

e-ForAll:
A Poverty Reduction Strategy
for the Information Age

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e-ForAll:

A Poverty Reduction Strategy for the Information Age

INTRODUCTION

Pervasive poverty and inequality amidst plenty is the major threat to prosperity, stability and peace at the dawn of the 21st Century. Notwithstanding extensive discourse about the digital divide, most information and communication technology (ICT) initiatives start by encouraging nations to become e-ready: to boost economic growth and increase e-commerce. These initiatives will help countries grow and contribute to poverty alleviation. But globalization and ICT development tend to increase inequality. Countries that seek widespread prosperity and social stability would do well to focus instead on ***e-ForAll***; i.e. on making the **opportunities** that ICTs open up for individual and social improvement accessible to all citizens; and on applying ICTs to **empower** common folk and engage their participation in national and local development initiatives, and to reduce personal and societal **insecurity**.

INEQUALITY, POVERTY AND INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs)

World Trends in Inequality and Poverty

Between 1960 and 1990 income inequality did not change much worldwide (Table 1). The most discernible changes are an improvement in income distribution in Sub-Saharan Africa upon independence, and worsening inequality in Eastern Europe after changes in regimes.

	1960		1970		1980		1990	
	Bottom 20%	Top 20%						
Eastern Europe	9.67	36.30	9.76	34.51	9.81	34.64	8.83	37.80
South Asia	7.39	44.05	7.84	42.19	7.91	42.57	8.76	39.91
East Asia and the Pacific	6.44	45.90	6.00	46.50	6.27	45.50	6.84	44.33
North Africa and Middle East	5.70	49.00	n.a.	n.a.	6.64	46.72	6.90	45.35
Indus. & high income developing countries	6.42	41.22	6.31	41.11	6.68	39.89	6.26	39.79
Sub-Saharan Africa	2.76	61.97	5.10	55.82	5.70	48.86	5.15	52.37
Latin America and the Caribbean	3.42	61.52	3.69	54.18	3.67	54.86	4.52	52.94

Source: [Deininger and Squire 1996]

World Bank data (Table 2) suggests there has been an important reduction in relative poverty in the last decade, even though the total number of poor people increased significantly, along with overall growth in population. The bright spots are in East Asia and the Pacific, where poverty was reduced noticeably and, to a lesser extent, in Latin America and the Caribbean. Aggregate data however fail to show

country variations within regions, and also do not capture the ups and downs associated with economic cycles.

	People living on less than US\$ 2/day					
	millions of people			headcount index (%)		
	1987	1990	1998	1987	1990	1998
Eastern Europe and Central Asia	16.3	43.8	98.2	3.6	9.6	20.7
South Asia	911.0	976	1094.6	86.3	86.8	83.9
East Asia and the Pacific	1052.3	1084.4	884.9	67.0	66.1	48.7
North Africa and Middle East	65.1	58.7	85.4	30.0	24.8	29.9
Sub-Saharan Africa	356.6	388.2	489.3	76.5	76.4	78.0
Latin America and the Caribbean	147.6	167.2	159.0	35.5	38.1	31.7
TOTAL	2,548.9	2,718.3	2,811.4	61.0	61.7	56.1

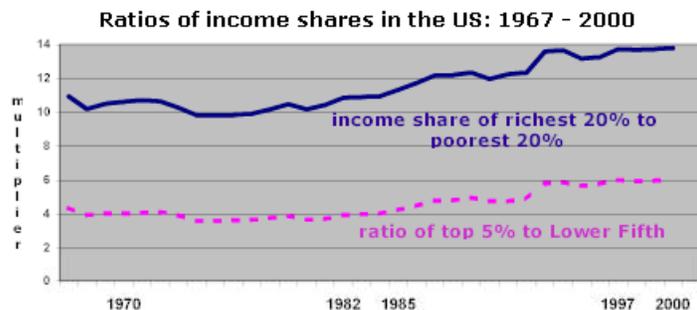
Source: [PovertyNet]

Growth and an open trade regime help reduce poverty [Luke, Radelet and Warner 1999], [Roemer and Gugerty 1999]. The beneficial impact of growth on poverty, however, is limited in countries where income inequality is high, and where it is increasing. High inequality dampens a country's growth prospects; and major structural differences, in educational attainment, geography, and ethnic differentiation, further diminish the impact growth has on poverty [Ravallion 2001] [Lustig, Arias and Rigolini 2002].

Impact of ICTs on the US Economy

Rapid growth in the US has been accompanied by increasing inequality and practically unchanged poverty levels.

Whereas in 1980 the richest 20% of US households received ten times as much income as the poorest 20%, by 2000 they were earning 14 times as much. The top 5% earned 4 times as much as the bottom 20% in 1970, but 6 times as much in 2000.¹ Poverty has behaved more erratically, in tune with business cycles. Beginning around 1993 the strong economy produced a significant decline in the percent of people with incomes below the poverty



line to about 11%, a level similar to that prevalent in the early 1970s.

In a world economy increasingly driven by trade, growth would have an equalizing effect in developing countries where unskilled labor is abundant, and an opposite effect on industrialized economies.

Information and communication technologies are behind much of the renewed dynamism experienced by the US economy over the past 30 years.² ICT expansion also accounts in part for the increases in US income inequality. Not all the rise in inequality is attributable to ICT development. Lower trade barriers and an increase in trade, has put unskilled US workers in competition with large numbers of low wage workers in developing countries. Weakened bargaining power of labor unions and ineffective minimum wage legislation, may be other contributing factors [Mishel 1995] [Gosling and Lemieux 2001].

Inequality and ICT Development

ICT development tends to increase within-country income inequality for several reasons.

First, in the case of US innovators, those who developed widely used applications reaped extraordinary benefits from being first in tapping a huge world market.

Second, the recent surge in US productivity that began in the mid-1990s is closely related to the linking of computers and businesses that accelerated with the advent of the Internet [Crandall and Jackson 2002].

Third, ICT infrastructure is more profitable and therefore easier to develop in urban areas; further broadening urban-rural income earning and social service opportunities.

Fourth, modern labor markets are increasingly demanding new skills, computer and Internet literacy. They are also requiring flexible hours, frequent job changes, intermittent periods of unemployment, and periodic retraining. Unskilled low-productivity labor becomes "commoditized", earning low pay, easily disposed of, and unprotected from bouts of unemployment by weakened labor unions. The process has been described in detail by [Castells 2000], and the evidence of the unbalancing effect of rapid technological change in an open trade environment on income distribution is accumulating ([Diwan and Walton 1997], [Wood 1997], [Tan and Batra 1997], and [Leamer 2001]³).

ICTs are of course impacting developing countries differently than they affected the US economy. Opportunities to develop a "killer application" are not that frequent, and extraordinarily profitable ICT undertakings can be exploited successfully only where venture capital is plentiful and incentives favor innovation; features more common in developed country settings. Potential innovators living in developing countries tend to network with peers abroad and eventually migrate and become part of the brain drain.

There are however many opportunities in developing countries for companies to gain from interconnectedness, and those that do get networked will outperform the small and informal sector producers that make up most of developing country enterprises. Disparities in rural-urban infrastructure and in economic development are acute in most developing countries and will tend to broaden with ICT development, because of the high costs of ICT infrastructure deployment in rural areas and because of the limited profit potential of rural markets. There are also plenty of unskilled workers in developing countries and these are most easily left behind.

The major difference between the US and developing economies is not in the way that ICT development will impact inequality. The US has in place a social safety net, comprised of public institutions (unemployment insurance, food stamps) and an extensive network of civil society foundations and organizations, that enables the country to cushion the effect of temporary setbacks and ensuing increases in the ranks of the poor. Such institutions are uncommon or hardly affordable in developing countries; and are among the first items eliminated when belt tightening is required.

Today's developing country elites, with full access to ICTs and connections to networks of people outside of their own country, are well equipped to weather economic downturns. When the going gets rough, the rich of Latin America move their capital and themselves to South Florida. It is the poor who have few alternatives and bear the burden of adversity. Increasingly, however, the poor are seeking ways to escape despair in their own countries, swelling poverty ranks in North America (Table 3).

