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2000-12-15
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http://hdl.handle.net/10539/19844
Marcelle, G. (2000). Creating an African women's cyberspace. The Southern African Journal of Information and Communication (SAJIC), 1. https://doi.org/10.23962/10539/19844

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The Southern African Journal of Information and Communication - Issue 1, 2000

Creating an African Women's Cyberspace (1)

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Introduction

This paper seeks to identify and define a set of interrelated processes that are necessary for creating an information society that accommodates the needs, aspirations and vision of African women.

Readers are encouraged to turn on its head the notion of an Africa which has 'lagged behind', is 'left out' and is 'backward' and in so doing, to ask more relevant questions such as: Which information technology products, services and associated informatic cultural forms can be beneficial to African women? Which of these can assist these women in realising their objectives of economic sustainability and dignity?

The features of the global information society or 'cyberspace' as it has become known are examined and African women need to be located within these prevailing notions. This discussion sets the stage for a closer examination of how African women might successfully create a cyberspace that accommodates their realities by transforming what currently exists.

A detailed description and analysis of the barriers facing African women's participation in the global information society follows. The focus is on infrastructure deficiencies, policy misdiagnoses and structural and cultural features of African societies**.** The approach taken in this analysis of existing barriers, is to integrate an assessment of the barriers facing African women's participation in ICT development with discussions of the positive approaches that have been considered at a policy and micro-level to overcome these barriers**.**

Empirical data is provided to document examples of past and on-going interventions by African women and their allies in informatics and telematics. These examples are used to demonstrate that African women acting individually and collectively are fashioning a model and notion of cyberspace, which is more conducive to their active participation.

The final part of this paper brings together lessons for co-operation and partnership between international supra-governmental bodies, non-governmental organisations and funding bodies. Guidelines for future action by those allies who are engaged in creating an African woman's cyberspace are also identified.

The methodology for this work combined action-oriented computer mediated research that included online searching, on-line requests for contributions posted to specialist electronic fora (feminist, African, women and technology moderated mailing lists), electronic mail correspondence with academics, activists, technologists and consulting published materials produced by agencies in the United Nations system, non-governmental organisations and academics. The author's use of secondary material is complemented by her on-going involvement in several NGO projects designed to improve the effectiveness of women's and specifically African women's organisations use of information technology in their capacity building efforts.

Visualising an African Women's Cyberspace

What would a cyberspace, which accommodated the needs, culture, economic conditions, values and life experiences of African women, look like? While this is difficult to imagine and to specify what is certain, is that it will not closely resemble the most common notions and realities of today's cyberspace. A discussion of the elements of cyberspace follows. These elements will need to be considered and examined if they are to be refashioned to fit with the African women's realities.

The first element to be questioned is the claim that the Internet and cyberspace is global. To do so, requires us to ask the question does the global reach of the underlying technologies confer any of the characteristics of globalism on the end product? The author thinks. The cost-economics associated with recent developments in telecommunications and information technologies result in dramatic increases in price/performance ratios for switching and control systems. This does have the effect of diminishing the costs of international transmission of voice and data traffic. However, the ability to expand telecommunication networks more cost-effectively across a number of countries without inhibiting cost considerations, should not be confused with the development of a global system. This characteristic of *globalism* should only be considered to be met, if the set of interrelated elements of a network or communication system in addition to being connected over international boundaries, also have decision-making systems which extend over these national and geographic boundaries. In this way, the political aspects of the term 'global' are considered in addition to the purely technical or instrumental aspects. At present, cyberspace fails both of these tests on purely instrumental counts, the communication networks are still concentrated in wealthy countries, as the Internet connectivity tables show. Secondly, and in the author's view, more importantly, the decision-making about the technological, economic and political development of cyberspace is also concentrated in the hands of the very few. Despite these characteristics, cyberspace is already hailed as being *global.*

Why this myth of globalism is important here, is that within it, there is more than a hint of the converge or peril theme. In this worldview, African women and men are bombarded with views of themselves as backward for having failed to grasp the opportunity to be part of global change. Some of this rhetoric is found even in well intentioned policy documents that are ostensibly concerned with increasing African participation in 'global' technological change. For example, one World Bank report stated:

> Africa needs to seize this opportunity, quickly. If African countries cannot take advantage of the information revolution and surf this great wave of technological change, they may be crushed by it. In that case, they are likely to be even more marginalised and economically stagnant in the future than they are today. (3)

Many influential writers, whose theorising is influential in constructing cyberspace realities and myths, offer utopian and un-critical technologically deterministic futures. In their narratives, telematic technologies make geographic distance irrelevant, have global scope and reach; is a basic requirement for human-life in the new millennium; and is an indispensable feature of modern life. In many of these constructions of telematic technologies and related futures, what is offered is an uncritical, un-disaggregated, non-specific view of the many varied positive changes which are automatically achievable with the applications of these technologies. This is the second element of cyberspace that ought to be questioned.

Cyberspace is often conflated to be equivalent to the Internet project that consists of at its most basic level a set of interconnected computer networks, which permit communication and exchange of data in a variety of formats using specific protocols. However, this definition of the Internet project leaves aside many of the central characteristics which though residing outside the equipment and technology are as important for the functioning and specification of the Internet and its related and constituent culture. The misspecification of these telematic systems to include only equipment and software leaves out the important cultural and social contexts in which the equipment and software is produced and used. When

the users of any technologies are geographically, culturally and economically distant from the producers of that technology, the importance of shared cultural meanings in the effective adoption and use of technology becomes even starker. African women are certainly well outside the mainstream of the construction of Internet related technology products and services and have little in common with the main producers of these systems and services. Considering the meanings, values and judgements embodied and contained in any technology system is the third aspect of visualising an African woman's cyberspace.

There are many sub-systems in an information networking system and we consider how African women might better interact with each of these in turn. Firstly, the data, which can be manipulated, reconstituted, reconstructed and transmitted on the Internet, must first be originated or conceived. This data usually referred to as the content of information services consists of symbols, images, sounds, etc. which all have meanings that are culturally determined and have specific interpretations for the transmitter and receiver. Increasing African women's electronic publication and information management capabilities so that they are able to produce more content is an important part of visualising an African woman's cyberspace.

Secondly, the technology itself consists of sets of rules, heuristics, instructions, blueprints named variously operating software, application software, and manuals. If African women are to participate as effective producers of telematic technologies they must master several technological and scientific areas, requiring formal and informal training in computer-science, software engineering, network design, network management and related disciplines. As users of these technologies, African women require skills in information management, systems design, operations science, computer literacy and problem solving among others.

Thirdly, the transmission of information about how these tools can and should be used are also inscribed in culturally specific artifacts such as magazines, newspapers and electronic newsgroups. The exchange of information and sharing of ideas through a variety of media provides useful guidelines on the characteristics of different tools and products. This aids the technology diffusion mechanism and the product/service innovation mechanism. When there is close feedback and interaction between the users and producers of infomatic products and services, the potential for users to master technologies is improved and the likelihood of producers better serving customer needs is also increased.

