International Institute for Sustainable Development
Institut international du développement durable
http://www.iisd.org

Women as Professionals in the Costa Rican Information Technology Sector

Exploring the Relationship Between Sustainable Development and Gender Gaps in the Information Society

Margarita Salas
Margarita Salas - Fundación Acceso/Bellanet LAC

This paper was published in

A Developing Connection: Bridging the Policy Gap between the Information Society and Sustainable Development
ISBN 1-895536-77-4

Terri Willard, Maja Andjelkovic, Steve Vosloo, Wainaina Mungai, Margarita Salas, Anusha Lall, Atanu Garai, Diogo André de Assumpção, Amira Sobeih, IISD, 2005.

Women as Professionals in the Costa Rican Information Technology Sector

Exploring the Relationship Between Sustainable Development and Gender Gaps in the Information Society

Margarita Salas
Fundación Acceso

Abstract

ICTs are generating more than $2 billion dollars annually for Costa Rica, and the industry is one of the fastest growing in the country. Yet, women continue to constitute a minority in the IT professional sector and their participation seems to be decreasing. Since Costa Rica considers IT to be an important opportunity for development, the continued gender imbalance within the sector creates unfavourable conditions for women's socio-economic future. Salas suggests some tools for improving the current gender imbalance in Costa Rica's IT industry and calls for policy that will break away from stereotypical professional roles. She underlines the need for technical training institutes, as well as centres of higher education, to encourage women to enter and remain in science and technology careers.

This paper consists of seven sections. The first three are meant to give the reader the broader context in which this research takes place. Hence, the introduction provides general information regarding the Next Generations Policy Directions Project, which is the starting point for this study. The thematic justification (Section 2) explains how the research views the relationship between gender and sustainable development, as well as the connection to the information society agenda. Section 3 outlines the methodology used to produce and organize the contents.

Sections 4 and 5 present results from documentation as well as fieldwork. They represent the new data that were either gathered from census and statistical institutions or generated through interviews with local key stakeholders. Section 6 highlights five case studies that illustrate some of the national experiences that are being developed in gender and information technologies. Section 7 offers research conclusions and recommendations.

▼

At the state level, the National Commission for Information and Communication Technologies has been formed as a coordinating body with representation from a large number of ministries and state organizations from the information and communication technologies sector to boost sustainable and competitive development internationally, as well as socio-economic progress at the regional level.

▲

1
Introduction

2005 is the year of two critical events for the international development community. The first, the five-year review of the United Nations Millennium Development Goals (MDGs +5), took place in September; and the second, the World Summit on Information Society (WSIS) second phase, in November. Although both initiatives seek to improve livelihoods and promote development, each one has emerged from a different community and reflects different priorities.

According to the International Institute for Sustainable Development (IISD)[1] "*few discussions have focused on harmonizing the visions of the emerging information society with the principles and priorities articulated by the United Nations Millennium Development Goals (MDGs) and the World Summit on Sustainable Development (WSSD)*". It´s very important to build bridges between these paradigms to foster collaboration as well as knowledge and resource sharing within the international development community and among key stakeholders in each country.

Based on the success of the WSIS Youth Caucus, IISD led a scoping study to assess the potential for engaging young researchers to catalyze changes in policy and practice in developing countries around the convergence of the information society and sustainable development. The scoping study revealed, among others, three important findings:

1. Young people might serve as powerful catalysts for building a southern dialogue on sustainable development and the information society.
2. While there is considerable research on the information society and sustainable development, it is primarily focused on applications and policy frameworks within Europe and North America.
3. There may be other visions of the convergence between sustainable development and the information society growing out of developing country priorities which have not yet been introduced to the international debate.[2]

Based on these findings and the above-stated concern regarding dialogue between paradigms, IISD launched the Information Society and Sustainable Development: Next Generation Policy Directions research study. The project engaged a team of young researchers from southern-based organizations to develop national case studies on cross-cutting and nationally relevant themes that would be a meeting point for information society and sustainable development issues.

---

1 International Institute for Sustainable Development, *Information Society and Sustainable Development: Next Generation Policy Directions Project*, 2004, p. 2.

2 Idem, p. 3.

In Costa Rica, the participating organization is Bellanet's office for Latin America and the Caribbean (http://www.bellanet.org) hosted in Fundación Acceso, a local NGO. Bellanet is a non-profit development organization, a recognized member of the information and communication technologies for development (ICT4D) community and with broad experience in research and implementation within the areas of information and communication technologies as well as knowledge sharing and collaboration processes.

For the purposes of this initiative Bellanet LAC identified that in Costa Rica gender is a key area in which to build bridges between the information society and development issues, with a specific focus on the under-representation of women as professionals in the information and technology sector. Hence, Bellanet LAC conducted research exploring the dimensions of this problem, as well as the perceptions of local key stakeholders around it. The study also showcases five local initiatives that illustrate different approaches to the subject of women and ICTs and collects concrete recommendations on how to promote ICT use among women in the Costa Rican context.

2
Thematic Justification

According to the Tenth State of the Nation Project Report, in Costa Rica:[3] "Human sustainable development is a continuous and integral process which brings together components and dimensions of the development of societies and people in which an important focus is building capacity and providing resources, by and for the people, so that equity grows for current and future generations."

This definition of sustainable development reintroduces two elements that are crucial in framing this research: creating opportunities; and developing equity. A society that does not achieve an adequate balance of the well-being of all groups of its people cannot call itself developed or sustainable. Likewise, a country that seeks to generate well-being for its people must put in place mechanisms to create opportunities for those whom the prevailing socio-economic system does not benefit. Undoubtedly, women are one of those groups that experience discrimination.

2.1 Gender equality is an essential building block in achieving sustainable development

Gender inequality is an obstacle for sustainable development, not only in its economic dimension, but in all its areas. In fact, Hemmati and Gardiner[4] state that gender equality is an essential building block in achieving sustainable development, in that none of the three pillars necessary for sustainable development (environmental protection, economic well-being and social equality) can be achieved without resolving the current problem of gender inequality. The fundamental role of equality between the sexes can be emphasized in each of these pillars.

In order to achieve effective *environmental protection*, it is important to adequately understand the relationship between women and natural resources, as well as women's rights and their role in resource planning and administration. Also, the recognition and incorporation of women's knowledge in the environmental realm is important, as is a clear understanding of the specific gender impacts of environmental degradation and abuse.

Attaining *economic well-being* also requires the use of gender-inclusive strategies. According to Hemmati & Gardiner: "*70% of the world's estimated 1.3 billion people living in absolute poverty are women*."[5] A healthy economy cannot be achieved if the contributions and skills of all members of society are not taken into account.

3 Programa Estado de la Nación, 2004.

4 Minu Hemmati and Rosalie Gardiner, 2001.

5 Idem, p. 1.

Finally, *social equality* is inextricably linked to gender equality; sexism, racism and discrimination based on ethnicity, faith, political opinions, social status or sexual orientation are clear indicators of social inequality. No society can live sustainably, nor can its members lead dignified lives, if discrimination against any social group exists.

As this relates to the information society, those of us who live in developing countries face an enormous challenge in generating conditions in our communities so that the digital revolution does not create new marginalization for us, a process that has already started. Various studies have pointed out how digital gaps have come to expand and strengthen the current social gaps, including the gender gaps.

Among the poor of the world, women are the poorest: we perform a large amount of unpaid, unaccounted work. Traditionally, the relationship between women and technology has been one of fear and distance. Since technology belongs to the public realm, it has been out of women's reach for many years. It's easy to foresee that if, as women, we don't build our capacity or gain access to the resources that are so highly valued in the information society, the feminization of poverty and the exclusion of women from important areas of decision-making will grow deeper.

2.2 New inequalities, to a large extent, will be structured around the ability to use ICTs in the processes of creating knowledge

Elisabeth Kelan[6] believes that new inequalities, to a large extent, will be structured around the ability to use ICTs in the processes of creating knowledge. "Those who come out ahead in the new economy usually work with organizations typical of the new economy: organizations which produce and sell information and communication technologies."

That is why it is important that beyond merely using ICTs, women must gain access to them professionally so that we can occupy positions of great added value and build capacity in order to transform technologies to meet our own needs.

The role of ICTs is growing in regards to development processes. According to Gloria Bonder,[7] each day the relationship between scientific and technological advances and political and economic decisions grows closer. The presence of scientists and/or science-based arguments in the power centres has been increasing, and their influence in decision-making is of fundamental importance.

