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**Engendering Management and Regulation of ICTs:  
Narrowing The Digital Divide For Women**

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**BACKGROUND**

There is growing realization that major inequities of access that exist in certain populations—the poor, rural, female and aged—are not all due to high costs alone. This is because the ICT sector is strongly impacted - even *led* - by regulation. While their high cost is a challenge to making ICTs universally accessible as a tool of development, effective regulation can make the task much more manageable.

Regulation is not simply a set of rigid rules mandating, for instance, that services meet some prescribed standards rules or that a particular person's, community's or region's interests be prioritized. Regulation is a rich concept and a specialized and often technical area of study. Except in North America, which has a long history of regulation, most other countries until the early 1980s tended to run the telecommunications sector as a public monopoly governed by a set of administrative rules set by government. The last 15-20 years have seen intense activity in developed and, in recent times, developing countries to set up independent regulators for the communications sector. Paradoxically the need for sophisticated regulation is greatest as markets become more *deregulated* the world over as governments begin to rely more and more on private enterprise to create and run communications infrastructure.

Regulation employs what are essentially economic and legal principles to produce a set of rules for market behaviour - e.g. who can provide what service and under what conditions - in order to achieve desired policy outcomes such as universal access, affordable services, commercially viable operations, etc. It typically tries to reconcile the creation of a commercial environment where investors know that reasonable profit will be forthcoming, with a framework of rules to ensure that public policy objectives such as affordability, public access, etc., can be met. This is a pre-requisite for the effective use of ICTs by women today.

There is evidence that the absence of appropriate regulation has prevented investors from taking the plunge and consumer needs not being met. For instance, E-Commerce can empower a large number of people, especially women, to work and function more effectively from their homes. Regulators who will determine issues of contracts and enforcement, and taxes, among other things will determine the further success of this. Similarly, mobile handsets used by women to access services in privacy, rather than the often inconveniently located public phones, can become drastically cheaper by regulatory interventions targeted to reducing licensing fees, spectrum prices, and interconnection

charges. Lack of gender-sensitive regulation has prevented women from accessing many services and exploiting the many potential opportunities that ICTs offer.

This paper examines how regulation can assist in gender-balanced ICT use. There are many other issues that improve women's access to and use of ICTs such as skills enhancement, management expertise, training in leadership, marketing, advertising, politics, and of course, resources of time, money, etc. These are important and discussed elsewhere. This paper concentrates on the nature of specific regulatory interventions required to meet the needs of women as an integral part of the market for ICT infrastructure and applications. It looks at the regulatory options in effective delivery and pricing of critical services to those without adequate access to infrastructure and content. It examines how regulatory frameworks for the ICT and related sectors can create an enabling environment for women entrepreneurs and workers.

Regulation as a tool for desired developmental outcomes in the communications sector has been the subject of much recent work. But its use as a tool specifically for gender equity, is a relatively recent concern. The International Telecommunication Union, the sector's main international regulatory body which was established over a hundred years ago in 1865 set up its "Task Force on Gender Issues" only after the World Telecommunication Development Conference in 1998. The task force's document for Gender Awareness Guidelines for Policymaking and Regulatory Agencies appeared only in 2001. There is therefore limited exploration of regulatory mechanisms and policy approaches of national governments and international agencies to optimize benefits of ICTs for women. A recent example has been the legislation in South Africa. However, in general, "Policy intervention in the ICT sector is very much at the stage of being a work-in-progress; conceptual frameworks, policy tools, systems of data collection, indicator construction, and evaluation methodologies are all very rudimentary." (Marcelle 1998)

The paper highlights some emerging trends and best practices in the sector in order to explore replicable models for gender-balanced regulation and management policies and practices.

### **ICTs as a Tool of Women's Empowerment?**

Information and Communication Technologies (ICTs) can potentially impact virtually almost every area of human concern. With the rapid advance in ICTs, distance is no longer the challenge it used to be. Huge amounts of information today can be stored, processed, transferred and accessed virtually instantly as well as cheaply. Networking and collaboration has become extremely simple and cost effective. Since most human social and business activities have a significant information component, the potential benefits may well not even have been imagined.

