/frontpage/321/4853/>  
E-Government practices from all over the world  
<http://apdip.net/resources/e-governance/killerapps/Annex%20A.pdf>  
FAO Bridging the Digital Divide searchable database of rural case studies  
[http://www.fao.org/rdd/case\\_studies\\_en.asp](http://www.fao.org/rdd/case_studies_en.asp)  
i4d: The first monthly magazine on ICT4D  
<http://i4donline.net/index.asp>  
International Institute for Communication and Development (IICD)  
<http://www.iicd.org/>  
Next Billion's Activity Database  
<http://www.nextbillion.net/activitycapsule>  
Stockholm Challenge projects  
<http://www.stockholmchallenge.se/projectdata.asp>  
USAID ICT projects inventory  
<http://www.dec.org/partners/ict/ICTsearch.cfm>  
World Summit Awards: the Best in e-Content and Creativity  
<http://www.wsis-award.org/>

***ICT4D portals and websites with specific gender sources***

- Asia Pacific Development Program Gender Resources  
<http://www.apdipnet/projects/gender/resources/>  
CEDEFOP: Generic ICT Skills Profiles  
[http://www.career-space.com/downloads/allprofiles\\_2205\\_EN.pdf](http://www.career-space.com/downloads/allprofiles_2205_EN.pdf)  
GEM: Gender Evaluation Methodology for Women and ICTs – A Learning Tool for Change and Empowerment  
<http://www.apcwomen.org/gem/index.htm>  
International Telecommunications Task Force on Gender Issues  
<http://www.itu.int/ITU-D/gender/>  
Wikibook: Gender and ICT/Lessons Yet Unlearned  
[http://en.wikibooks.org/wiki/Gender\\_and\\_ICT/lessons\\_yet\\_unlearned](http://en.wikibooks.org/wiki/Gender_and_ICT/lessons_yet_unlearned)  
Women's ICT-Based Enterprise for Development  
<http://www.womenicnterprise.org/>  
ICT4D portals and websites on measuring impact of ICTs  
UNCTAD's [www.Measuring-ict.unctad.org](http://www.Measuring-ict.unctad.org) (no gender-disaggregated stats nor analysis) [http://new.unctad.org/default\\_\\_\\_\\_\\_575.aspx](http://new.unctad.org/default_____575.aspx)  
UNESCO Methodology to Assess ICT Impact On Poverty Eradication  
[http://portal.unesco.org/ci/en/ev.php-URL\\_ID=13276&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=13276&URL_DO=DO_TOPIC&URL_SECTION=201.html)

# Potential Action Plan Matrix for Gender-Sensitive Approaches to ICTs

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Much has been written on indicators for gender equity and ICT for development. This guideline is developed to be a cross-sectional look at potential indicators that directly affect economic development. A deeper, well developed discussion of the issues of gender indicators for science, engineering and technology (SET), please see Huyer and Westholm (2007). This also includes an appendix of multiple sources of gender disaggregated data in SET. Special thanks also goes to the Eftimie and others for their report “Mining for Equity: Gender Dimensions of the Extractive Industries” (forthcoming in September 2009), which provided a useful framework and concepts for this appendix.



**Impact: Improved economic outcomes through women's increased access to ICTs to benefit women, their families and communities**

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
<b>A. Informal and Formal Education</b>				
1. Increase education levels for girls and women through the distribution of knowledge through ICTs.	<ul style="list-style-type: none"> <li>∞ Increase school enrollment for girls.</li> <li>∞ Increase access to knowledge and learning anywhere, anytime.</li> <li>∞ Improve knowledge access to improve basic human needs to allow time and energy for education.</li> <li>∞ Improve literacy training for women.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Number and percent of girls attending and completing primary and secondary school.</li> <li>∞ Number and percent of girls and women with access to ICTs (radio, TV, cell phone, computer, Internet, other) in their households.</li> <li>∞ Number and percent of girls and women with access to ICTs in schools or community centers.</li> <li>∞ Frequency of use and percent of time spent using ICTs for education or learning activities.</li> <li>∞ Percent of girls and women who have access to electricity.</li> <li>∞ Percent of girls and women who have access to clean water and basic needs.</li> <li>∞ Number of adult women who attend and complete literacy training classes or e-learning classes.</li> <li>∞ Percent of women who are literate.</li> </ul>	<ul style="list-style-type: none"> <li>∞ USE ICTs to communicate and market educational opportunities and value for girls and women.</li> <li>∞ Develop and/or expand innovative methods for ICT distribution and connectivity.</li> <li>∞ Create female-friendly ICT-enabled community sites for women to access with their children.</li> <li>∞ Train teachers to integrate ICTs into education for all.</li> <li>∞ Develop informal career awareness activities to promote an interest among girls in science, technology, and engineering jobs and careers.</li> <li>∞ Provide e-learning opportunities that are interesting and engaging to girls.</li> <li>∞ Provide incentives for parents to encourage their girls to become educated.</li> <li>∞ Design and implement adult literacy programs where none exist.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Local governments, foundations, aid agencies.</li> <li>∞ Entrepreneurs, businesses, aid agencies, chambers of commerce, professional bodies.</li> <li>∞ Government and community organizations.</li> <li>∞ Government.</li> <li>∞ Government, academic institutions, NGOs.</li> <li>∞ Government, aid agencies.</li> <li>∞ NGOs, government agencies, businesses.</li> <li>∞ NGOs, government, educational</li> </ul>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
				entities.
2. Increase women's participation in education programs related to ICTs.	<ul style="list-style-type: none"> <li>∞ Increase enrollment of women in computer science, information systems, and (pre) engineering programs at the secondary and tertiary level.</li> <li>∞ Creation or expansion of women's networking organizations to support women in ICT-related education and the workforce.</li> <li>∞ Increase women's access to basic ICT literacy training for education/employment that addresses women's unique needs of childcare, rural location, low literacy, and language barriers.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent and number of women enrolled in ICT-related formal education and/or training classes.</li> <li>∞ Number of marketing materials developed and disseminated for recruitment by colleges that include images of women.</li> <li>∞ Number and percent of women faculty in ICT-related programs.</li> <li>∞ Number of women serving ICT educational/training programs.</li> <li>∞ Location of ICT education and training programs.</li> <li>∞ Degree of accommodation of ICT training/education for women's literacy, language, or location needs.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Provide educational pathway programs to prepare women for ICT education.</li> <li>∞ Create promotional efforts to recruit women to ICT education programs.</li> <li>∞ Use ICTS to disseminate information to women about associations, educational programs, and training for ICT jobs and careers.</li> <li>∞ Develop ICT training to address women's unique needs, including language, literacy, location, ethnicity, disability, and age.</li> <li>∞ Develop databank of female role models.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Educational organizations, NGOs, government.</li> <li>∞ Educational organizations, NGOs, government.</li> <li>∞ Businesses, educators, governments, NGOs.</li> <li>∞ Businesses, educators, governments, NGOs.</li> <li>∞ NGOs, government, business.</li> </ul>
<b>B. Health Care Quality, Access and Cost</b>				
1. Improve general health for women, their families, and communities through ICTs	<ul style="list-style-type: none"> <li>∞ Increase access to health-related knowledge including point of service for direct care and hospitalization</li> <li>∞ Increase access to health-related knowledge including addressing unique culture and context in the local language</li> <li>∞ Increase access</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent of women who visit local health center for primary care needs.</li> <li>∞ Infant mortality rates.</li> <li>∞ Maternal mortality rates.</li> <li>∞ Percent of women with sexually transmitted diseases.</li> <li>∞ Number of</li> </ul>	<ul style="list-style-type: none"> <li>∞ Increase ICT content to provide culturally appropriate health care information, including practices for healthier living.</li> <li>∞ Provide opportunities for women in rural areas to gather traditional knowledge and</li> </ul>	<ul style="list-style-type: none"> <li>∞ Community Centers, local government, educational organizations, medical professionals.</li> <li>∞ Entrepreneurs, foundations, businesses, and governments.</li> </ul>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
	to medical specialists via ICTs.	different medications per household.	market it for personal empowerment and community health. ∞ Develop or expand innovative practices to access medical professionals through ICTs.	∞ Entrepreneurs, foundations, businesses, and governments.
2. Improve nutrition for women and families through ICTs.	∞ Improve knowledge about safe food and water preparation and storage readily available. ∞ Improve knowledge about nutritional content for healthy living accessible through ICTs in the native language or through non-literate formats.	∞ Incidences of diabetes. ∞ Percent of community reporting hunger and malnutrition. ∞ Percent of childhood dental disease. ∞ Community healthcare websites visits. ∞ Incidences of AIDS. ∞ Incidences of death due to nutrition and health care choices.	∞ Engage women to provide knowledge for improved health care choices through multiple sources of ICTs. ∞ Undertake surveys to understand ICT usage for improved outcomes. ∞ Through ICTs undertake communication campaigns and provide medical interventions to identify and treat lifestyle disease. ∞ Create online communities in which women can support each other.	∞ Businesses, governments, educational organizations.  ∞ Government.  ∞ Government, medical organizations, aid agencies.  ∞ NGOs, academic organizations.
3. Improve affordability of health care for women, their families, and communities through ICTs.	∞ Increase access and use of health care resources. ∞ Increase costs savings redirected to education and other needs.	∞ Percent of office visits. ∞ Compliance level with health care regimes, including medication. ∞ Percent of hospitalization. ∞ Percent of household income directed to health care costs.	∞ Create inexpensive avenues for content to be distributed through ICTs to support health care education. ∞ Create ICT access to medical professionals to save travel and time for all.	∞ Government, aid agencies, medical professionals, business.  ∞ Medical community, ICT business