2.3 ICTs are the new "coffee" for Costa Rica

In the case of Costa Rica, it is particularly important that we, as women, are able to fully participate in the information technology sector, because the country is

6 Elisabeth Kelan, 2004.

7 Gloria Bonder, 2003.

directing a growing quantity of resources toward transforming information technology, to spearhead the economic development of the country.

William Mora, advisor to the Ministry of Science and Technology, says: "currently, the ICTs are generating more than $2 billion annually for the country, which signals exponential growth in that sector. Some people believe that technology is the new 'coffee' for Costa Rica and would like to position the country as one in which a profitable investment can be made in the technological sector."

There are various initiatives that encourage the development of the country in that direction. At the state level, the National Commission for information and Communication Technologies has been formed as a coordinating body with representation from a large number of ministries and state organizations from the information and communication technologies sector to boost sustainable and competitive development internationally, as well as socio-economic progress at the regional level. As well, in the private sector, the long-standing promotional project to promote the software industry (CAPROSOFT) has broadened its horizons by transforming itself into the Costa Rican Chamber of Information and Communication Technologies (CAMTIC).[8]

2.4 The Costa Rican development model depends on full inclusion of women in ICTs

The venture into technology will bring changes to the Costa Rican development model—a model based on the export of agricultural products is no longer being considered. Human resources are being developed in areas of likely competition for the country, creating an economy with a skilled labour force specializing in non-traditional products backed by scientific and technological research.

Given this particular economic environment, it is very important to examine the level of inclusion of women as professionals in the information technology sector, as well as the strategies that can be adopted to overcome the current gap and allow Costa Rican women to become full participants in the economic development of their country, as active citizens in decision–making, and in defining policies and concrete initiatives in the area of science and technology so that this key sector can also respond to women's needs and priorities.

8 CAMTIC, 2004.

3
Methodological Aspects of the Research

In order to address the inclusion of women as professionals in the information technology sector, it's important to characterize the dimensions of the problem, as well as explore reasons that may explain, in the concrete Costa Rican context, why this distance between women and technology persists.

Bellanet LAC contributed to bridging this gap by developing this research study. An initial exploration focused on the following research question:

Why are women a minority within the information technology (IT) professional sector in Costa Rica, and what are some of the possible strategies that can overcome the conditions blocking their access?

A literature review revealed figures from various organizations which ascertain the level of professional women's participation in the information technology sector. The following organizations were consulted:

- National Council of State University Rectors (CONARE);
- National Council of Private University Education (CONESUP);
- Costa Rican Chamber of Information and Communication Technologies (CAMTIC);
- National Council of Science and Technology Research (CONICIT); and
- National Institute of Statistics and Censuses (INEC).

Seventeen interviews were conducted with key stakeholders[9] who work in information technology and/or gender issues in academia, civil society, government or private enterprise. All of the interviews were digitally recorded and their contents organized according to the following categories:

- relationship between women and information technology in Costa Rica;
- explanatory factors for the gap;
- level of relevance of the gap; and
- strategies to overcome the gap.

In-depth interviews were conducted with five organizations that have developed initiatives to involve women in information technology. These short cases discuss initiatives in this field that have been developed in Costa Rica, and include:

- organizations who work with ICTs and teenage women;
- oganizations advocating for the use of or using ICTs for the empowerment of women and political advocacy; and
- organizations advocating or using ICTs for entrepreneurship and employment.

9 Please see Appendix A for a list of interview respondents grouped according to sector.

After the first initial draft was ready, preliminary results were presented. The objective of this activity was to receive feedback from the country's stakeholders in order to verify if the research paper had been able to present an adequate picture on the topic of women as professionals in IT in Costa Rica. Hence, most of the people previously interviewed were invited as well as some new stakeholders that were recommended by them.

The exercise started with a presentation of the research, followed by questions, suggestions and recommendations, and included informal interaction during the coffee break, an important opportunity for networking among people from the different sectors. As people talked and relaxed, they were more flexible and open to share information that they had previously not made available. Since the approach of this research relates to advancing information society issues as a way to promote sustainable development, this gathering was a first step towards bringing these two groups of stakeholders together.

4
National Statistics on Professional Women in IT

Before presenting the results of the interviews and fieldwork, it's important to lay out the broader context by presenting some basic information on Costa Rica and characterizing the presence of women as professionals in the information technology field. The following information was gathered by reviewing documents, mainly from national economic reports, higher education councils and enterprise chambers.

4.1 National context

According to the Tenth State of the Nation Project Report,[10] Costa Rica has a population of 4,169,730, of which 50.9 per cent are men and 49.1 per cent are women. The human development index is .832 which puts Costa Rica in 42nd place out of the 175 countries evaluated worldwide. This national figure is very close to that of the gender-related development index of .824, putting the country in 41st place.

Despite the positive picture for women that these figures seem to reflect, Costa Rica has not achieved the same level of gender equality in all areas. In fact, Miguel Gutiérrez[11] affirms that "employment and remuneration are definitely the main source of gender inequality in Costa Rica." The results of an informal survey[12] conducted by the newspaper La Nación of female students, professionals and workers found that women agree that there are work opportunities but the problems lie in remuneration and in accessing positions higher up in the hierarchy.

The rate of open unemployment in Costa Rica is higher for women (8.2 per cent versus 5.8 per cent for men), as is the rate of underemployment (7.0 per cent versus 4.6 per cent for men). Likewise, the percentage of poor families with female heads of households has grown by 10 per cent in nine years. That is to say, poor Costa Rican families headed by women are ever increasing, which further intensifies the feminization of poverty in the country.

4.2 Educational figures

According to information provided by CONARE, the country has been successful in integrating a significant number of women at the university level and, in some cases, forming a wide majority among graduates. See Table 1 for the distribution of degrees conferred in the state university system for 2001–2003.

Clearly, there is a growing trend to incorporate women into the higher education system, at both the public and private levels. It is interesting to note that the only educational institution in which women are a minority is the Technological Institute of Costa Rica, which offers training predominantly in engineering and technology.

10 Programa Estado de la Nación, 2004.

11 http://www.nacion.com/ln_ee/2005/mayo/23/pais2.html

12 Idem.

Table 1: Degrees conferred in the public and private university system (2001–2003)

	2001		2002		2003	
	Men	Women	Men	Women	Men	Women
ITCR	70.6%	29.4%	68.1%	31.9%	63.1%	36.9%
UCR	44.5%	55.5%	44.4%	55.6%	42.6%	57.4%
UNA	38.9%	61.1%	35.5%	64.5%	33.5%	66.5%
UNED	23.4%	76.6%	22.6%	77.4%	24.5%	75.5%
Private Universities	37.0%	63.0%	36.0%	64.0%	39.0%	61.0%
Average	**42.9%**	**57.1%**	**41.3%**	**58.7%**	**40.5%**	**59.5%**

Source: State Universities, Registration Departments, CONESUP

The presence of a minority of women specifically in the area of information technology can be seen in all state and private universities. Even in institutions in which women form a wide majority at the general level, they constitute a minority in the particular area of technology.

Table 2: Degrees conferred in the IT field,* according to sex (2001–2003)

	2001		2002		2003	
	Men	Women	Men	Women	Men	Women
ITCR						
Computer science	84%	16%	75%	25%	71%	19%
Electronic engineering	91%	9%	91%	9%	90%	10%
UCR						
Computer science	77%	23%	78%	22%	73%	27%
Computers and business	65%	35%	62%	38%	67%	33%
UNA						
Computer science	65%	35%	69%	31%	67%	33%
Technology administration	63%	37%	69%	31%	70%	30%
UNED						
Computers and management	83%	17%	67%	33%	70%	30%
Private Universities°						
Systems engineering	68%	32%	69%	31%	67%	33%
Computer engineering	68%	32%	62%	38%	60%	40%
Average	**74%**	**26%**	**71%**	**29%**	**78%**	**22%**

**IT: information science, systems engineering, computer science, electronic engineering*
°This information was taken from private universities with at least 500 graduates
Source: State universities, Registration departments, CONESUP

The information collected does not signal a clear trend regarding the increase or decrease of female graduates in IT in Costa Rica. But what can be deduced is that women definitely constitute a minority of 30 per cent.

