Programmes and Projects

Information and Comunication Technologies

at the Service of the Rural Poor of

Latin America and the Caribbean

This Report was prepared in 2005 by an FAO Investment Centre mission (Francisco Proenza) within the framework of the FAO/World Bank Cooperative Programme. In FAO the study was coordinated and supervised by Selim Mohor, Chief of the Latin America and the Caribbean Service of the Investment Centre Division.

The report draws on broad experience with information and communication technology (ICT) interventions in Latin America, as well as on case studies reviewing World Bank sponsored interventions in Nicaragua, by the *Proyecto de Tecnología Agrícola* (PTA) and in Ecuador, by the *Proyecto de Reducción de la Pobreza y Desarrollo Rural Local* (PROLOCAL).

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The findings and conclusions presented in the report are the responsibility of the authors and do not represent the views of FAO or the World Bank.

PROGRAMMES AND PROJECTS

Information and Communication Technologies at the Service of the Rural Poor of Latin America and the Caribbean

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Information and Communication Technologies
at the Service of the Rural Poor of
Latin America and the Caribbean

There is no reason to believe that the distribution of income that emerges out of market processes is desirable or acceptable. Unbridled market forces without any role of government might lead to a large number of people living under subsistence. This is an area for government to do something. ...As we think about the innovation economy, we should remember that most of the innovation in the private sector is based on research financed by the government, such as its role in developing the Internet.

Joseph Stiglitz, 3 September 2004, The Wall Street Journal

On the meaning of a telecenter:

"a place where I leave my pots and pans behind in search for my dreams of becoming a poet, … writing poetry in the computer."

Domestic worker, La Araucanía, Chile
Garrido, Morales y Villarroel [2002]. p. 3

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List of Acronyms and Abbreviations

AEDES	*Asociación Especializada para el Desarrollo Sostenibile (Peru)*
B2B	Business to Business
CIDEL	*Centros de Información para el Desarrollo Local (Nicaragua)*
CONATEL	Consejo Nacional de Telecomunicaciones (Ecuador)
CRTC	Canada Radio-television and Telecommunications Commission
DDEZ	Dambulla Dedicated Economic Zone (Sri Lanka)
FAO	Food and Agriculture Organization of the United Nations
IADB	Inter-American Development Bank
ICT	Information and Communication Technology
ICTA	Information and Communication Technology Agency (Sri Lanka)
IFAD	International Fund for Agricultural Development
IIIT	International Institute of Information Technology (India)
INDAP	National Institute of Agricultural Development (Chile)
MDEZ	Meegoda Dedicated Economic Zone (Sri Lanka)
MSME	Micro, Small and Medium Enterprise Development
NGO	Non-Governmental Organization
OMB	Office of Management and Budget (US)
PC	Personal Computer
PC3	Public Computer and Communication Center
PI	Public Institutions Index Rank
PROLOCAL	*Proyecto de Reducción de la Pobreza y Desarrollo Rural Local (Ecuador)*
PROMPyme	Peru Government-Sponsored MSME Support Agency
REDSERCOTEC	Technical Cooperation Service Website (Chile)
SIA	*Servicio de Información Agraria* (Nicaragua)
SICA	*Servicio de Información y Censo Agropecuario del Ministero de Agricultura y Ganadería del Ecuador*
SINIA	*Sistema Nacional de Información* Ambiental (Nicaragua)
UAE	United Arab Emirates
UCODEL	*Unidades de Comunicación para el Desarrollo Local (Nicaragua)*
UK	United Kingdom
UN	United Nations
UNESCO	The United Nations Educational, Scientific and Cultural Organization
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WEF	World Economic Forum
WiFi	Wireless Technology brand owned by WiFi Alliance
WiMax	**W**orldwide **I**nteroperability for **M**icrowave **Acc**ess

I. INTRODUCTION AND STUDY FRAMEWORK

1.   Information and Communication Technologies (ICTs) are a potentially revolutionary means of empowering the poor. Yet most people in Latin America and the Caribbean do not have access to a telephone or computers and only a few have access to broadband (Table 1).