	US population - total and of hispanic descent			Persons with incomes below poverty line - total US and of hispanic descent		
	US '000s	Hispanic '000s	Hispanic as % of total	total US poor '000s	Poor hispanic ('000s)	Hispanic as % of poor
1972	206,004	10,588	5%	24,460	2,414	10%
1980	225,027	13,600	6%	29,272	3,419	12%
1990	248,644	21,405	9%	33,585	6,006	18%
2000	275,917	33,719	12%	31,139	7,155	23%

Source: US Bureau of the Census

Poverty in Latin America pales in comparison with that in Asia and Sub-Saharan Africa (Table 2), but inequality is more pronounced in Latin America and is a common feature in practically all countries of the region (Table 4). In increasingly skills-based open economies, inequality in income and in educational achievement, two features typical of Latin American countries, will tend to undermine regional efforts to grow and achieve social and, ultimately, political stability.

In the remaining of this paper a vision of ICT development policy effort is proposed that takes into account this inequality bias intrinsic in ICT development. Because inequality is most acute in Latin America and because the particular cultural and institutional setting is critical, the primary focus is on this region. Some of the recommendations presented are probably also applicable in other parts of the world.

Table 4. Percentage Share of Income or Consumption: Poorest and Richest Quintiles, % Below International Poverty Line, and Per capita Income in Selected Countries

	Lowest 20%	Highest 20%	Population (%) below US\$ 2/day	Per capita income (US\$)		Lowest 20%	Highest 20%	Population (%) below US\$ 2/day	Per capita income (US\$)
Latin America and Caribbean					Asia & Pacific Countries				
Argentina				11,324	China	5.9	46.6	53.7	3,291
Brazil	2.5	63.8	17.4	6,317	Rep. Korea	7.5	39.3		14,637
Guatemala	2.1	63.6	64.3	3,517	Indonesia	8.0	44.9	66.1	2,439
Paraguay	2.3	62.4	38.5	4,193	India	8.1	46.1	86.2	2,149
Colombia	3.0	60.9	28.7	5,709	Bangladesh	8.7	42.8	77.8	1,475
El Salvador	3.4	56.5	51.9	4,048	Sub-Saharan Africa				
Honduras	3.4	58.0	68.8	2,254	South Africa	2.9	64.8	35.8	8,318
Chile	3.5	61.0	20.3	8,370	Kenya	5.0	50.2	62.3	975
Mexico	3.6	58.2	42.5	7,719	Nigeria	4.4	55.7	90.8	744
Panamá	3.6	52.8	25.1	5,016	Senegal	6.4	48.2	67.8	1,341
Venezuela	3.7	53.1	36.4	5,268	Ghana	8.4	41.7		1,793
Costa Rica	4.0	51.8	26.3	5,770	North Africa and Middle East				
Nicaragua	4.2	55.2		4,653	Egypt	9.8	39.0	11.4	3,303
Dominican Rep.	4.3	53.7	16.0	4,653	Morocco	6.5	46.6	7.5	3,190
Perú	4.4	51.8	41.4	4,387	Jordan	7.6	44.4	7.4	3,542
Ecuador	5.4	49.7	52.3	2,605	Algeria	7.0	42.6	15.1	4,753
Uruguay	5.4	48.3	6.6	8,280	Eastern Europe				
Bolivia	5.6	48.2	38.6	2,193	Estonia	6.2	41.8	17.7	7,826
Haiti				1,407	Hungary	8.8	39.9	4.0	10,479
Jamaica	7.0	43.9	25.2	3,276	Czech Republic	10.3	35.9		12,289
Sample OECD Countries									
UK	6.6	33.0		20,883	Spain	7.5	40.3		16,730
US	5.2	46.4		30,600	Italy	8.7	36.3		20,751
Australia	5.9	41.3		22,448	Germany	8.2	38.5		22,404
Ireland	6.7	42.9		19,180	Norway	9.7	35.8		26,522
France	7.2	40.2		21,897	Finland	10.0	35.8		21,209
Canada	7.5	39.3		23,725	Japan	10.6	35.7		24,041

Source: World Development Indicators 2001. World Development Report 2000/2001.

Notes:

- No data is available for CARICOM countries other than Jamaica and Haiti.

- Inequality and poverty data reported are based on latest survey information to give a sense of "general order of magnitude". International poverty lines are estimated by the World Bank in 1993 purchasing power parity prices (PPP).

- Inequality does not change much over time, but poverty figures change with economic cycles. Comparisons of poverty levels across countries present difficulties, mainly on account of different methodologies and year of survey. Blank spaces indicate data is unavailable.

STRATEGIC THINKING ABOUT ICTS

Practically all countries of the world are launching national strategies to share in the benefits of the information revolution.

In Latin America, ICT development strategies must address the central challenge facing the region: poverty and persistent and pervasive inequality.

Is this too much to ask? Is it economically feasible? Nobody knows, because the present stage is one of trial and error and because constraints on ICT expansion throughout the region are daunting.

What is clear is that economy wide returns to ICTs are high; that unless the issue of poverty takes center stage new rich enclaves will arise and leave poverty largely untouched, and that State action can help determine the extent to which ICT benefits are broadly shared.

Notwithstanding the inequality bias of ICT development, the new technologies offer extraordinary opportunities to reduce the costs of the provision of services to low-income people. In many ICT related processes the marginal costs are close to zero. The cost associated with an additional telephone call or one more Internet user or of a longer call or Internet link is minimal, unless the increase occurs during the peak period of usage. Once produced, the cost of reproducing a CD is negligible. Once the content of a web page has been prepared, the number of visitors has practically no effect on the costs of maintaining or updating it. Governmental action to facilitate the provision of such services can therefore have a huge impact on the livelihoods of low-income peoples.

Connectivity to the Internet, for example, can help overcome some of the most significant obstacles undermining the development of remote rural areas. They can enable low-cost access to governmental services, agricultural product and market information, project and local investment opportunities, financial services, distance education, online health services, and job vacancies and community development networks.

Some countries have been remarkably successful in implementing over a short period of time an equitable ICT development strategy that is broadly endorsed by its citizenry and is fully supported at the highest levels of government. In 1992 Estonia had just lost its major trading partner and was experiencing hyperinflation and a 15% fall in GDP [Darling 2001]. The country was turned around by sound economic policies and a thrust to modernization in which equitable ICT development plays a key role. Building on a policy tradition of equitable growth, South Korea's *informatization* program has raised the number of Internet users from 2% in 1995 to 65% in 2001 [Park 2001a]. Both countries have a substantial educational base developed through sustained effort over the years. Their action programs include cost-effective comprehensive measures to ensure that all citizens have access to and partake in the benefits of ICT development.

In thinking about ICT policy, e-readiness guides [McConnell 2002] [CID 2002] [Bridges.org 2001] constitute a useful point of departure. These are primarily

“descriptive” tools, rather than prescriptive policy instruments. The resulting country assessments are valuable to private companies and investors, and to government officials that may want to learn where their country stands *vis a vis* others. They may also help officials recognize important determinants of ICT sector development.

The first two columns in Table 5 briefly reproduce the key questions addressed by two of the most prominent e-readiness methodologies presently in use.⁴ The right hand column presents a somewhat different set of questions, compatible with a more inclusive ICT development vision. *e-ForAll* explicitly addresses the way in which a Government might approach the development of a country’s ICT capabilities to **combat poverty in a cost-effective and sustainable manner.**

E-FORALL: A PUBLIC POLICY GUIDE FOR POVERTY REDUCTION

***e-ForAll* is a strategic public policy guide to the application of ICTs in the fight against poverty.** It is founded on three basic principles:

First, the new Information and Communication Technologies (ICTs) have an enormous **potential** to improve the livelihoods of low incomes peoples by reducing the cost of providing services to traditionally marginalized communities and facilitating the build up of constructive social capital. *e-ForAll* comprises some key steps that are necessary to realize this potential.