The use of ICTs can have a major bearing on e-governance. There is an accepted and increasing consensus that the two main causes of the continued low status of women in societies is due to their under-representation in governance and their inequitable incomes (UNDP 2001). Better governance - where women's stake is arguably even greater than men's- can be the most important spin-off if ICT policies can be handled creatively (Anand 2002).

However, ICTs, like other technologies, are produced and used in a specific historical and commercial context, and are not neutral in their content and impact. For example, it

was a policy implementation in India a few years ago, that resulted in the first public phone in villages being located in the chief's house, ostensibly to make use of the possibly better infrastructure there and to prevent vandalism. However, given the mix of authority, awe and fear that the Chief represents in most Indian villages, the location of phone itself would deter women (and the poor) from using the facility. As another example, consider that if regulators envisage large up-front payments as licence fees, women entrepreneurs, a greater majority of whom are small businesses, would be impacted more than men, and would be less likely to enter the market. Thus, important goals of social and economic policy can be compromised if ICT regulation does not pay sufficient attention to its gender dimension.

The effectiveness of ICTs as tools of development and women's empowerment will depend on how carefully the gender perspective is woven in policy making and regulation in the ICT sector, and also in subsidiary areas sectors such as investment, taxation and employment. While women and the underprivileged face many disadvantages, it is possible to manage and regulate ICTs in a way that could serve affirmatively to enable them from making the best of an important new tool of development for the empowerment of women. It could be possible to formulate regulatory regimes that will not leave women even worse off as many initiatives have done in the past.

### **Why Don't Women Have Access To ICTs?**

To understand the nature of the policies or regulatory challenges in trying to deliver benefits of the ICTs to women and develop a 'checklist' of issues for consideration, it is worth stating why these inequities in access to ICTs exist. Besides women being historically disadvantaged, some of the more specific reasons are:

- Infrastructure is expensive to install and equipment is costly;
- Women are not seen as an attractive market in an increasingly commercially run sector;
- Content is inadequate in quantity and quality;
- Women constitute 70% of the world's poorest; expensive ICTs are unaffordable for the poor;
- Women's levels of literacy and education are lower than men's;
- Much Internet and e-commerce activity requires a degree of technological and other literacy that women do not always have, especially in poorer or rural areas of developing countries,
- Women's needs have traditionally taken lower priorities in the ICT environments since there are few players,
- The percentage of women decision-makers and opinion makers is small, and of this, even fewer public and private sector players have a critical mass of empowered women.

Women's needs are sophisticated and complex and require more substantive interventions and coordination between players. For instance, to provide ICT-based services such as tele-education or tele-health to women requires a profound understanding of the specific conditions in which women live.

Thus, these and several other social and cultural factors such as access to money, security, and food in an often-unequal family and work environment determine whether women can benefit from services.

A survey conducted by the International Telecommunications Union (ITU) in May 2002 seeks to dispel some common misgivings. It showed that 99 per cent of the women surveyed in 6 geographic regions felt that ICTs were important for personal empowerment, entrepreneurship, and professional goals. Literacy levels and availability of ICTs were considered as important issues for overcoming the digital divide. Interestingly, language and time availability were the lowest ranked obstacles.

### **Policy and Regulatory Issues in Women's Access to ICTs**

The 2001 UNDP Human Development Report points out that regulation and policy measures will have to be in place to ensure that women will benefit from ICTs.

#### **General issues for ensuring engendered policies in any sector**

Many policy and regulatory issues in ensuring women's access to ICTs are the same as engendering policies in any sector. For example, issues such as gender disaggregated data; and gender sensitization and training of regulatory staff—with a focus on gender and related issues of concern to women and mechanisms to ensure that regulatory/policy information is readily accessible to women. An important need is that women are involved in the regulatory *process* itself (Jorge 2001, Hafkin 2001). Consequently, efforts are required to attract women professionals and users to work for or with regulatory bodies, especially in strategic positions.

It is important to remind ourselves at this point that for any reasonable chance of success, "ICT policies should also be integrated with other policy areas to ensure that efforts towards sustainable development are co-ordinated and cohesive" (Gillwald, 2001).