CONARE does not have a breakdown by sex regarding student registration in the state-owned or private systems. The only information that could be found regarding state institutions was from the Technological Institute of Costa Rica (ITCR) where the trend seems to be that female registration in computer-related

programs is decreasing: 20 per cent of students in 2003; 18.3 per cent in 2004.[13] Regarding private institutions specializing in computer training, Cenfotec provided us with information for the current year in which female registration comprises 14 per cent of the total.

Neither does CONARE have comparative data on drop-out rates. Some key people have pointed out that the education system discourages the enrolment of women in technological programs. This aspect will be dealt with qualitatively in the section on the vision of local stakeholders. Statistically, with the information currently available, it is not possible to confirm or refute this perception.

4.3 Work-related figures

First of all, it was important to estimate the number of women currently undertaking research in the area of information technology. A special query of the database of the National Council of Science and Technology Research (CONICIT) revealed that of the total number of projects related to this topic currently registered with the Council, 30 per cent are developed by women.

Regarding the private sector, according to the Costa Rican Chamber of Information and Communication Technologies (CAMTIC), of the total number of businesses registered with the chamber, only seven per cent of owners and/or managers are women.

Table 3: Population employed in IT in Costa Rica, according to sex (2002–2004)

Occupations	2002		2003		2004	
	Men	Women	Men	Women	Men	Women
Design and analysis of information systems	76%	24%	80%	20%	80%	20%
Computer programming	92%	8%	90%	10%	82%	18%
Electronic engineering and telecommunications	100%	0%	91%	9%	100%	0%
Computer programming technicians	79%	21%	90%	10%	81%	19%
Computer equipment control technicians	80%	20%	84%	16%	100%	0%
Electronics and telecommunications technicians and assistants	97%	3%	100%	0%	95%	5%
Average	**87%**	**13%**	**89%**	**11%**	**90%**	**10%**

Source: Special query of the National Multi-purpose Households Survey, INEC

In terms of professional careers in information technology, a special query of the National Multi-purpose Households Survey, undertaken on a yearly basis by the National Institute of Statistics and Censuses (INEC), also shows lower figures— even a downward trend—regarding women's participation as professionals in this sector.

13 CONARE, forthcoming.

It seems that the trend of a 70/30 ratio in the participation of women as professionals in information technology in Costa Rica, as reported by Láscaris *et al.*for the decade between 1990 and 1999 has, in some cases, remained steady but, in general, it has worsened.

There is no gender breakdown in data that affords an estimate of the number of women in Costa Rica who use the Internet. The National Institute of Statistics and Censuses has for many years included a special section on telecommunications in their Households Survey, but since the information is not broken down according to gender, it is not useful for the interests of this current study.

5
Vision of Local Stakeholders

Every issue's key stakeholders usually include those organizations or institutions—be they public or private—that have a very strong say in the area of interest. In order to influence such a group it's very important to know and understand how they see the subject. This research approached some local stakeholders and interviewed them regarding four sub-topics:

- how they saw the relationship between women and technology;
- which reasons could explain the gap between women and the IT professional field;
- how relevant they thought this gap to be; and
- which strategies they thought would be most effective in the country to bridge that gap.

Stakeholders from academia, private enterprises, NGOs and government were taken into account. A small workshop was carried out where preliminary results were presented in order to have feedback from the stakeholders that were interviewed, as well as from other relevant national players. The results of the interviews as well as the feedback received at the workshop were integrated and are presented in the four sub-topics previously mentioned.

Each sub-topic section notes whether consensus existed, and which type of organizations agreed or disagreed on specific matters. This does not mean that the point of view of the majority is more valid or valuable than those ideas stated by fewer organizations. This is a qualitative and exploratory study, and hence it is focused on presenting the variety of positions found among the organizations interviewed without making generalizations.

5.1 Relationship between women and technology

Regarding the relationship between women and information technology in Costa Rica, the interviewees stated that, to begin with, the situation must be framed within a broader context, since the country seems to reproduce the situation that prevails in the rest of Latin America. One of the NGOs interviewed pointed out that the gains achieved in primary and secondary education, as well as the broad coverage of telecommunication services, contribute to lessening the unbalance somewhat. However, they all agree that the low degree of participation of women in the science and technology sector in general is quite evident.

The interviewees from the private companies agree that there are very few women in the field. However, they feel that this is due, in part, to the fact that there aren't very many professional women in the sector to choose from, and they express their interest in incorporating more women into the labour force. In fact, they say that women have begun to fill positions of power because of their management

and administration skills, an impression that may be a result of socialization processes.

Another aspect that was pointed out by two NGOs and two academic stakeholders is the unequal value placed on the type of work performed. They explained that, for example, documentation is considered to be a female task, as is report editing and manual writing; these are tasks which are valued to a lesser degree and tend to be associated with secretarial work. "There are still very few women working in the area of computer hardware and cabling,"[14] stated a woman who is currently the network administrator for the faculty of engineering at the University of Costa Rica.

Regarding the approach to technology, two NGOs and one government interviewee pointed out that the presence of more women in the sector does not mean that there has been a female-based approach to technology. That is, there is a concern that the women who have been able to permeate the sector have had to do so in a very male-based environment. One of the NGOs summarized it thusly: "As long as women do not stand out as women and adjust themselves to the male pattern, they will have no problems."[15] This poses an important challenge because it reflects that many males still reject very much the presence of females and that the women working in the industry often enough have to "disguise" themselves as men, by following their relationship patterns and behaviours in order to be accepted in the workplace. That is, the women still have to comply with a male-based culture because the working environment does not seem to have become flexible enough to incorporate the values, views and positions of women.

5.2 Explaining the gap between women and the professional IT sector

Among the factors cited by all interviewees regarding the possible explanations for this gender gap are those which can be grouped within a macro-social context, such as the presence of a patriarchal system that divides behaviours according to sex and decides which duties are acceptable for men and which are appropriate for women. From this perspective, stakeholders consider that what is occurring in the technological sector is simply a reflection of society at large.

Another element of full consensus among the people interviewed is the relevance of considering the processes of early socialization, which are closely related to the formal education system. They stated that the primary and secondary school system is designed in such a way that girls lose their impetus to pursue science and technology, especially during adolescence, because stereotypes regarding gender differences are reinforced. For example, feelings of fear towards mathematics are reinforced in girls. Stakeholders also pointed out that girls are given encouragement in the areas of social sciences and health, which reproduce the gender roles related to protecting and taking care of others.

14 Fabiola Rodriguez, 2005.

15 Lena Zúñiga, 2005.

The IT image that is marketed is another factor that keeps women away from the field. As one of the academics explained: "it really isn't very clear what IT even means, nor the variety of areas in which one can work within the sector. As well, the interfaces and configurations are mainly directed at men, as they follow a very masculine logic."[16] This statement was supported by three other NGOs and two government interviewees, but found no agreement from the private sector.

The issue of double standards is also present within the IT sector. Two government stakeholders and two NGOs interviewed stated that proposals submitted by women are not valued as highly as those coming from men. At the same time, the areas where women have traditionally demonstrated greater skills, such as interaction with users and the adjustment of programs to meet users' needs, are not highly valued by companies.

The work environment is also a factor that sometimes has a bearing on this issue. One of the interviewees said that, "although you could not generalize for all companies and institutions, some workplaces where I've been with an exclusively male staff became very sexualized, and conversations and camaraderie were so laden with overt sexual content, that this created a very hostile environment."[17] Although this perception was supported by two other government stakeholders, it was also opposed by one of the private enterprises interviewed. Therefore, we should not assume consensus on the issue.

Another barrier pointed out by one of the government stakeholders is that when there are IT training opportunities in organizations, most of the time it is the men who are chosen to attend, which further perpetuates the male-only presence in the area and blocks women's access to the field. This unequal access to training opportunities occurs in the broader framework of a patriarchal system that has historically kept women from having the same opportunities as men, on the basis of attributing men a higher intellectual capacity, especially in the areas of mathematics and exact sciences. As the perception has been collectively internalized, this type of discrimination may come from either men or women who still believe that men are genetically more intelligent, and that, therefore, giving men training opportunities represents a better investment for the organization.

Finally, a majority believe that information technology training itself forces women to leave the field. In this respect, 10 of the interviewees from all sectors refer to the high drop-out rates of women in IT and stress that, to a large extent, IT educational programs are structured according to the assumption that the students will be men. The stakeholders point out that these programs require an enormous amount of time on the students' part to experiment and create, which is time that women, with their multiple societal roles, have less of than their male counterparts.