<b>Desired Outcomes</b>	<b>Desired Outputs</b>	<b>Indicators</b>	<b>Associated Activity</b>	<b>Organization</b>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
<b>C. Employment</b>				
1. Increase direct employment of women.	<ul style="list-style-type: none"> <li>∞ Develop or expand affirmative action initiatives to increase women's participation in ICT businesses at all levels.</li> <li>∞ Develop women and IT networking organizations.</li> <li>∞ Develop pathway programs to recruit women from education to employment.</li> <li>∞ Develop female-friendly ICT employment opportunities in rural areas.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Ratio of men to women's employment in ICT companies.</li> <li>∞ Number of women employed by ICT companies in total.</li> <li>∞ Ratio of women employed in unskilled and skilled IT jobs to those in supervisory and managerial positions.</li> <li>∞ Percent of highly qualified IT professional women actively seeking work.</li> <li>∞ Percent of highly qualified IT professional men actively seeking work.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Increase e-skill training for women to address culture issues in the workplace.</li> <li>∞ Provide affirmative action information to women through employer and government sites, as well as through NGOs.</li> <li>∞ Work with employers to increase their readiness to hire and support women.</li> <li>∞ Integrate women in all mainstream employment efforts, particularly in rural areas.</li> <li>∞ Develop personal and professional programmers for women.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Employers, NGOs, education, government.</li> <li>∞ Employers, NGOs, education, government.</li> <li>∞ Businesses, NGOs.</li> <li>∞ Employers, NGOs, education, government, aid organizations.</li> <li>∞ Businesses, women networks, NGOs.</li> </ul>
2. Increase opportunities for women in supervisory and management level leadership positions in ICT companies.	<ul style="list-style-type: none"> <li>∞ Measure women's participation at all levels of corporate hierarchy.</li> <li>∞ Identify the number of legal actions filed by women for harassment and other discrimination factors.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent women's participation in upper management of ICT companies and on boards of trustees.</li> <li>∞ Percent of men and women supervised by women.</li> <li>∞ Percent of women reporting being mentored for leadership.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Provide employer-training to support female recruitment, retention, and promotion.</li> <li>∞ Provide employer-based as well as association based support networks for women in leadership.</li> <li>∞ Develop database of women experts in ICT to enable recruitment and retention.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Business, NGOs.</li> <li>∞ Employers, associations, women's NGOs.</li> <li>∞ Government, aid agencies, NGOs.</li> </ul>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
			∞ Offer mentoring programmers for both men and women.	∞ Businesses, government, NGOs.
3. Improve working conditions for women in ICT businesses.	<ul style="list-style-type: none"> <li>∞ Harassment is decreased.</li> <li>∞ Increased workplace retention.</li> <li>∞ Improved job satisfaction by women.</li> <li>∞ Improved company performance.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent women reporting a positive experience in the workplace.</li> <li>∞ Percent of actions taken against employers by women.</li> <li>∞ Retention rates.</li> <li>∞ List of services to support families by employer and sector.</li> <li>∞ Return on investment for businesses.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Educate women on their rights and responsibilities in the ICT workplace.</li> <li>∞ Support efforts to promote equal pay for equal work.</li> <li>∞ Develop surveys and other strategies for measuring disaggregated employee satisfaction.</li> <li>∞ Provide flex-time/ childcare, leave policies, and other employment options to support families and work life balance.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Business, educational organizations, associations, NGOs.</li> <li>∞ Government, NGOs.</li> <li>∞ Businesses, government, NGOs.</li> <li>∞ Businesses, government.</li> </ul>
4. ICT companies take into account women's views and integrate their ideas into business strategies that serve all.	<ul style="list-style-type: none"> <li>∞ Increase content on websites targeting women's interests and needs.</li> <li>∞ Increase ICT business development and growth for all markets, including women's.</li> <li>∞ Percent increase in women's access and use of ICTs per household.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent increase of ICT web pages targeting women's interests and needs.</li> <li>∞ Percent business revenue driven by ICTs.</li> <li>∞ Percent increase in women's access and use of ICTs per household.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Businesses develop products and services for women and distributed through multiple ICTs.</li> <li>∞ ICT hardware and services customized for women's needs and interests.</li> <li>∞ Women empowered in businesses to provide leadership at strategy levels for product design and development.</li> <li>∞ Develop forum for women's voices to be heard.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Business.</li> <li>∞ Business.</li> <li>∞ Business.</li> <li>∞ Businesses, NGOs.</li> </ul>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
<b>D. Entrepreneurship and Empowerment</b>				
1. Improve access to banking and micro and macro enterprise systems to build ICT or ICT-enabled businesses.	<ul style="list-style-type: none"> <li>∞ Increase in women secured loans from banks and micro-credit institutions equal to men.</li> <li>∞ Loans do not require countersignature of husband.</li> <li>∞ Increase in numbers of women who have access to finances to start their own small businesses.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Number and Percent of women with bank accounts in their own names.</li> <li>∞ Number and amount size of loans made directly to women within the past year by institution.</li> <li>∞ Number of micro credit schemes which women can access.</li> <li>∞ Number of pro-female banking regulations.</li> <li>∞ Number of female-owned businesses in ICT community.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Prepare, implement, monitor, and enforce banking regulations that remove any barriers to and facilitate women's equal access to finance.</li> <li>∞ Prepare, fund, and implement, micro credit programs targeting women.</li> <li>∞ Prepare, fund and implement training programs in small business skills to accompany micro credit programs.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Government.</li> <li>∞ Government, NGOs, aid agencies.</li> <li>∞ Government, educational organizations, NGOs, aid agencies.</li> </ul>
2. Increased control of economic resources by women including right to own business and its assets in their own names.	<ul style="list-style-type: none"> <li>∞ Increase in the number of female-owned ICT or ICT-enabled business.</li> <li>∞ Increase in the content, resources, and hardware serving the interests and needs of women.</li> <li>∞ Increase wealth owned by women.</li> <li>∞ Decrease vulnerability of unemployed female headed households.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent and number of female owned ICT or ICT-enabled businesses or micro-enterprises.</li> <li>∞ Percent of ICT web pages targeting women's interests and needs.</li> <li>∞ Percent of women purchasing, renting, or accessing through public means ICTs.</li> <li>∞ Percent business revenue driven by ICTs.</li> <li>∞ Percent of wealth held by women at the local, national, and regional level.</li> <li>∞ Share of earned household income controlled</li> </ul>	<ul style="list-style-type: none"> <li>∞ Prepare and implement any legal reforms needed to remove legal restrictions preventing women owning land or other assets.</li> <li>∞ Support women's ability to collect and manage wealth generated from her business.</li> <li>∞ Increase awareness amongst business intermediaries with regard to women friendly business support.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Government.</li> <li>∞ Government.</li> <li>∞ Business intermediaries.</li> </ul>

Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
		by women (percent). ∞ Number of women in community with land titles in their own names.		
<b>E. Leadership</b>				
1. Improved participation and leadership of women in community and business economic activities and decision-making bodies.	∞ Percent increase in number of women in community leadership. ∞ Increase in the number of women engaged in community leadership organizations. ∞ Increase in the number and percent of women in higher level management of companies, including "C" level. ∞ Increased percent of women in government roles with power over economic development decisions.	∞ Percent of community leadership positions held by women. ∞ Number and percent of women who participate in women's civil society organizations. ∞ Number of women-focused civil society groups. ∞ Number and percent of women in government leadership positions at all levels. ∞ Number and percent of women in business leadership levels, including boards of trustees. ∞ Number and percent of women in civil service jobs with power over financial decisions. ∞ Number and percent of women in leadership roles of powerful NGOs and aid agencies.	∞ Conduct focus groups to determine barriers to women's participation. ∞ Conduct capacity building exercises for women to prepare them to take on leadership roles. ∞ Develop collaborative efforts among NGOs to create a mega community with greater power and influence. ∞ Create online knowledge resources to support women in all levels of leadership (from education, to public advocacy). ∞ Market the value-added for economic development. ∞ Collect gender-disaggregated data monitoring women's increased role in leadership levels to economic development.	∞ Government, civil society, businesses.  ∞ NGOs, businesses.  ∞ NGOs, civil society.  ∞ NGOs, civil society, business, government.  ∞ NGOs.  ∞ Government.
2. Women groups have a strong voice and their views and	∞ Women's participation in the knowledge society is represented	∞ Percent and number of women in legislative role in government.	∞ Ensure that women are well represented in Local and Regional	∞ Government, civil society.



Desired Outcomes	Desired Outputs	Indicators	Associated Activity	Organization
<p>concerns are fully taken into account in local and regional development planning and decision making.</p>	<p>equally to men's.</p> <ul style="list-style-type: none"> <li>∞ Legislation supporting women's interests is passed and implemented.</li> <li>∞ Local and regional development including infrastructure for knowledge access, community facilities, and business incentives meet women's needs and priorities.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Percent of policy initiatives supported for women's participation and leadership in the knowledge society.</li> <li>∞ Number of women members of local and regional development committees.</li> <li>∞ Amount of consultation with women's groups regarding local and regional development plans.</li> <li>∞ Percent of women who consider that local and regional development plans are well designed.</li> </ul>	<p>Planning Committees in all phases of broadband and ICT development.</p> <ul style="list-style-type: none"> <li>∞ Undertake research into how women are impacted by ICTs in specific communities and disseminate results.</li> <li>∞ Work with national governments to disaggregate data to better understand women's involvement at all levels of the knowledge society.</li> <li>∞ Help develop and support grass roots efforts for women and ICTs access, literacy, development and design and leadership.</li> <li>∞ Integrate women's needs into all mainstream efforts connected to all aspects of the knowledge society.</li> </ul>	<ul style="list-style-type: none"> <li>∞ Academic institutions.</li> <li>∞ Governments, academic organizations, development agencies.</li> <li>∞ NGOs, government, civil society.</li> <li>∞ All stakeholders.</li> </ul>

# List of Case Studies To Be Reviewed

## E-government services for women, and used by women

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Public Access Points Egypt	Telecenters that have Internet access, equipped with 10 computers and offers training in a variety of IT-related fields were set up in urban and rural areas of Egypt. Beneficiaries include Egyptians without private access to Internet, based in rural areas, children with the establishment of a computer club. Impacts include women and youth empowerment, bridging the digital divide between rural and urban communities.	Annex A—Innovative e-Government Practices from All Over the World: <a href="http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf">http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf</a>
Documenting Women's Experiences in Situations of Armed Conflict Uganda	This project targeted areas that have or are experiencing armed conflict in Uganda. It was accomplished with the full participation of women war survivors and local leaders using appropriate ICT tools. Beneficiaries include women. Impacts include increased awareness on the effects of conflict and the need for peace. Also, the documentaries were used by lobbyist for peace building purposes.	Annex A—Innovative e-Government Practices from All Over the World: <a href="http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf">http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf</a>
APC-Africa-Women Regional-Africa	A network of organizations that work to empower African women's organizations to access and use ICTs to promote equality and development. The program provides information to women about gender and ICTs, conducts research on gender and ICTs and delivers training to women. Beneficiaries include African women. Impacts include empowerment of	Annex A—Innovative e-Government Practices from All Over the World: <a href="http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf">http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf</a>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Multipurpose Community Telecentre Network Regional-Africa	<p>African women through access to ICTs, training, research, and information in the field of ICT.</p> <p>The project set up 100 telecenters, developed links with educators, and shared their facilities to train users in computer literacy, use of computer applications, Internet, and email. The telecentre also provides public telephone, fax, and Internet connectivity. Beneficiaries include African women and citizenry. Impacts include 100 multipurpose telecenters that were established in more than 20 countries, created employment opportunities for women as they are the owners and managers of telecenters; provided affordable and easy access of information and telecommunications in the communities.</p>	<p>Annex A—Innovative e-Government Practices from All Over the World:  <a href="http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf">http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf</a></p>
Acacia Initiative: Communities and the Information Society in Africa Regional-Sub-Saharan Africa	<p>An integrated programme of research and development plus demonstration projects to address issues as applications relating to community needs, infrastructure, and policy in the Sub-Saharan African communities. Beneficiaries include people in Mozambique, Senegal, South Africa, and Uganda. Impacts include increased number of schools with Internet connection in South Africa; in Mozambique, jobs and education were provided by telecenters, number of tourists also increased from the use of the Internet; in Senegal, up-to-date health information was provided; and economic empowerment of women.</p>	<p>Annex A—Innovative e-Government Practices from All Over the World:  <a href="http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf">http://www.apdip.net/resources/e-governance/killerapps/Annex%20A.pdf</a></p>

