ICTs, Globalisation and Poverty Reduction:
Gender Dimensions of the Knowledge Society

Part II. Gender Equality and Poverty Reduction in the Knowledge Society

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Introduction

Despite the many barriers which prevent women from becoming full participants in the knowledge society, increasing evidence is emerging which indicates that ICTs can provide many opportunities for women to improve their income generation, levels of education, health, provide them with information and awareness concerning their public and private rights, and improve the wellbeing of themselves and their families. As argued by the Expert Group Meeting convened by the United Nations Division for the Advancement of Women in November 2002, "when there is an enabling environment, ICT can provide diverse avenues for women's social, political and economic empowerment."[1]

Nevertheless, existing analysis indicates that women will not be equal participants in the knowledge society, even in areas or projects which address their concerns, unless they are actively consulted and strategies are designed to integrate them fully into ICT projects and the IT sector. This involves:

- Creating an **enabling environment** which supports and encourages strategies to promote women's equal access to and opportunity to benefit from ICT projects, as well as creating a regulation and policy environment which supports women's use of ICTs
- Developing **content** which speaks to women's concerns and reflects their local knowledge, and which is of value for their daily lives, business enterprises, and family responsibilities (including information on **health, agriculture/small-scale production, natural resources management and SMEs**);
- Supporting increased representation of women and girls in scientific and technical **education**, and using ICTs to promote their increased participation in education at all levels;
- Promoting increased **employment in the IT sector** for women.
- Implementing e-governance strategies which are accessible to women; and promoting women's lobbying and advocacy activities.

1. Enabling Women's Participation in the Knowledge Society

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[1] EGM, p. 3

In view of women's low rates of Internet access, and the emerging results of ICT projects which indicate that women benefit less than men, supporting women's increased access to and opportunity to benefit from ICTs is a priority for policy and research.

ICT access strategies will benefit women when they address the barriers identified above, including: cost of access; travel distance to access point, language, socio-cultural practices, infrastructural restrictions, flexible access times, and content. Experiments with a variety of approaches, and mixes of technologies are ongoing. This paper will not attempt to provide comprehensive assessments of all strategies, but outline key elements and present general findings and areas for more research on telecentres, technology mixes and low-cost technologies, and telecommunications policy and regulation.

In the developing part of the world, **telecentres** are widely promoted as a low-cost and effective way to provide accessible community access to ICTs. The term usually refers to institutions that offer free and public access to information services for social development of disadvantaged groups. These centres are generally initiated by government and donor agencies to provide information to the local communities on market, government services, local resources, health care and education. Such centres are dependent on government or donor support. One example of such an institution-based initiative is that of ACACIA,[2] funded by the International Development Research Centre (IDRC) of Canada. The project intended to expand ICTs to rural and disadvantaged communities in Africa through social investments in pilot multipurpose community telecentres, school networking activities and accelerated ICT policy development initiatives in sub-Saharan Africa.

Recent evaluations of telecentres indicate that the emphasis has tended to be on the provision of hardware and on solving the technical problems of connectivity rather than on ensuring that telecentres address local needs, capacities and preferences. Some analysis have commented that little attention is paid to content, and in fact, startup costs are extremely high – a South African estimate suggests it costs US$40,000 to set up a telecentre.

Further, preliminary evidence suggests that telecentres in developing countries are not particularly effective in helping women to gain access to better economic, educational and other opportunities. Access costs and other factors remain a barrier for women. An evaluation of ACAIA-funded telecentres in Africa indicated that women consistently make up less than 1/3 of telecentres users even when female trainers and facilitators, and women-targeted training materials are made available. One of the primary determinants of women's use of the centres was considered to be cost: making Internet access available at low cost did not substantially increase the numbers of women using the telecentre, since women tend to have little cash at their disposal. Other factors included social and religious barriers, and skepticism regarding the value of ICT access.[3]

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[2] Acronym in French stands for Communities and the Information Society in Africa
[3] Thioune, 2003; Rathgeber, 2002

Long term sustainability of these centres is also an unresolved question, since they depend on the income generating capacity of the users either as entrepreneurs or as distant employees.[4]