16 Ana Rosa Ruiz y Laura Queralt, 2005.

17 Kemly Camacho, 2005.

5.3 Relevance of the gender gap in the professional IT sector

Interview respondents all share the concern over the under-representation of women in the IT sector. However, there are important differences regarding why they believe the gender gap is a problem for the country.

In general, the interviewees place the significance of this gender gap within the more general framework of the division of labour by sex. That is, they are concerned in general about the fact that careers are divided by sex. However, they recognize that the digital gap opens the social gap even wider and they agree that gender gaps are deepened when professional gaps exist. Above all, they feel that if women are distanced from technology, it should be a choice, a result of reflective process or a decision, and not a result of the imposition of male standards.

A minority of the people interviewed (one NGO and one participant from government) believe that the participation of more women in the IT sector will bring a greater focus on social development; technological standards vary according to gender, and the current standards are predominantly male and individualistic. However, this is a point on which most of the interviewees disagreed. In fact, one of the NGOs stated that "the neo-liberal and individualistic perspective, as well as productivity at all costs, has affected men just as deeply as women."[18] The interviewee from the National Women's Institute added that the issue is not about women rescuing the IT sector and making ICTs more socially oriented, but rather that it is one of rights.

An issue thought by all stakeholders as becoming increasingly important was the potential for exponential exclusion of women, given the tendency to move towards an information society in which those with access to information and technology resources will have more power and better jobs. If there are obstacles in being able to access decision-making, political power and greater remuneration, this has a negative influence on the various aspects of well-being,"[19] said the advisor from the Ministry of Science and Technology. On the positive side, the private sector points out that the involvement of women in IT could help to address the problems of employability they face. On a related note, three of the NGOs stress that this can happen only if the strategies to promote the IT sector are accompanied by strategies to help the population in general gain access to them as a form of development, and not to continue strengthening an elite.

Some of the interviewees (two from government and four from NGOs) also felt that there is a growing phenomenon of "invisibilization" of women's work in IT, and that their tasks are more poorly remunerated because they are less valued. They explained that there are many women working in IT sectors on which little value is placed, including project management, interface creation and graphic design. This is unfortunate, because as one of the academics pointed out, "the IT

18 Lena Zúñiga, 2005.

19 William Mora, 2005.

sector could greatly gain from the incorporation of women, as their contributions are valuable and their intelligence and creativity could be better utilized."[20] In support of this perception, two private sector representatives and one academic stated that women are better able to establish caring relationships, they communicate more effectively and their analysis is more comprehensive, which is why they are preferred in some companies and institutions. This is also a point of disagreement among those interviewed because at least one person of each sector (government, NGOs, private and academics) had a strong stand against stating sex-disaggregated capacities. However, there is consensus in that if women are excluded from IT, there is no opportunity for knowledge to be used in a different way than the current male-based one.

5.4 Strategies to close the gap

The fourth issue this research asked the stakeholders has to do with stating where it would be more effective to put the efforts in order to overcome the gender gap in the professional IT sector. The responses are presented in order of consensus, that is, from those suggestions that met most agreement to those who had fewer supporters. The group offered the following recommendations as the most appropriate to tackle the gender gap:

a) Early Contact:

- provide girls the opportunity to use equipment and programs to create a closeness and familiarity with technology;
- develop summer camps for girls to promote science, with laboratories and games;
- improve vocational assistance and guidance;
- carry out science and technology promotional programs with a gender perspective; and
- review how gender roles are promoted in schools.

b) Pedagogical Changes:

- work in partnerships integrating technology and the empowerment of women from a pedagogical perspective;
- create specific methodologies taking into account that not all people can easily move from concrete processes to abstract ones; and
- provide non-sexist conditions in educational environments.

c) Turning the Focus Around:

- humanize technology and give it an emotional aspect;
- create software, right from the start, for men as well as for women;
- market the various development possibilities within the IT sector;

20 Ignacio Trejos, 2005.

- emphasize how access to technology can transform peoples' lives; and
- place young women in the media as role models related to technology.

d) Affirmative Action:

- incorporate programs specifically for women;
- establish obligatory guidelines for the private sector;
- establish IT quotas in the public university educational system;
- provide state-promoted ICT training in workplaces where women are employed;
- develop proposals from a women's perspective;
- reformulate science and technology curricula so they attract both sexes;
- develop local initiatives in the communities;
- make the women who already work in the IT sector more visible;
- identify the processes of women's knowledge-building;
- provide grants for technology-specific educational programs;
- conduct campaigns in high schools to promote the integration of women in the technology sector;
- promote gender equity guidelines in private companies;
- foster union and support among women; and
- conduct specific studies on women and technology.

e) Social Pressure:

- put pressure on the government to commit to an agenda of universal access regarding ICTs and the Internet;
- make use of the pressure from financial sources to establish political relationships and allies; and
- relaunch the Law of Social Equality, the various conventions, and, specifically, the Beijing Platform.

f) State Commitment:

- take into account the way women will use the technology, as well as more cooperative uses of it, collective creation, development of areas of interest to women, and ways of approaching the end users;
- create the economic conditions necessary for women's participation;
- incorporating the gender issue in the guidelines from CONATIC; and
- develop coordinated public policies in order to break away from stereotypical roles.

From the order of the above categories, it is clear that stakeholders point their fingers directly to the role of early educational and socialization experiences. This may also be partially influenced by the popular conception that early years play

such a key role in determining the directions of people's lives. Among the recommendations that were less "popular" are the ones regarding social pressure and state commitment. This is very worrisome since it's the role of the state to guarantee conditions for the promotion of well-being for its citizens, and to pay special attention to those groups who have been historically marginalized. However, this role of the state is not a fundamental part of the collective psyche of the organizations interviewed. Therefore, recommendations at the public policy level were not frequently heard in the interviews, case studies or feedback meetings.

Although, when asked directly, the interviewees felt that it is the responsibility of all the sectors to fight against gender disparity in the information technology sector, the recommendations to bridge the digital gender gap are not strongly targeted at the state. Among the stakeholders mentioned as institutions that should be directly involved are:

- Public institutions: MICIT, CONATIC, INAMU, Ministry of Commerce
- Universities: especially ITCR
- Educational bodies: MEP
- Civil Society: ICE, FOD, Fundación Acceso, FIRE, community organizations

6
Case Studies

The stakeholder interview process yielded the first information gathered in the research. The second piece of fieldwork comprised six in-depth interviews conducted with representatives of national initiatives that link women and the ICT sector. These short case studies were chosen after the interviews with the stakeholders where key factors were identified. The first two cases are related to the use of technology for employment and, due to its close relationship with the subject, it is a practical experience that gives a face to the issue of women working as professionals in Costa Rica's IT sector. Since early contact was a point of consensus among the interviewees, the second group of cases are examples of work carried out with teenagers. One of them is an initiative to train girls in the IT field and the other one is a study conducted to explore girls' perceptions of computer science.

Finally, two cases of ICTs for the empowerment of women are presented. They are seemingly more distant from the subject in study because in them, women, though they make strategic use of ICTs, are not professionals in IT nor do their projects attempt to bring women closer to the professional IT field. They have been showcased as examples of the type of work that women carry out in the IT field and that is often not visible. These examples stress the positive impact inclusion in ICT can have on women's full participation in political decision-making and advocacy processes.

Each case consists of two parts: the first one is a description of the initiative and the second one an account of each organization's view of the most successful elements of their experiences, and the challenges or difficulties they encountered along the way.

6.1 IT for the development of entrepreneurship and employment

This section includes two examples of approaching ICTs from the point of view of income generation and entrepreneurship. The Book Club is the first example. Despite the fact that it is a private company, their ultimate goal is not to generate profit. Instead, the priority of its members is to carry out a cultural promotion project, and to accomplish this, they work primarily with volunteers, staging large events with exceptionally few financial resources. This way of working is completely in line with the most traditional stereotypically female ideals, reflected by the adolescents in the CAMTIC study which is presented in the second grouping, regarding work with adolescents.

The second initiative is directly linked to income generation, as it constitutes a private enterprise. One interesting aspect is that the interviewee clearly expresses her thoughts about the double role women play: the disjunction between women as professionals and women as mothers. She even feels that this contradiction is more difficult to resolve in the private sector than in the public one, given that the latter provides more social security.