**IT/IT-enabled services industry and impact on women employment and income opportunities**

<b>Project, policy or program initiative</b>	<b>Brief description of impact to date &amp; current status</b>	<b>Website or other reference</b>
APEC Women's e-BIZ Training Seoul, Korea (2007)	The WeBiz Training co-organized by ITU, the Women's e-Biz Training, the Asia Pacific Women's Information Network Center (APWINC) and UN APCICT was held from 16 to 21 July 2007 in Seoul Korea (next training is from July 11 to 7, 2008). ITU also organized breakout sessions on Empowering Home workers through ICTs, which produced, among others, country reports and recommendations. Approximately 40 delegates (women entrepreneurs, policy makers, and regulators) from Asia Pacific countries participated in this training whose objective was to support the buildup of a women e-Business network among women entrepreneurs and government policy makers.	<a href="http://webiz.women.or.kr/training/">http://webiz.women.or.kr/training/</a>
The Phoenix Project Taiwan (2005)	This project started in 2005 with a Microsoft Unlimited Potential Grant. It teaches basic IT skills to women in Taiwan via a 24-hour curriculum, focusing on how to send emails, how to use digital cameras, and how to post on the internet with a description, as these basic skills are relevant for women in communicating with their children and possibly doing business online. By 2007, the government saw the impact of the project and provided a matching fund. In 2008, a PC manufacture (ASUS) donated 500 easy to use low cost notebooks (EeePC) to the project. The project worked with more than 150 NPOs Nation Wide and has reached more than 50,000 women in all 23 counties in Taiwan. After only 24 hours training, the soft-results were amazing in addition to the hard skills the women learned including improved status in the family, improved child-mother relationship especially for teenagers and grownup children and improved self-confidence.	<a href="http://womenuphome.ecba.org.tw/default.aspx">http://womenuphome.ecba.org.tw/default.aspx</a>
Women in Technology Middle East and North Africa (WIT MENA)	Partnership program to empower women and expand their participation in the workforce by providing a number of local partner organizations, and the women they serve, with essential ICT	

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
(2005)	<p>skills through Microsoft Unlimited Potential, business planning, and professional development skills training. In partnership with Microsoft and Middle East Partnership Initiative of the US Department of State, WIT is implemented by the Institute of International Education in collaboration with local partners in nine countries: Bahrain, Iraq, Jordan, Lebanon, Morocco, Oman, Saudi Arabia, United Arab Emirates, and Yemen. Since its launch in 2005, WIT has trained 3,500 women and built the capacity of 50 local women's organizations in the Middle East. By 2010 WIT will benefit more than 10,000 participants, creating a strong base of women with vital IT and professional skills, allowing them access to new careers and increasing their role in shaping their societies. WIT's Business Planning training prepares local women's organizations to operate CTCs on a cost recovery model in order to expand their reach, sustainability, and ability to serve and train women. WIT illustrates an innovative partnership model between local and international organizations with a significant leverage of our community affairs work.</p>	
<p>Pallitathya Help-line, Development Research Network (D.Net) Bangladesh (2004)</p>	<p>D.Net (Development Research Network) is a non-profit organization, which envisages the use of information and communication technology (ICT) for economic development of Bangladesh. Incepted in January 2001, D.Net obtained legal status under the Societies Act 1860 with the Registrar of Joint Stock Companies, Bangladesh. Working with interfaces of all development use, D.Net thrives to build up itself as a multi-disciplinary organization.</p> <p>In 2004, Pallitathya Help-line is another project under Pallitathya Programme, which provides villagers with a set of mobile phone numbers to make a specific query on any livelihood matters or to send some urgent information to D.Net for further action. The call is answered by a specialist at the 'help-desk' located at D.Net's headquarter.</p>	<p>D. Net:  <a href="http://www.dnet-bangladesh.org/main.html">http://www.dnet-bangladesh.org/main.html</a></p> <p>Telecenters:  <a href="http://www.pallitathya.org/">http://www.pallitathya.org/</a></p> <p>Help line:  <a href="http://www.dnet-bangladesh.org/programs/helo_line.html">http://www.dnet-bangladesh.org/programs/helo_line.html</a></p> <p>2005 Gender and ICT awards:  <a href="http://www.genderawards.net/the_awards/press/index.htm">http://www.genderawards.net/the_awards/press/index.htm</a></p> <p><a href="http://www.genderawards.net/winners/2005/GICT_2005.pdf">http://www.genderawards.net/winners/2005/GICT_2005.pdf</a></p> <p>2006 review of two villages:  <a href="http://www.comminit.com/en/node/71408/36">http://www.comminit.com/en/node/71408/36</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	<p>At present D.Net provides 'help-line' services in four villages of Nilphamari, Bagerhat, Netrokona and Noakahli districts. There are four bare-foot women mobile-phone operators who work as infomediaries.</p> <p>The Helpline was accessed by over 4,000 users over a 15 month period. Research shows that 95 percent of queries are answered and 80 percent are satisfied with the information they get. 70 percent report having no local source for the information they get. The main benefit is financial saving with many examples of travel or use of middlemen being avoided. Women are the key beneficiaries. Mobile ladies is a profession for women in even the most remote villages that could lead to the ultimate employment of 89,000 women.</p>	<p><a href="http://www.comminit.com/en/node/132155">http://www.comminit.com/en/node/132155</a></p> <p>Livelihood Case Studies, D.Net, Dhaka, 2007: <a href="http://www.pallitathya.org/en/case_studies/index.html">www.pallitathya.org/en/case_studies/index.html</a></p> <p>Pallitathya Help Line, D.Net, Dhaka, 2005:<a href="http://www.dnet-bangladesh.org/Pallitathya_pcc.pdf">www.dnet-bangladesh.org/Pallitathya_pcc.pdf</a></p>