Second, *e-ForAll* should put ICTs at the service of everyone in a society. Public policy should provide for the competitive and transparent enabling environment to facilitate ICT business development. *e-ForAll* should also include concrete programs to open **opportunities** for the poor to increase their incomes and improve their livelihoods, **empower** them through participation in the decision making process, and enhance their **security** from adverse shocks and health hazards⁵.

Third, ICT development for socioeconomic change will require considerable **State support and financing.** Nevertheless, in a developing country context, State support cannot proceed without regards to cost, impact and effectiveness. ICT initiatives to combat poverty must be suited to the low productivity environment in which they are to be applied, and any subsidies required **must be cost effective and result in sustainable benefits.**

Table 6 incorporates these principles into a model ICT development program based on an *e-ForAll* policy guide. The list of activities is meant to be illustrative, not comprehensive, and their classification regarding impact on opportunity, empowerment or security is indicative. In practice overlap is expected and desirable.

Table 5. From e-readiness to e-ForAll

e-readiness		e-ForAll
McConnell International	Harvard's CID	
<p>Connectivity</p> <p>Are networks easy and affordable to access and to use?</p>	<p>Network Access</p> <p>What are the availability, cost and quality of ICT networks, services and equipment?</p>	<p>Widespread Access to Networks</p> <p>Are there widespread low-cost means for the majority of the population to access reliable ICT networks, services and equipment? Are there specific programs directed at securing full access by low-income people and enhancing development impact of ICT use?</p>
<p>Human Capital</p> <p>Are the right people available to support e-business and to build a knowledge-based society?</p>	<p>Networked Learning</p> <p>Does the Educational System integrate ICTs into its processes to improve learning? Are there technical training programs in the community that can train and prepare an ICT Workforce?</p>	<p>Democratic Networked Learning</p> <p>Do the public systems of formal and vocational education integrate ICTs into its processes to improve learning by the majority of the population? Does it train and prepare a workforce that is computer and Internet literate and is capable of upgrading its skills frequently?</p>
<p>e-business Climate</p> <p>How easy is it to do e-business today?</p>	<p>Networked Economy</p> <p>How are businesses and governments using information and communication technologies to interact with the public and with each other?</p>	<p>Networked Competitive Development ForAll</p> <p>Are small firms, microentrepreneurs, small farmers and wageworkers being incorporated into the network economy?</p>
	<p>Networked Society</p> <p>To what extent are individuals using information and communication technologies to interact with the public and in their personal lives? Are there significant opportunities available for those with ICT skills?</p>	<p>Networked Social Development</p> <p>Are national institutions that support social development and security making effective use of ICTs and social participation in their delivery of services targeted to low-income members of society?</p>
<p>Information Security</p> <p>Can the processing and storage of networked information be trusted?</p>		
<p>e-Leadership</p> <p>Is e-Readiness a national priority?</p>	<p>Network Policy</p> <p>To what extent does the policy environment promote or hinder the growth of ICT adoption and use?</p>	<p>ICTs and Poverty Reduction in National Dev. Policy</p> <p>Is poverty reduction a centerpiece of national policy? Is the application of ICTs to reduce poverty encouraged? Are ICT development and poverty reduction policies affordable, institutionally viable, transparent, sustainable, participatory and subject to review and adjustment?</p>

e-readiness benchmarks are taken from [McConnell International 2001] and [CID].

Table 6. Proposed Elements Comprising an e-ForAll Public Policy Guide		
<p><u>Widespread Access to Networks</u> Are there widespread low-cost means for the majority to access ICT networks, services and equipment? Are there specific programs geared to address access requirements of low-income peoples.</p>	<p>a Does the regulatory framework stimulate fair and transparent competition, and the participation of a broad range of operators? ----- b Are there country initiatives to bring connectivity to remote rural areas at a cost that is sustainable and affordable, both to the State and to users? ----- c Are there programs to increase awareness in the population of the opportunities that ICTs have to offer? ----- d Are there efforts to provide support, on a competitive basis, to socioeconomic development initiatives that make use of ICTs to service the needs of low-income communities?</p>	<p>Opportunity/ Security/ Empowerment</p>
<p><u>Democratic Networked Learning</u> Do public systems of education integrate ICTs and prepare a computer and Internet literate workforce that is capable of frequently upgrading its skills?</p>	<p>e Are efforts being made to ensure that the formal school system, teachers in particular, are fully equipped to help students benefit from computerized and networked learning? Is primary and secondary education delivering the strong literacy skills that ICT skills must build on? ----- f Are there technical training programs in the community to prepare a workforce that is computer and Internet literate and is capable of upgrading its skills frequently? ----- g Are there programs that make use of ICTs to address the educational and training needs of low-income adults?</p>	<p>Opportunity</p>
<p><u>Networked Competitive Development ForAll</u> Are small firms, microentrepreneurs, small farmers and wage workers being incorporated into the network economy?</p>	<p>h Do public institutions use ICTs to make job information available online to improve the performance of labor markets? ----- i Are small firms and microentrepreneurs being supported and trained in the use of ICTs to improve their competitiveness (productivity, marketing service delivery) and develop strategic partnerships with other enterprises? Do microenterprise service providers (savings, credit, training, business development) make effective use of ICTs? ----- j Are there national systems of public procurement that facilitate supply by competitive micro and small enterprises?</p>	
<p><u>Networked Social Development</u> Are national institutions that support social development and security making effective use of ICTs in their delivery of services to the poor?</p>	<p>k Are there low-cost opportunities for poor people to themselves apply ICTs to strengthen bonds with other peoples and community groups and enhance their incomes and security? ----- l Are ICTs being used to improve the performance and service delivery of agencies entrusted with food security, public health, public safety, domestic violence prevention and counseling, and disaster prevention and mitigation? ----- m Are there initiatives specifically targeted to incorporate traditionally disenfranchised groups (e.g. indigenous peoples, women, persons with disabilities, unemployed youths, small and landless farmers) into the Network Society.?</p>	<p>Security</p>
<p><u>ICTs and Poverty in National Dev. Policy</u> Is poverty reduction a centerpiece of national policy? Is the application of ICTs to reduce poverty encouraged? Are ICT development and poverty reduction policies affordable, institutionally viable, transparent, sustainable, participatory and subject to review and adjustment?</p>	<p>n Are there efforts to develop sustainable e-Government systems to service the needs of the poor, and engage their participation in the design and operation of these systems? ----- o Is the State implementing an effective system of decentralized decision-making to engage the participation of low-income and traditionally disenfranchised groups? Are ICTs being used to give these groups an effective voice? ----- p Is poverty reduction a centerpiece of national development policy? Do policymakers understand the role that the State needs to play in order for ICTs to help combat poverty? ----- q Are there reliable mechanisms for interagency coordination and for partnerships with private and civil society institutions? ----- r Are government ICT support programs transparent, sustainable, accountable and cost effective? Are there systems for monitoring ICT project impacts and adjusting programs based of lessons from experience? Does the public have an input in program design?</p>	<p>Empowerment</p> <p>Institutional Viability</p>

Widespread Access to Networks

The Significance of Access

The revolutionary feature of modern ICTs – mainly the Internet and mobile telephony – is their ability to facilitate low cost interaction among network members. Most present day calls for “content” miss this key attribute of the new technologies. Radio and television have been around for a while and constitute broadcast technologies; top down mediums.⁶ Whoever controls the content, controls the message. The value of a broadcast network is proportional to the number of members. The value of a point-to-point communications network is, by Metcalf’s Law, proportional to the square of the number of participants. [Odlyzko 2000, page 30].

Broadcast technologies are very valuable instruments of communications, training, education and outreach; often very effective in a development context [FAO 2001; Castro, Wolf and García 1999; Dock and Helwig 1999]. They may help build up networks for social change [Dragón 2000]. What needs to be emphasized, because it is so often overlooked, is the potential impact of the new interactive network technologies.