The Book Club Cultural Project

Organization: Book Club – http://www.clubdelibros.com

Implementation period: Commenced in 2003 and currently in progress

Objective: Promote literature among the Costa Rican population

The initiative arose as a Web page dedicated to promoting an appreciation for books among Costa Ricans. The initiative was launched when the founding team discovered that in Costa Rica there were no programs specifically aimed at promoting reading. It involves a group of women who are virtually all volunteers. This is not a public relations group, and the only income is obtained through specific projects and the sale of services.

Most of the volunteers find out about the initiative through the Web page (http://www.clubdelibros.com) or through the activities the group organizes. There is a core group of four volunteers, who are in charge of the ongoing work, and another 15 or so people who help out with special activities. For the Book Club team, it is important that the volunteers be people who love reading and feel strongly about promoting it. The project has also formed alliances with storytellers and people involved in cinema. According to the organizers, the Book Club has about 18,000 subscribers to their bulletin.

Legally, the Book Club is registered as a corporation, despite the fact that it is a non-profit initiative. This is due to the relative ease in registering a corporation, as opposed to the difficulty in forming an organization large enough to become a foundation or association. A few attempts have been made to register the corporation internationally, but they haven't been successful. Generally, the group works with local resources, such as networking with book stores or specific authors. For example, an activity was organized to commemorate the birthday of Hans Christian-Andersen; 500 people attended the event and it was funded through a partnership with a book store, which set up a stand and sold books. The Book Club works primarily through commemorative events, and there is little long-term planning. The Ministry of Culture, Youth and Sport has provided some support through workshop grants, but this is for the participants on an individual basis, and not as a cultural initiative *per se*.

The activities of the Book Club are aimed at encouraging people to read books, and they take place mainly at events such as flea markets, book presentations, book store literary gatherings, children's events, movie and literature events, activities in schools, visits to Aboriginal reservations, and book donations to prisons and schools. One of the projects they are hoping to get funding for is the compilation of narrations by senior citizens in the communities.

Currently, a Book Council is being formed in Costa Rica, in which it is hoped that a book policy can be developed. Facing this process, the members feel that they have invested in creating confidence in their work with the Book Chamber and other organizations. The initiative has been able to support its activities through

exchanges and swaps, but has received very little concrete funding, despite the potential it has shown in attracting people to its events. The Book Club would like to obtain more funding in order to increase its schedule of activities and operate within a wider geographical area.

ICTs have allowed the project to survive. The technological aspect is fundamental, as it is the means by which the organization communicates with people and publicizes its activities. Each week there are over 30 new subscribers through the Web. The Book Club has a database of 18,000 readers, grouped according to the types of books in which they are interested. The members consider it a live electronic list, because their subscribers communicate with them. For example, when they hold book raffles, sometimes 200 people participate, and when they send out their newsletter, they receive up to 500 e-mails a week from people giving their feedback. The Web page allows for a great amount of interactivity, as the sections are modified according to public requests, and it functions like a literary portal. Some requests for modernization have gone unheeded, due to the technological limitations of the Costa Rican population. It is an initiative that has grown immensely; it is very innovative and has changed how book stores promote books.

Despite the fact that the Book Club is run by women, it is not thought of as a women's group; the members feel that the absence of men is by chance only. In fact, they state that when it comes to their work, the most important thing is the promotion of literature, and they have the support and collaboration of various men. Nevertheless, when they look at their daily work, the members recognize that, as women, they are used to being communicative, to forming alliances and maximizing resources. Despite the fact that they have organized gender exhibitions, they don't feel they have one particular emphasis, but rather deal with a wide array of topics. They do consider gender an important element and have developed close ties with many women's organizations, but they do not have a specific agenda in this area.

Regarding technological training, they state that they have learned what they have needed to. They have not studied public relations or customer service, but experience itself has given them the skills they need. Furthermore, they often receive suggestions and offers for technological support from the readers themselves. Their audience is made up of people who read, although some older people do not access the Internet, so they would like to develop some print material. The Book Club feels that through its efforts, it is promoting the traditional activity of reading through digital means.

Successful Aspects	Challenges and Obstacles
• Public satisfaction which they receive daily through e-mails and activity attendance	• Administrative resources and legal counsel
• Growing support for the initiative by book stores	• Planning and resource generation

A closer look at the elements pointed out as successful and/or challenging by this initiative produces interesting results from a gender perspective. Even though this project is an entrepreneurial activity and after some time has been able to provide one of its members with a full-time paid job, what´s highlighted is the satisfaction participants receive from the approval and support of their public. Also, the challenges are precisely the turning point that could unleash the economic growth of this initiative. Problems with planning and income generation are very common in female-based organizations. Hence, although the participants were able to harness ICTs into an enterprise that could potentially become an important source of economic revenue, gender aspects come into the field and render it an initiative that shares more characteristics with other female voluntary organizations than with IT-related enterprises.

Electromática S.A.

Organization: Electromática Full Computer Solutions
http://www.electromatica.net

Objective: Develop, implement, design and maintain comprehensive computer-based solutions, which are highly professional and adapted to the economic reality of the environment.

Six years ago: Electromática was born: a company that develops customized software. When it began, the company decided to form alliances with two initiatives: the Oracle creator groups, and the incubation centre from the Technological Institute of Costa Rica. It turned out that the latter was not a fruitful experience due to a negative impact on the company's image: being associated with an incubation initiative made people think the company was not experienced enough. However, this bad decision also led the company to strengthen its sales and marketing department.

Electromática considers that the alliance with Oracle was the best decision they made, because currently the company develops specifically tailored products, using the Oracle platform, and it also provides support and training for this system. The enterprise has solid experience in handling quality control systems, stock management and financial accounting programs.

One of the two owners of this company is a woman named Flor Obando, who had worked nine years for the Customs Laboratory, and took part in the process to create a technology platform for that organization. After that, she was transferred to the Housing Ministry as a programmer. She decided to make a move from the public to the private sector, although in the public sector there is more equality than in the private sector, as well as more stability and social security. She commented that procreation implies a discriminatory workplace disadvantage, so the majority of contractors see this as a risk factor which negatively affects their interests.

Apart from continuing to work in the area of computer technology, she began to work in middle management in private companies, in managerial positions. To

explain her development as a businesswoman in the technological field, she refers to her childhood and to the influence of her parents, who instilled certain values in her, as well as a competitive way of thinking, which was far from the traditional cultural stereotypes of a woman's role.

Flor Obando feels that her work in the technical area was a natural fit, and was related to what the workplace expected of her. Since her early days in the laboratory, she has had to acquire technological skills in order to do her job, and discovered that she had an affinity for it. Her rise in the field, starting out with very little technological knowledge, first as a plant worker, then in management positions, and finally forming her own company, is the result of her competitive personality and the fact that she has set professional goals for herself during the last 27 years of work.

Owning a company has been a big change, and it influences the way this woman deals with her colleagues and her capacity to fulfil her personal goals. She is sure that the fact that she is a woman has never been a problem for her clients. However, she experienced various problems in her former management positions, above all in the private sector. One of the reasons for her success in her business is the good relationship she has with her current partner, who is very open-minded and not prejudiced.

Successful Aspects	Challenges and Obstacles
• Oracle linkage • Good relationship with partners • Joining CAMTIC has brought more support	• Bad experience with ITCR's incubation centre • The market in Costa Rica is difficult. There are ephemeral software companies and there is little confidence in investors

6.2 Information technologies and adolescent women

One of the focuses of the study on women and IT in Costa Rica that it's important to highlight are the initiatives that have been directed at work with adolescents. They are of particular interest, as the period of adolescence seems to be a key moment in time in which women experience alienation from technology. One of the local stakeholders pointed out that "during adolescence there is a hypersexualization that happens during women's identity building that distances them from science and technology, as society in general does not value the fact that girls can be as intelligent as boys."[21]

These two examples from initiatives developed in Costa Rica showcase the impact that bringing teenagers closer to technology can have. The first initiative is a participatory study conducted by the Chamber of Software with rural adolescents to determine their own perceptions regarding technology. The reproduction of a patriarchal ideology in which women are tied to privacy is clearly reflected.