Technology mixes are an important factor in ensuring access to ICTs for women, in that they provide technologies which are adapted to local conditions and requirements, such as unreliable electricity or low literacy rates, and allow sharing, packaging and presentation of information in ways that women understand and appreciate. For example, the Tanzania Media Women's Association distributes information it gleans from the Internet through newsletters, radio, and other forms of locally-based communication.[5]

Radio has proven to be an important communications technology for women, in that it does not require literacy, it is affordable, and women can work while listening. Examples of use of radio for literacy, information on food production, making women's concerns known to local policy makers and other uses are well documented.[6]

Areas for further research:
2. Assessment of the use by women of telecentres and other kinds of community access points.
3. Further work is needed on telecentre sustainability, including analysis which takes into account a broader assessment of results than profit margins (such as value to users; increase in local production; participation of community in national governance, etc);
4. Models for information delivery systems which incorporate a mix of ICTs appropriate to local conditions and educational levels of the users.
5. Modes of training on the use of ICTs which are women-appropriate
6. Evaluation of ICT projects, including gendered opportunities to benefit and assessments of best practices and lessons learned.
7. Support to women to define and create content and information carried by ICTs.

2. Telecommunications Policy and Regulation

Given the constraints that women experience in using and benefiting from ICTs, ICT policy will not be gender-neutral, but will, in fact exacerbate existing gendered socioeconomic inequalities in a society, unless both gender and social implications are taken into account. Doing this doesn't require a large investment of resources, but rather a shifting of perspective. Communication regulation which focuses on licensing, spectrum issues, competition acts and telecom codes as ends in themselves can lose sight of larger societal goals of connectivity, education, information, consumer protection and resolving market failures. This kind of long-term perspective is more conducive to achieving the goals of IT policy and regulation, and to incorporating social considerations, including women's needs and gender concerns. If

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[4] Tschang, 2002. See also Part III.
[5] Alloo, 1995.
[6] See, for example, Girard, 2003.

understood in this light, policies which support women's equitable access to and use of ICTs can be naturally integrated into a socially-sensitive national e-policy. [7]

Reviews have been done of the gender implications and considerations relevant to ICT policy; as well as steps that can be taken to encourage greater access to ICT and use of telecommunications by women.[8] Examples of how infrastructure and regulations can affect women positively include:

- Infrastructure and deployment: Implementing cost-effective and appropriate solutions, including wireless, cell, radio and "simple" computer technologies, and ensuring infrastructure is deployed in rural areas, where women make up a high proportion of the population
- Liberalisation: Opening the telecom sector to competition can bring in investment and force down user prices
- Licensing and regulation: Licensing fees, spectrum prices and interconnections charges should be kept at reasonable rates. Certain numbers of licences can be allocated to women-owned businesses or businesses with women in management conditions; fees could be waived for businesses run by women entrepreneurs or those providing servicing to under-served areas.
- Universal access: Emphasise public access points as an alternative to more capital-intensive choices; ensure that appropriate elements are in place to support women, such as training, low cost, use of local languages, and locations where women can easily access
- Intermediation: Provision of staff at telecentres or community access points or liaison with women's NGOs will facilitate use of ICTs by women and under-served groups.
- Build capacity: ensure women have equal access to opportunities, training and education; implement mechanisms to support women's entrance into the sector at all levels; support programs to train women in ICT technical and management programs

The case for gender analysis of ICT policy is greatly hampered by the current lack of sex disaggregated statistics and indicators. As well, there is a general lack of understanding of gender analysis and potential implications of ICT policy among policy makers. A few countries in Africa have taken steps towards gender equality in areas of policy related to ICT . For example, South Africa has included a chapter on human resources capacity in its national R&D strategy), while in Asia, the Republic of Korea has established a proactive ICT policy towards gender equality in its Basic Plan for Women's Informatization (2002-2006).

Additionally, it is known that governmental commitments to gender equality set the stage for the adoption of transformative strategies to mainstream gender perspectives in all policy areas, including those in which ICT policy is present and relevant: such as, rural development, education, health, universal access, telecommunications regulation, among others.

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[7] Seow, 2002.
[8] see Hafkin, 2002; Anand and Uppal, 2002.