Reminiscent of the early development of snail mail and the telephone, social interaction through e-mail and chatting is often underestimated. Yet these interactions form the basis for socialization, the development of trust and economic integration.

“Only a tiny fraction of the information passing through communications systems has ever been high quality scholarly knowledge. ... sociability was frequently dismissed as idle gossip, and especially in the early days of the telephone, was actively discouraged. ... a 1909 study of telephone service commissioned by the city of Chicago advocated measured rate service as a way to reduce ‘useless calls’. Yet the most successful communication technologies, the mail and the telephone, reached their full potential only when they embraced sociability and those ‘useless calls’ as their goal. That seemingly idle chit-chat not only provided direct revenues, but it encouraged the diffusion of the corresponding technology, and made it more useful for commercial and other applications. Such social interaction frequently function to grease the wheels of commerce. [Odlyzko 2000, page 29].

Point to point communications is grass roots, it is flexible, it is democratic, and is not easily subject to control or supervision by bureaucrats or self-appointed “community leaders”. It makes the economic aspects of people’s lives more efficient, as they keep in touch with personal networks, learn about markets, refine production techniques, eliminate time spent on travel to meet people to get information, etc. [Hudson 1984]. It can also help build up social capital [Woolcock and Narayan 1999, p. 19].

Much of the existing formal content utilizes the Web to broadcast information and, in this sense, overlooks the interactive power of the Internet. In practically every user survey, the use of e-mail is most prevalent and important to users because it

permits direct interaction; and it is no coincidence that among the most successful Web ventures are those that encourage the formation of online communities (yahoo, terra, geocities) and help organize user services (e-Bay). What invariably wins out, in market terms and in terms of user demands is access to point to point communications, complemented by online services that add value to the user's experience of the Internet.

An unfortunate recurrent debate is whether access to connectivity to the Internet is more important than content or otherwise. The broadcast side of the Internet, i.e. the World Wide Web, enables the broadcast of practically an infinite number of channels, giving access to myriad information sources and services. Moreover, it is becoming increasingly easy and inexpensive for individuals and organizations to have their own imprint on cyberspace through a personal or group web page. **Both connectivity and content are important.** But the common misconception that access makes no sense without content is ill advised. It is people connected to the net that give the Internet its most valuable content, both in creating Web pages and in direct interaction via email, listservs, etc.

Point to point communication is needed to empower the poor with a voice online and the ability to network and build up social capital. It needs to be complemented by Internet content that provides services that traditionally bypassed low-income people, and by content generated by people themselves giving expression to their needs and aspirations. The value of ICTs in combating poverty will remain very limited as long as participation rates remain repressed. At the present stage of development in which most developing countries face significant gaps in access to ICTs (Table 7), **providing connectivity, and complementary support to make that connectivity truly accessible to the poor over and above hardware, should have the highest priority in an e-ForAll policy agenda.**

	Internet Users	PCs	Main Tel. Lines	Mobile subs.		Internet Users	PCs	Main Tel. Lines	Mobile subs.
	--- per 100 inhabitants ---					--- per 100 inhabitants ---			
Latin America and Caribbean					Asia & Pacific Countries				
Argentina	8.0	5.3	21.6	18.6	China	2.6	1.9	13.8	11.2
Brazil	4.6	6.3	21.7	16.7	Rep. Korea	51.1	25.1	47.6	60.8
Guatemala	2.0	1.7	6.5	9.7	Indonesia	1.9	1.1	3.7	2.5
Paraguay	1.1	1.1	5.1	20.4	India	0.1	0.6	3.4	0.6
Colombia	2.7	4.2	17.1	7.4	Bangladesh	0.0	0.2	0.4	0.4
El Salvador	0.8	2.2	9.3	12.5	Sub-Saharan Africa				
Honduras	0.6	1.2	4.7	3.6	South Africa	7.0	6.9	11.4	21.0
Chile	20.0	8.4	23.9	34.0	Kenya	1.6	0.6	1.0	1.6
Mexico	3.5	6.9	13.5	20.1	Nigeria	0.0	0.7	0.4	0.3
Panamá	3.2	3.8	14.8	20.7	Senegal	0.1	1.9	2.5	4.0
Venezuela	5.3	5.3	11.2	26.4	Ghana	0.2	0.3	1.2	0.9
Costa Rica	9.3	17.0	23.0	7.6	North Africa and Middle East				
Nicaragua	1.0	1.0	3.1	3.0	Egypt	0.9	1.6	10.3	4.3
Dominican Rep.	2.1		10.8	12.4	Morocco	1.3	1.3	3.9	15.7
Perú	11.5	4.8	7.8	5.9	Jordan	4.1	3.3	12.7	14.4
Ecuador	2.5	2.3	10.4	6.7	Algeria	0.0	0.7	6.0	0.3
Uruguay	11.9	11.0	28.3	15.5	Eastern Europe				
Bolivia	1.4	2.0	6.0	8.7	Estonia	30.0	17.5	35.2	45.5
Haiti	0.4		1.0	1.1	Hungary	14.8	10.0	37.4	49.8
Jamaica	3.8	5.0	19.7	26.9	Czech Republic	13.6	12.1	37.4	65.9
Sample OECD Countries					Spain				
UK	40.0	36.6	57.8	78.3	Italy	27.6	19.5	47.1	83.9
US	49.9	62.3	52.0	44.4	Germany	36.4	33.6	63.5	68.3
Australia	37.2	51.7	66.5	57.8	Norway	59.6	50.8	72.0	82.5
Ireland	23.3	39.1	48.5	72.9	Finland	43.0	42.4	54.8	77.8
France	26.4	33.7	57.4	60.5	Japan	45.5	34.9	59.7	57.2
Canada	43.5	39.0	65.6	32.0					

Source: ITU Indicators 2001. (<http://www.itu.int/ITU-D/ict/statistics/>)

Shared Public Access

One of the most economical forms of providing connectivity to the poor is through shared public telecommunications access facilities commonly known as telecenters.

The significance of shared access for the poor may be appreciated from data for Perú. Its dense network of urban *cabinas públicas* is without parallel anywhere else in the world. As of June 2001, 33% of the population of Lima was using the Internet at least once a month [Apoyo 2001]. This figure is a dramatic increase from the 18% registered just a year ago, and significantly higher than the 11.5% registered by ITU data (reported on Table 7; and only covering users directly connected to the network). Users of *cabinas* paid an average of US\$ 0.70/hour of Internet use. In the lower income strata (category E), only 5% of the population used the Internet at least once a month; 21% in the category D. Within this small low-income (D/E) group, 90% connect to the Net using *cabinas públicas* (Table 8). Among low-income women users, 90% of them connect through *cabinas*.

Table 8. Location of Internet Use Among Lima Residents

From where do you connect to the Internet when you do?						
Location	by income category (A highest, E lowest)				by gender	
	A	B	C	D/E	Male	Female
<i>Cabina pública</i>	59	77	88	91	77	90
at work	22	29	14	6	24	11
school	21	17	16	16	15	19
at home	53	17	2	2	14	8
family or friend's house	10	4	4	9	9	2

Source: [Apoyo 2001]. Note: Users may connect in more than one place.

The commercial variety of telecenters (cybercafes, *cabinas públicas*) are common in some cities (e.g. Lima, Mexico, Quito, La Paz), but practically nonexistent in others (e.g. Sao Paulo); mainly because spontaneous commercial spread of telecenters is conditional on specific circumstances that are not always present in a country or community: relative prices of alternative forms of communications, a dense low-income customer base, low cost technical know-how; and popular familiarity with ICTs. Even where commercial telecenters are located in urban marginal neighborhoods they are frequented, primarily, by well-educated young people.

To reach the large mass of low-income people, most of whom have limited education and are unfamiliar with the new technologies, specific measures – promotion campaigns, start-up investment capital, training programs, and demand support during the initial stages while users become familiar with the technology - will need to be instituted. These measures are costly. They yield high social but low private returns. Private enterprise can help provide the services but cannot afford to bear their costs [Proenza 2001].