Table 1. ICT Infrastructure Indicators - 2002/2003 - LAC and Selected Countries

	Internet Users	PCs*	Main Lines	Cell. subs.		Internet Users	PCs*	Main Lines	Cell. subs.
	per 100 inhabitants					per 100 inhabitants			
South America					**Central America and Mexico**				
Argentina	11.2	8.2	21.9	17.8	Belize	10.9	35.0	11.3	20.5
Bolivia	3.2	2.3	7.2	15.2	Costa Rica	28.8	21.8	27.8	18.1
Brazil	8.2	7.5	22.3	26.4	El Salvador	8.3	3.3	11.3	17.3
Chile	27.2	11.9	22.1	51.1	Guatemala	3.3	1.4	7.1	13.2
Colombia	5.3	21.3	17.9	14.1	Honduras	4.0	1.5	4.9	5.5
Ecuador	4.6	3.2	12.2	18.9	Nicaragua	1.7	2.9	3.7	8.5
Guyana	14.2	2.7	9.2	9.9	Panama	6.2	3.8	12.2	26.8
Paraguay	2.0	3.5	4.6	29.9	México	12.0	8.3	16.0	29.5
Perú	10.4	4.3	6.7	31.4	**Caribbean**				
Suriname	4.4	4.6	15.2	32.0	Cuba	0.9	2.4	6.4	0.3
Uruguay	11.9	11.0	28.0	19.3	Grenada	16.9	13.2	29.0	37.6
Venezuela	6.0	6.1	11.1	27.3	Haití	18.0	1.4	1.7	3.8
					Jamaica	22.8	5.4	16.9	68.0
					Rep. Dom.	10.2	n.a.	11.5	27.2
					Trinidad T.	10.6	8.0	25.0	39.9
OECD and other high ICT countries									
U.K.	42.3	40.6	59.1	91.2	Germany	47.3	48.5	65.7	78.5
U.S.A.	55.6	66.0	62.4	54.6	Norway	34.6	52.8	71.4	90.9
Australia	56.7	60.2	54.2	72.0	Finland	53.4	44.2	49.2	91.0
Ireland	31.7	42.1	49.1	88.0	Japan	48.3	38.2	47.2	67.9
France	36.6	34.7	56.6	69.6	Rep. Korea	61.0	55.8	53.8	70.1
Canada	48.4	48.7	65.1	41.9	Estonia	44.4	44.0	34.1	77.7
Spain	23.9	19.6	42.9	91.6	Portugal	19.4	13.4	41.1	89.9
Italy	33.7	23.1	48.4	101.8	Czech Rep.	30.8	17.7	36.0	96.5

Source: ITU Indicators, 2003. (www.itu.int/ITU-D/ict/statistics/).
* Most of the data is for 2003; except for PCs for which most of the indicators are for 2002,

2.   Realizing the empowering potential of ICTs will require investments that increase access in remote low productivity areas and the development of innovative applications that cater to the needs of the poor and small firms. The costs of the investment required to redress this shortfall have been decreasing rapidly, but still yield low short term private returns. The private sector cannot alone be expected to underwrite the costs of these developments. If Government does not support these public investments, economic disparities will rise, undermining social stability and future growth. (Rodríguez [undated])

_____

3.   Effective public sector action is required, to establish a regulatory and legal framework that enables the rise of a vibrant innovative competitive private telecommunications and ICT services sector, and to institute selective efficient and transparent public subsidies with high social payoff but low financial returns. This is needed most urgently precisely in contexts where public institutions are often ineffective, corrupt and unaccountable.

4.   The challenge takes added significance in Latin America and the Caribbean where many countries face serious governance challenges and have weak public institutions (Table 2; Hofman [2004]).

Table 2. . Public Institutions Quality Indicators –
Latin America and Caribbean and Selected Countries, 2003

	WEF PI Rank	Failed States Rank		WEF PI Rank	Failed States Rank
South America			**Central America and Mexico**		
Argentina	88	..	Belize	..	..
Bolivia	79	..	Costa Rica	49	..
Brazil	53	..	El Salvador	40	..
Chile	19	..	Guatemala	87	31
Colombia	60	14	Honduras	99	41
Ecuador	80	46	Nicaragua	78	..
Guyana	..	..	Panamá	71	..
Paraguay	97	36	México	50	..
Perú	54	40	**Caribbean**		
Suriname	..	..	Cuba	..	58
Uruguay	29	..	Grenada	..	..
Venezuela	89	21	Haití	102	10
			Jamaica	70	..
			Dominican Rep.	64	19
			Trinidad & T.	56	..
OECD and other high ICT countries					
U.K.	12	..	Germany	9	..
U.S.A.	17	..	Norway	16	..
Australia	4	..	Finland	2	..
Ireland	25	..	Japan	30	..
France	23	..	Rep. Korea	36	..
Canada	24	..	Estonia	28	..
Spain	31	..	Portugal	22	..
Italy	46	..	Czech Rep.	47	..

Sources/Notes:
- WEF [2004], PI Rank: Public Institutions Index Rank. A total of 102 countries were ranked. A low value means a higher rank indicating better quality of public institutions.
- Foreign Policy [2005] Only 60 countries were ranked. A low value means a higher rank, indicating higher degree of instability, measured in terms of 12 indicators: demographic pressure, refugees and displaced persons, group grievance, human flight, uneven development, economic decline, illegitimacy of the state, public services, human rights, security apparatus, factionalized elites and external intervention.

Study Objective and Benchmarks

5.   This study reviews recent experience applying ICTs in the fight against rural poverty and identifies ways in which donor interventions can make effective use of ICTs to improve the living conditions of rural communities in Latin America and the Caribbean and help reduce poverty.

6.   An intervention is considered successful if: (i) it helps reduce rural poverty and (ii) its beneficial effects are sustainable. A second order objective is that ICT development interventions should also: (iii) strengthen the efficiency, accountability and transparency of a country's public institutions.

Rural Poverty

7.   The Latin America and the Caribbean region is highly urbanized (Table 3). Overall urban poverty is higher than rural poverty, but the incidence of poverty is generally much higher in rural areas and the direst forms of poverty happen in rural settings. Isolation limits market opportunities and access to assets and services and is a major cause of severe poverty for many rural communities.