An African women's cyberspace will also need to create opportunities for user-producer interaction and intermediate products which enable women to learn about the technologies and get information to update their knowledge and skills. At present in Africa, the transmission of information about imported technologies also uses imported, unfamiliar communication media. Even for the typical user of telematic systems well educated, middle income, urban professional African women the *psychological* distance from the end-product technology is compounded by the absence of teaching materials and learning aids which bear any resemblance to her day-to-day reality. This will be so much more significant for the rural African woman in a village.

The economic potential of telematics is also determined by the structural and institutional context in which the technologies are applied. The development and application of telematic technologies, which is labelled as development of *cyberspace* or the *information society* arose in post-industrial capitalist economies, as a result of complex changes in economic structure and institutional arrangements. Even within rich countries, the pace of that change, the impact it produces and the specific causes are very varied. What is common across the wealthy countries, which have been active participants in development of an *information society,* is that strategic efforts to support, promote and facilitate production and effective application of telematic services exist. For the majority of these countries, these strategic efforts are undertaken by large private sector organisations as well as the state sector, often acting in partnership. The main purpose to which these strategic efforts are directed is to ensure that production and application of telematics enhances the international competitiveness of producers and

users. To this end, two different types of strategies have been adopted; firstly, policies to intervene in domestic markets of the producers of telematics so that there is continuous innovation and production of these science and technology intensive services and secondly, efforts to increase international market access for the outputs of these producers. The benefits of the information society vary considerably depending on where one is located in the value-added chain for this set of economic activities. Visualising an African woman's cyberspace must also locate different activities within this value-added chain, and ask specific questions about the nature and size of benefits that arise from cyberspace developments.

The *information society* or *cyberspace* can be read as shorthand for a complicated web of mutually reinforcing and integrated economic relationships between producers and users of these technologies. Another important feature of the development of the information society in Western economies is that the production and use of telematics is commodified. This has led to the development of many intermediate products and services that are provided by specialist service providers who occupy a variety of positions vis-a-vis the economic agent or agents which originated the product or service. The tendency for technological change to cause changes in institutional structures and to have consequences for growth and other indicators of economic performance is increasingly being accepted as a reality. Economic policy making is paying closer attention to the management and direction of technological change so that it can be harnessed for productivity and other performance improvements. For information/microelectronics/communication technologies, the processes through which these technologies interact with economic structures have some specific features. The output of telematic industries constitute important intermediate inputs for other economic activity particularly for the service sector; the products and services in this arena have been undergoing a rapid pace of change in product features and functionality and subsequent generations of products are produced with ever-increasing speed; the research and development process for the core technologies (e.g. integrated circuit design; computer processing tools, computer architecture) require extremely high fixed costs. These features have consequences for the ability of various societies to master the development of these technologies. The ability to direct and shape these processes of interaction will determine whether the overall impact is beneficial. A country's ability to be effective in shaping and directing interaction of technological development with other processes will be determined largely by the capability, strength and depth of the national technological institutions. Unfortunately, many African countries do not fare well when measured against any of these criteria and this results in an important constraint in realising benefits from technological change.

The above discussion has identified some of the essential features and deconstructed some of the social and economic processes that are involved in the development of cyberspace. The author has attempted to locate African women within the narrative of cyberspace. There is, however, more to the visualisation project than exploration of current realities. This project must be interested and concerned with the transformation of the construction of cyberspace(s) extent that does not position African women as owners of the space or benefactors of the project. The following section of the paper tackles this transformation agenda.

Creating that Vision: Identifying and Removing Barriers

The challenge which faces African women and their allies, is to imagine, specify and implement a set of interventions which would create a cyberspace in which African women are active participants and realise benefits from being engaged in its development. The features of global cyberspace pose many challenges for African women by constructing structural and other barriers and creating an improved reality. This requires a number of specific interventions to identify and remove barriers. An agenda for undertaking this transformation project is discussed in more detail under the following headings:

1. Focused public policy intervention
2. Allocate ICT development resources to women
3. Provide and improve infrastructure
4. Build technological capability
5. Facilitate and encourage the involvement of African women in technological innovation and product and technology design
6. Create culturally resonant content
7. Design and deliver appropriate training programmes
8. Increase effective demand for ICT products and services

Focused public policy intervention

The research and analysis of the Gender Working Group (4 established that the intersection of gender with science, technology and with development, is relatively unexplored territory. This means that policy makers often ignore the needs, requirements and aspirations of women in developing countries when designing science and technology policies. Even when gender is introduced at a conceptual level, policy makers often rely on very poor, outdated, incomplete and inaccurate data. Women from developing countries are poorly represented in the national and international decision making bodies that determine science and technology policy. This leads to ineffective policy making and it is therefore not surprising that the outcomes of the past policy interventions have not been successful.

One can add to these problems a wholly unsatisfactory implementation record on recommendations aimed at securing gender equity. National governments have failed to put in place many of the programmes and initiatives recommended and mandated by international treaties and conventions. The international governmental machinery has also been unable to enforce these undertakings or to impose any sanctions or penalties on recalcitrant governments.

African women therefore face a double jeopardy supply conditions, which fail to meet existing levels of demand for telematic services (5) coupled with public policy which is inadequate or ineffective. In continental Africa, the policy making organisations concerned with economic and social development and those concerned with science and technology planning have not undertaken a well co-ordinated, integrated approach to achieve their mandates. Instead, institutional separation and conceptual separation have been persistent problems (6). This separation has many significant implications, it results in duplication of effort, reduces opportunities for organisational learning and cross-fertilization of ideas and produces fragmentation. Even within a single bureaucracy, the units responsible for science and technology planning and promotion and those responsible for gender related programmes are often quite separate and distinct, with little or no co-ordination of effort.

In recent years, there have been a few high-level statements of important policy objectives and associated programmes, which attempt to link, gender concerns to information and communication technology development objectives. The WomenWatch initiative which falls under the auspices of three UN agencies UNDAW, INSTRAW and UNIFEM is one such worthwhile programme that seeks to ensure that there is effective use of electronic communication technologies particularly the Internet in the implementation and follow-up to the Global Platform of Action. The main policy document produced by the

WomenWatch initiative is the report of the Expert Group meeting held in June 1996, in which a group of experts outlined many principles for empowering women in the Information Society. (7)

For any policy statements to be meaningful it must be accompanied by action and achieving implementation of policy has always proved to be considerably more difficult. One of the major problems, which hamper implementation, is the high degree of fragmentation among the various policy-making agents operating in the information and communications field. This condition is not unique to information and communication policy making and has been recognised by feminists, scholars and advocates working in diverse aspects of women's empowerment. The international feminist movement has fine-tuned its ability to intervene into policy-making arenas by undertaking multiple points of entry and increasing the focus of advocacy efforts. These strategies proved themselves during the recent United Nations World Conferences Cairo, Copenhagen, Beijing and Istanbul but have yet to be extended to the debates around the building of the information society. Much groundwork exists and there is agreement on many points, the priorities include needing to: reduce increasing disparities in access and control; improve women's access to decision-making; and improve education and training systems. Similar interventions have been made in areas such as health, education, population and poverty alleviation. However, the dialogue and debate is not taking place with sufficient intensity in the planning and shaping of the so-called 'information society'.