State Support to Increase Access

How can the State help connect a large proportion of its citizens to the Internet without creating inefficiencies or going bankrupt in the process?

The strengthening of regulatory regimes and flat rate pricing are two key measures that could help expand Internet use in both rural and urban markets, but particularly in the latter. ICT expansion in rural areas is likely to require more focused programs.

Telecom Regulation

The development of telecommunications infrastructure involves: i) the establishment of networks requiring sizeable investments with long pay back periods and significant economies of scale and scope; ii) location specific assets that cannot be easily deployed elsewhere; iii) services that are considered essential to the welfare of a nation. For many years these 3 features have set telecommunications apart from other sectors as a natural monopoly.⁷

Telecommunication operators were traditionally State run and charged high rates for long distance service to subsidize local service and infrastructure development in low profit areas. With the 1980s debt crisis that affected nearly all countries of the region, and declining telecom revenues on account of technological convergence and increasing competitive pressures in long distance markets, the standard model began to fall apart. Beginning in Chile in 1987, most countries of the region privatized their main line operator and allowed some degree of competition in telecommunication services. The modes implemented varied from one country to another: some kept the monopoly position intact (e.g. Costa Rica, Uruguay), others kept their monopoly operator but opened up their market, particularly in new service areas like Internet and cellular telephony (e.g. Colombia); a third group awarded long periods of exclusivity (e.g. Jamaica, Trinidad and Tobago, Guyana); and a final group privatized and fostered competition right after privatization (Brazil, El Salvador, Guatemala) or following a short period of exclusivity (e.g. Chile, Perú).

Table 9 summarizes tendencies observed with respect to the impact of privatization and of the degree of competition in the telecommunications market.

Table 9. Observed Tendencies in the Effects of Privatization and Competition

Main Line Operator	Competition	
	less	more
State run	<ul style="list-style-type: none"> - inefficient (high cost) - low-prices (fiscal drain) - low- quality/ long waiting periods - limited service growth - limited variety of services 	<ul style="list-style-type: none"> - pressure on State operator to increase efficiency - low prices (fiscal drain) - greater quality/faster service - high growth in services - more varied services - "crean skimming" by private firms ==> larger fiscal deficits by State operator
private	<ul style="list-style-type: none"> - relatively efficient - high profits/high prices - limited quality of services - some investment and growth in service - limited innovation 	<ul style="list-style-type: none"> - efficient (low cost) - low prices - high quality service - high investment and very high growth in services - more innovation - greater variety of services

Overall, privatization has improved telecommunications services and expanded telecom infrastructure. But private monopolies can be as bad as State monopolies, and in some cases worse.⁸ The principal driving force leading to growth in services and quality and to lower prices is **competition**. It is the opening of telecom markets to competition from cellular operators that has brought about rapid growth in mobile telephony; in some countries achieving greater penetration than fixed landlines (Table 7). Competition is so important that some countries, like New Zealand and Australia, are doing away with their regulatory bodies and relying instead on commissions mandated to advance competition.

Notwithstanding privatization and liberalization efforts, in practically all countries of the region the incumbent operator controls a significant segment of the main line networks and wields considerable power; both market power and political power. Countries privatizing their telecommunications sector have established regulatory bodies to try to keep this power in check; not an easy task considering that many operators are larger economic entities than the countries they serve.

Given the extraordinary power of most incumbent operators, a hands-off approach is not practicable in developing countries. Competition may however be advanced through improved governance of regulatory frameworks and appropriate institutional incentives ([item a in Table 6](#)). This is one area where international cooperation could be effective - e.g. through training of regulators and assistance to help decision makers understand and improve regulatory governance. Some of the key attributes of a suitable regulatory framework are [Gutiérrez 2002]:

autonomy of the regulating agency from operators, politicians and other interested parties (e.g. industrial consumers),

accountability to consumers serviced, to operators (to ensure normal returns on investment) and to governmental institutions providing for transparent ways for dealing with disputes;

clarity of objectives to check the monopolistic tendency of incumbent operators to exercise market power;

transparency and participation of stakeholders so that they are aware of the rules and perceive them as fair and equitable;

solid legal foundation, to ensure credibility and sustainability of measures taken.

Flat Rates

As the market for telecommunications services matures and becomes more competitive, simple pricing options like the **flat rate** for telephony and Internet services are likely to become standard, even though a user-base pricing mechanism might in principle appear to be more "efficient", and even if, on average, consumers might have to pay slightly higher prices [Odlyzko 2000]. Once introduced, simple pricing schemes generate extraordinary demand. The insurance value consumers attach to not having to worry about how long they spend using the service appears to be a very strong incentive in favor of simplified pricing. For low-income users the

insurance value may be the critical determinant of using or not using ICTs, especially the Internet.⁹

Given the limited levels of competition typical in most regional telecom markets, the auctioning of special incentives, awarded to operators that are willing to innovate and introduce flat rate pricing, might be a suitable market friendly, transparent, sustainable and cost-effective way of stimulating rapid expansion of Internet use among middle to low income customers ([item r in Table 6](#)).¹⁰

Competitive Funding of Rural Telecenter Expansion

A competitive regulatory framework alone will not suffice to lure operators to serve low-profit remote, economically depressed and sparsely populated rural areas. These areas generally lack elementary service facilities and human capital infrastructure, and are found in rugged terrains that rule out low-cost line of sight wireless communications. For example, Peru's rural inhabitants represents about 28% of the total population. As in most other countries of the world, poverty is most pervasive and pernicious in rural areas. In 1994, the number of people in rural areas living below the national poverty line was estimated at 67% compared to 46% for urban populations [World Bank 2000/1]. About 90% of the country's towns have less than 300 inhabitants; many are difficult to reach, with technology as well as by any means of transportation. The cost of serving these towns, including the cost of collecting user fees, is very high; and the potential revenues are negligible.

Notwithstanding these limitations, three Latin American countries – Perú [Cannock 2001], Chile [Wellenius 2001] and Colombia [Proenza, Bastidas-Buch and Montero 2001] – have established reverse auction programs that award subsidies on a competitive basis to operators that establish and run ICT services in low profit rural areas. Most of the auctions have been for rural telephony; but Colombia has already had two auctions to establish rural telecenters and the other two countries are planning similar programs ([item b, Table 6](#)).¹¹

Even if a poor country cannot afford to serve all rural towns, these schemes enable Governments to control how much of a subsidy they are willing and able to spend in order to serve rural communities. A suitable auction design is vital [Proenza 2002], not just to assure accountability, transparency and sustainability, but to increase competitive pressures by encouraging a large number of bidders to participate [[item r, Table 6](#)].

Democratic Networked Learning

Back in the 1970s it was evident that the returns to investment in education were highest in primary schooling, followed by secondary education. Over the next 30 years while South Asian countries were investing in basic schooling, Latin American countries dedicated their limited resources to developing their universities. Today, the skills bias in the regional population accounts for a large part of the observed inequity in Latin America's income distribution [Morley 2001].

ICTs cannot redistribute investment in education to better match economic returns and social requirements. ICTs cannot prevail over resource constraints – reflected in part in an average public expenditure on education in 1994-96 of only 3.6% of GNP

in Latin America and the Caribbean compared to 5.8% for a sample of OECD countries (Table 10)¹². ICTs also cannot overcome the discrimination that in some countries prevent indigenous peoples from earning as much as their nonindigenous counterparts, even after accounting for all skill related attributes [Patrinos]. But ICTs, combined with sound educational planning and public sector management in partnership with private sector and civil society organizations, can help lower the cost of provision of educational services and make a marked difference in extending the reach of a country's educational programs and improving the skills of the majority of the region's population.