Table 3. Population and Poverty in Latin America and the Caribbean

	Population (2004)		% Poor in:		Survey Date
	Total 000	**% Rural**	**Rural**	**Urban**	
South America					
Argentina	39,311	9.4			
Bolivia	9,138	35.7	81.7	33.8	1996
Brazil	182,798	15.8	41.5	13.2	1995
Chile	16,185	12.3	14.7	5.6	1995
Colombia	45,600	22.6	31.2	8.0	1992
Ecuador	13,379	37.2	47.0	25.0	1994
Guyana	768	61.5			
Paraguay	6,018	42.2	45.3	7.5	1995
Peru	27,968	25.4	64.7	40.4	1997
Suriname	642	15.7			
Uruguay	3,463	7.0			
Venezuela	26,640	11.9	73.1	45.8	1995
Central America and Mexico					
Belize	266	51.5			
Costa Rica	4,327	38.3			
El Salvador	6,709	39.9			
Guatemala	12,978	52.8	71.9	33.7	1989
Honduras	7,257	53.6	51.0	57.0	1993
Nicaragua	5,727	41.9	76.1	31.9	1993
Panama	3,235	42.2	64.9	15.3	1997
Mexico	106,385	24.0			
Caribbean					
Cuba	11,353	24.0			
Haiti	8,549	61.2			
Jamaica	2,701	47.8			
S. Kitts and Nevis	42	66.7			
Saint Lucia	150	69.3			
Trinidad and T.	1,311	23.8	20.0	24.0	1992
Dom. Republic	8,998	39.9	29.8	10.9	1992

Sources: Population data: FAOStat
http://faostat.fao.org/faostat/collections?version=int&hasbulk=1&subset=agriculture

Poverty data: IFAD [2001], Chapter 2. The Rural Poor; www.ifad.org/poverty

8.   To have significant impact on the rural poor, ICTs must address **its causes**. The region's rural poor operate in a low productivity context. They possess few assets, and their relative isolation limits their access to quality services (e.g. transportation, education, health). Their bargaining position is weak, and they face few off-farm income earning opportunities.

Sustainability

9.   The benefits derived from ICTs should be sustainable. A systemic concept of sustainability that goes beyond the immediate effects of an individual intervention or facility is essential. In the case of telecenters[1], for example, commercial telecenters, i.e. cybercafes, are not all individually sustainable. Some fail while others thrive, but the system as a whole is resilient as long as there is a demand for the service. In a similar vein, all of the telecenters or services started by State Action **need not survive**. What is important is for these services to continue - provided by either the initial facility established through government or donor funding, or by other institutions, public or private, that arise subsequently to meet the increase in service demand stimulated by the program.

Governance

10.   ICT development often requires complex institutional changes, interagency coordination, and, in the case of e-Government, changes in the flow of administrative procedures; i.e. in "back office operations". In India, some attempts to use telecenter operators as a means of bypassing bureaucratic obstacles often falter following a change in the government leader that championed the program.[2]

11.   These disappointments cannot be blamed on "lack or waning leadership." Public sector incentives are different in very fundamental ways from those operating in the private sector (Kraemer and King [2003]). ICTs and telecenters can help expedite communications and data exchange; but there is simply no substitute for real reforms that ultimately change administrative processes and reduce opportunities for rent seeking by public officials. Realigning public sector incentives is difficult, particularly in fields that are transaction intensive and where the specificity of objectives is low; i.e. where the practical feasibility of monitoring the output performance of public services is limited. (Fukuyama [2004]).

12.   Priority should therefore be afforded to ICT interventions that require minimal or gradual institutional changes and that are relatively low risk.

Kinds of Interventions

13.   Three kinds of interventions critical to rural poverty reduction are considered in this report.

  (i)   Efforts to expand widespread and equitable **access** to communications and to the services enabled by ICTs.

  (ii)   provision of government services online: **e-Government** specifically directed to serve the needs of the rural poor.

  (iii) **digital literacy** and **community development** services.

II. ACCESS

Significance of Interactive Communications

14.	Rural people rely on a complex web of neighbors, public officials, associates, and friends, to obtain valuable and reliable information about income earning opportunities and better technology. Personalized attention, personal knowledge, confidence, and frequent interaction are fundamental to the sustainability and success of these networks in bringing about technology transfer and social and economic change. (Barrett [2004], Conley and Udry [2005], and Udry and Conley [2004])

15.	Information gathered by farmers through interaction with peers can be of enormous practical value. Much of the information obtained is idiosyncratic, such as, for example, regarding the trustworthiness and reliability of a particular input provider, the credit worthiness of a potential buyer, the price paid for potatoes at farm gate in a neighboring town, the cost of transporting produce from the village to a nearby market, present conditions of a tertiary road linking two villages, weather in the vicinity of the village, the returns achieved by a trusted neighbor from a crop grown under local conditions.

16.	Traditional media (fliers, newspapers, radio and television) are powerful means of disseminating information but have limitations as tools for personal interaction. The Internet and the telephone may be used to broadcast information but when used this way the richness of information and understanding that can be achieved through interactive exchange is lost. The Internet and the mobile phone are no substitute for face to face communications, but they can empower farmers and rural communities by enabling, expanding and strengthening networks and facilitating continuous low-cost human interaction.