InfoShree Systems and Peripherals Kasargod, India (2003)	<p>The main activities of the unit are PC assembling and installation, service and sales. The unit also undertakes computer training and data entry operations. Currently, the unit is planning a further (limited) diversification: to supply reconditioned second-hand computer systems from a minimum price of US\$200 since demand for cheap systems is rising. The unit has ten core women members including the group leader and the secretary, all in their twenties.</p>	<p><a href="http://www.womenictenterprise.org/kasargod.htm">http://www.womenictenterprise.org/kasargod.htm</a></p>
The SCALA (Sharing Computer Access Locally and Abroad) Project Philippines (2002)	<p>EWB collaborated with the Social Technology Bureau of the DSWD to design and pilot the SCALA Project (Sharing Computer Access Locally and Abroad). The SCALA Project involved setting up Computer Livelihood Training Centers (CLTC) to help underprivileged youth access employment opportunities. The training at the CLTCs includes basic computer literacy training, life skills education, resource linkages, and employment support. As of 2005, 60 percent of the project's beneficiaries were underprivileged female out-of-school youth and 90 percent of the DSWD was comprised of female social workers. Impacts included: students of the project all have internet access,</p>	<p>The Scala Project: <a href="http://www.ewb.ca/en/whatwedo/overseas/projects/past/scala.html">http://www.ewb.ca/en/whatwedo/overseas/projects/past/scala.html</a></p> <p>2005 Gender and ICT awards: <a href="http://www.genderawards.net/winners/winners.htm">http://www.genderawards.net/winners/winners.htm</a></p> <p>Gender and ICT database: <a href="http://www.genderawards.net/gict_pr_db_result.shtml?x=91356&amp;ayear=2005">http://www.genderawards.net/gict_pr_db_result.shtml?x=91356&amp;ayear=2005</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Women-operated ICT Services Unit North-Western Uganda (2002)	<p>which provides them with access to information from all parts of the world; the project results in higher self-esteem and self-confidence in the women who graduate from this program.</p> <p>The ICT unit carries out computer application training, typesetting, data entry, and photo scanning. Its main customers include civil servants, students on vacation and from tertiary institutions, local government contractors, and local government councils. It has five PCs (Dell, Compaq, Acer) and uses MS Office Suite, Adobe Pagemaker, and SPSS.</p>	<p><a href="http://www.womenictenterprise.org/afard.htm">http://www.womenictenterprise.org/afard.htm</a></p>
Cybercafé Ile-Ife, Nigeria (2002)	<p>The enterprise is owned by a man and a woman who also manage it jointly with one other male employee. At inception the woman owner/manager purchased all the hardware (computers, peripherals, network cables, clips, clipping tools, RJ 45, etc), and supervised the business set-up (designed the network cabling, and supervised the laying of the network cables, and carpentry work such as tables and partitioning). She is now in charge of hiring staff, with input from other members, and actively participates in problem solving and management decisions.</p> <p>These female staff essentially assist the customers in accessing the Internet, surfing the web, sending and reading email messages, transferring and saving files, Internet telephoning, and sending or printing fax messages. They also print tickets for the customers. They purchase net-2-phone credits from the representative in Lagos. They also maintain the systems, switching them off and on, and updating the files. If the system slows down, they check for viruses, and also that they can check the radio on the mast by pinging the radio both at the site and the providers end. They also check to ensure the volume of bandwidth consumed is as requested. The female co-owner has a PhD.</p>	<p><a href="http://www.womenictenterprise.org/ileife.htm">http://www.womenictenterprise.org/ileife.htm</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
The VIRTUAL Computer Club Donetsk, Ukraine (2002)	The VIRTUAL Computer Club is a woman-run IT sector microenterprise. The Computer Club offers a number of services for the local population: computer games; computer training courses; typing, printing and copying of documents; and personal development for children and parents. It runs 10 workstations and by 2004, 12,000 hours of computer games had been provided and 60 people had received training. The total sales volume was US\$5,500 and approximately US\$200 monthly profit is made.	<a href="http://www.womenictenterprise.org/ukraine.htm">http://www.womenictenterprise.org/ukraine.htm</a>
Kalomo Bwacha Women's ICT Club Zambia (2000)	Kalomo Bwacha Women's Club was formed in 2000 in order to support women in their small-scale enterprises as well as to shed more light on how marginalized women were in Kalomo. It was formed by a group of ten women from different backgrounds who came together with a view to supporting each other and other women within and around the surrounding villages. They started a small-scale enterprise, which included tailoring, craftwork such as the creation of reed mats, knitting, sewing tablecloths, cooking, and baking. The idea was to cater for community events such as weddings, traditional ceremonies and other parties.	<a href="http://www.womenictenterprise.org/kalomo.htm">http://www.womenictenterprise.org/kalomo.htm</a>
eHomemakers Malaysia (1998)	On a mission to boost home entrepreneurship by tackling self-esteem issues that traditionally afflict women that have devoted many years of their lives as mothers, eHomemakers has decided to set up a program meant to provide management skills to run a home business. The eHomemakers portal is not only a platform that contains valuable information on how to come up with a business plan or registration requirements with the government. It also features IT tips and home-based profiles of the 400+ home-based businesses that work in fields as diverse as landscaping, accounting, translation, and cooking. Parallel to the	eHomemakers: <a href="http://www.ehomemakers.net/en/index.php">http://www.ehomemakers.net/en/index.php</a>  Empowering Women Through Home-Based Income Earning Opportunities: <a href="http://www.undprcc.lk/ext/mdgi_regional_workshop_2007/pdf/Localization%20of%20MDGs%20and%20Monitoring/EHomemakers_Network.pdf">http://www.undprcc.lk/ext/mdgi_regional_workshop_2007/pdf/Localization%20of%20MDGs%20and%20Monitoring/EHomemakers_Network.pdf</a>  2005 Gender and ICT awards: <a href="http://www.genderawards.net/the_awards/press/index.htm">http://www.genderawards.net/the_awards/press/index.htm</a>  <a href="http://www.genderawards.net/winners/">http://www.genderawards.net/winners/</a>



Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	website, eHomemakers also provides ICT training, research, and advocacy.	<a href="#">2005/GICT_2005.pdf</a>
Rodwel Foundation Women's Cooperatives Zimbabwe (1996)	As of 2005, Rodwel had one telephone, four PCs, two printers and a modem. Rodwel offers short training courses ranging from a basic 'Introduction to Computers' to training in e-commerce and international trade using the Internet. The short courses are aimed mainly at individuals and customers are mostly women (unemployed housewives), who range from literate to semi-literate.	<a href="http://www.womenicnterprise.org/rodwel.htm">http://www.womenicnterprise.org/rodwel.htm</a>
Radio Farm Zambia (1960s)	Radio Farm Forum is a government-initiated ICT project to enable rural farmers to communicate effectively with the Ministry of Agriculture. This form of ICT has been proven to be extremely successful in addressing the common needs and problems of resource-deficient farmers.	<a href="http://ocw.mit.edu/NR/rdonlyres/Foreign-Languages-and-Literatures/21F-034Fall-2005/3D2F9026-BCDE-408A-A10B-488C73A9CEAE/0/zambiancs.pdf">http://ocw.mit.edu/NR/rdonlyres/Foreign-Languages-and-Literatures/21F-034Fall-2005/3D2F9026-BCDE-408A-A10B-488C73A9CEAE/0/zambiancs.pdf</a>
BusyInternet (BI) Ghana	BI is a private organization that runs business incubator programs in developing countries to foster business growth through ICT. With funding from the WB and the Japanese government, BI Ghana has successfully helped five companies through their startup phase and put them on the road to sustainability. The goal of the project is to provide internet access and business advice to a wide range of people and to provide intensive business incubation with office space, access to physical infrastructure, and business registration to a smaller group of startup businesses. Over the last 26 months, BusyInternet has facilitated the set-up and growth of 11 ICT companies. BusyInternet Ghana is one of the leading technology incubators in Ghana, and has established a clear market differentiation, providing a mix of tenants with an environment for networking opportunities.	<a href="http://www.infodev.org/en/Project.22.html#Ghana">http://www.infodev.org/en/Project.22.html#Ghana</a>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
E-Mentoring Network for Women in Engineering and Science	MentorNet is the award-winning nonprofit e-mentoring network that positively affects the retention and success of those in engineering, science and mathematics, particularly but not exclusively women and others underrepresented in these fields. Founded in 1997, MentorNet provides highly motivated protégés from many of the world's top colleges and universities with positive, one-on-one, email-based mentoring relationships with mentors from industry, government, and higher education. In addition, the MentorNet Community provides opportunities to connect with others from around the world who are interested in diversifying engineering and science.	<a href="http://www.mentornet.net/">http://www.mentornet.net/</a>
Putting ICTs in the Hands of the Poor, Seelampur Community ICT Center India	The women of the Muslim minority of Seelampur live in extreme poverty and struggle to gain access to information and knowledge to better their living conditions. Sharma explains to the listeners seated in a half-circle in the exposition space of the bustling Tunis summit, that the project is designed to encourage livelihood skills among women through vocational CDs, providing computer skills training, and developing linkages for marketing women's traditional arts and crafts products.	<a href="http://enrich.nic.in/">http://enrich.nic.in/</a>  (2005 Gender and ICT awards: <a href="http://www.genderawards.net/the_awards/press/index.htm">http://www.genderawards.net/the_awards/press/index.htm</a> ; <a href="http://www.genderawards.net/winners/2005/GICT_2005.pdf">http://www.genderawards.net/winners/2005/GICT_2005.pdf</a> )
TechnoWorld Computer Centre Malappuram, India	The whole idea of TechnoWorld started when the Community Development Society of Malappuram Municipality (an apex body of women's self-help groups) invited applications from members of various women's neighbourhood self-help groups (NHGs) to open a computer centre under an enterprise scheme of Kudumbashree: Kerala State's agency for poverty alleviation. The ten members of TechnoWorld, who came from seven NHGs in the administrative area of Malappuram town, joined together to open the centre. All of them were new to computers and received twenty days training in computer operations from Aptech Computers. In addition to that they were given training in their own centre for a further two months.	<a href="http://www.womenicenterprise.org/malappuram.htm">http://www.womenicenterprise.org/malappuram.htm</a>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	<p>The group mobilized a loan of US\$3,000 from the bank and contributed another US\$30 each. With this they purchased five computers (most with monochrome monitors to save money). They hired one room in the town's shopping complex and officially launched the enterprise on 27th March, 2000. Most of their work involves data entry and desktop publishing (DTP) for various government departments, mainly provided through the assistance of Kudumbashree. Their initial bank loan has been paid back and they have withstood the challenges of the last five years. Seven of the ten are still active.</p>	
Divine Computers Vadakara, India	<p>It was the IT @ School Programme, launched by the government in Kerala State, India to deliver computer education to school students at subsidized rates that gave rise to Divine Computers at Azhiyur Secondary School in Vadakara.</p>	<p><a href="http://www.womenicnterprise.org/vadakara.htm">http://www.womenicnterprise.org/vadakara.htm</a></p>
e-Seva Centers Andhra Pradesh, India	<p>This project, which is run by the West-Godavari District Administration in Andhra Pradesh State, India, has established Web-enabled rural 'e-Seva Centers' run by self-help groups of women from the poorest segments of society. The aim is to help them achieve economic independence. It is also an attempt to replace the traditional form of governance and its accompanying deficiencies with a modern, more open, transparent and responsive service delivery system.</p>	<p><a href="http://www.womenicnterprise.org/eseva.htm">http://www.womenicnterprise.org/eseva.htm</a></p>
Women's collaboration at Ibadan Business Centre Nigeria	<p>This ICT-based enterprise at the University of Ibadan is a center in the university where women are provided space for their own data processing machines to serve the university community: students, academic staff, non-academic staff, professionals, and visitors. By 2004, the Business Centre houses about 45 self-employed women, each with her own (second-hand) computer and printer which typically would have cost her about US\$300. This money comes from various sources including proceeds from previous business, sale of shares and loans from credit societies.</p>	<p><a href="http://www.womenicnterprise.org/ibadan.htm">http://www.womenicnterprise.org/ibadan.htm</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
The dot-ORG e-BIZ project Macedonia	<p>Demonstrates an extremely effective approach to using ICT to improve the competitiveness of women-owned businesses. The project has created 7 e-BIZ centers: (1) ExploringMacedonia, the National Tourism Portal, (2) New Trend Apparel Technology Center, (3) ModEur Footwear Technology Center, (4) CIRKO, Engineering Center of Excellence, (5) Clearview, Online Management Training Center, (6) FashionMK, the Fashion Industry e-commerce Center, and (7) SEEU Business Center. In less than two years, the e-BIZ centers have served over 450 SMEs and positioned themselves to serve 1,500 SMEs over the next 2 years.</p>	<p><a href="http://www.dot-com-alliance.org/newsletter/article.php?article_id=164">http://www.dot-com-alliance.org/newsletter/article.php?article_id=164</a></p> <p><a href="http://www.ebiz.org.mk/">http://www.ebiz.org.mk/</a></p>
Foundation for Rural Integrated Enterprises N Development (F.R.I.E.N.D) Fiji	<p>FRIEND is an organization that works towards economic empowerment in rural marginalized communities (including squatter settlements, deaf community, and so forth) through three programs, income generation, savings scheme and a governance program. The organization is headed and staffed by mostly women and many of the community members who have taken the initiative to join FRIEND's income generation and savings program have been women. These women are asked to use their own talents and resources in creating a product which we can market for them. FRIEND trains and supports the women on everything from production and packaging regulations (Occupational Health and Safety (OHS) and HACCP- Hazard Analysis Control Critical Point procedures) to business planning, budgeting and savings options. We are able to show the outcomes from these initiatives through the internet which increases the exposure of existing skills. FRIEND works on a governance program whereby communities identify their needs and solutions in a participatory manner. In this process, the need for income was identified as a priority over and over again in the many communities we have conducted this process in.</p> <p>FRIEND has also determined this achievement through the number of</p>	<p><a href="http://www.fijifriend.org">www.fijifriend.org</a></p> <p>2005 Gender and ICT awards: <a href="http://www.genderawards.net/winners/winners.htm">http://www.genderawards.net/winners/winners.htm</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Women's IT Professional Training Program Republic of South Korea	<p>income generation projects that have proved to be sustainable and have provided a secure outlet for income. Another indicator of achievement is the number of rural savers that have achieved their targets they set up for themselves. These women have dreamt big and have been given an opportunity or means to reach that dream.</p> <p>The project (1) supports entry of women professionals in a male dominant IT profession; (2) develops a professional IT training course which creates opportunities for women; and (3) inspires professional consciousness among women through continuous consulting and job lectures.</p>	<p>2005 Gender and ICT awards:</p> <p><a href="http://www.genderawards.net/winners/winners.htm">http://www.genderawards.net/winners/winners.htm</a></p>
Women's Voices Kenya, Peru and Zimbabwe	<p>Women's Voices is part of the international Women's Information and Communications Technology (WICT) project which works with poor urban women in Kenya, Peru, and Zimbabwe by supporting their existing communication skills. The women in each country received brief training in video use before taking control in using it to reach, inform, and influence those who have the power to affect their lives.</p>	<p>Practical Action—Women's Voices: <a href="http://practicalaction.org/?id=womens_voices2">http://practicalaction.org/?id=womens_voices2</a></p> <p>Case study in Kenya: <a href="http://practicalaction.org/?id=womens_voices2#wict%20kenya">http://practicalaction.org/?id=womens_voices2#wict%20kenya</a></p>
International Telecommunication Centre (ITC) Vietnam	<p>ITC is a subsidiary of Vietnam Telecom International (VTI), which in turn is a subsidiary of Vietnam Post and Telecommunications, a national agency. ITC has three units: ITC 1 at Hanoi, ITC 2 at HCMC and ITC3 at Da Nang. In the Hanoi unit, women form about 50 percent of the total labor force and almost 90 percent of the workforce. The top management of VTI consists of 23 percent women and ITC 3 was headed by a women. More than 95 percent of the staff are required to use IT and jobs at ITC require knowledge of a foreign language, technical and professional skills, along with personality attributes such as patience and strong communication. It was felt that women would be temperamentally suited to certain jobs that were considered "feminine," while men were regarded as more suited for highly skilled jobs and therefore, were</p>	<p>Unpublished paper. (2004). Women in the ICT Labor Market. Engendering ICT.</p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	<p>offered better pay. It is evident that even in an organization with a history of employing women, women workers are generally given routine jobs and lower salaries than men. At the same time, professional training provided in ITC 1 allowed 27 percent of the women to take on jobs requiring higher technical efficiency, and four of them were promoted to management positions. VTI aims to promote greater participation of women in leadership and is planning to have a woman manager in every division where women form at least 30 percent of the workforce.</p>	