Some gender experts, while working with government policy makers and regulators find that using statistics or case study data can demonstrate the gender effects of a policy and or regulatory decisions. Also, knowing which questions to ask about a proposed action or policy is also an important behaviour or policy change agent. They find it easier to integrate gender into implementation—or the practical end of things—without necessarily changing the gender "position" of the policy makers involved.

An important issue is how much technical knowledge is needed by women to: (a) understand and make inputs into ICT policy and regulation and (b) to be recognized as being qualified to make these inputs?

It is our opinion that the need for effective articulation of gender issues in telecom policy should not be seen synonymously with the need for technical expertise required to deal with specialized issues. Women who know what is missing from telecom policymaking and are interested in impacting the regulation and management of the sector need not be highly technically qualified themselves. Rather, they need to work with professionals in the sector, who are open to engendering policies. For example, an advocacy group can take on the task of learning about regulation and policy issues and then make this knowledge more widely known to a constituency interested in engendering ICT policies.

In the discussion of engendering ICTs there is a hint that it is policy makers who need sensitisation. This is true, but what is also true, is that advocates who want change need to empower themselves with knowledge of regulatory processes, timelines and issues, and work to influence these.

Beyond this, there are other specific issues:

### **Sector specific issues in engendered communication policies**

ICT infrastructure is expensive and requires substantial investments. Since, women, in general, earn less and may need assistance, what it is important is to consider which policies will attract investments required to serve them. Some options include the following:

#### *Telecom Sector Liberalization and Competition*

In view of massive investments required for infrastructure and the shortage of public resources in most developing countries, players (other than just governments) must be allowed to enter the sector to supplement or free up public investments. Dismantling monopolies to introduce competition in the infrastructure market place could be an important first step in this direction. The resulting competition, bearing in mind other factors listed below, could make more funds available, and force down end user prices, to make access more affordable. Given that a large number of willing private investors may be small entrepreneurs or large corporations, and other similar players with more funds, it is important to ensure that all available funds -small or large- can be mobilized. Then, it is equally important that the funds be allowed go the longest way and any artificial barriers, which serve no explicit public policy goals, be dismantled.

Opening the telecom sector to private enterprise has resulted in substantial improvement in access to telephones in Latin America such as in Chile and Peru; and in Africa in Uganda to name a few countries. Estonia, Morocco, Singapore, and Uganda are becoming important role models for sector reform. The European Union and North America have almost entirely brought down all barriers to entry in their telecommunication markets.

#### *Independent Regulation*

With a greater number of players in the market, and the often-substantial investments involved in setting up infrastructures and services, the success of policy initiatives in ICTs will depend on the independence of regulatory agencies. For example, in Morocco, an independent regulator was seen as an important reason for the high bids obtained for telecommunications licences. The need for independent regulators will be felt most when commercially-driven private sector players are sought to be enlisted by them to deliver on social/gender policy objectives that might at first seem to be at odds with the latter's obvious interest in maximizing profits.

#### *Awareness Building*

Much of the potential benefits of ICTs are unknown to the very people who need them most. An important task for regulators and policy makers is to ensure that women receive information and research regarding the potential of ICTs as a tool for empowerment and the kind of specific initiatives under taken by them towards this goal. It is critical that this be seen as a part of the regulators' typical duties to consult widely and to issue documentation for consideration by the players in the market and the public at large.

## *Reducing Cost of Infrastructure creation and operation*

### Fees for Licences and Radio Frequency Spectrum

Fees for telecommunications licences are frequently high and run into millions of dollars. Mobile service licences can often involve payments for use of radio frequency spectrum beyond the reach of all, except the major transnational corporations. Such high costs in setting up infrastructure are passed on in one way or another to the users. Similarly, high fees increase the cost of access to mobile technologies, which provide critical flexibility to women by bringing phones to those who have limited mobility due to cultural and economic reasons. For instance, Grameen Phone in Bangladesh not only provides access to those who lack it, but also does so in the parts of the home or outside where appropriate privacy can also be found. Thus, when affordability of services is an issue, as it is for most women and the poor, then the appropriateness of having high up-front licence fees is clearly questionable.