17.	Communications provided through the telephone, e-mail, chatting or Internet telephony, will enable rural people to overcome some of the major constraints they face, by putting within the reach of every farmer and rural resident the ability to exchange specific idiosyncratic information about markets, projects, and community activities and local government. It will enhance their lives in many ways, as rural people are enabled to contact and keep in touch with personal networks, learn about markets, refine production techniques, and eliminate time spent on travel to get information and services. [3]

Access Options for the Poor

Mobile Telephony

18.	Telephony is the preferred mode of communication of most people, and as new applications are arising, the mobile telephone is revolutionizing the way people interact with each other, look up information and gain access to services (Castells et al [2004]).

19.	Mobile telephony requires no written language skills and little knowledge of technology. As its geographic reach expands and new applications are developed, mobile telephony will become an increasingly powerful way to communicate and provide public services to the rural poor. Some of the services that the State can begin to provide through the Internet, will gradually be adapted to increase their reach using mobile telephony.

Commercial Telecenters

20.   Given their low cost and because there exist well developed applications and services deliverable through the Internet, telecenters constitute a valued resource for **urban** ICT users. Combined with a suitable telecommunications policy, telecenters can make access to ICTs affordable by sharing the cost of connectivity and computers among users.

21.   Peru has a dense network of about 5,000 *cabinas públicas,* most of them located in Lima and other urban centers. Open competition in telecommunications, and among ISP's and *cabina* operators, have resulted in increasingly lower service costs. In May-June 2004, 49% of Lima's telecenter users were paying between US$ 0.30 and US$ 0.46 for an hour of computer/Internet use, and 34% were paying US$ 0.30 or less.

22.   Peru's *cabinas* are ubiquitous and useful to everyone, but particularly important to low income people. In May-June 2004, the proportion of Lima's population aged 8-70 using the Internet regularly (at least once a month) was 41 percent, and the proportion in the 12-50 age group was 54 percent. [Apoyo 2004]. For the age 8-70 group, Internet use is much higher in the upper (84% for "A" socioeconomic status) than the lower income brackets (37% for "D" and 30% for "E" status); and higher for men (54%) than for women (42%). Most of Lima's Internet users – 88% of those aged 8-70 – connect to the Internet through *cabinas*. *Cabina* use is a matter of convenience for the higher income groups, but for low income people they often represent the only access option. Ninety three percent of low income users (D and E) use cabinas as their habitual place to connect to the Internet (Table 4).

Table 4. Use of the Internet by Lima's Regular Internet Users Aged 8-70: Habitual Place and Places of Use by Socioeconomic Status - 2004 (%)

Habitual Place of Use				
Location	Socioeconomic Status (A highest; E lowest)			
	A	**B**	**C**	**D/E**
Cabina pública	22	56	82	93
Workplace	19	16	7	3
School	4	5	5	2
Home	52	21	4	-
House of friend or relative	2	2	2	2
Places where Lima residents Use the Internet*				
Location	Socioeconomic Status (A highest; E lowest)			
	A	**B**	**C**	**D/E**
Cabina pública	39	78	92	98
Workplace	33	23	11	4
School	16	12	11	7
Home	68	31	7	1
House of friend or relative	11	12	7	4

Source: Apoyo [2004].
*User's generally connect to the Internet from more than one location.

23.   Most of Peru's *cabina* users are quite satisfied with the service they receive. Asked to identify favourable and unfavourable attributes of *cabinas,* those who cite favourable features generally outdo the unfavourable (Table 5).

Table 5. Peruvian User Perception of Favorable and Unfavorable Attributes of *Cabinas*

Attribute	% survey users who mention this attribute as:	
	Favorable	Unfavorable
Service	30	8
Privacy	24	18
Location	24	4
Internet Browsing	24	12
Infrastructure	20	18
Price	20	3
Equipment	18	14

Source: Apoyo [2004]

VoIP

24.	The type of service provided is also important. Internet telephony (VoIP) is a service that is highly prized by low income users of *cabinas* (Table 6).

Table 6. % of Peru's *Cabina* Users who Talk on the Phone through the Internet, by Socioeconomic Status

Socioeconomic Status	% of Users
A (highest)	33
B	29
C	29
D/E (lowest)	40
All Users	33

Source: Apoyo [2005]

25.	Some countries see VoIP as an innovative technology that increases competition in the telecommunications sector and a way to lower costs and increase consumer surplus. The US's follows a minimal regulation approach (http://www.fcc.gov/voip/), requiring only basic quality standards, such as the provision that VoIP phones be able to connect to the national 911 emergency number. Canada's regulator has adopted a more aggressive asymmetric approach, allowing new entrants to the telecommunications market to provide VoIP services connecting to the incumbent carriers, but continuing to regulate pricing by the incumbents in an effort to prevent predatory pricing from stifling competition (Chamy [2005], CRTC [2005]).

26.	VoIP is a major source of income for the estimated 700 cybercafes in Nicaragua. For the rural telecenters sponsored by the Bank sponsored Agricultural Technology Project, VoIP is critical to achieving sustainability, generating about 30% of total service revenues (Proenza [2004]). VoIP is still a "grey" area in Nicaragua's regulatory environment; a service that is tolerated rather than enabled, to some extent on account of the country's present institutional uncertainties.