21 Maria Suarez, 2005

The other experience is developed by the gender program within the country's technological state university. It's a computer training program aimed at adolescent mothers, in which the important aspect of taking into account the particular characteristics of adolescents is exemplified.

Study on strengthening gender equity in the information technologies field at the higher education level

Organization: Software Sector Support Program (BID-CAPROSOFT-CENAT-PROCOMER)

Implementation period: 2003

Objective: To discover some of the factors which contribute to the low rate of women's participation in the technology sector.

In June of 2001, PROSOFTWARE developed a Human Resources Supply and Demand Study to find out which educational programs have a high ratio of men, which are relatively balanced, and which are predominantly female-dominated. The information technologies area can be classified within the programs in Costa Rica which are predominantly male-dominated. This same study revealed that only 7–17% of the staff working in this area are women.

The PROSOFTWARE study makes reference to some factors related to the socialization process that could have an influence on gender inequality in that sector. Taking that study as an important precedent, the initiative to undertake a study with a gender focus arose, which would systematize the influence of some of the factors that could have a bearing on the unbalance regarding women entering this field.

In addition, based on this systematized process from a gender perspective, the intention was to design a survey that could be conducted at the national level in order to discover the interference of the various factors and develop a strategy that would increase the percentage of women entering the information technology field. This, in turn, would help to establish equality among the sexes and increase the specialized human resources in this area.

The study was set up as a workshop as a part of the qualitative research, from a participatory action research framework. The research process involved reproducing the workshop in four sessions of approximately six hours each. The participant groups were made up of 20 middle class adolescent women, 16 and 17 years old, who were in their fourth or fifth year of high school. They came from urban and rural areas, as well as areas categorized as marginally urban. The participants were mainly from public and academic high schools of Hatillo, Cot de Cartago and Puntarenas; it was only a group of participants from Limón who attended the Scientific High School.

The results reflect an understanding of gender that incorporates new elements, such as access to the public sphere, but also maintains and upholds traditional positions that undeniably associate women with motherhood. The adolescents felt that

looking after others is intrinsic to women's nature, and that women should have access to an education only if it does not interfere with their duties at home.

When the girls were asked why they hadn't chosen the computer field, they pointed out that "through this career you can't help others and you can't have a direct relationship with people: the relationship is through a machine and tends to be cold." Also, the maternal role is very significant; they expressed the fact that a career in computers is one that never ends, that requires constant upgrading of expertise, and that "no mother would be willing to exchange her child for a profession or to earn more money."

Another influential aspect is the perception about the capacity of women to participate in non-traditional areas, as well as their self-perception about their own capacity to perform in these areas. The young women expressed their feelings that women are afraid to choose a career that is not familiar to them and one that does not afford them a traditional role.

A third factor is that of the mediating factors in the socialization process: the family and the educational system. The girls pointed out that right from childhood they are associated with traditional roles, and that women are brought up to be passive, submissive and to serve others.

Fourth, the lack of knowledge means that many of the participants have a very basic understanding of computer science, and the computer is considered to be complementary to other fields or used as a support to carry out a task (such as a receptionist or secretary would do), and is limited to the use of Microsoft programs.

The following recommendations were developed, based on the findings:

- Develop programs that involve companies excelling in the technological field. Have the companies give talks and involve the young women in the workplace in such a way that they learn through modelling and participatory observation.
- Develop activities to raise awareness among heads of companies and commercial producers so that they make positions available to women in the area of technology and reject stereotypes.
- Develop a comparative study with women who are attending higher education and enrolled in technological programs, in order to determine the factors that led to their integration.

Successful Aspects	Challenges and Obstacles
• A process of learning exchange was facilitated, in which the required information was obtained and the participants felt that they learned new things at an interpersonal level. • The session allowed the participants to change their way of thinking, which demystified the computer field.	• There was no follow-up on the recommendations.

Technical training for adolescent mothers in non-traditional and competitive technical areas

Organization: Gender Equity Program of the Technological Institute of Costa Rica (PEG-ITCR)

Implementation period: Commenced in 2000, currently ongoing

Objective: To provide technical training in non-traditional careers to pregnant teens or adolescent mothers, in order to facilitate their reintegration or continuation in the formal education systems, as well as to facilitate their preparation for, and access to, real employment or income generation opportunities.

The initiative to provide training in non-traditional areas to women at social risk has important roots in the project currently underway in the Gender Equity Program of the Technological Institute of Costa Rica (PEG-ITCR). In 1998, a project aimed at young women was undertaken, with the financial support of the European Union, which provided training to 120 adolescents. In 2000, the project continued with the same population, this time with the financial assistance of UNESCO. Subsequently, this training initiative was linked to a national program to assist adolescent mothers, which is why the population specifically revolves around teenagers who are pregnant or have children. The latter is the project that is still currently underway; the participants are adolescents who are pregnant or already mothers and under 18 years of age, which are the requirements for accessing funding from the Fund for Children and Adolescents, the current financial support for the project.

A real challenge in the training project was achieving class dynamics that would be permanent. A great effort was made to make sure each participant had her own computer to use. A teacher and an assistant were made available to each group. Effort was also made to make the groups homogeneous, which presented difficulties given the fact that the participants are adolescents with a low level of education.

One aspect of this population is that the girls are very young, which means that university methodologies cannot be used. The majority are girls who had dropped out of the formal educational system, not only because of their pregnancy, but also due to socio-economic conditions and social risk. They come from family situations where domestic violence is prevalent and great control is exercised. They often lack family support for their studies. In their homes, education is not considered important, and aggression is rampant; they are often pressured to quit.

The most innovative aspect of the initiative has been to have a customized educational program. Taking the concrete profile of the participants into account, specific pedagogical modules have been designed. The national education system has missed the opportunity to meet the needs of a diverse student population. The Gender Equity Program has developed an academic program specifically for

pregnant teens and adolescent mothers. This program has taken into account their particularities, adjusting the schedule to make it convenient for them, making the educational materials comprehensible for them and making sure that the classes meet their needs. The program also provides other aspects to encourage completion, such as childcare, bus passes and snacks.

Successful Aspects	Challenges and Obstacles
• Creation of a customized methodology developed specifically for the population	• Make more efforts to link to the Building Opportunities program
• Awareness raising and training for teams of teachers involved in the project	• Discontinuation of funding presents an obstacle to program coordination
• The participants are empowered and feel respected	• Availability of institutional infrastructure was reduced
• Myths are quashed regarding technological areas	• Course accreditation in other educational institutions in the country
• The institution has become more aware of the issue of women's access to technology	• Increase the training time to one or two years, to achieve a greater impact

6.3 IT to empower women and develop political advocacy

Within this category are two initiatives developed by civil society organizations that advocate for women's rights. In both cases, technology is a strategic medium that helps women attain their ultimate goals. One of the very interesting aspects of these initiatives is the strategies these women employ to make collective use of technology. In both cases, the individualistic relationship with the machine is transcended, and whether for the purposes of learning in pairs or through media pools, the values of cooperation and common good prevail.

It is also important to reiterate that these initiatives were chosen to highlight one of the important uses of technology that women in Costa Rica are making: political advocacy. Electronic lists, Web sites and virtual groups have given many women's organizations an important opportunity to express themselves, as well as the possibility to participate and exert pressure in the political sphere, even though there are great geographical distances. Likewise, they have used ICTs in order to create alliances with women's movements around the world.

Women's media pool

Organization: International Feminist Radio – http://www.fire.or.cr

Implementation period: Commenced in 2004 and currently in progress

Objective: Produce information from communication and informative media and initiatives by women who have had access to media interested in covering the Beijing + 10 event.

The initiative to create a women's media pool arose from a practical necessity, as the most recent members of the Feminist Radio felt quite insecure about covering Beijing

+ 10, due to their lack of information. Added to this was the bewilderment felt by other members of the organization at the lack of coordination among women's media organizations for this event in particular. There was also a certain void regarding articulated initiatives, and there was no meeting called due to the lack of resources.

FIRE decided to call a meeting, which they wanted to be quick and easy to coordinate, smoothly run, and would not require resources on top of those that the organizations had already budgeted for covering the event. Often, having resources available implies an excessive amount of paper from each organization due to the fact that each must be accountable. Furthermore, the journalists and broadcasters attending for the first time would feel more supported.