Countries that are short of funds for under-served areas or people cannot afford to have regulations, which require would-be investors to pay huge licence fees, bid for expensive licences or unduly restrict areas of operation. Governments of such countries may be better off with lower entry barriers and up-front payments. They may stand to gain more from future increases in savings and earnings due to an improved infrastructure that accelerates economic productivity and lowers the need for government funds as well as provides possible revenues from taxes of profits in future.

Reduction in entry barriers like licence fees and the freedom to choose services and service areas can be a major enabler for small investors. The latter may have the interest or ability only to set up businesses in smaller areas and for their target customers, who may not necessarily be attractive to a larger player. A case in point would be providing telephony in an under-served or un-served rural area, where a local entrepreneur may have a greater chance of wanting to serve and succeeding in doing so since they may have other related businesses and relationships, to provide synergies in the activity.

To empower women, the licensing regime could have a licence fee waiver for businesses run by women entrepreneurs. It could provide waivers to businesses who serve areas where there is a clear gender divide in access to ICTs. It could provide incentives for those businesses that who are working or want to work affirmatively to provide or package services of special interest to women, or agree to hire more women in their workforce. An innovative service provider, providing village public phones exclusively staffed by women, could be given incentives such as in the form of licence fee waivers. Such a provider, who facilitates access to communications to less mobile women as Grameen Phone does in Bangladesh, could be a typical beneficiary of such regime. Operators using technologies or practices that enable, say, illiterate or handicapped women to access the services could similarly be charged lower or no fees to set up operations.

### Flexibility in serving customers

In many countries, licences have built-in restrictions. In India, the operator is required to set up and run all licensed services itself and resale is not allowed. This tends to exclude a woman entrepreneur from participating in a market even when the licensed operator and the likely reseller can make a deal. It may result in delay in providing services in areas where the operator does not have an its own organization. Regulation that allows flexibility in serving customers, with only those minimal conditionalities that can be cost-

justified in public interest, could go some way in empowering women and other entrepreneurs.

#### Interconnection of networks

As mentioned above, allowing more and flexible forms of investment in communications infrastructure will benefit those who were less attractive to telecom service providers because of their low buying power, remoteness, and low population. However, new and small networks created through regulatory facilitation, will be virtually useless if those on the new network can not access the larger existing network, or be reached from it. For this, the new and old networks must be connected.

The new network, which needs this interconnection more urgently than the existing one—which is already connected to its larger number of subscribers—is rarely if ever accomplished on commercial and technical terms attractive to new players. Terms for interconnection are one of the most important and challenging tasks in telecom regulation and can, if handled poorly, set back almost all efforts to create communications infrastructure for those who do not have access. But, a regulatory regime that works affirmatively to protect the commercial interests of new infrastructure creators, can be a major incentive for investment in under-served areas. Similarly, regulatory regimes, which mandate, or at least encourage, sharing of infrastructure between multiple players, can work towards reducing cost of delivering services.

#### Technology

There is an inherent risk in regulation that mandates choice of a specific technology e.g. Global System for Mobile Communications (GSM), when more than one can be used. Such a rule can often work against new players who may have commercial reasons to prefer another. Similarly many of the “Wi-Fi” or 802.11 technologies<sup>1</sup> that can potentially bring down the cost of Internet provision or voice communications drastically are in fact disallowed by regulation in many countries. Similarly, cheap Internet telephony is banned in many countries. This is despite the fact that it can provide particularly cheap long distance communications.

The few telephones in a neighbourhood with inadequate infrastructure are understandably less used for socialization and more for economic tasks and emergencies. For the same reason, women -especially rural women- predominantly make long distance calls to family who have migrated to other parts within and outside the country for employment, and may well be important sources of income. It is easy to see how regulation prevents delivery of services beneficial to women and poor rural communities.