27.	Vinueza and Rodríguez [2004] estimated there were 166 formally registered cybercafes in Quito in 2003. Cybercafes are also commonplace in Guayaquil and are also found in Ecuador's larger towns. In Quito, the main purpose for using cybercafés is communications, with nearly 50% of users indicating that keeping contact with family and friends as their main reason objective. VoIP is an important service used by 17.5% of users surveyed in 2003.

28.   Restrictions on VoIP are stifling the development of competitive markets in many developing countries. Notwithstanding its importance to low income Ecuadorians, regulations instituted 25 January 2005 permit Cybercafes to offer Voice over Internet telephony only for international but not for national calls. (CONATEL [2005]). In Guyana, the monopoly carrier does not allow VoIP calls through cybercafés using their services. Some Guyanese ISPs using wireless technologies are competing and providing VoiP services, but are often challenged by the regulator. Similarly, in India and in Indonesia, often at the urging of incumbent monopoly or cartel operators who see their traditional source of revenue challenged, restrictions are imposed on VoIP, one of the services that is most valued by low income people. These measures sharply curtail the benefits of ICTs and undermine the viability of private investment in infrastructure and telecenter development.

Rural Telecenters

The Access Challenge

29.   Success in rural telecenter development requires achieving sustainability in low-income high cost settings, and on the adoption a new technology and new skills by a significant number of rural people residing in the vicinity of the center. These conditions preclude private sector investment in the short term. State action is required; even though the State can be very ineffective.

39.   An individual center is sustainable if it is able to generate sufficient revenues to cover operating expenses (i.e. operational sustainability), and hopefully also earn a return on investment so that it can eventually replace its capital equipment (full financial sustainability). In a competitive urban center, competition forces telecenter prices and profits down to the bare minimum, for the benefit of consumers.

31.   Figure 1 shows a telecenter profit's as a function of urbanization. Urbanization is a powerful proxy for underlying variables correlated with a cosmopolitan environment, such as high population density, low cost of connectivity, ease of making repairs and maintaining equipment, and relatively higher educational attainment of the customer base. Population density is critical, because telecenters are highly susceptible to distance. Few persons will use a telecenter located far from home or their workplace. In Peru, for example, 82% of *cabina* users walk to the *cabinas*, compared to 13% who drive or use public transport to reach them. The higher the density the easier it is to attract a steady clientele to fill the workstations.
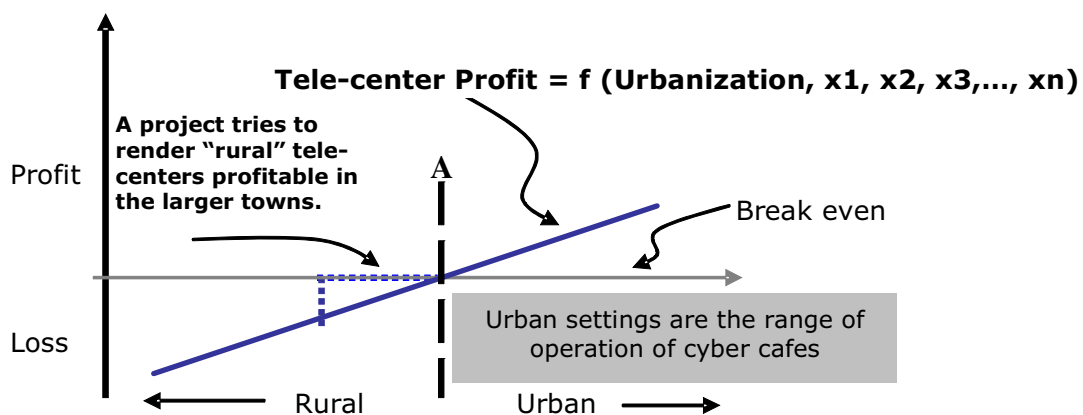

Figure 1

32.	The establishment of telecenters in very small villages is difficult because of the high cost of the infrastructure and its maintenance, and also because of low population density (long distances to the center) and the resultant limited market. **At present stage of ICT development in Latin America and the Caribbean, ICT access points most likely to become sustainable in the near term are those in medium size towns with a market potential.**

33.	Some determinants of telecenter profits may be influenced by Government action but others cannot (Table 7).

Table 7. Key Determinants of Tele-center Profits, Effect of Urbanization and Project Target Variables

	Urban	Rural	Factors amenable to change
Cost			
Connectivity	Low	High	Yes – promotion of competition in telecommunications sector
Equipment O&M	Low	High	
Software	Neutral		Yes – through national policy
Revenue			
Population density	High	Low	
Ability to pay	High	Low	Yes – but in the long term
Willingness to pay	High	Low	Yes – e.g. digital literacy training and public services online.

34.	Government cannot change a town's population density. Government also cannot improve community income overnight or otherwise affect a community's ability to pay for telecenter services in the short term.

35.	Governments can nevertheless help lower rural connectivity costs by promoting competition and encouraging new entrants in the telecommunications sector. For remote areas with limited infrastructure the establishment of grant funding using minimum subsidy competitive awards could encourage the needed investments. These contests should be technology neutral, but the most promising means of developing the rural infrastructure broadband network appears to be using wireless technologies (See Annexes A and B, and Proenza 2005b). If properly designed, these competitions will also encourage new telecommunications entrants to build their own infrastructural networks and thus increase facilities-based competition and put downward pressure on prices.