	1984-86	1994-96		1984-86	1994-96
Latin America and Caribbean			Asia & Pacific Countries		
Argentina	1.9	3.2	China	2.5	2.3
Brazil	3.9	3.4	Rep. Korea	4.3	3.7
Guatemala	1.7	1.6	Indonesia		1.4
Paraguay	1.4	3.4	India	3.4	3.4
Colombia	2.9	4.0	Bangladesh	1.4	2.2
El Salvador	3.1	2.2	Sub-Saharan Africa		
Honduras	4.5	3.6	South Africa	6.0	7.4
Chile	4.6	3.2	Kenya	6.3	6.8
Mexico	3.9	4.8	Nigeria	1.4	0.8
Panamá	4.6	5.2	Senegal		3.9
Venezuela	4.9	5.2	Ghana	2.5	4.4
Costa Rica	5.0	4.9	North Africa and Middle East		
Nicaragua	7.1	3.7	Egypt	6.0	4.8
Dominican Rep.	1.6	2.0	Morocco	6.3	5.6
Perú	3.0	3.4	Jordan	5.4	8.1
Ecuador	3.8	3.4	Algeria	7.9	5.6
Uruguay	2.9	2.9	Eastern Europe		
Bolivia	2.1	5.2	Estonia		7.0
Haiti	1.2		Hungary	5.6	5.5
Jamaica	5.8	6.5	Czech Republic		5.4
Sample OECD Countries					
UK	5.0	5.4	Spain	3.2	5.0
US	6.1	5.4	Italy	5.0	4.8
Australia	5.6	5.5	Germany		4.8
Ireland	6.4	7.1	Norway	6.1	7.9
France	6.0	6.0	Finland	5.3	7.5
Canada	6.7	6.9	Japan	5.0	3.6

Source: <http://www.uis.unesco.org/en/stats/stats0.htm>

Note: Average provided is for years for which data is available. Some of the data "averages" are really taken over two or even only one year. Blank spaces indicate no data is available.

Formal Education

Regional strategies must address two problems: substandard primary and secondary education; and unequal education by socioeconomic strata [IADB 2000a]. Teachers in many public school systems of the region are poorly paid and poorly trained, absenteeism is widespread and accountability is lax; books and teaching materials are scarce; and administration is highly centralized at Ministerial level, with critical decisions regarding teaching assignments and promotions out of the purview of local school officials. Early childhood education, known to have a critical influence on subsequent academic achievement and productivity, is nevertheless largely neglected.

ICTs can contribute to educational reform within the region by enhancing school information, monitoring and control systems, and thus facilitating the transfer decision-making to local administrators and parents. ICTs can also help train teachers and increase the productivity of teacher and student training.¹³

Because teachers unfamiliar with ICTs soon become an obstacle to student achievement, teacher training ([item e in Table 6](#)) is a central feature of Estonia's Tiger Leap initiative to improve computer education in all of the country's secondary schools [Darling 2001].

In Latin America, the Computer Education Program in Costa Rica, financed by the Ministry of Public Education and executed by the Omar Dengo Foundation, exemplifies a long-term visionary educational program that has been applying ICTs to enhance quality and equity in education since 1988. The Ministry of Education contributes the program's resources, while the Foundation contributes the management and work methodology, produces educational materials, and executes **training programs for teachers**. The program currently delivers services to 50% of Costa Rica's primary schoolchildren, in rural and urban fringe areas. (see [FOD] and [Verdisco and Navarro 2000]). It is being expanded to cover secondary schools and provide connectivity to the Internet.

Vocational Education

Latin America's long tradition in vocational training institutions exhibits great variety in scope and effectiveness [IADB 2000b]. The most critical challenge is to match the training provided with labor market demands; especially for those programs targeted to unemployed youths and informal sector workers which in some economies represent as much as 50% of the total labor force.

Computer and Internet literacy training in vocational education programs could help strengthen graduates' ability to meet the demands of a modern labor force ([item f in Table 6](#)). ICTs could also improve the capacity of State funding agencies to monitor – through computerized systems online - the effectiveness of their vocational training programs and help them redirect funds to fields and institutions offering higher returns.

Distance Learning

In principle, the investment costs associated with developing interactive distance formal and vocational education content in Spanish could be spread out to serve many users throughout Latin America. In practice successful and cost-effective courseware is still being developed, as are suitable mechanisms for sharing such applications.¹⁴ This is one area where international cooperation – with participation of regional universities, Ministries of Education and Labor, and Technical Training Institutes - could make a significant contribution to educational reform at the service of the poor.

Adult Education

Educational programs easily bypass low-income adults because, in general, returns on investment are low. Nevertheless, initiatives like Joko Clubs in Senegal [Carney 2002], are demonstrating that ICTs make it feasible and operationally viable to train adults with basic skills ([item g in Table 6](#)), including literacy, in very low-income environments.

Networked Competitive Development

Cotahuasi is located in one of the most economically depressed, remote areas of Perú, 400 Km away from Arequipa. Per capita income is about US\$ 250/year, much lower than the national average. Travel to Cotahuasi through rugged terrain takes about 12 hours by car, if the roads are good and you manage to arrive. If you ask Manuel Tejada, Executive Director of [AEDES](#), a lead NGO working in Cotahuasi, he will tell you that he is not engaged in e-commerce, that he is only making use of computers and the Internet to make his job easier. AEDES has in fact helped identify buyers for the local organically produced *Kiwicha* in European markets, organized local producers to supply that market, and gradually built up an export business that last year enabled 235 families to sell abroad about US\$ 350,000 worth of produce.¹⁵

e-commerce? Absolutely. Nothing fancy. No hype. Solid organizational groundwork over a period of 9 years, combined with the kind of international marketing and networking that an expensive dial up connection will allow. There are many NGOs worldwide doing similar work with varying degree of success. Their support, as part of a transparent, efficient, competitive funding program based on merit, would be a high priority initiative under an *e-ForAll* development strategy ([item i in Table 6](#)).

There are many other microenterprise development initiatives applying ICTs and deserving support. Some are building up on extensive experience with microenterprise assistance but entering risky new terrain and partnering with private enterprise to provide an e-commerce solution for small firms [Hekl and Waack 2001]. Others are driven by private industry as these begin to make their purchasing online (e.g. Almacenes Exito in Colombia).

Public procurement online (e-procurement) promises to increase transparency in State purchasing and help lower fiscal expenditures. By simplifying marketing, it may also reduce the edge that scale in marketing activities may have given to large firms, now enabling micro and small producers greater participation in supplying government agencies ([item j in Table 6](#)).

With markets shifting rapidly and jobs increasingly temporary, a key labor policy objective should be to increase efficiency in the functioning of labor markets and reducing the amount of time a worker spends unemployed in between jobs. [Accenture 2002, page 21] highlights as good e-government practices the job market sites in Australia (www.jobsearch.gov.au), Canada (www.hrdc.gc.ca), and the US (www.ajb.org). Unfortunately, developing country job information and placement sites ([item h in Table 6](#)) at present tend to be poor in design and underutilized, mainly for lack of worker access to connectivity.

Networked Social Development

Building Social Capital Through ICTs

In 2001 workers of Latin American and Caribbean descent living abroad sent an estimated total of US\$ 23 billion to their home country (Table 11), about 80% from the US but also from Europe (mainly Spain, Italy and Portugal), Japan and Canada. Each worker made an average of seven to eight transfers per year on average amounting to US\$ 200 each. That adds up to about 100 million financial transactions! [MIF-IADB 2002].

Mexico	9,273
Brasil	2,600
El Salvador	1,972
Dominican Republic	1,807
Ecuador	1,400
Jamaica	959
Cuba	930
Perú	905
Haiti	810
Colombia	670
Nicaragua	610
Guatemala	584
Honduras	460
Bolivia	103
	23,083

Source: [MIF-IADB 2002]

It is **bonding social capital**, nurtured by point to point communications (snail mail, telephone, and increasingly even if slowly, the Internet) that ties family and friends across national boundaries and motivates and keeps these remittances flowing. These are not rich people; about 64% earn less than US\$ 30,000 per year and about 40% do not have a high school diploma [Bendixen & Associates 2001]. For lack of alternatives or for the sake of convenience, given the options offered by the market they are willing to pay an average of US\$ 25 every time they send US\$ 200, or 12.5% [MIF-IADB 2002]. Applying that figure to the total bill, the annual cost of sending those remittances adds up to US\$ 2.8 billion a year.