This approach advocating ‘technology neutrality’ i.e., the freedom to use whatever technology will enable the desired function or service to be delivered is useful in most instances. However, it may sometimes need to be weighed against the need for technology

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<sup>1</sup> Wi-Fi or "wireless fidelity", is a popular networking standard used to create wireless local area networks (LANs) in homes and offices at speeds faster than advanced mobile -phone networks. They involve sharing of a single broadband connection amongst neighbouring users who have appropriate personal computer components such as interface cards, which can bring down costs appreciably.

standards whose choice could provide the economies of scale for a service. This qualification should not necessarily detract from the main argument above since, in a way, it actually demonstrates not only the complex role of regulation but also the need to approach it strategically. This is best seen in the choice of standards for mobile telephony. The choice of mobile standards e.g. GSM, Code-Division Multiple Access (CDMA), etc., in most countries ensured that the market was not fragmented in its initial stages. But the continued insistence on the same standards could arguably prevent mobile technologies that, say, are cheap and effective for sparsely served areas.

#### Equipment

A useful regulatory intervention can be to ensure low taxes and duties on equipment, which can potentially facilitate access of ICTs to women. For instance high custom duties on mobile phones or PCs could raise prices for end users quite substantially. Regulation, which treats all electronic gadgets as 'luxury' products whose users can afford to pay high prices, can unwittingly exclude women from using ICTs that can empower them.

#### Software

Most areas of ICT activity have public domain, free or cheap software created by non-commercial producers. For example, the public domain Linux operating system is widely respected and competes aggressively in almost all features with the current market leader, MS Windows. It is free, has its own version of most popular applications for word processing, databases, spreadsheets, presentations etc. It is widely available and believed to be virtually immune to virus attacks. While important differences, especially familiarity or ease of use, may well favour Microsoft Windows, choosing Linux can potentially save hundreds of dollars in costs, an advantage that may make a world of difference to communities with a limited budget.

#### Innovation

Populations with low literacy rates require more support from technology and funding for graphical or multimedia interfaces for those unable to read menus will make an important contribution. Regulators and governments can facilitate this in many ways by providing funds for research and development as well as testing. They could mandate that operators assist in testing and implementing technology and software options considered by them to facilitate women's access to ICTs.

#### Ensuring equitable and convenient access

Licences to provide telecommunications frequently include a so-called universal service obligation that mandates them to provide a bouquet of services at a regulated price to anyone who demands it. These services could be plain voice, emergency services, etc., to poor, remote, or low usage customers irrespective of whether this narrow service offering is profitable or not. Universal service rules could improve if some gender-based issues were also addressed through them.

Regulation, which mandates provision and maintenance of telephones, ICT equipment, and services in places that can be accessed easily, at all times and by all, especially women, is very important. Rules that ensure public tele-centres be installed readily in an inexpensive and non-bureaucratic fashion can go a long way in providing timely access in developing countries where processes and procedures can be daunting. Regulators can demand that the order, in which unserved areas/households/persons are serviced, reflect

underlying male-female distribution in the populations. Such rules could further envisage that specific women's communities (e.g. single mothers, widows, women pensioners, etc.) is prioritized. Similarly, a nuanced definition of universal access could be created by regulation to include convenient telephonic access to services such as health, child care, maternity hospitals, etc., which add to women's costs of access to communications.

Regulators can mandate that service providers offer price packages more appropriate for women. The option to pay an agreed average bill based on past usage could help many to budget more easily. Regulation insisting that a price package be available for low usage customers, like older persons, whose infrequent phone-calls are often emergency calls to doctors, can help meet the needs of communities a large number of whose members are women.

### *ICT Content Issues*

There is a shortage of women centered content that must be addressed if ICTs are to play a role in women's empowerment. This would require regulatory and policy support for creating, procuring, and processing content of value to women, and training and awareness building. Intellectual property rights may also come in the way of delivering information of relevance to women. Bulk licensing of Intellectual Property relevant to or of interest to women for example, reliable information on reproductive health, agricultural markets, management, can help to reduce costs involved in accessing this information since royalties could be prohibitive in some cases. Policy makers and regulators would therefore need to ensure that public policy objectives could be reconciled with legitimate commercial expectations of producers.