Allocate ICT development resources to women

Many projects and policy-making initiatives, including those described in the following section, suffer from inadequate resourcing and uncertainty. While these are common woes of many NGO led projects, it is worth noting that even in governmental initiatives, the share of financial and other technical resources devoted specifically to reducing gender inequality in electronic communication networking is woefully inadequate. There has been considerable interest in improving connectivity levels in Africa, but while some consideration has been given to taking the needs of local communities into account (as illustrated by the recommendations of the Empowering Communities workshop held in conjunction with the Information Society and Development conference in South Africa in May 1996), [get quote], there was no gender disaggregation of these recommendations. In treating the grassroots community as a gender-neutral amalgam, these useful recommendations run the risk of failing to capture the specificity of African women in small enterprises particularly in urban settings.

Mike Jensen, an independent technologist who is well known for his pioneering work to extend connectivity in Africa, provides a catalogue of information and communication initiatives that are currently underway or are being planned in Africa. These include funding of infrastructure development by specialised United Nations agencies and regional offices (International Telecommunications Union, World Bank, UNESCO, UN Economic Commission for Africa); donor funded research and training programmes (IDRC, FES); academic research; the G7 Global Information Infrastructure programme, with its associated funding of pilot and demonstration projects and the work of the Global Infrastructure Commission. (8)

The policy documents produced by the United Nations Economic Commission for Africa High Level Working Group of Experts provide very relevant and up to date analysis and recommendations. Their outputs include a major report entitled *'Africa's Information and Communication Initiative: an Action Plan to Accelerate Socio-Economic Development'*, presented to an Addis-Abba meeting of African Ministers of Planning in May 1996 and a set of related case studies for Ethiopia, Senegal, South-Africa and Egypt. However, the analytical framework and the resulting policy recommendations suffer because they do not explicitly examine the differential needs and requirements of African men and women. The original group of experts on the High Level Working Group did not include representatives from African women's organisations, or from organisations such as Once and Future Action Network, a consortium of

organisations involved in gender, science and technology planning and advocacy. (9)

Many African nations are presently restructuring their telecommunication sectors using technical analysis, advice and support from agencies such as the World Bank, ITU and other multilaterals. The state-of-the art in telecommunications policy and information society planning, recognises and actively promotes deregulation, institutional reform, consideration of rural development objectives, redefinition of universal service, tariff reform and convergence of policies for basic telecommunication and other telematic services. There is an increasing awareness of the need to consider requirements of different segments: rural vs. urban, residential vs. business, small business vs. large companies, etc. However, there is no consideration of gender differentiated impacts in these national policy documents. For example, the Republic of South Africa, produced a White Paper on Telecommunications in the context of Restructuring and Development which sets out bold goals for extending modern information and telecommunication infrastructure to disadvantaged groups but says little which is specifically relevant to women as an interest group.

Provide and improve infrastructure

Africa has 12% of the world's population and only 2% of its telephone lines. Over half of all these lines are in the largest cities. There is only one telephone line for every 235 persons in sub-Saharan Africa. The costs of installing and maintaining lines is higher in Africa than in other countries, even when compared to other developing countries and reliability of service is quite poor. Despite this limited access and poor quality, the demand for telecommunication services, according to the standard measures (numbers on waiting lists, etc.), is remarkably high. What is more, when African men and women have access to telecommunication facilities, the levels of utilisation are quite high compared with other developing countries, as measured by minutes of outgoing traffic. Network configuration in Africa still largely mirrors colonial patterns of trade and communication flows. International traffic is routed via Europe and traffic between former colonisers and African nations still accounts for the lion's share of the total volume of telecommunication traffic. For many countries in Africa, interregional traffic is a small percentage of the total volume of outgoing and incoming traffic. (10)

Comparable figures for computer usage and availability in Africa are not as widely available; but there is enough fragmentary evidence to suggest that, except for South Africa, the continent is plagued with many problems. Personal computers are not manufactured within Africa and so attract high duties and import tariffs. This, according to TitahMboh (11), can result in the cost of basic computer equipment and consumables being as much as ten times as high in Africa as in the country of manufacture. There are problems with access to training, technical information, computer spare parts and repair services, unreliable electricity supplies and having to cope with increasingly fast rates of technological obsolescence. Importing computer equipment adds to the foreign exchange debt burden of many African nations.

While there are many initiatives which aim to ameliorate this situation as far as inadequate infrastructure provision is concerned, few if any of the many projects currently underway in Africa and for African nations specifically, address women's needs and particular requirements.

Build Technological Capability

When building a technological capability, it is important to include the human skills and knowledge component of technological capability. This element is unfortunately in short supply in continental Africa. The numbers of graduates in technical fields both at secondary and tertiary level are woefully inadequate. This is not surprising given the high rate of illiteracy, but is made worse by the brain drain which results in many of Africa's highly skilled professionals migrating and residing outside of the

continent. This overall skill shortage is much greater for female technologists.

Facilitate and encourage the involvement of African women in technological innovation and product and technology design.

There are many sites of production of the products and services we have come to call electronic communication technologies. Some of these are commercial and others such as academia are not profit orientated. Notwithstanding this variety, all three sites of production should be proactive in facilitating involvement and participation of African women through employment policies, women-friendly work practices and direct encouragement for women to participate in all levels of the technology creation and commercialisation process. Although there is little statistical evidence, it is well known that in the majority of African countries, women are not well represented among the scientific and technical fields from which the managers and technologists are drawn, who lead the development of electronic and communication services.

In addition to efforts made by individual producers, women collectively can make the scientific and technological world a tolerable environment through networking and advocacy activities and efforts. The work of members of the OFAN consortium; national Women In Science and other professional bodies have helped in encouraging women to enter and remain in these professions. Many organisations have developed mentoring programmes and other outreach activities. These organisations deserve the support of the national and international community.

Create culturally resonant content

One of the most significant barriers to the use of ICT products and services in Africa is that the information products, which are created, circulated and transformed using electronic communication technologies, are predominantly in English. There are many African languages and dialects and there are few Internet products that contain material in these languages.