The possibilities of using ICTs to the cost of remittances are endless; e.g. through information exchange about options and prices via chat and e-mail, or through the arrival of new entrants in the remittances market – e.g. cooperatives or NGOs – that provide transfer and other banking services online.¹⁶ Once Internet access becomes common place, competition for the remittances market will accelerate and innovative entrepreneurs will develop new ways to effect electronic transfers (e.g. through telecenters) and offer the service at lower cost. For now, reaping these benefits will have to wait until these families and their relatives abroad join the Internet ([item k in Table 6](#)).

Point to point communications can also help build up **bridging social capital**. Delgadillo [2000] relates how the livelihood of a group women mussel pickers in Esmeraldas, Ecuador, was being threatened by a local chieftain who had illegally purchased the mangroves where the women harvested mussels, in order to set up

commercial shrimp farms. With assistance from a local NGO, a telecenter was established, the women were trained, and ran a campaign to call the attention of the international community. This bypassed and effectively challenged the local media that operated under the control of the mayor and local shrimp farming interests. It also helped the women establish a link with Greenpeace, who joined their efforts to ensure compliance with national legislation and eventually forced the reversal of the mangrove sale.

Addressing Insecurity

Between 1980 and 2001, 926 natural disasters caused 124,800 deaths in Latin America and the Caribbean. The number of deaths per disaster, per earthquake or per hurricane, was much higher for the region than for US and Canada jointly considered (Table 12).

	No. of Natural Disasters			Number of Deaths from:			No. of Deaths per Event		
	Total	Quakes	Hurricanes	Total	Quakes	Hurricanes	Total	Quakes	Hurricanes
The Americas	1,388	98	157	132,716	14,935	21,832	96	152	139
US and Canada	462	11	31	7,918	138	384	75	13	12
Latin America & Caribbean	926	87	126	124,798	14,797	21,448	206	170	170

Source data: <http://www.cred.be/emdat/intro.html>

This differential impact in the number of deaths per incident is not casual. Natural disasters are very prejudiced. They impact the disadvantaged in developing countries with extraordinary severity and increase the vulnerability of the poor to further misfortune. Those who die, are injured or displaced during a disaster, are those who live in bad quality housing, or who live on the edge of a hill, or who fail to evacuate for lack of information or unsuitable shelter.

Furthermore, statistics do not record the kinds of small crises that poor people face everyday. Being poor is synonymous with being vulnerable, facing hunger, malnutrition and ill health; dreading the future.

ICT use by Government and international agencies can help reduce developing countries' vulnerability to natural disasters and to other kinds of risks ([item l in Table 6](#)). [Gupta 2000] shows the contribution GIS and remote sensing are making in improving natural disaster warning and forecasting systems in India. [Corral, Winters and Gordillo] note the efforts being made by Governments, with FAO assistance, to develop a comprehensive Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) that makes extensive use of modern ICTs to help guide food security policy and programming.

Modern responses to risk management, including risks from natural disasters, also recognize the value of empowering people and communities to organize themselves and manage the risks they face ([item k in Table 6](#); see [Yodmani 2001] and [Maskrey 1993]).

Hurricane Mitch struck Honduras in October 1998, causing an estimated 14,600 deaths and displacing or otherwise affecting a total of 2.1 million people. In the months that followed, sales of Honduras mobile phones skyrocketed. Unfortunately, only those who lived close to urban areas covered by cellular service had that option.

Pakkialouchme, a 24 year-old Dalit woman¹⁷ accessing a telecenter in South India, every day gathers storm data from a US Navy web site that is subsequently broadcast through loudspeakers to fishermen who convene along the shore to hear the day's forecast. Previously, five to ten fishermen died in local storms every year, but no deaths have been recorded since the broadcasts started two years ago [Vittachi 2001].

India's Self Employed Women's Association, serving an estimated 250,000 women working in the informal sector, is using computers and the Internet in many of its operations including its health services and disaster mitigation efforts [Dalmia 2001][ILO 2001, page 195].

Special Programs

The notion that Internet use creates valuable social capital will sound hollow to readers with teenage children at home chatting their lives away. People in the US who use the Internet for information exchange (search for information and sending e-mail) tend to be more engaged in civic activities, more trusting of other people and more content with their own lives; but the reverse is true for persons who used the Internet for entertainment purposes (defined as chatting and games) [Shah, Kwak and Holbert 2001]. How these results might transfer to a developing country context is an open question, but they suggest that the impact of ICTs on social development will be conditional on user applications.

Supplementary programs specifically geared to low-income and disenfranchised groups are important because otherwise: i) the social and economic impact of establishing connectivity will be less than desirable ([item d in Table 6](#)); and ii) the depth of outreach - i.e. the ability to improve living conditions amongst the most excluded members of society - will be limited ([item m in Table 6](#)).

The indigenous people of Latin America add up to around 33 to 40 million people. They represent a large proportion of the population of Bolivia (59-81%), Guatemala (43-50%), Ecuador (35%), and Perú (40%); and are found in significant numbers in Mexico (7-13%), Chile (10%), Panamá (8%), Colombia (2.2%), Honduras (1.3%), Nicaragua (1.8%), Venezuela (0.9%) and Paraguay (0.7%).¹⁸ Indigenous people are among the most oppressed, poverty stricken group in the region. They exhibit the worst socioeconomic indicators, are for the most part excluded from positions of authority, and their possibilities for mobility within Latin American social structure are minimal [Hopenhayn and Bello 2001]. Whereas women in Latin America have achieved levels of education even superior to those of males, indigenous women show poorer levels of education, morbidity and mortality than their male cohorts.

Indigenous people have a distinct social history. Their authority and organizational structure is different, their language is different, their view of the world is often also different. They commonly lack the formal institutional structures to benefit from existing social programs or to operate with effectiveness in local markets. Reducing

poverty among indigenous people, as well as among other traditionally disenfranchised groups (which varies between societies), will require the institution of special programs ([item m in Table 6](#)) [Menou 2001] [Renshaw 2001]. ICTs can contribute in various ways, as for example in Guatemala through the training of teachers in bilingual and multicultural education, developing early childhood educational training materials, and by strengthening the cultural identity of Mayan communities (<http://www.enlacequiche.org/>).

ICTs and Poverty Reduction in National Development Policy

Vision and Commitment to Empower and Service All Citizens

Translating the potential impact of ICTs on poverty reduction into reality will require a vision for the future that puts poverty reduction as a centerpiece of national and international policy, recognizes the threat of increasing inequality in the information age, and applies the power of ICTs to combating poverty ([item p in Table 6](#)).

Beyond vision, successful promotion of ICTs for development requires awareness campaigns ([item c in Table 6](#)); a common activity in countries that have been successful in their promotion of ICTs.¹⁹ The objective is not to promise the impossible, impractical or unaffordable, but to engage the population and increase awareness of the importance of ICTs and their usefulness in everyday life.

These efforts must also lead to a commitment to make services available online that respond to the specific needs of the poor. These services need not be operated by Government directly and should not substitute private sector initiatives. [Stiglitz, Orszag and Orszag] give a useful set of rules to help determine when it is appropriate for Government to provide online services. The example of the most successful private initiatives (e-Bay being a prime example) should be followed, and engage the target clientele in defining service needs and operational requirements ([item n in Table 6](#)). These services should also be supportive of broader efforts to decentralize decision-making and to give local communities resources and a voice in shaping local development initiatives ([item o in Table 6](#)).

Institutional Viability

Information and communications technology programs and projects **involve many disciplines and sectors**, making coordination across disciplines and partnership with different kinds of public and private institutions indispensable. Achieving the necessary coordination is a complex assignment, and distributing competencies is no easy task, even if essential ([item q in Table 6](#)).²⁰ It may require a redesign of the way Government agencies interact with each other, with businesses and with civil society.

e-Government initiatives, for example, are recognizing the importance of coordinating across multiple tiers of government and are establishing Chief Information Officers to avoid wasteful duplication of effort. [Accenture 2002, pages 15-16]. And some countries are setting up special ministries (Korea) or units within existing powerful Ministries (Jamaica) or at the Office of the President (Guyana), to address the needs for interagency coordination whenever dealing with ICTs.