Areas for further research include:

- Collection of evidence and data to demonstrate the links between gender and development; and gender and ICTs for development
- Analysis of the gendered effects of telecommunications policy and regulation, building on work done to date.
- Effects on gender equality and social equity of telecommunications policy, regulation, and technologies such as GIS (footnote on GIS effects).
- Research and packaging of guidelines on mainstreaming gender into ICT policy, including curricula development and information kits.
- Research and analysis of strategies and approaches to integrate civil society consultation into ICT policy development and implementation.
- Identification and incorporation of social elements of long-term goals into regulation frameworks.
- Strategies for making low-income markets, including women, attractive to private sector providers and investors, including research on the opportunities in low-income markets.[9]

3. Appropriate and Relevant Content

More research is needed on identifying, developing and disseminating women-appropriate content, that is, content which a) is developed by women and reflects their knowledge and perspectives; b) helps them more effectively fulfil their daily tasks and responsibilities, thereby increasing their well-being and that of their families; and c) increases their income. The CD-ROM project implemented at a telecentre in Nakaseke entitled 'Rural Women in Africa: Ideas for Earning Money', is a response to the need for and access to information. It was developed after extensive consultation with local women, and provides information in local languages and in audio form for illiterate women. It is a good example of a way of offering rural women direct access to information in a form they understand and value and which helps them in a practical way to improve their productivity and socio-economic status.[10]

As the FAO has noted, access to increased information in general contributes to women's income-earning capacity – even access to reproductive health will allow women to increase their productivity and income generation.[11]

This is an important area for further research and policy action, where strategically allocated resources and support could produce enormous benefits. Particularly important is the recognition and valuing of women's local knowledge, in addition to building their capacity to generate content, through the strategies discussed in this paper.

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[9] Examples include GrameenPhone (see Part III and Richardson et al, 2000) as well as research which indicates that the poor do constitute a viable market for technology (Prahalad and Hammond, 2002).
[10] Miujumbi, 2002.
[11] ILO, 2001.

Women's local knowledge – Women are holders and innovators of knowledge on seed preservation and storage, food processing, health practices and local natural resource management. Women play a strategic role in the incubation and transfer of critical knowledge, which often forms the blueprint of survival for communities to adapt and minimize their risks under adverse circumstances. Because of their biological and social roles, they are intimately acquainted with the social, economic and environmental needs of their own communities.[12] For example, a study carried out by the Intermediate Technology Development Group found that while women's knowledge and skills tend to be invisible because it is embedded in the perceived "domestic" nature of women's work, women's technical skills underpin survival responses.[13]

A great deal of work has been done on the value of women's local knowledge concerning food production, natural resources management, and health issues. This knowledge has been generally overlooked, but represents the accumulation of centuries and even millennia of environmentally and socially- sustainable practices. Further research and analysis in this area needs to be done on:

- how ICTs can be used to ensure women's knowledge is not lost;
- the role of ICTs in ensuring that women benefit from the proceeds (financial and otherwise) of this knowledge;
- dissemination of women's knowledge where it may be beneficial in ways that do not disempower them or allow the theft of this knowledge.

3. Supporting Women's Productive and Reproductive Activities

In order for ICTs to contribute to poverty eradication, it is important that they help women fulfil their daily productive and reproductive activities. It is well-recognised that the work that women do provide for the health and well-being of their families and communities. They make major contributions to food production, are responsible for health care and prevention in their families, while the income they earn is often critical to family survival and maintenance. As a result, there are several sectors in which ICTs can make an important contribution to poverty reduction and the wellbeing of people, and which have been comparatively overlooked to date. They include health information which is directed to women; support for women's agricultural, food production and natural resources management activities; and increasing access to education for women and girls.

3.1 Health
The use of ICTs by health practitioners in developing countries is quite well-established. Organisations such as Satellife and HealthNet[14] are successful examples of projects which provide health information and connections to their colleagues in other parts of the world for developing country health professionals. For example, the World Health Organization is in

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[12] Nath, 2000. See also Kettel, 1995 and Appleton et al, 1995.
[13] ITDG 2000.
[14] www.satellife.org; www.healthnet.org.

the process of providing free access to health journals and documentation via the World Wide Web to doctors and research institutions in the developing world.