The initiative was widely received, and more than 70 organizations met. This was due to the tradition of working together, as well as the confidence in FIRE because of its transparency and relevance. The needs and expectations of the other organizations turned out to be similar. The feminist and women's movement has changed the way it functions internationally: there is now more interest in building bridges among regions. The media pool would make information available to many other media organizations and, at the same time, would give each organization input for their articles and reports.

The media pool was an initiative of FIRE, but this did not mean that the organization would dominate it. Rather, it was decided that a coordinating body would be elected, and FIRE was chosen to coordinate for two years. Nevertheless, it was explicitly decided that the pool coordination would rotate and be run smoothly. Three events were chosen to be covered during this year.

More than half of the members of the media pool were not physically in New York for the Beijing + 10 event, but still wanted to cover the event: the pool allowed them to do this. The members of the media pool were on an electronic discussion list, and they would immediately receive information and photos. FIRE would place this information on the Web page created for that purpose (http://www.womensmediapool.org), and to which the public also had access.

Three types of media, which had not participated before, joined the Pool: media journalists, communicators and public relations representatives.

The initiative was developed to address the need for communication and information. Any organization willing to communicate through the platform in its totality, and who was committed to addressing all of the issues in the action platform without censure, was able to take part, without worrying about author credits. That is to say, the Pool had an agenda and had content, but did not value the work of one sector over another.

The project was an opportunity to demonstrate what can be done with coordinated efforts that are not dominated by one organization. The initiative also modelled the possibility of providing vital coordination without additional resources. The organizations involved were very enthusiastic about the possibility of finding new ways to communicate information. Nevertheless, an important

lobby effort made by the pool was to highlight the lack of resources for women's media.

Not only did the organizations use ICTs for communication purposes, but they also came up with innovative ways to use them in new combinations. For example, it was decided that the Web page should emphasize the presence of many languages and should communicate multilingualism, which is why it did not contain tracks in each language. Despite being very simple, there was a high level of interactivity on the page.

Reflections were made regarding the absence of additional resources. These usually come hand in hand with pressure from funding bodies which involve control by one organization, externally defined agendas and pressure to personalize the results. The Media Pool, embryonically, reflected an alternative way.

Successful Aspects	Challenges and Obstacles
• The electronic list offered an opportune flow of inputs and outputs in various languages. • Organizations that were not present at the Beijing + 10 event could report on it. • 60,978 Web page hits in two weeks during and after the event. • The Pool lobbied regarding the evaluation of Section "J" of the Women and Media Platform.	• Reaching a consensus regarding the minimum amount of information to be made available for each event • Resources to guarantee a sub-regional balance for those attending the events. • Translation. • Competition among organizations who work in the same types of media. • Mapping out the expertise of the members in order to use it to better advantage.

New technologies to empower and encourage leadership in young women

Organization: Francisca "Pancha" Carrasco Jiménez Feminist Centre
pancha@racsa.co.cr

Implementation Period: 1999–2000

Objective: Develop personal and collective empowerment, leadership and knowledge output of young women by providing information technology communication tools.

In earlier projects developed with young women, the members of this feminist centre, known as "Las Panchas," detected a low rate of technology use, which encouraged them to implement an initiative specifically aimed at the technological empowerment of young women. It was also considered an important element in capacity building for entering the labour market, as well as a way to promote and disseminate the work and thoughts of young feminists. Historically, Las Panchas had worked mainly in the cultural and artistic spheres, such as theatre, poetry and art. In searching for a way to build on this, the project focused on learning to create Web pages, which could reflect their artistic talents.

In order to implement the project, Las Panchas obtained funding from the Gender Equality Fund of ACDI. The members of the centre with the most skills in computer technology coordinated and facilitated the process: 12 young women between the ages of 17 and 27 participated. Three of them worked with the organization and the other nine had participated in former projects. Each one was trained in a specific program to contribute to the project: Dreamweaver, Photo Shop, Illustrator, Home Site and FTP. Nevertheless, there was a skill transfer that developed, and the 12 participants improved their computer skills in the specific programs as well as in the use of e-mail and the Internet. Training in the programs was delivered through peer support and work in pairs.

The Web page was called "Despertando Embrujos" (evoking spells) and was related to the promotion and information dissemination of Las Panchas, linking it to the print bulletin that the organization produced. One of the follow-up strategies of the project was to request a Canadian volunteer from CUSO's NetCorps program so that the young women could continue to post information on their "Despertando Embrujos" Web page.

The impact of the project was limited due to its short duration, although it was very meaningful for the participants. It had various components, one of which was a reflection on gender and age. Another was technical computer training, and a third was planning, designing and creating the Web page. The latter required contacting other women who wanted to promote their artistic work, from a gender perspective, through the Web page.

The most interesting aspect of working in ICTs with this group of young women was the conception of the use of technology, as they had a strong tendency towards expressing themselves in a face-to-face or non-technological mediated way. They formed groups, one editing and analyzing the messages of the artistic works, and others working on the graphic interface. The women tended to be afraid of the technology and of making mistakes, so overcoming those fears was added to the project goals in order to promote empowerment and resolving difficulties collectively.

The training that took place through peer support was achieved by the collaboration of one person interested in the program and another person who had overcome certain fears of technology. Also, there was reflection on the work in pairs. This is related to the way feminist knowledge is transmitted, because feminist trends were discussed, and learning took place at an intergenerational level. Those who knew more about technology were the young women who were a little older than the others, and who were better off financially and/or had a higher level of education. Half of the members were in high school and the other half in university. Space was made in the office so that the members could use the computer. The methodology of the project was to demonstrate technology in a very concrete manner, in the beginning, such as the creation of physical files, before introducing virtual processes.

Successful Aspects	Challenges and Obstacles
• Being the first initiative to create a Web page, where young feminists could express themselves through their art, was innovative. • Two years later, one of the participants, who came from a low socio-economic background, enrolled in a technology program. • The project encouraged artistic and conceptual production from a gender perspective.	• There was no ongoing funding to continue the project. • There were no links with other organizations which could have maintained or reproduced the initiative with their groups. • Some members lacked teaching experience in order to transfer technical knowledge.

7
Conclusions and Recommendations

Conclusions

7.1 Sex disaggregated data regarding ICTs are not fully available

It is important to point out that through the National Institute of Statistics and Censuses (INEC), there is information available on the level of Internet use, as well as the level of computer access and use in the home. However, because this is a special section of the survey, the data is not broken down according to gender. To obtain data broken down by sex, researchers have to request special data processing and in some cases use indirect indicators.

7.2 The available female participation numbers show a decreasing trend

According to the information and statistics uncovered by the research, as well as the perception of the local stakeholders, in Costa Rica women continue to constitute a minority in the information technology professional sector. Furthermore, the participation of women in this sector seems to be decreasing, which coincides with global trends, where fewer and fewer women are entering the field as professionals.

7.3 IT female exclusion may translate into gendered lower income

Given that Costa Rica is currently promoting information technology as an important development option, if Costa Rican women don't manage to enter the IT sector equitably, they may be faced with less favourable conditions regarding their socio-economic well-being in the future. Therefore, it is important for technical training institutes, as well as centres of higher education, to develop initiatives that encourage women to enter science and technology careers, as well as to create the conditions necessary for women to remain in them.

7.3 The main conditions that exclude women are stereotyped gender roles, male-based approach to technology and lack of policies

Based on the perception of the stakeholders interviewed as well as the in-depth interviews from the case studies, the main reasons to explain the digital gender gap in Costa Rica are related to the reinforcement of traditionally stereotyped gender roles in the formal education system; the male-based approach to technology that undermines those aspects of information technology that are more socially related; and the lack of specific policies to address the issue.

7.4 International agreements in this matter are not being fully enforced

Costa Rica subscribed to the Beijing platform of Action, in which article J of the declaration alludes to women's rights, not only in having access to the media and technology, but also in producing them. Likewise, the country is participating in the Millennium Development Goals process, the third objective of which mentions promoting gender equality and the autonomy of women. However, Costa Rica currently lacks the public policies or coordinated intersectoral initiatives directed at promoting the incorporation of women in the information technology sector as professionals.

7.5 Insufficient interaction between gender equity and information society agendas

It seems that the topic of information technology occupies very little space in the women's movement agenda, as well as in the institutions and organizations that fight for gender equity. This is crucial since gender equity is a key aspect of sustainable development and the stakeholders interviewed coincide in stating that digital gaps may further broaden the existing gender gap, hence undermining sustainable development.