In planning programs to expand access to facilities and online services, inter-agency coordination and partnerships with the private sector and civil society are vital.

Consider school-run telecenters: the provision of connectivity to school labs, operated as public facilities after school hours. Commercial telecenters everywhere get very little business in the morning, which is when most schools operate and could make use of the service. Although in principle an ideal way to share scarce connectivity resources, school telecenters have in practice proven difficult to implement. School systems are usually run under highly centralized authority, whereas telecenters thrive under local management and decision-making. National school administrators are weary of sharing their school's equipment and connectivity, and they discourage the charging of fees by local school officials. Without the means to pay for operation and maintenance (be it through fees or direct support if Government can afford it) telecenter sustainability is compromised.

Some institutional frameworks are amenable to shared connectivity. In Canada, there is no equivalent to an "Education Ministry". Decisions on ICT promotion is vested on Industry Canada, which does not have to compete with other agencies in order to put in place its [SchoolNet](#) Program. An alternative, perhaps more suitable to Latin America's institutional environment, might be to turn the concept around; i.e. to establish telecenters in the vicinity of schools, run by an entrepreneur or local NGO, to service school needs during the morning (for a fee partly funded by Government), and those of the community afterwards (on a commercial basis).

CONCLUDING REMARKS

ICTs are no magic wand. Reducing poverty requires leadership, a national consensus that acknowledges poverty as a major problem to be overcome, and the will of nations to invest and make concerted long term sustained efforts to achieve equitable growth. The solutions to poverty are generally known and often require action in matters that have little to do with technology. What ICTs offer is an unprecedented set of tools; an opportunity for a win-win situation that make the provision of services and the opening of opportunities for the poor less costly to achieve than ever before. It is, nevertheless, an opportunity that needs to be seized and built upon.

e-ForAll is a guide for ICT policy design. Its recommendations, summarized in [Table 6](#), aim to offer policy makers practical and institutionally and economically viable recommendations that put poverty reduction at the forefront.

e-ForAll is work in progress. Its application is being tested on a trial basis in Peru, with funding from the Food and Agriculture Organization of the United Nations (FAO) and in collaboration with the College of Communication of the University of Texas, Perú's Ministry of Agriculture. the *Organismo Supervisor de la Inversión en Telecomunicaciones* (OSIPTEL), the Intermediate Technology Development Group (ITDG-Perú), the *Asociación Especializada para el Desarrollo Sostenible*, AEDES, and the *Centro Peruano de Estudios Sociales* (CEPES)

With adjustments for context, *e-ForAll* should be amenable for application in other countries of Latin America and the Caribbean and elsewhere.

NOTES

1. [Krueger 2002] presents a comprehensive review of income and wealth inequality in the US. See also [Krugman 2000] and [Dornbush 2000].
2. Jorgensen {2000, 2002} and [Jorgenson and Stiroh 2000] assess the impact of computers and microprocessors on US growth and productivity, [Canning 1999] focuses on the role of telecommunications, [Brynjolfsson and Hitt 2000] and [Bresnahan, Brynjolfsson and Hitt 2002] on the effect of skills and organizational changes in business processes enabled by the new technologies. [Crandall 2001] gives a good overview of these studies and emphasizes the role of networking in increasing productivity, with an evident surge evident beginning in 1995.
3. For an insightful albeit inconclusive assessment of theory and evidence see Levinsohn [2001]. Theoretical models by [Aghion 2001] and [Vindigni 2002] explain the widening wage gaps observed between skilled and unskilled workers, particularly in industrialized economies and mainly in the US and the UK, in terms of the dynamic pervasive impacts of ICTs: "major technological change" for Aghion, "skills-biased technological change for Vindigni.
4. [Bridges.org 2001] presents a good comparative review of existing e-readiness initiatives.
5. These are the 3 critical threads for poverty reduction first outlined in the World Bank's World Development Report 2000/01.
6. "The participatory nature of the Net is so fundamentally different from traditional media, that we have not really taken on board quite how revolutionary it is." Anuradha Vittachi, Director of OneWorld International Foundation, August 2001 (<http://www.oneworld.net/about/ppack/releases/Civicus.shtml>).
7. This section draws on work by [Gutiérrez 2002], [Gutiérrez and Berg 1998], [Jamison and Berg [2000], [Jamison 2000], and [Belt 2000].
8. "That [Washington] consensus...focused on privatization, but paid too little attention to the institutional infrastructure that is required to make markets work, and specifically to the importance of competition", Joseph Stiglitz, quoted in [Gutiérrez 2002].
9. "Fortunately, there is a small, very basic step we can take today that will have a huge, lasting effect on tomorrow: Price local telephone calls at a flat rate. Though most people in the United States already enjoy flat rates, the same is not true, alas, in most of Europe or the developing world. (...) Sure, nothing is ever simple, but this one is real close. Unfettered access to the Net is key to the future of education. And learning, whether it's face-to-face or at great distance, takes time. Yet metered, by-the-minute pricing fosters short-term thinking in the most elementary sense. Instead of encouraging children to explore, parents nervously watch the clock as soon as their kids log on. The incentive is to have your child spend less time learning, not more - something unimaginable with a book or a library. Ironically, the high cost associated with time spent on the Net is not from Internet access itself, which is generally flat rate, but from the local telephone bill." ([Negroponte 1998], also cited in [Doval *et al.* 2000] page 3).

10. However, in many developing countries the costs of purchasing a computer remains another major limitation on widespread individual connectivity (as opposed to through a shared facility like a telecenter).

11. With assistance from the Inter-American Development Bank, Guyana is also planning to expand Internet service to rural areas [IADB 2002].

12. The simple comparison of public expenditures in education ignores differences in the application and quality of the expenditures as well as differences in age structure. OECD countries generally have an older population than developing countries, and therefore, in principle, would require a lower level of expenditure in education as a percent of GNP.

13. The compilation of papers prepared by [Navarro, García and Wolff], based largely on articles that first appeared in TechKnowLogia, is a good introduction to the application of ICTs to formal, vocational and distance education. [Osín 1998] offers some practical guidelines for introducing computers in education in developing countries. [Potashnik and Adkins, pages 4-6] summarize some of the programs using computers in formal education in Latin America (Costa Rica, Mexico, Chile) and the Caribbean (Belize, Jamaica), and the main uses to which computers have been put by these programs (Basic Literacy and Numeracy, Productivity Tools, Programming LOGO, Constructivist pedagogy, Communication Networks and Knowledge sharing). [Alvarez *et al* 1998] examine the experience of the two most important long term initiatives in Latin America applying computers in education; i.e. that of Costa Rica and Chile.

14. "The computer and Internet media may be interactive but they remain poor and primitive media compared to the shine and punch of high quality television." [Castro 2000, page 4]. More recent efforts by US Universities appear to have developed valuable online course content, but are having problems achieving financial sustainability. [New York Times 2002].

15. AEDES has other accomplishments not covered in this paper; e.g. working with women association of producers of processed products, identifying products with an export market that are compatible with the local ecology, developing a participatory regional development strategy, giving technical assistance to farmers; and running a telecenter for the benefit of the community and local school children.

16. [Orozco 2002b] page 16, briefly mentions one such initiative sponsored by the Asociación InfoCentros in El Salvador.

17. Dalit means "oppressed". It is the present day term used to refer to persons formerly called "untouchables".

18. Data in parenthesis are taken from [Hopenhayn and Bello, page 14]. For the most part they are taken from 1990 censuses of population, but some estimates from survey data re also included.

19. For an analysis of Korea's use of mass media for such purposes see [Park 2001b].

20. This applies to nations as well as to international agencies. See, for instance, the discussion on World Bank ICT interventions in [World Bank 2001].

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