English language content is available in many countries but local populations, especially poor women, do not often speak English. There is need for substantial policy and regulatory support for translating relevant material on a priority basis through appropriate subsidies, if necessary. Similarly, regulators could demand that services offered to communities reflects not only their gender distribution but also their literacy and education levels so that they do not begin to self select the more literate or educated in the populations. Such an approach may well be a prerequisite if, for example, the benefits of e-commerce have to be delivered to the relatively small businesses that women often run. Additionally, NGOs and other community and development organizations can also be asked by regulators to serve as language and content intermediaries.

Another type of content issue, with a regulatory dimension is access to abusive or exploitative content considered unsuitable by many women. Regulators can mandate that service providers provide choice and an appropriate mix of technological options to enable women to control the content they receive. For instance, the certain types of content provided - say, expensive business or other specialized information, adult entertainment services- can be regulated by creative regulatory provision. The obligation on service providers to provide such services to users only if they explicitly opt in for them can go a long way to prevent accidental or malicious delivery of offensive and often expensive content being delivered to unwilling or unsuspecting users.

### *Intermediation*

The linkage between regulators and the community will need to be mediated especially for women users in the near future, at least. Many of the benefits of ICTs- for example,

access to prices of products created or sold by women- should not necessarily require the beneficiary to be trained or educated. If appropriate help from staff or volunteers is available for the information to be looked up in a database or searched on the Internet as examples, then the information of value can be passed on orally. It is interesting to see that staffed telecentres are the norm in many countries of the south. It would be useful if the need and support for mediation is recognized by regulators, policy makers as well as managers.

### **Best practices**

The most explicit support for gender equity in telecommunications, policy and regulation is seen in the case of South Africa. According to the country's White Paper on communications, "Besides referring to those who were disadvantaged by the apartheid system in the past, the term 'disadvantaged' also applies to those South Africans who have been historically disadvantaged through discrimination on the grounds of gender and/or disability". The paper goes on to stress the need to ensure gender equity in issues like licensing, procurement and training. The Universal Service Agency of South Africa has a mandate including setting up of community telecentres, although the experience from the experiment is mixed since many of these tele-centres turned out to be not commercially viable.

Another country that has laid special emphasis on delivering ICT infrastructure to its citizens is Singapore. Chile and Peru in Latin America and Uganda in Africa have successfully deregulated their telecom sectors and have been able to bring in private investments to poorer areas that were until recently under-served. In Europe Estonia's reform process has delivered massive foreign investments and has expanded its infrastructure dramatically with access to most services like telephony, internet, email, etc., growing by as much as five fold in as many years. Competition has caused prices to come down heavily and for economic opportunities to increase. There has been significant government support for content relating to health and education and importantly, e-governance measures such as the provision of virtually all government documents on-line. There has been a rapid improvement in services to target populations in rural and remote regions.

Over the last decade, several countries, donor agencies and development organizations have initiated ICT projects that could be useful models for others. The authors have selected some projects that have a gender component and elements that may could be worth replicating.

Many projects come under the umbrella of "telecentres". These 'centres' provide access to a selection of ICT-based services such as telephony, fax, e-mail, and Internet; office equipment such as computers, CD-ROM, printers and photocopiers; multimedia hardware and software, including radio, TV and video; and meeting spaces for local businesses and community, training, etc. There are facilities for printing of documents, leaflets, letters, information about employment, health, prices for community produce, etc. Telecentres have been introduced in at east 21 developing countries, and more are planned. Some of the countries are: Brazil, Chile, Ecuador, Estonia, Ghana, Haiti, Hungary, India, Kenya, Maldives, Paraguay, Romania, Senegal, South Africa, Uganda, Vietnam and others.

Evidence from the telecentres experience broadly highlights the need to be demand-driven, ensure community participation, target development content, have local focus and above all to be clear about goals.

Amongst telecentre success stories highlighted by the Final Report of the Digital Opportunity Initiative, 2001, produced by Accenture, Markle Foundation and UNDP is the *Infocentro* in El Salvador. The project which is run by an NGO with an aggressively market-driven approach, has leveraged shared access to computers and bandwidth, created economies through aggregation of its users and usage and used it to negotiate better deals with service providers.