36.	On the revenue side, Government can fund programs that increase the rural resident's willingness to pay for services by increasing digital literacy and providing valuable public services online.

The Governance Challenge

37.	Many countries sponsor rural telecenter development projects to try to bring the potential benefits of telecenters to low income rural communities.[4] Telecenters, however, are highly visible and, in a rural village, a prominent "sign of progress". Every politician wants to be associated with progress. Unfortunately, political interest in a telecenter wanes shortly after inauguration. As a result, the process of telecenter program design is affected by considerations that ultimately undermine sustainability and impact (Table 8), and the process of telecenter establishment becomes politicized and lacking transparency.

Table 8. Stylized Comparison of Private vs. Public Sector Telecenter Approaches

Private Sector	Tendency of Public Programs	
Careful establishment – risks are taken only when entrepreneur is ready, after a thorough assessment of market potential and costs.	**Fast rollout. The more and the faster the better.** Inauguration takes precedence over prudence and sustainability.	**Higher risk**
Located close to the market: next to tourists, or where young people and students are found.	Tendency to go for blanket subsidies in the **poorest areas**; instead of addressing the poverty problem gradually (e.g. commencing with larger towns).	**Higher Costs**
Continuous monitoring of market trends, client needs, market prices and constant search for new customers and new opportunities for profitable service.	**Little monitoring.** After inauguration, having the telecenter as a showcase is more important than whether it is used or not. Impact tends to be secondary consideration.	**Lower service revenues** **Lower impact**
Careful pricing, discriminatory pricing: to increase revenue and profits.	**Free services or excess subsidies**, in the name of equity but to the detriment of sustainability (e.g. instead of charging high income customers and only subsidizing the poor on a selective basis).	**Lower service revenues**
Minimum staffing: use of family or low salary attendants.	**Overstaffing** is common; and so is tendency to use overqualified staff.	**Higher costs**
Minimum training; only bare minimum required.	**Excess training** in many fields, with little regard for cost or affordability.	**Higher costs**
Services provided are only those that the market will bear. Low cost premises and minimum equipment.	**Expensive equipment and furnishings and multiple services**, well beyond market requirements.	**Higher costs**
Pirated software is commonplace. Otherwise open source or low cost software (e.g. Open Office) is used.	Chosen solutions are costly, and tend to mirror those with which public servants are familiar - irrespective of cost or societal implications. They lock-in the country into using high cost proprietary technology.	**Higher costs**

38.   Where governments can afford to fund operating costs, library programs offering connectivity and computer services free of charge (e.g. in Chile (www.biblioredes.cl), Australia, and the US), can have a significant social impact in rural communities. The Korean Government also sponsors a major telecenter program, free of charge, as part of its overall digital literacy agenda (Cho [2004]). In low income developing countries, however, the financial expenditures needed to maintain the centers often become unbearable for the State; e.g. Argentina (Proenza [2003a]) and Paraguay.

39.   The more successful programs rely on management that is private or separate from Government. Entrepreneurial examples include e-Chopal (http://www.echoupal.com/default.asp; Annamalai and Rao [2003]) and the n-Logue Communication projects (www.n-logue.com; Jhunjhunwala, Narasimhan and Ramachandran [2004]), both in India; and the Public Computer and Communication Center (PC3) Project in mid-sized towns in Bulgaria (Tiff [2002]). The Hungarian telecottages, run by NGOs are mostly located in local government premises, but are operated independently from Government and also appear to be high impact and sustainable.

III. E-GOVERNMENT AT THE SERVICE OF THE POOR

Regional Overview

40.   The generally low levels of access to infrastructure typical of developing countries hold back governmental offers of content and services online. Since there is no effective demand, there is little value in supplying these services. Where telecenters are ubiquitous, however, the potential for serving the poor through online services can be realized. Telecenter sustainability is also enhanced, as the value of connectivity increases and low income users become more willing and able to connect to the Internet. The relatively large number of cybercafés throughout the region's urban centers appears sufficiently large to justify starting a program of online service specifically directed at the poor, even if for the time being the urban poor and low middle class will be the principal beneficiaries.

41.   According to the UN [2004], in April-May 2004 four Latin American countries ranked among the top 25 in terms of willingness and ability of their governments to provide services to citizens using ICTs. Chile, ranked 6th, received a higher mark than Canada, Australia, Finland, Germany, Sweden, Belgium, the Netherlands and Israel. The other high ranking Latin American countries were Mexico (11), Colombia (23) and Brazil (24).[5]

Table 9. Web Measure Index 2004 - LAC and Selected Countries

	Index	Rank		Index	Rank
South America			**Central America and Mexico**		
Argentina	0.643	22	Belize	0.216	99
Bolivia	0.255	84	Costa Rica	0.174	114
Brazil	0.637	24	El Salvador	0.394	56
Chile	0.884	6	Guatemala	0.317	72
Colombia	0.641	23	Honduras	0.243	87
Ecuador	0.243	88	Nicaragua	0.274	80
Guyana	0.208	104	Panamá	0.523	40
Paraguay	0.108	139	México	0.784	11
Perú	0.517	42	**Caribbean**		
Suriname	0.050	163	Cuba	0.093	144
Uruguay	0.483	48	Grenada	0.035	169
Venezuela	0.517	41	Haití	0.000	None
			Jamaica	0.409	52
			Dominican Rep.	0.355	64
			Trinidad & T.	0.328	68
OECD and other high ICT countries					
U.K.	0.973	3	Germany	0.795	10
U.S.A.	1.000	1	Norway	0.687	20
Australia	0.830	6	Finland	0.807	9
Ireland	0.656	19	Japan	0.629	25
France	0.541	24	Rep. Korea	0.946	4
Canada	0.873	7	Estonia	0.699	17
Spain	0.390	34	Portugal	0.394	59
Italy	0.552	33.000	Czech Rep.	0.548	34