Language is however, only one aspect of cultural meaningfulness and resonance. Appropriate technology has been defined and prescribed in ways that has functioned as a tool of exclusion.[add section on race, cultural, ethnic superiority The definition of appropriateness is often assigned not by the 'users' but by the far more powerful interest group of donors, sellers of technology and even from self-appointed advocates of the user group. Those with power are able to exert influence over the technological choices available to users resulting in their lack of agency, dis-empowerment and alienation.

In other areas of technology policy, the need to transmit information about the content and purpose of technological systems using meaningful language and symbols with shared meanings is well established. The author's concern [get citation].is that unless information content is produced and transmitted in a language which can be understood by the majority of Africa's women and in ways which reflect their priority issues of concern and shared values, the Internet and other ICTs will remain distant and meaningless.

The author believes that this concern is shared by NGO leaders such as Sara Macharia of FemNet, a Nairobi based network for African women, who states:

> [That] the relevance of the information being disseminated [on the Internet] ...may be readily accessible but sometimes the materials being transmitted may appear too technical, too difficult to understand or having no bearing to the African situation, therefore causing users in the region to ignore such material. (12)

Her paper also addresses the problem of making information relevant to African women and recommends that:

a. WomenWatch lay more emphasis on the dissemination of those sections of the Platform for Action that has been translated to grassroots level.

b. For users in Africa, WomenWatch lay emphasis on the dissemination of information regarding the 12 critical issues of concern for Africa as described in the African Platform for Action.

Further support is provided by Cheris Kramarae, who in her presentation to the WomenWatch expert workshop identified another important barrier to cultural relevance that was missing in Western male narratives of the Internet. She postulates that there is an unrealised possibility of developing:

> a feminist ethic [of the Internet], which attends to, values of cooperation, relationship and interdependence, and to the well being of children to the well being of people. (13)

This view of the feasibility and desirability of making information contained in delivery systems, such as the Internet, relevant to the end-user the African woman is not always shared. To illustrate, the author quotes a male respondent's reply to her electronic posting, requesting case studies and comments on African women's efforts to create an amenable cyberspace:

> Having been in SA for over 15 years, from Holland and not knowing what your experience in African matters, I would like to put some sobering thoughts into your mind concerning your ideas. Speaking for SA only, I have had the pleasure to visit some rural communities and work closely with people from the bottom-end of the urban society (contract workers, etc.) Your ideas to establish some or other information society for women interests will create some excitement with the absolute top layer of our society (1% to 5% max). The rest has more practical problems to deal with. Such as: making ends meet with a number of children and no husband, avoiding being raped or robbed or both. I have stated elsewhere that Technology, if not carefully managed, will widen the gap once more between the disadvantaged and the elite in our societies. BTW [by the way] this trend is gender blind. The infrastructure for technology requires invariably the supply of electricity, which is only available in the larger cities and not in the rural areas. When trying to expand infrastructure into those areas one encounters theft of cables (copper wire sells well and a hundred meters or so keeps a village alive for a month) and solar cells (used to charge a battery for a radio or fridge). The prime needs of those people have not been secured! I don't know all the answers, but I know that the gender issue is low on the agenda of the 'woman in the street'. I am a management consultant, mainly operating in BPR and IT subjects for government and industry.

The author interprets this interjection to be a pessimistic evaluation that scornfully suggests whether it is even worthwhile to consider ways of making the Internet and other ICTs available and more relevant to African women. The author suggests that the person providing this response is a self-appointed spokesperson for the woman in the street who, unlike the group he 'speaks' for, has avenues of access to those groups in decision-making positions.

Cultural relevance of ICTs is also hampered by poor use of sound information management principles. Women frequently encounter bias and lack of gender sensitivity when using the Internet and other ICTs. This for some women made the technology unappealing and inhibiting. Key search words and categories had been largely developed by men and show male bias thus making it more difficult for women to find relevant information. Browsing and search tools are not particularly efficient on the Internet and this led

to searching being very time-consuming, for women whose time was in short supply.

Design and deliver appropriate training programmes

In order to learn about cyberspace related technologies, women should have the advantage of using well-designed training programmes which incorporate hands-on skills; use motivational training materials; user friendly manuals and involve local user support.

Training for women should include technical training, trouble-shooting and problem solving skills. The experiences of academics and NGO trainers should be considered when designing programmes. Kramarae identifies self-education and other open learning methodologies as useful pedagogic methods for introducing women to these technologies and the social and political issues raised by their use.

Increase effective demand for ICT products and services

Poverty continues to be a very real problem and a barrier in Africa. The continent need not develop computer networks based on the one-or-more per household model that is taking root in the West. There are alternative models which would take account of the relative paucity of effective demand, could lead to development of alternative models of computer and society interaction and be better integrated into the fabric of African societies.

Several useful suggestions came out of the WomenWatch project report:

> Use existing [UN] facilities to increase outreach to grassroots NGOs who normally have very limited funds and very limited access to technology. It would be ideal if UNDP were to set aside a facility for interested NGOs to access the Internet. Another possibility would be to collaborate with servers that have already created networks in the region. One such server has made a tremendous effort in sub-Saharan Africa and has set up femlink, a very trying active forum on women's issues to which many NGOs and individuals have subscribed. Such 'focal points' would go a long way to improving accessibility.
>
> In order for women to use computer-networking tools, they require at minimum, access to a telephone and a computer. Participants from developing countries identified major constraints to access as being affordability of equipment, non-availability of required software and hardware, and inadequate and/or unreliable telecommunications infrastructure. The importance of facilitating distribution of equipment to developing countries through bulk procurement/subsidised distribution programmes was mentioned.

The expert workshop identified projects already underway such as the Sustainable Development Networking Project (SDNP) which aims to increase connectivity in the South and in former Eastern Europe. SDNP is currently operational in 24 countries, and has provided access to approximately 7,000 institutions. It was suggested that collaboration between SDNP and WomenWatch in field activities should be explored. SDNP could offer access to its current sites and stakeholders and one or two existing SDNP sites could be selected for a pilot test for WomenWatch networking activities.

Other projects for improving access were identified such as PROJECT SCOPE, a North-South partnership which aims to widen access to information and communication technologies by developing telecentres. SCOPE was active in South Africa and has been successful in facilitating improved public access. The telecentres gave priority to women and children and contributed to improvements of the quality of life of people in the user communities.

Programmes, Projects and Policy Initiatives which Point the Way

This section of the paper describes and analyses a few important policy interventions that aim to bridge the gap between women's articulation of their needs and concerns and policy making about information and communication technology development. Case studies are reviewed and they provide examples of how women and African women in particular are making their own relevant realities in cyberspace. The policy statements offered by agencies and other organs within the United Nations system, often forms the framework in which specific regional concerns are expressed and so are important for present purposes. In addition to formulating policy, some United Nations bodies in partnership with civil society and the private sector are delivering information and communications related services to women; these programmes are also relevant and provide important lessons. Civil society organisations are actively involved in developing the African information society. An analysis of the successes and limitations of some civil society projects follows the discussion of policy-related intervention and service delivery by multilateral agencies.