While these kinds of projects provide successful examples of how ICT can contribute to improve health conditions in developing countries, the provision and use of health information to women directly has been given less attention. It is unknown to what extent women benefit from health information made available through ICTs. How many doctors and health workers participating in these programmes are women? Further, how many women on the ground gain access to this information? Comparatively few ICT-based health information projects to date have targeted women users despite the fact that they are the primary users of health information. As found by the AfriAfya health information initiative in Kenya, health information made available is often not easily understandable at the local level. AfriAfya found that it was necessary to "translate" HIV/AIDS information received from its World Space satellite receiver, in order to use it in the community.[15] The Association of Uganda Women Medical Doctors has begun a pilot project to electronically disseminate information on reproductive health to women-oriented NGOs for advocacy and personal use. Four members of the association, having received training in basic e-mail and Internet skills, download necessary information, repackage it, and send it to the NGOs online. The program distributes the latest medical information to those who would otherwise go without it.[16]

When introducing ICTs to health workers for work in the field, the effects on gender relations and the status of women and men health workers need to be taken into account. For example, when female health workers in India were provided with personal digital assistants (PDAs) for data gathering in the field, it was found that the men became resentful and demanded access to similar technologies. Evaluation of the project also found that the health data gathered was determined by government health departments, and bore little connection to the health concerns of women involved in the project.[17]

The potential presented by software which gathers a health information in new ways, and can present new kinds of health-related information could make an important contribution to the way women's health concerns are perceived. For example, the Tanzania Essential Health Interventions Project worked with rural health offices and policy makers to draw out and present raw data on the health status of rural populations. New software applications, along with the processed data, allowed district health planners to prioritise and allocate resources towards cost-effective health interventions based on data reflecting the existing health picture. Thus the planners were able to focus on the planning of curative and preventative interventions to address the locally-important diseases rather than the classical approach of planning for specific diseases which were assumed to be prevalent. As a result, resource allocation matched more closely the actual prevailing burden of disease in their area, so that

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[15] Nyamai, 2002.
[16] Providing Information Electronically on Reproductive Health, http://www.challenge.stockholm.se/. Accessed 17 March 2003.
[17] Hafkin and Huyer, 2002.

infant and child mortality rates have decreased substantially since the new software was introduced. [18]

Research areas:

- What models of information and information technology transfer for local health projects are most effective in getting information to women users?
- What are the lessons learned from the introduction of ICT technologies to male and female health workers? What strategies are useful to ensure that both women and men have equal access and benefit equally from the use of these technologies?
- What are the most effective strategies for reaching young women and men around reproductive health and HIV/AIDS issues with ICTs?
- What kind of health information do women find most useful? What format and approach to content is most effective?
- What contribution can software and ICT-based data collection frameworks make to increasing the accuracy of morbidity and mortality assessments at national and local levels for decision makers? Assessments of software development models and approaches.
- Development and testing of new software models and data collection methods on health issues of important to women.

3.2 Agriculture and Natural Resources Management

Women are responsible for 60-80 percent of food production across the developing world, and are responsible for half of the food production worldwide. They are twice as likely to be involved in agriculture-related activity as men, either paid or unpaid. In sub-Saharan Africa, 90% of women are farmers, and they provide 70% of the subsistence production.[19] Agricultural production activities include cultivation, harvesting, processing, food preparation, care of livestock and selling of produce. Despite this major contribution to agricultural production, women do not tend to own or control key resources, such as land, credit, technological productivity-enhancing inputs and services on which their agricultural activities depend. Women's access to technological inputs such as benefits of research and innovation, improved seeds, fertilizers, pesticides and technologies to improve production is limited.

ICTs are fostering change in agricultural knowledge and information systems even in the poorest nations. Mobile telephones allow farmers to verify prices, arrange transport and communicate with distributors and clients. Rural radio programmes use email, fax and mobile telephone to enable sharing and dissemination of agriculture-related information. For example, the Zambia Federation of African Media Women (FAMW) facilitates advocacy and communication between farmer radio listening groups and politicians through these technologies.

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[18] Reid, 2002.

[19] FAO, "Gender and Food Security – Agriculture," http://www.fao.org/gender/en/agri-e.htm (Accessed 6 January 2003); United Nations, 2000; Hambly et al, 2002.