The literature on review and evaluation of the telecentres does not give a major indication of policies that have taken gender dimensions into consideration, but there are instances where some affirmative action and positive discrimination towards women has been planned.

In Ghana's Community Learning Centres (CLCs), there is a female Manager and her assistant, a male "technie". This staffing pattern was intentional, designed to encourage women to feel comfortable to visit the CLCs. This has proved to be a wise strategy, as more men than women were visiting the CLCs and women needed more encouragement. (Latchem and Walker 2001).

In the Indian state of Tamil Nadu, the Chennai-based M.S. Swaminathan Research Foundation (MSSRF) established "Village Knowledge Centres" to provide villagers with essential information such as weather conditions for local fisherfolk, grain prices, women's health and rural welfare schemes, and even announcements of exam results and cricket scores. As a policy matter, the MSSRF gave high consideration to socio-economic contexts, gender and local culture. From the beginning, the project has a policy that the Village Knowledge Centres ICT community centres be located in villages in facilities that are donated by the community, be open to all in the community, and be staffed by at least 50 per cent women. The staffing of the Centre is on a voluntary basis, but if an honorarium is needed, this amount will be raised from the local community. All staff (supported by the local community) receives gender training. Located in the heart of the villages, many centres have all female staff. In addition, great care has been paid to the content interest of women and catering to that interest. Given the Indian context of class, caste and sex barriers, this experiment has done well as it has factored the gender and social dimensions from the start.

In Bangladesh, GrameenPhone sells phones and time to urban customers and also sponsors Village Phone, a programme in which people without phone service in rural areas take out small loans to purchase cell phones and air time at cost (Reed 2002). Started in 1997, it has 575,000 subscribers in 12,000 villages, making it the largest mobile operation in the country. At the end of 2001, GrameenPhone Ltd. made \$27 million in pre-tax profit, just after five years—far sooner than many First World start-ups. In this case, the Bangladesh government did not charge an upfront licensing fee, because, according to Iqbal Qadir the founder of GrameenPhone, it expected cell phones to be a marginal business for the very rich. GrameenPhone now has more subscribers than the government-owned telephone company.

The Grameen Telecom experience in business planning suggests a potential solution for attracting telecom operators to service rural areas: target un-served and under-served

regions and provide support for acquisition of quality market appraisal knowledge and market data through research in the field. It also points to a potential solution for telecom operators facing the significant challenge of managing the last mile of rural telecom operators: link existing and successful micro-credit organizations with telecom operators (fixed line and/or wireless) to expand public call office (PCO) coverage in rural areas. (Richardson, Ramirez, and Haq 2000).

The case of GrameenPhone also shows that affirmative action will help in removing the historical disadvantages faced by women in areas of employment. Micro credit may have a limited role to play in setting up large telecom infrastructures, but its role in facilitating the services end of this market can be quite substantial as the experience demonstrates. The various ways of brining down costs of infrastructure creation, through regulation, have already been discussed in the text above.

The realization that ICTs can play a pivotal role in development, especially in women's development, is relatively recent. Even during this period, it has received scant attention from policy makers who are preoccupied with another new paradigm - role of and the need for private sector investment to supplement or replace public investments. Consequently the delivery of telecom infrastructure or services to women has tended to be subsumed in the larger goal of expanding infrastructure to the poor.

The All India Society of Electronics and Computer Technology (AISECT) ([www.aisect.org](http://www.aisect.org)) based in Bhopal, India, has pioneered a slightly different type 'telecentres'. It helped rural youth set up centres that provided ICT-based services mentioned above and other 'technical services' such as repairs of radios, televisions and refrigerators. These centres meet real rural needs and become more viable commercially.

## **Conclusion**

We have tried to highlight the many regulatory issues that determine women's ability to access ICTs and to derive their virtually unimaginable advantages. The nature of regulatory concerns is diverse and the options to deal with them, numerous. We have highlighted several specific regulatory interventions that will go some way towards address their agenda. In view of the multi-faceted nature of the issue, the need for prioritization, advocacy, expertise and above all, creativity is obvious. Women's ability to benefit from ICTs will therefore depend to a large extent on how successful they are in weaving their ICT agenda into national policies and regulation of this sector.

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