Ranking number is within a total of 168 countries with a Web presence.
Source: UN [2004]

42.	The UN's Global e-Readiness Report [2004] identifies five stages of development of government offering of public services online.

I. **Emerging** - A few government sites with links and elementary information.

II. **Enhanced** - Expanded offer of information on government policy, but the basic approach is unidirectional, from Government to the citizen;

III. **Interactive** - Government begins to provide more conveniences to citizens, e.g. downloadable forms for tax and license renewal. Government officials can be contacted via email and the sites are updated regularly. Audio and video capability is provided for some services.

IV.**Transactional** - Two way interaction between citizens and government becomes commonplace. Forms may be downloaded (ID cards, licenses); purchases of goods and services from government may be made. Entrepreneurs can bid for goods and services online using secure links.

V. **Networked** - Mature forms of e-government services are available. Government encourages participatory decision making. Databases across different government agencies are linked.

43.	Except for the four regional leaders, Chile, Brazil, Colombia and Mexico, which have to some extent developed their capacity to interact with citizens and provide mature services online; most other countries in Latin America and the Caribbean are in the second or Enhanced stage of e-Government. They are in essence using the Internet to broadcast information, as opposed to interacting with citizens. Several – i.e. Belize, Cuba, Costa Rica, Guyana, Grenada, Paraguay, Suriname and Haiti - may be characterized as having only an emerging e-government presence.

Content Development: The Bank's Experience in Nicaragua and Ecuador

44.	Four sites created under World Bank sponsorship, two each in Ecuador and Nicaragua, have been examined as part of this study.

i. The *Servicio de Información y Censo Agropecuario del Ministerio de Agricultura y Ganadería del Ecuador*, SICA website (www.sica.gov.ec), established under World Bank sponsorship by the Agricultural Census and Information System Technical Assistance Project, and

ii.	Ecualocal (http://pydlos.ucuenca.edu.ec/ecualocal.htm), the site established by PROLOCAL to support its own work.

iii. The *Servicio de Información Agraria* portal (www.sia.net.ni), developed with Bank support by the Agricultural Technology Project. The site has been in operation since March 2003 and was formally launched October 2003. The system is fed with Ag sector information through partnership agreements established with 33 different agencies.

iv. A separate portal – not envisaged at appraisal - where community leaders can maintain information about their municipalities, including local diagnostic reports for the various communities that make up each *municipio* and that were prepared with support from the SIA training program.
(www.municipiosnicaragua.org.ni/menumapa.htm)

45.   Applying the UN criteria to these four websites, they all may be said to be in the second or Enhanced stage of development.[6]

> The SICA site offer some interactivity, in terms of forms that entrepreneurs may fill out to make offers to buy or sell products, or to be a part of the site's directory of enterprises. It is not known just how effective SICA's online market offers are.

> Present offer of content by SIA's website is fairly basic. Some of the material presented is potentially quite valuable – e.g. weekly prices at wholesale markets – but, with very few farmers with access to the Internet, the practical impact of having this information in cyberspace is probably very small. The site also enables the posting of offers to buy or sell products and services online.

> Except for the municipal portal developed by SIA, the target audiences of these four websites are primarily government planning officials and decision-makers. Services directly addressed to citizens is limited; except for the wholesale price information in the SICA site which appears to be updated regularly and should prove useful as more farmers gain regular access to the Internet.

> All of these sites require some form of maintenance or upkeep. The SICA site is not presently receiving maintenance and will soon be outdated, except perhaps if support from another donor sponsored project materializes. The *Ecualocal* site depends on regular feeding of materials from local government units. Given the weaknesses observed in local government, it is doubtful that without donor funding the required level of coordination and human effort required for updating the site will materialize. Now that SIA funding has dried up it is unclear that either the SIA or municipal portals will be maintained or even kept live.

Thematic Review of e-Government Initiatives

46.   The focus here is selective and concentrates on applications that are relatively easy to implement and maintain and that have significant potential impact on the poor. Some important applications – e.g. Rural Land Registries - are not considered, mainly on account of their complexity and for lack of regional evidence of effective institutionally viable systems.

Agricultural Marketing

Market Price Information Gathering

47.   In an attempt to increase the transparency and exchange of markets and thus lower trader margins, most Ministries of Agriculture engage in some form of regular collection of market price data. Price and market information is generally gathered at wholesale market sites by research and support staff, sometimes with the assistance of traders and farmers. This data is then disseminated using traditional broadcast media, radio, television, newspapers and fliers. The advent of the Internet is providing another low-cost means of dissemination, but presently it is not much used by farmers who have no access to ICTs.