#### Access to broadband by women and impact on economic opportunities and poverty reduction

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
10,000 Women	<p>10,000 Women is intended to target women already engaged in small businesses in developing countries and provide them with further training in subjects including marketing, e-commerce, accounting and accessing capital. The certificate training will last from five weeks to six months.</p>	<p><a href="http://www.10000women.org/">http://www.10000women.org/</a></p>
PROMIS	<p>A holistic service for SMEs which is going into the market in five European countries. PROMIS provides European SME's and consultants with tailored business services and eTraining in the field of Environment, Health&amp;Safety and Quality (EHS-Q). PROMIS will support them in complying with the complex legal, commercial, and social requirements at national and international level and therefore strengthening their competitive advantage at an affordable price.</p>	<p><a href="http://www.promis.eu/">http://www.promis.eu/</a></p>

### Access to information and knowledge in rural areas and specific impact on women's social and political participation

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Ek Duniya Ek Awaaz, One World South Asia	<p>The project works towards the creation of a common, shared platform of knowledge for the local, marginalized urban and rural communities in order to contribute and participate actively to put forth their own concerns and issues, in their own voice. By imparting training on basic technical know-how, the program aims to employ the technology of radio to convert passive receivers/audiences of media, particularly people from the marginalized communities, into active producers of information relevant and topical to their socio-cultural and economic circumstances. The platform of learning was provided to a number of NGOs/CBOs and the young men and women working with the communities in India and Nepal. The process has been replicated in Bangladesh and Sri Lanka.</p>	
Knowledge networks	<p>The majority of the world's poor men and women have limited access to information and knowledge that would enable them to overcome their own poverty. Development organizations, social networks, information brokers and others with a mandate to combat poverty all have a responsibility to understand what knowledge people already have; what information they need and in what form; and to communicate effectively in order to improve poor men and women's access to information. ITDG Practical Action has a mission to make knowledge networks work for the poor. We are looking for participation in the creation of a global knowledge network to improve access to information on technology for poverty reduction.</p> <p>In November 2002, ITDG Practical Action hosted an international workshop, which debated the role of networks on appropriate technology and discussed how to better communicate such information. Evidence of organizational practice from Peru, Sri Lanka, and Zimbabwe sparked some stimulating debate on organizational practice, and on the criteria likely to promote effective communication at a</p>	<p>Practical Action—Knowledge networks: <a href="http://practicalaction.org/?id=knowledge_networks">http://practicalaction.org/?id=knowledge_networks</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Podcasting Pilot Peru	<p>local level. The role of the information intermediary (in the form of an organization or an individual) was considered and the process of distillation and transformation of information they undergo discussed.</p> <p>In Peru, Practical Action is testing the potential of podcasting to disseminate knowledge and information for poverty reduction, using a mixture of new and old technology. Radio has long been acknowledged as a media that reaches grassroots groups. Until recently, however, it has been relatively expensive to start-up and has various regulatory issues to overcome. Now, podcasting is believed to offer a low-cost way of broadcasting audio to defined groups of people.</p> <p>Practical Action Latin America is conducting a pilot project in the rural region of Cajamarca, northern Peru, to analyze the viability of podcasting for the generation and diffusion of knowledge in poor areas of Peru. The program content is tailored to local needs and interests in the different areas of Cajamarca. In Chanta Alta, for instance, the programs provide information about cattle raising and dairy production, while in Chiliete they concentrate on growing grapes and beans. The language is kept simple, to make the broadcasts more accessible than technical leaflets. It is hoped that if the pilot project proves successful, the scheme could be replicated by Practical Action in Sri Lanka and Zimbabwe.</p>	Practical Action—Local voices in Peru: <a href="http://practicalaction.org/?id=podcasting_peru">http://practicalaction.org/?id=podcasting_peru</a>
Capacity building through ICT and networking Lithuania	The projects aim is to improve the conditions for sustainable human development for women in rural and less dynamic areas by empowering women (through women's NGOs and self help organizations) by provision of ICTs to support information flows and knowledge building for better understanding of and increased involvement in social, political and economic spheres of life, both at the local and regional level. As the main part of educational campaign, it	<a href="http://www.undp.lt/en/">http://www.undp.lt/en/</a>



Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Women of Pastapur documentary India	<p>organizes seminars and training courses, creates and maintains an electronic library containing information on Women's issues, and establishes and updates a Women Information Portal in Lithuanian.</p> <p>A new, 27-minute documentary, a DVD directed and photographed by Alfonso Gumucio-Dagron, the Consortium managing director of programmes, shows that, when people who are poor own their own media, they have the means to raise their voices as a community, address problems and improve their lives. In the villages around Zaheerabad, an impoverished area in the state of Andhra Pradesh, India, a handful of Dalit women, illiterate and mostly dedicated to farming, took communication into their own hands, using video and radio in their struggle for self-reliance. Achieving local, national, and global impact, the community's broadcasts show CFSC in action.</p>	<p><a href="http://www.communicationforsocialchange.org/publications-resources.php?id=366">http://www.communicationforsocialchange.org/publications-resources.php?id=366</a></p>
Women on the Net, UNESCO	<p>The Women on the Net project works to assist the ways women are using the Internet for their empowerment. The project aims to open up possibilities for women to engage with this new information technology with a comprehensive understanding of the medium in both its technological capacity and political context. WoN provides a space for analytical and practical activities for women's groups to engaged in the new ICTs for better and stronger communication, networking and advocacy for women's rights on the development agenda.</p>	<p><a href="http://portal.unesco.org/education/en/ev.php-URL_ID=25218&amp;URL_DO=DO_TOPIC&amp;URL_SECTION=201.html">http://portal.unesco.org/education/en/ev.php-URL_ID=25218&amp;URL_DO=DO_TOPIC&amp;URL_SECTION=201.html</a></p>
Voices from Magdalena documentary Columbia	<p>"Voices from the Magdalena. Communication for Peace" is a 35-minute video documentary on the community radio network in the Magdalena Media region of Colombia. The region is traditionally known because of being the territory of confrontation between the guerrilla and paramilitary forces, which has caused over the decades enormous economic, political and social damage to the population. However, people have organized to elevate their voices</p>	<p><a href="http://www.geocities.com/agumucio/INDCineVideo.html">http://www.geocities.com/agumucio/INDCineVideo.html</a></p>

<b>Project, policy or program initiative</b>	<b>Brief description of impact to date &amp; current status</b>	<b>Website or other reference</b>
	<p>through community radio stations that promote peace and regional development through the strengthening of communication and cultural identity. A team of university scholars and communication activists from the network of stations (AREDMAG) recently conducted a research project which not only revealed how the stations contribute to peace and development, but also created new means to conduct evaluations of community media participatory processes. The documentary, directed by Alfonso Gumucio-Dagron, describes the context in the region, the participatory processes promoted by community radio stations, and the role of evaluation.</p>	
<p>Union Rights documentary Bolivia</p>	<p>This is one of six documentaries on various aspects of human rights that were directed by different filmmakers in Chile, Uganda, South Africa, India, Peru and Bolivia, as part of the Dutch television series "People Matter". The film concentrates on the struggle of miner's unions to keep their organizations strong and influential in the Bolivian political context. Produced by AVISE—The Netherlands 1988, 27 minutes.</p>	<p><a href="http://www.geocities.com/agumucio/INDCineVideo.html">http://www.geocities.com/agumucio/INDCineVideo.html</a></p>
<p>Voices of the Mines documentary Bolivia</p>	<p>Acknowledging the importance of Bolivian miner's community radio stations, which developed since the fifties, UNESCO produced this documentary, co-directed by Eduardo Barrios. The film gives an overview of how communication helped to better organize the workers and made their voice be heard loud and clear even during the most difficult political circumstances. Produced by UNESCO—France 1983, 29 minutes.</p>	<p><a href="http://www.geocities.com/agumucio/INDCineVideo.html">http://www.geocities.com/agumucio/INDCineVideo.html</a></p>



**Women's role in extending ICT access and services**

<b>Project, policy or program initiative</b>	<b>Brief description of impact to date &amp; current status</b>	<b>Website or other reference</b>
Providing ICT Solutions Morogoro, Tanzania	Millennium Computer & Electronic Services (MICES) was set up by Mrs Kilasara using her own savings. She is an entrepreneur who was employed at Sokoine University as a computer technician where she started to help the university employees with their computer-related problems. As well as delivering IT training, assembling hardware and doing data entry, MICES offers solutions to various ICT-based problems. Customers include institutions such as the municipal council, universities, private sector investors, banks, private individuals, and the Regional Commissioner's offices in Tanzania. By 2004, total sales were equivalent to about US\$150,000.	<a href="http://www.womenicntenterprise.org/mices.htm">http://www.womenicntenterprise.org/mices.htm</a>
Conexiones: Creating safe cyberspaces for migrant women	Laura Agustin originally from Argentina, who now works with migrant women in Europe, in particular Latino migrants. From her background in popular education she is interested and concerned that women migrants have access to easy communication modes, from cell phones to Internet Cafes in order to speak to each other, have better access to information and also to mobilize. She works with migrants who are frequenting brothels, bars, houses, offices, 'outreach' vehicles, and 'the street', in its many versions. For three years she has been moderating a romance-language email list in which organized groups of and individual sex workers and support personnel participate—religious, NGO, researchers, activists. This list provides daily knowledge to women working in the sex-industry and migration discourses. This list challenges the politics of migrant organizations that in Europe are overwhelmingly run by men.	<a href="http://www.nodo50.org/conexiones/Laura_Agustin/">http://www.nodo50.org/conexiones/Laura_Agustin/</a>
Tanzania Media Women's Association (TAMWA), Tanzania	Since its inception TAMWA has consciously and tirelessly worked to uplift the status of women in society by informing and highlighting the issues and problems which act as barriers to emancipation as full and equal	<a href="http://www.tamwa.or.tz/">http://www.tamwa.or.tz/</a>