Recommendations

The study recommends that the gender conceptions being promoted within the education system be reviewed, specifically those related to science and gender. Likewise, it would be very helpful to formulate specific initiatives that encourage women to enter the area of science and technology during their adolescence.

This study is an initial attempt to approach the gender gap in information technology and it would be helpful that further research be undertaken on the specific topic of women as professionals in the information technology sector. We suggest that exploration is needed regarding which roles are being undertaken by women within the sector. This study covered the professions that are traditionally associated with information technology (systems engineering and computer science), but a broader analysis would allow for a wider mapping out of the different technological professions that women enter.

It would be very beneficial for research purposes that the National Institute of Statistics and Censuses, or any other national institution that does polling of homes or does statistical field studies, would always incorporate the sex variable in the demographic data so that the information can be analyzed differentially.

It would be advisable for the National Commission for Information and Communication Technologies to incorporate into their strategic objectives and work plan specific and detailed objectives that promote gender equity and the incorporation of women into the sector, under equitable conditions.

It is important that institutions and organizations that promote gender equity incorporate the equitable access of women to information technology in their strategic objectives, because this issue is not only about technology, but also development and well-being.

Bibliography

Bonder, Gloria 2003, Ponencia Mas allá de la igualdad numérica: Estrategias educativas para la participación plena de las mujeres en la producción de Ciencia y Tecnología. Tercer Encuentro Latinoamericano "Participación en Ciencia, Tecnología y Política: una perspectiva de Género".

Camacho, Kemly, Personal interview, April 26, 2005.

CAMTIC 2004, Costa Rica verde e inteligente: estrategia nacional de tecnologías de información y comunicación. <http://www.camtic.org>.

Castillo, Mariana and Ugalde, Evelyn, Personal interview, April 28, 2005.

CONARE 2001, National Council of State University Presidents – Higher Education Planning Office. Características Sociodemográficas de los Estudiantes de las Universidades Estatales, 2000. Opes Publicaciones.

CONARE, Higher Education Planning Office, Statistics on diplomas issued, 2001–2003. Unpublished.

Hemmati, Minu & Gardiner, Rosalie 2001, UNED Forum, as part of the Towards Earth Summit 2002 project. <http://www.generoyambiente.org/ES/secciones/subseccion_23_28.html>.

Hernández, Andrea, Personal interview, April 8, 2005.

International Institute for Sustainable Development 2004, *Information Society and Sustainable Development: Next Generation Policy Directions Project*. <http://www.iisd.org>.

Kelan, Elisabeth 2004, *Gender, employment and ICTs in the information society: An analysis of gender subject constitution processes in ICT work*. Doctoral thesis proposal, to be submitted to the London School of Economics and Political Science

Láscaris, Tatiana, Aguilar, Guillermo, Silva, Sandra, Coto, Juana María, Calderón, Odalía y Brenes, Isabel 2001, *Ciencia, Tecnología y Género en Costa Rica 1990–1999*. Proyecto Iberamericano de Ciencia, Tecnología y Género. UNESCO, OEI

Lockwood, Tanya, Personal interview, April 20, 2005.

Mora, William, Personal interview, April 19, 2005.

Obando, Flor, Personal interview, April 25, 2005.

State of the Nation Program 2004, Tenth *State of the Nation Report on Sustainable Human Development*, San José, Costa Rica. <http://www.estadonacion.org>.

Queralt, Laura and Ruiz, Ana Rosa, Personal interview, April 26, 2005.

Recinos, Sonia, Personal interview, April 7, 2005.
Rodríguez, Fabiola, Personal interview, April 18, 2005.
Salas, Maricel, Personal interview, April 22, 2005.
Sancho, Lilliana, Personal interview, April 12, 2005.
Serrano, Ester, Personal interview, April 13, 2005.
Suárez, María, Personal interview, April 25, 2005.
Trejos, Ignacio, Personal interview, April 18, 2005.
Zúñiga, Lena, Personal interview, April 26, 2005.

Appendix A

List of organizational interview respondents

Academia

- CENFOTEC
- University of Costa Rica (UCR)
- Technological Institute of Costa Rica (ITCR)

Civil Society

- Francisca Carrasco Jiménez, Feminist Centre
- Bellanet´s Regional Office in Latinamerica and the Caribbean
- Feminist International Radio Endeavour (FIRE)
- Fundación Acceso
- Linux User Group in Costa Rica (GLUCR)

Private Enterprises

- Advansys S.A.
- Club de Libros S.A.
- Electromática
- SEFISA S.A.

State/Government

- Costa Rican Institute of Electricity (ICE)
- National Council of Science and Technology Research (CONICIT)
- National Women's Institute (INAMU)
- Ministry of Science and Technology (MICIT)

Appendix B

List of personal interviews

Name	Organization	Sector
1. Guiselle Bustos	National Council of Private University Education	State
3. Kemly Camacho	Bellanet LAC/Access Foundation	Civil Society
4. Mariana Castillo	Book Club	Private company
5. Andrea Hernández	Linux User Group (GLUCR)	Civil Society
6. Tanya Lockwood	Francisca Carrasco Feminist Centre	Civil Society
7. William Mora	Ministry of Science and Technology	State
8. Flor Obando	Electromática	Private company
9. Laura Queralt	Technological Institute of Costa Rica	Academic
10. Sonia Recinos	SEFISA S.A.	Private
11. Fabiola Rodríguez	University of Costa Rica	Academic
12. Ana Rosa Ruiz	Technological Institute of Costa Rica	Academic
13. Maricel Salas	Costa Rican Institute of Electricity	State
14. Lilliana Sancho	Advansys	Private company
15. Ester Serrano	National Institute of Women	State
16. María Suárez	Feminist Radio	Civil Society
17. Ignacio Trejos	CENFOTEC	Academic
18. Evelyn Ugalde	Book Club	Private company
19. Lena Zúñiga	Bellanet LAC/Access Foundation	Civil Society

Glossary

Spanish	Spanish acronym	English translation
Asociación Costarricense de Derecho Informático	ACDI	Costa Rican Association for Cyber Law
Cámara Costarricense de Tecnologías de Información y Comunicación	CAMTIC	Costa Rican Chamber of Information and Communication Technologies
Centro Feminista Francisca Carrasco Jiménez		Francisca Carrasco Jiménez Feminist Centre
Club de Libros		Book Club
Colegio Científico		Scientific High School
Comisión Nacional de Tecnologías de Información y Comunicación	CONATIC	National Commission of Information and Communication Technologies
Concejo Nacional de Educación Universitaria Privada	CONESUP	National Council of Private University Education
Concejo Nacional de Investigación en Ciencia y Tecnología	CONICIT	National Council of Science and Technology Research
Concejo Nacional de Rectores de Universidades Estatales	CONARE	National Council of State University Presidents
Fondo de la Niñez y Adolescencia		Fund for Children and Adolescents
Fondo para la Igualdad de Género del ACDI		Gender Equality Fund of ACDI
Fundación Acceso		Access Foundation
Fundación Omar Dengo	FOD	Omar Dengo Foundation
Grupo de Usuarios de Linux en Costa Rica	GLUCR	Linux User Group in Costa Rica
Instituto Costarricense de Electricidad	ICE	Costa Rican Institute of Electricity

Spanish	Spanish acronym	English translation
Instituto Nacional de Estadística y Censos	INEC	National Institute of Statistics and Censuses
Instituto Nacional de las Mujeres	INAMU	National Women's Institute
Instituto Tecnológico de Costa Rica	ITCR	Technological Institute of Costa Rica
Ministerio de Ciencia y Tecnología	MICIT	Ministry of Science and Technology
Ministerio de Educación Pública	MEP	Ministry of Public Education
Oficina de Planificación de Educación Superior (de CONARE)		Higher Education Planning Office (of CONARE)
Pool de Mujeres en los Medios		Women's Media Pool
Programa Construyendo Oportunidades		Building Opportunities program
Programa de Equidad de Género del Instituto Tecnológico de Costa Rica	PEG-ITCR	Gender Equity Program of the Technological Institute of Costa Rica
Programa Estado de la Nación		State of the Nation Program
Radio Feminista Internacional	FIRE	Feminist International Radio Endeavour
Universidad de Costa Rica	UCR	University of Costa Rica
Universidad Estatal a Distancia	UNED	State Distance University
Universidad Nacional	UNA	National University