The effects on gender relations of ICTs are particularly important with respect to agricultural production, because subsistence agriculture remains an important part of many developing country economies. Agriculture also provides, both directly and indirectly, an opportunity for women to improve nutrition and increase income for themselves and their families. [20]

However, a major gap – both at the research and direct action levels – is that women living in poverty are unable to use ICTs as a tool for production . Women today still lack access to the technologies which could help them to improve farm yields and to increase the quality and diversity of their non-farm economic activities. A number of groups working with grassroots women's organisations from all regions of the world report that lack of access to improved techniques and technologies is a major constraint on the ability of their members to compete in an increasingly globalised world and to take advantage of new economic opportunities arising.

Research areas:

– the use of computers and the internet to provide information on 'appropriate' techniques and technologies for increasing yields, for increasing economic returns through primary processing of commodities, or through improving the quality of artisanal products.
• review of existing information on use of production technologies by women,
• research on how and why information remains a major constraint on the uptake of improved technologies by informal women producers/workers; and what approaches and strategies can be implemented to redress this situation
• Research on supporting the creation and exchange of local and locally relevant content by rural women themselves, or customized to their needs, language and literacy abilities, and their interests.
• Synthesis of existing and disparate work and research on gender, ICTs and agriculture for rural development.[21]

3.3 Education

Women and girls have levels of illiteracy which are twice that of men, and lower access to education at all levels. They have less access to scientific and technical education specifically as well as less access to skills training and development which will enable them to gain IT employment. Reasons for this range from cultural and attitudinal barriers to difficulties in obtaining qualifications for advanced studies, to a variety of institutional barriers which inhibit women's continuing education.

Cultural and attitudinal factors include perceptions about the role and status of women, and the appropriateness of encouraging continuing education for girls and women. In developing countries the tendency of parents is to invest more on the education of the male child. This is

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[20] Carr and Huyer, 2002.
[21] Carr, 2003; Hambly et al, 2002.

because daughters leave the parental home at marriage and in many societies the family has to save for a dowry to marry the daughters off. Girls who do go to primary school often are not given the opportunity to attend at secondary and tertiary levels. Preconceptions that women's responsibilities confine them to the home, and expectations that married women will not work outside the home also contribute to restrict girls' access to education.

Once girls do enter school, they are discouraged from learning science and technology, either consciously or unconsciously, as a result of parents' and teachers' biases. S&T is often not considered an appropriate occupation for girls and women, for reasons ranging from lack of intellectual ability to expectations that the primary occupation for women is to marry, bear children and work inside the home. Other cultural reasons include fear of sexual harassment by other pupils or teachers. Studies indicate that a narrow technology focus in the curriculum, while appealing to boys, can alienate girls, who are more interested in understanding how the technology fits into a larger social, environmental or work context.[22] Other factors include lack of role models, and public perceptions of who or what a scientist "is".

Situational barriers include lack of family commitment, lack of partner support, living in rural or isolated areas, and lack of access to resources to support education.

Qualification and institutional barriers which block women's access to S&T education include the lack of female teachers and assumptions of male teachers mentioned above; inflexible admissions, selection and entry requirements which do not take into account women's varying educational backgrounds, approaches and abilities; and heavy attendance requirements for practical skills and laboratory work which are more difficult for women to meet in view of their family responsibilities.[23]

ICTs can contribute to redressing these gender inequalities in access to education. They provide the potential to increase accessibility to knowledge in general, but more specifically, they can diversify and improve both formal and non-formal education in both developed and developing countries. This is especially true in the case of education for women, who are often restricted from formal education for reasons of distance, cost, time and family expectations. ICTs provide the possibility for women to obtain education on topics of interest and practical use, at times that are convenient to them. Different forms of information technologies provide flexibility of varying formats, suited to women's geographical location, language and daily schedule. They can also be used for literacy training.[24]

For example:

–   The Commonwealth of Learning (COL) implemented programmes which used radio-based learning, reinforcing and reinforced by print media and face-to-face training and discussion sessions. It was found that non-formal education could contribute to "a

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[22] AAUW, 2001; Bissell, et al, 2002.
[23] Huyer, 2003.
[24] Evans, 1995.