<b>Project, policy or program initiative</b>	<b>Brief description of impact to date &amp; current status</b>	<b>Website or other reference</b>
	<p>members of the society. This has been done through research work, meetings and seminars, news reports and features, radio and television programs and outreach campaigns. To cap it all TAMWA runs a gender violence victims support centre, the Crisis Centre.</p>	

## Recent ICT Evaluation Studies (Not Necessarily Gender Focused)

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
World Bank Group's Gender Action Plan	A new US\$60 million initiative announced at 2009 Davos will promote women's economic empowerment and gender equality. As part of this plan, Cisco and Standard Chartered will partner with the World Bank to provide training for young women in some of the world's poorest countries under the Adolescent Girls Initiative—a project pioneered in Liberia in partnership with the Nike Foundation, which is being expanded to Afghanistan, Nepal, Rwanda, South Sudan, and Togo. In coordination with the Private Sector Forum, Goldman Sachs also announced it will provide business and management education to 10,000 women in Liberia to offer business and management education.	<a href="http://go.worldbank.org/7FYZWJCAL0">http://go.worldbank.org/7FYZWJCAL0</a> .
Cape Gateway Project, Provincial Government of Western Cape, South Africa	The establishment of Cape Gateway and its information portal are central to the Provincial Government of the Western Cape's (PGWC) efforts to introduce e-government to the Province. The project centers on developing an information resource which will be accessible to the public through an online portal, a telephone contact centre, and a centrally located walk-in resource centre in Cape Town, South Africa. Bridges.org was engaged to conduct an independent evaluation of the Cape Gateway Project, specifically to assess whether the portal element employed "best practice" in e-government and delivered "real access" to online government information to	<a href="http://www.comminit.com/en/node/71840/307">http://www.comminit.com/en/node/71840/307</a> <a href="http://www.comminit.com/en/node/71840/348">http://www.comminit.com/en/node/71840/348</a> <a href="http://capeonline.org/capegateway/Cape_Gateway_29May2003_FINAL.pdf">http://capeonline.org/capegateway/Cape_Gateway_29May2003_FINAL.pdf</a>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
Participation through Communicative Action: A Case Study of GIS for Addressing Land/Water Development in India	<p>citizens.</p> <p>According to this paper, the use of geographic information systems (GIS) in the fight against accelerated process of land degradation offers opportunities to optimize the use of resources to rejuvenate the land. However, there are concerns about how development initiatives relying on advanced technological systems can effectively respond to local needs. Published in Information Technology for Development in 2003, this paper addresses the issue through a 2002 case study of the planning and implementation of a GIS-based intervention for land and water recuperation in Anantapur, a district in the state of Andhra Pradesh, India.</p> <p>The study found that a participatory approach employed in the initiative encouraged local people to assume ownership of development programs, informing them of the design and implementation process. Communication strategies used in achieving this goal included: (1) holding gram sabha or village council meetings; (2) the creation of local GIS database and a local GIS unit; (3) assigning academic research units to particular districts; and (4) promoting a public process of progress and outcome report. It is argued that a participatory process can be effectively enabled through communicative action incorporating local communities and indigenous knowledge to the management of local information tools.</p>	<p><a href="http://www.comminit.com/en/node/71036/307">http://www.comminit.com/en/node/71036/307</a></p>
GIS and Land Reparation in South Africa (2000)	<p>Published in Volume 14 of the Journal of International Development in 2002, this case study explores the use of geographic information systems (GIS) in the process of development, land reparation, and restitution on the Cato Manor Development Project in Durban, South Africa in the year 2000. The study shows that GIS is not necessarily a value-free tool. Technical inequalities were embedded in the development project where access to technological knowledge became a determining factor</p>	<p><a href="http://www.comminit.com/en/node/219910/307">http://www.comminit.com/en/node/219910/307</a></p>

Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	<p>in the development process. The seemingly irrational and emotional arguments presented by the claimants stood in contrast with the technical rationality of the GIS tool utilized in the settlement process of land reparation. However, non-technical arguments were important for the legitimacy of a process aimed to advance the inclusion of disfranchised communities.</p> <p>The study concludes that the notion of public interest presented by the development agency as reflected in the settlement process was centered on implementation and outcomes, mainly informed by the technical tool used in designing the projects: the GIS. Therefore, the settlement process that followed the court hearing was driven by technical concerns and methods rather than mediation and conflict resolution procedures. This case study raises questions about how beneficiaries of development programs are represented in the design of interventions that heavily rely on advanced technological tools (for example GIS).</p>	
Enterprise Across the Divide: Information Systems and Rural Microenterprise in Botswana	<p>Published in the Journal of International Development in 2002, this paper explores the role of information and information-handling technologies in rural micro-enterprises (MSEs). Through a case study of rural MSEs in Botswana's economically poorest areas in 1999, the researchers identify social networks as the primary information system among poor rural entrepreneurs. These networks are rather informal, and highly localized information systems. While effective in many ways, these systems can also be constrained and very insular. Greater access to shared telephone services is proposed as strategy for breaking this insularity. Information and communication technologies (ICTs) may play a supplementary role. They will need to be based in intermediary organizations that can provide complementary inputs of finance, skills, knowledge, and other resources.</p> <p>Overall, this case study could not determine the impact of ICT on rural</p>	<a href="http://www.cominit.com/en/node/220054/307">http://www.cominit.com/en/node/220054/307</a>



Project, policy or program initiative	Brief description of impact to date & current status	Website or other reference
	<p>microenterprises because participant firms were not using ICT in their regular business. The vast majority of MSEs surveyed could not afford individual access to ICT. Few of them reported occasional use of the telephone. Those who used phones reported a reduction in their operational costs (for example by substituting travels), increased income, or reduced uncertainty of transactions with suppliers and customers. Evidence suggested that information needs of rural MSEs were quite localized and likely to be met more by informal, organic information systems (social networks) than by formal, ICT-based systems. Social networks and social capital became the most valuable resource of information management for rural MSEs. Business owners also placed greater trust and value in information received from personal sources and channels. Information delivered by institutional, non-commercial institutions (for example government agencies, non-governmental organizations (NGOs), donor agencies) was second in importance.</p>	

# Eco-Audit

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*40 feet in height and 6-8 inches in diameter	Pounds	Gallons	Pounds CO <sub>2</sub> Equivalent	BTUs



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This paper reviews how women in the developing world access and use information and communication technology (ICT). It examines the discourse and controversies surrounding the digital gender divide, including links to poverty and illiteracy. Major themes concerning women and ICTs are explored, such as women in the ICT workforce, how girls and women relate differently to ICT, and opportunities and barriers for women in science and technology in general. Current research relating to gender and ICT is often country-specific and is more prevalent in developed countries than in developing countries. This paper suggests where additional research is needed on barriers to women's entry and access to ICT.

The overall objective of this paper is to influence policy dialogue around women and ICT for development by raising awareness of the digital gender divide. Economic opportunity for women in ICT will not be realized until policies address gender considerations and ensure that ICT investment contributes to more sustainable and equitable development.

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