International, domestic private sector organisations and national governments are the two remaining main categories of actors who shape the development of the information society in Africa. However, many of the actors within these groups do not explicitly recognise the gender impact of information and communication technologies and often produce deleterious effects on women through benign neglect and are thus considered not to be good role models.

Policy Intervention to Bridge the Gap

There is some evidence that policy makers who aim to improve women's life conditions, are beginning to pay attention to facilitating their access to and participation in development of information and communication technologies. For example, the 40th session of the Commission of the Status of Women (CSW) meeting in March 1996, included the following recommendations:

> Women and global communications
>
> Advances in information technology have opened boundaries. The roles of women in global communication networks need to be strengthened. Barriers to such information technology and to women's involvement at every level of its development should be reduced (Section E para. 17).

The Commission on the Status of Women (CSW) is a high-level inter-governmental body, within the United Nations system, which considers issues related to women's equality and empowerment. The CSW as a subsidiary body of the Economic and Social Council, can bring governmental focus and attention to women's issues and the impact of social and economic change on the lives of women. It is the main body charged with monitoring the implementation of the Beijing Declaration and Platform for Action adopted at the 1995 Fourth World Conference on Women.

This CSW recommendation, builds on and goes further than the treatment of women's participation in information and communication technology systems contained in the Beijing Declaration and Final Platform for Action, which supported actions aimed at:

> increasing women's participation in and access to expression and decision making in and through the media and new technologies of communication.

These high-level commitments are a useful starting point for women and their allies. Since the majority of African governments adopted the Beijing Declaration and Platform for Action, these commitments can

give focus to lobbying and advocacy efforts. Governments should be encouraged and supported in their implementation of these sectoral commitments, while also ensuring that they are integrated with other commitments made in areas such as poverty alleviation, institutional reform, finance, economic reform and education and training.

However, when formulating a strategy for effective intervention in the policy-making arena in this field, it is necessary to pay attention to the sites of policy making other than those that deal explicitly with women's empowerment. Development of the information society landscape in Africa is largely determined by four main sets of actors national governments, multilateral organisations, private sector companies and donor agencies and finally, civil society. Within the multilateral agency category, the specialised agencies within the United Nations system, primarily the International Telecommunications Union and UNESCO are the lead players. As in many other areas of development, the World Bank plays an important role as a funder of infrastructure projects or as a catalyst for generating bilateral funding from commercial lenders and donors, etc. In addition to providing finance directly, these multilateral organisations define the yardsticks against which national governments develop their policy initiatives. Therefore, if women in Africa are to be successful in transforming the policies that shape information society development in their countries, they must also focus on attempting to influence and shape policy discourse in these national and supra-national institutions. There are very few models of this kind of policy intervention in the information society field. However, the analysis that follows will show that there are some preliminary steps being taken that can be shaped by African women for their purposes and objectives.

WomenWatch

The WomenWatch project is one such initiative that aims to intervene at a policy level. The architects of that programme have committed to undertake strategic actions, which if successful, can provide a model for changing and expanding the focus of information and telecommunications policy making organisations, to include considerations of women's needs and aspirations. In this regard, the intention of the WomenWatch initiative is to:

> play a proactive role in the telecommunication and information policy process within the United Nations system and vis-á- vis other multilateral and regional organisations, to ensure that gender considerations become and remain an integral part of those discussions and decisions. This would include a voice with groups like the World Bank, the International Telecommunication Union, European Union and the United Nations Commission for Science and Technology. (14)

The general recommendations of the WomenWatch Expert Group Meeting are particularly relevant for framing the African women's active participation in cyber-society, these are shown in Exhibit 1. The section that follows analyses the potential impact of this programme.

Women on the Net

It is worth noting that other United Nation bodies also have projects, which address women and information society issues. For example, UNESCO with the Society of International Development, international non-governmental organisations are sponsors of a Women and Cyberculture project titled *'Women on the Net: a multicultural perspective on international communication systems'*, that aims to:

> introduce a multicultural gender perspective ... to ensure that different cultural and geographical environments (rural and urban) of women interacting on the Net and across generations will be taken into account as concrete information and case studies (meta-data)

> are gathered together to build a picture of the distinctive perceptions of cyberspace women held by different regions. And in addition, the project would aim to strengthen women's already established skills in networking in civil society, academia, policy making and media through encouraging women to use the Net and thereby setting out parameters for how to reorient the debate as catalyzers of new thinking and for networking to foster democracy and peace.

The project produced the UNESCO-SID International Annotated Multicultural Guide to Women Working on the Net in March 1997 and organised an Expert Workshop in Spain in May 1997. The participants in that workshop included individual women and representatives of groups of women ranging from large and well established women's networks which have welcomed the opportunities of electronic and computer communications to individual researchers who are exploring the culture of the cyberworld in different regions. The aims of the workshop were to facilitate debate among this diverse group who were:

> beginning to work on the Net taking up the possibilities it offers while being conscious of the need to challenge and correct the gender biases of cyberculture. They are developing an innovative and effective range of activities in order to give women in both the North and the South access to the Net, to close North-South gaps and to create new spaces for women in order to position them more effectively in cyberspace. The key strategy seems to be that these women aim to adopt, even adapt, the new information technology in appropriate ways that support women's everyday work and lifestyles rather than embracing the culture of high tech. (15)

The planned outputs from the UNESCO-SID workshop and project are documentation of women's involvement and participation in development of information and communication technologies and support for training programmes aimed at strengthening women's ICT skills.

Exhibit 1 **Recommendations of the WomenWatch Expert Group**

The Woman Watch Expert Group meeting agreed the following:

- [Electronic communication initiatives should be] global in scope, and not restrictive in terms of access, especially because of language [and] should be based on the principle of affordable access.
- There is a need to create and stimulate a facilitating environment … [through] research … to identify existing resources on-line and for identifying resources which could be on-line and to define women's needs for various forms of communication and information [and through ensuring that the] training level of those involved in developing the potential of the electronic communication must be maintained.
- There were varying problems with women's access to electronic communication worldwide. Disparity in terms of access exists across urban/rural, class, gender, age, ethnic lines and North-South lines. In many countries, obstacles existed to women's access to electronic communications. Some of the existing obstacles were:

- Inadequate telephone and electricity supply
- Lack of computer and other necessary technical equipment
- Lack of adequate training
- Insufficient staff
- High cost of telephone connections and equipment, and
- Unavailability of information in local languages.

- To avoid further marginalisation …off-line distribution strategies [should be used] to provide various modes of multi-directional communication of information needed to be established. Repackaging information into CD-Rom and diskette formats allowed 'mirroring' of large information resources for women, organisations and dissemination sites in locations with off-line access only. Although many networks did not have access to full Internet connectivity, it was possible to provide localized access to information resources.