stronger, more integrated and more community-based approach to rural development and especially to meeting the basic needs of the poor." [25]

– In India and Zambia, the Commonwealth of Learning (COL) and the British Department for International Development (DFID) co-funded projects to address high illiteracy rates, particularly of women, as well as lack of innovation in curriculum design, instructional materials and inappropriate teaching methods. The main project goals were to promote accessibility, interactivity, community ownership and sustainability. To this end, the project focused on: dialogue and discussions with the community, ensuring women were active participants and using participatory rural appraisal (PRA) techniques; demystifying technology so that the learner could exercise control over the use of the technology; ensuring that the community began to take responsibility for the on-going use of technology to serve their own development needs.[26]

Computers in schools can be a tool to introduce girls to IT. They tend to be implemented in education for 5 main reasons:

• To build a resource of people with skills in information technology
• To equip students for a future in which computer skills matter to all citizens
• To enhance the existing curriculum and improve the way in which it is taught
• To help educational reform
• For internet access and communication with other schools, colleges and learning communities.[27]

However , girls have not benefited equally from boys when computers are introduced to schools. Studies indicate that gender integration in programs to introduce computers to schools has been extremely limited to date. However, when attention is paid to gender patterns in access, it has been shown that girls do use computers effectively. A study by World Links found that when girls had access to computers, they tended to use them more for academic research and communication with friends and family, increasing their reasoning and communication skills. They also used Internet access to obtain information on issues such as reproduction and sexuality, information not available from their families or communities. Boys tended to use the computers for sports and music with less academic benefit.

Additionally, when girls had equal access to computers, their self-confidence improved. One participant in Senegal said, "We are no longer dependent on boys. We feel capable of solving our problems with great autonomy." [28]

These trends should be of concern to policy makers. Since girls are less likely to go on to higher education, access to a computer in primary school may be the best opportunity for

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[25] Siacawena, 2000.
[26] Dighe, 2002.
[27] Perraton, 2002.
[28] Gadio, 2001.

them to gain basic computer skills and develop an interest in computers which will encourage them to enter an IT profession.[29]

Areas for further research :
- – Gender-differentiated effects and benefits of the use of technologies for education
- – Feasibility, efficiency and reach of various strategies for using ICTs for education, particularly on the benefits and degree of participation of women and girls.
- – Costs, efficacy and benefits of distance learning, including the use of computers and Internet, particularly related to the benefits for girls and women, at all levels of education.
- – Collection of data and indicators on women's participation in computer sciences and IT in educational institutions and employment.
- – Strategies to encourage the participation of women and girls in scientific and technological education and training at school and in the workplace.

4. Conclusion

While women's participation in the information society is still quite low, and the barriers to this participation loom large, there are emerging examples of how women do use ICT for poverty alleviation, education, enterprise development, by creating improved wellbeing for themselves and their families and increasing their sense of choice and agency. We have seen that when women do have equitable access to ICT and experience its value for their lives, they use it successfully and with great creativity and interest.

Applications of ICTs for social development are receiving increased attention by both multilateral agencies and NGOs, as is ICT-supported networking and advocacy for women's collective action. But the use of ICTs to support women's empowerment and poverty reduction at the local and individual level is less understood and promoted. Funding assistance and credit for women's social and economic development tends to be concentrated in sectors such as literacy, health and fertility programs (targetted at women) for example, while projects to make agricultural information available via Internet and other ICTs tends to focus on male farmers. Few donors are entering the arena of enterprise training for women or investment in ICT use by women which goes beyond the establishment of public access centres.

The centrality of women to poverty reduction and sustainable development requires a widening of our approaches, both to ICT for development, and to gender and development, to understand the broader range of ICT use that women can benefit from, and to understand the contributions that women can make to the development and application of ICT systems. New approaches are needed also to widen the range of partners in this endeavour: governments and donor agencies must be involved, but also the private sector and NGO community.

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[29] Hafkin and Taggart, 2001

Our goal should be to better understand both how women can be supported by ICTs in poverty reduction and empowerment; and how new and expanded partnerships can be formed to strengthen and encourage the use of both old and new ICTs, argued by the 47th Session of the Commission for the Status of Women, to realise "the potential of ... information and communications technologies to contribute the advancement and empowerment of women".

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