- [There should be] commitment to providing multilingual translation and development of tools for processing text in non-Latin character sets.

- [To Encourage] use of NGO networks to re-disseminate and repackage information to, for example, illiterate populations and to populations without on-line facilities; possible partners would include existing women's networks; alternative media radio, bulletins, street theater; fax-phone-email and 'tree' networks.

Source: Report of the WomenWatch Expert Group Meeting, New York, June 1996.

Civil Society Initiatives

Having examined some of the policy level initiatives that determine the context for civil society intervention, it is useful to describe and analyse how civil society organisations have fared in their attempts to create an African woman's cyberspace. There are two main sources of data for this area of analysis. The first is a research report commissioned by the Gender and Sustainable Development Unit of the Canadian research organisation IDRC, to document and analyse women's use of information and communication technologies for sustainable development in Africa; the case studies presented in that report were used as secondary source material for this paper (16). The second source of data was obtained through personal involvement with NGO projects in Africa and international NGO efforts that aim to support women's networking. Unpublished project documents, electronic documents and correspondence from NGO managers combined with first-hand participation in project design and training activities, combine to provide very useful primary data.

The report prepared for the IDRC report provided eight case studies of NGO led projects in African countries and several more summary descriptions of other projects. The example cases provided in the report prepared for IDRC, are the success stories of ICTs and women in Africa; the organisations profiled in detail include: the Association for Progressive Communications (APC) regional programme, SANGONet, SYNFEV, LAWA, Reproductive Health Alliance, FEMCOM, GENNET and the African

Gender Institute. The study also briefly describes the work of many other organisations that deliver and use information services such as TAMWA, ZARD, ELCI and ECONews Africa.

The characterisation of NGO initiatives drawn from this study is that the main areas of focus are as follows:

- education, training and skills transfer
- information dissemination using electronic tools or combining ICT tools and more traditional communication tools
- providing Internet-access services (and other communication networking services) to a community of NGOs and
- advocacy around 'single-issue' such as reproductive rights and women's health issues.

It is worth amplifying on the work of the APC, although it is described in other secondary sources, to pull out the comparisons between its work and some of the other organisations. APC is:

> a global network of networks whose mission is to empower and support organisations, social movements and individuals through the use of information and communication technologies to build strategic communities and initiatives for the purpose of making meaningful contributions to human development, social justice, participatory democracies and sustainable societies. (17)

The network is composed of a consortium of 25 international member networks and links over 50,000 NGOs, activists, educators, policy-makers and community leaders in 133 countries. APC recognised the existence of a gender gap in the use of computer technology and in 1993 launched their Women's Networking Support Programme to help redress those inequities. This initiative focuses on increasing access to networking technologies and information sources for women and women's NGOs. APC's Women's Networking Support Program provided the Internet connection and Electronic Information Services at the United Nations Fourth World Conference on Women and the NGO Forum on Women, in Beijing, China, September 1995. The APC team was composed of 40 women from 25 countries, who offered user support and training in 18 languages (18). This Beijing project was the first time an all-women technical team operated the computer system at a UN Conference or NGO Forum. With this team of women, APC was able to demonstrate that computer communication is appropriate for women and can be professionally operated by women. The technical team was distributed between Beijing and London and included the following women representing African organisations: Technical Fatima Bhyat, Johannesburg, South Africa and Sana Bellamine, Tunis, Tunisia; User Support And Training Staff Regina Shakakata, Lusaka, Zambia and Haymee Perez, Luanda, Angola and Information Team (Beijing) Marie-Helene Mottin-Sylla, Dakar, Senegal, Information Team (London) Mercy Wambui, Nairobi, Kenya. APC's analysis of the use made of the computer communication systems during the Beijing conference provides the following information: (19)

Free e-mail accounts opened at the NGO Forum	1 700
E-mail messages sent and received	52 000
Visits to the local World Wide Web Page	38 000
Visits to the International World Wide Web Page	97 000
More than 80% of the users were from 15 high-income countries	

In addition to facilitating participation by African women as members of the Beijing team, APC member networks, partners and users are very active and form the leadership core of NGO networking among African women's organisations. There are strong traditions in this network for radical, non-mainstream communication and support of human rights and opposition groups. The main constituency is the progressive, non-profit sector and this confers goals and values on the work of the APC. In a communiqué issued in February 1997, the APC regional strategy group stated that:

> We will continue to work together to pursue our vision of a network with a purpose. Our goals of low-cost, co-operative Internet working, quality local content, and the widest possible participation will remain even if and when the current Internet mania dies away.

These and other examples (20) provide a general characterisation of the production and use of ICTs by African women's organisations, these features are summarised in Exhibit 2.

Exhibit 2 **Simple evaluation of civil society initiatives to support African women's networking**	
Strengths	**Weaknesses**
• Clearly defined objectives that maintain focus on the developmental role of ICTs and maintain values of equity and democratic participation	• Over reliance on project funding without sufficient attention to income generation
• Has produced a small cadre of women technologists and confident users of ICTs who are active in information and skills sharing	• Inadequate time and resources allocated to continuous training and skills upgrading. Numbers of female experts remain small even 2 years after the Beijing push
• Demonstrated ability to deliver quality services at major events such as the Beijing conference and regional Prep Coms	• Follow-up activity has generated much lower levels of participation and failed to maintain same level of momentum and interest
• Information management and information dissemination has developed as a core area of competence building on the numbers and strengths of female professions in the library science and information science fields	• The NGO networking community is vulnerable to changes in the market structure and non-profit service providers do not fare well under liberalisation policies
• High levels of commitment and dedication by project staff and managers	• Fairly small-scale projects that limit the impact of the activities. Many organisations are not well placed to scale their training and service delivery capacity.
• Represent interests of poor women, rural women and other marginalised and under-represented groups; by providing information services and advocating the	• Problems of inadequate resources and the vulnerability of finances reduce efforts on strategic planning, evaluation of past projects and resource allocation

concerns of these groups, NGOs provide a valuable and necessary balance to policy formulation	
Source: authors assessment	

There is considerable diversity among the civil society organisations present in the ICT sector in Africa and as such the features and characteristics described in this framework will not apply across the board. An important distinction is the difference between civil society organisations on the African continent, which have strong links with the international technical and development community and those that do not. Organisations using ICTs are well connected to an international community of activists, academics and in some cases to donors. These links provide access to skills, financial resources and opportunities for information exchange. The momentum for networking in Africa is often not generated within the continent but from outside and this needs to be corrected.

The importance of preparatory work for the Beijing conference was realised when women were developing the ICT applications in Africa. In the run-up to the Fourth World Conference on Women, national women's organisations were galvanised into action and had a clearly defined and sharp focus for their networking and communication activities. There was a demand for information on conference development, increased motivation for activists and national governments to exchange ideas and engage in debate before the global meeting of gender equity and empowerment. There was a clear positive impact on levels of ICT use and women who actively participated in the electronic networking preparations for the Beijing conference undoubtedly benefited as individuals. The burst of activity was not sustained and this can be related to the over-reliance on project funding which often correlates to major international events rather than the needs of countries where beneficiaries are located

The final section draws together the analysis of barriers facing African women, the policy framework that brings about change and the summary assessment of initiatives by multilateral agencies and civil society organisations. There are specific recommendations for the four main actors and agents of change.

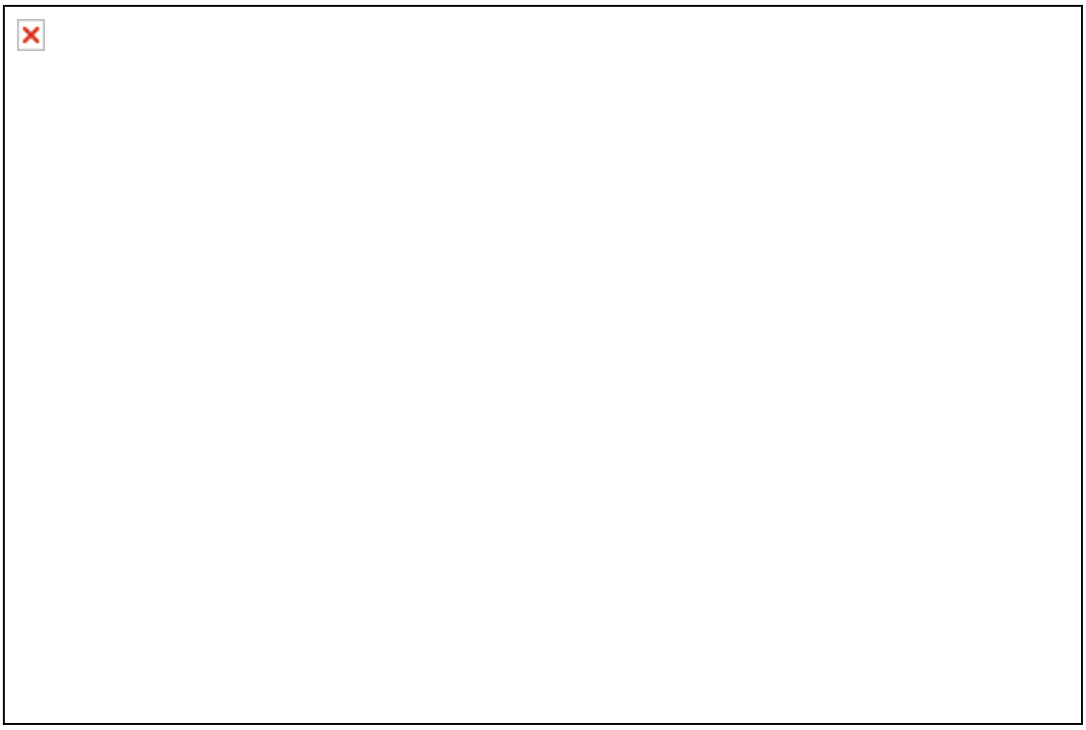
Assessment of Policy and Project Initiatives

Exhibit 3 sets out a simple framework that is useful for comparing the roles played by the four major actors and identifying action points. One dimension of the matrix compares the relative resource requirements of typical projects sponsored by each of these actors. Multilateral agencies and private sector organisations are in the highest quadrants while national governments and NGOs typically fund projects of a smaller size. National governments can influence the development of the Information Society through sector policies and macro-policies and are thus characterised as having a relatively high impact, high levels of interdependence and co-ordination requirements. This is similar for multilateral organisations. Conversely, although private sector organisations fund large projects, they are not obliged to co-ordinate with other actors and so have more independence relative to multilateral agencies and national governments.

The arrows in the diagram indicate the degree of linkage across those sectors. National governments are linked to multilateral agencies and the private sector but have weak links with NGOs. Private sector bodies in Africa, particularly donor agencies and international investors have active communication networks involving multilateral agencies and national governments. While there is communication between NGOs and donors, this is typically related to funding decisions rather than policy formulation. The lessons to take away from the policy initiatives and case study examples would reorganise those patterns of communication, facilitating and encouraging better linkage between the NGO sector and other interest groups. There is a need to arrive at a different balance between the domestic and international

actors within these categories.

Exhibit 3 Framework for assessing policy and project initiatives



Lessons to Be Drawn

- Many of the very worthwhile projects, including those referred to earlier are plagued by the twin problems of inadequate resourcing and uncertainty of budget allocations. While this applies particularly to the NGO sponsored projects, there are also not many examples of governmental projects in this field that are particularly addressed to the needs of women.

- Partnerships among different types of organisations are an essential requirement for success at the governmental level, one is better able to address the policy deficiencies and at the NGO and grassroots level, more careful attention is paid to the specific needs of women in their particular contexts. Designing projects and programmes that integrate and involve all interests groups is a necessary step in this important task.

- There is an unfortunate tendency in the area of technology for project funding to be susceptible to faddishness rather than being available on a sustained and continuous basis. This is true for many other types of technological training and technical transfer, but in the area of electronic and communication technologies where product life-cycles are so short, if funding responds only to the trendy subjects of the day, there is likely to be little real and valuable technological capability building.

- Women are invisible in the information society policy-making process. This under representation at decision making level in science and technology accounts in part for the alienation many women experience in relation to technology and the failure of policy making in this area to reflect specific realities of women. The extent and impact of this under representation differs across the countries of Africa, but all of the countries share the characteristic of having few women technologists in senior decision-making positions in academia, industry and government.

- The objectives of telecommunications and information sector planning need to be redefined to ensure that they include gender equity. Over the last two decades, the United Nations system has produced many recommendations on mechanisms which need to be put in place to take account of women's needs in information and communication policy and practice. The policy recommendations specifically address the need to promote better inter-agency co-ordination and co-operation across the UN system; the need to improve collaboration between the UN system; and to produce gender-disaggregated data so that policy and decision makers can examine the impact of programmes and projects on men and women. What has been a slow process is the actual change of practices, decision and policy-making structures in line with these recommendations. (21)

- There exist in Africa a number of activities and programmes which hold out positive lessons for the potential usefulness of electronic and communication technologies in NGO networking; improving the effectiveness of healthcare delivery; advocacy and campaigning; improving the effectiveness of data collection, analysis and policy making and for reducing the communication divide between the governed and the ruling elite.

- A more focused approach to advocacy has been adopted since the Beijing conference. Many of the leaders in that process have been using electronic and communication technologies to share information, exert pressure on governments, pool resources and co-ordinate campaigns. This group which advocates for women's empowerment includes many mainstream organisations and parts of the UN system. The demonstration effect of the Beijing electronic phenomenon has been tremendous.

- Closely related to the previous sign of hope, is the small but growing cadre of women technologists in Africa who through a process of training and experimentation are putting these tools to use and sharing their expertise with other women and men.

- As a result of the combination of these factors, there are already countervailing forces at work throwing up challenges to the Western constructions of cyberspace which are based on implicit (and often explicit) values of exclusion.

- As we have shown, language is an important cultural dimension of these technologies and the process through which some groups are excluded and others included the repackaging and translation of technological information in African languages must be undertaken and as importantly, the creation or electronic publishing of materials in African languages must be encouraged and supported.

What Role for Institutions and Research

- The organisations that are active in this field vary considerably in terms of their objectives, philosophy, structure, skills and capabilities, experiences and aspirations. Matching these divergent attributes to the needs of heterogeneous African women's organisations is not a simple task.

- There are research implications as far as need assessments are required to match existing needs with suitable providers of relevant skills and information. The author has stressed that many of these projects will benefit from partnership, but she wishes to caution that success is likely only if project implementation is accompanied by careful partner evaluation. These assessments and analyses should be made throughout the life of these projects that ought to be designed to include regular, periodic monitoring and evaluation processes.

- The project of creating an African woman's cyberspace will require confident utilisation and

development of technologies. This in turn will be dependent on women technologists having the freedom to experiment with a range of technologies. Such experimentation and capability building requires a long-term investment in reforming scientific and technological institutions so that they attract and retain African women technologists and provide these women with adequate resources.

- Cultural institutions and forms will also play a vital role; already many of the cybersites created by African-American women (22) demonstrate a texture and a richness that livens and challenges the privileged notion of information society. The multimedia site draws on the literary, performance art and political traditions of African-American women for its content. Surely there is more to come and as the African-centric content of electronic media increases in volume, our project will require sophisticated tools for management, retrieval, processing of this information.

Footnotes:

1. Revised version of paper presented at UNITED NATIONS UNIVERSITY INSTITUTE FOR NEW TECHNOLOGIES (UNU-INTECH) Workshop on Social and Economic Exclusion in the Information Society, Maastricht, Netherlands, October 1996

2. UNU-INTECH, Maastricht, The Netherlands, e-mail: marcelle@intech.unu.edu, October 1997

3. Increasing Internet Connectivity in Sub-Saharan Africa Issues, Options and World Bank Group Role Electronic document on http://www/worldbank.org Website dated 29 March 1995.

4. The Gender Working Group (GWG) of the United Nations Commission on Science and Technology for Development was set up to make recommendations on science and technology policy to national governments; to review the performance of the United Nations system and suggest improvements; and to provide advice to other relevant organisations such as the donor community. The findings and conclusions of the GWG are published in *'Science and Technology for Sustainable Human Development: The Gender Dimension'*, Feb 1995. Background research papers are compiled in Gender Working Group, UNCSTD, *'Missing Links: Gender Equity in Science and Technology for Development'*, IDRC 1995.

5. The International Telecommunications Union uses the ratio of waiting list to the total number of lines as a measure of unmet demand. In many African countries, the ratio of waiting list to total number of operation is very high, indicating that existing demand outstrips supply levels.

6. Gillian Marcelle and Merle Jacob, *'The Double-Bind: women in small and medium sized enterprises'*, Ch 11 in Missing Links op. cit.

7. Report of the Expert Workshop on WomenWatch: Global Information through Computer Networking Technology in the follow-up to the Fourth World Conference on Women. 26- 28th June 1996, NYC UN Division for the Advancement of Women,

UNIFEM & INSTRAW.

8. Mike Jensen, Summary of the ANI development agency survey and continent scan. Nov 1995 (mimeo).

9. The author's understanding is that the composition of the Group of Experts has now been enlarged to include representatives from SangoNet. It is however, not clear whether this person will have a specific brief to provide analysis on the gender impact of their recommendations.

10. For a complete and fuller description of inadequacies in provision of African telecommunications infrastructure see International Telecommunications Union (ITU), African Telecommunication Indicators, ITU 1994.

11. TitahMboh, Christiana. Information Technology Networking in Africa: ARCT Experience, May 1994 (mimeo). Presented at LSE conference on Globalisation and IT Networking 16-17th May 1994. London, UK.

12. Sara Macharia, Presentation to the Expert Group Meeting, WomenWatch Global Information through Computer Networking Technology in the follow-up to the Fourth World Conference on Women. 26- 28th June 1996, NYC UN Division for the Advancement of Women, UNIFEM & INSTRAW (mimeo).

13. Cheris Kramarae, Presentation to the Expert Group Meeting, WomenWatch Global Information through Computer Networking Technology in the follow-up to the Fourth World Conference on Women. 26- 28th June 1996, NYC UN Division for the Advancement of Women, UNIFEM & INSTRAW (mimeo).

14. UNIFEM & INSTRAW, 1996. op. cit.

15. For full description of this project and deliverables to date see http://www.waw.be/sid/won/won.htm

16. Sophia Huyer, *Supporting Women's Use of Information and Communication Technologies for Sustainable Development*, report prepared for IDRC, February 1997.

17. For description of the APC network see http://www.apc.org

18. The technical staff were drawn from APC member and partner networks. The primary team consisted of 40 women and one volunteer man in China, 3 women in London, and 3 men giving remote support. In addition, many women and men at several nodes gave additional support and assistance. The team in China came from 25 countries: Angola, Argentina, Australia, Austria, Brazil, Canada, Chile, Czech Republic, Ecuador, India, Japan, Mexico, Netherlands, Philippines, Romania, Russia, Senegal, Sri Lanka, South Africa, Tunisia, Ukraine, United Kingdom, United States, Uruguay and Zambia. The majority of the team were from developing countries. Source: electronic posting to APC conference (* Written 10:33 PM Oct 29, 1995 by igc:efarwell in gn:apc.forum */ THE TEAM) provided by electronic mail to the author.

19. Details provided by Karen Banks, Co-ordinator of APC's Women's Networking Support Programme via email correspondence.

20. For discussion of other networking projects and strategies see Regina Shakakata, Presentation to the WomenWatch Expert Workshop, June 1996 (mimeo) and Gillian Marcelle, Strengthening African Women's Organisations Using Information Technology, ABANTU for Development, March 1997 and APC Women's Programme Research Findings at http://community.web.net/apcwomen/.

21. Missing Links, op. cit. In particular, see (1) Appendix B pp 330-332 and (2) IDRC Gender and Information Working Group, Ch 12. Information as a Transformative Tool and (3) Ch 1 pp 1-25 Taking Action: Conclusions and Recommendations of the Gender Working Group.

22. For example http://www.diva.isis.net