48.   These data collection efforts are costly. Price data is site specific which means that every major market needs to be covered; and, in order to be reliable, data should also be frequently updated (e.g. daily or weekly). Notwithstanding the expense incurred, the resulting data is often deemed unreliable. Farmers consult the information posted by government, but tend to do their own search, relying more on price and market information obtained through their own network of traders, farmers, and friends.

49.   ICTs have spurred innovative efforts to lower market price collection costs. In Sri Lanka, for example, a project funded by the Information and Communications Technology Agency (ICTA) has developed a Govi Gnana (Farmer Knowledge) System to increasing the transparency, accuracy and timeliness of price information on about 130 vegetable products traded in the spot markets at Dambulla Dedicated Economic Zone (DDEZ) and in the smaller the Meegoda Dedicated Economic Zone (MDEZ) [de Silva 2004]. Local traders have agreed to feed the system, to improve performance and compete with other markets. The system is also supported by three investigators with PDAs roaming around the market verifying the information provided. Centrally located gigantic screens broadcast the information and have become popular among farmers visiting the markets. The project is considering an expansion to make the information available to farmers by telephone.

50.   These initiatives are still experimental and as yet unproven. Direct empowerment of farmers by giving them access to telephones and to the Internet, may end up being more cost effective than trying to enhance formal data collection by Government. Close monitoring and evaluation of these experiments is warranted and under way.

Online Markets

51.   E-commerce in the region is rising fast but is hardly reaching rural communities. Some of the obstacles preventing a more rapid expansion include: limited access infrastructure, lack of awareness of the Internet as a business tool, fear of insecurity of transactions and lack of trust in other market participants.

52.   Trust is the basis of commerce and human interaction is fundamental to the build up of trust (Moodley and Morris [2004]). The more successful Business to Business (B2B) market sites increase their service offerings over time, to facilitate networking, knowledge sharing, business information (e.g. insurance, finance) and the build up of trust among market participants (Ordanini [2003]).

53.   Because of network effects, online market participants tend to cluster in a few sites (e.g. e-Bay in the US; DeRemate.com, www.deremate.cl, in Chile). These select few online markets are successful, profitable and very prominent in the press. In practice, most online e-hubs provide information that can be used to identify other traders but very few engage in trade facilitation or the actual completion of transactions (Paré [2001], [2002]). The amount of new business that is being transacted through these sites appears to be small (Humphreys *et al* [2003]).

54.   Ministries of Agriculture and other public agencies throughout the region have instituted Market Online services, where farmers, traders and entrepreneurs may post offers to buy or sell products. For the most part these services are not moderated but users generally need to register with the site in order to make a posting. The sites generally show recent postings. Replies to individual postings are made either directly through a form available at the site, or through direct contact using other means (e.g. email or telephone).

55.   Nicaragua's SIA site, established under Bank sponsorship, enabled the posting of offers to sell or buy products, but user interest in this option subsided within a year's time. A similar "business rounds" system in Chile's Technical Cooperation Service website (www.redsercotec.cl) has also had limited impact. Sercotec officials presently see the site as more of training tool on online trading than as an enabler of trade. A detailed review of postings of the first year of functioning of Indonesia's online market site (see Annex C), also suggests that very little trade is being facilitated. This is remarkable, considering Indonesia's population of about 220 million and thus large number of potential online traders even at present low levels of ICT use.

56.	There appears to be little monitoring of who visits these online market sites or what effect they are having. Given the evident interest in online trade facilitation, this lack of monitoring is unfortunate, especially since the necessary data is easy to collect, and monitoring costs are low.

Micro, Small and Medium Enterprise (MSME) Development

57.	Recent years have witnessed a surge in business development services (BDS) offerings online, mostly geared to small and micro enterprise development, many provided under government sponsorship. What is the impact of these "services? It is difficult to tell because practically no monitoring is taking place. With so much duplication it is probable that many of these websites are used infrequently and yield little of practical value. What appears to be needed are comprehensive interactive portals that are responsive and enable interaction between government officials and small entrepreneurs and aspiring entrepreneurs, that uses the portal as a means of supporting other MSME promotion activities, and that monitors the effectiveness of the various services rendered.

58.	To have significant impact on MSMEs in Latin America and the Caribbean, the following need to be addressed:

(i)	lowering the costs of doing business associated with meeting Government licensing and regulatory requirements (at national and local levels);

(ii)	increasing the transparency and the information available to MSMEs so that they can participate effectively in Government procurement.

(iii)	increasing training, information and advice available online directed at the specific requirements of MSMEs,

Transactions online

59.	Governments have begun to address the cost of regulation by establishing One Stop Shops where citizens and entrepreneurs can in principle meet every requirement under one roof. Such facilities have been established for example in Bahia (http://www.sac.ba.gov.br/) and in Indonesia, for example (Asia Foundation [2004]).

60.	Modern governments make it easier for citizens and businesses to carry out transactions online. The ideal is a single one stop shop online for every kind of transaction that a citizen might be involved in (e.g. see Chile's award winning site: www.tramitefacil.cl). Some regional websites have reportedly started to post some forms and allow some transactions to be carried online; but, overall, the "back office" work that would be required to establish a more comprehensive online transactional presence is probably out of reach for many governments of the region over the short term.

Advice Online

61.	The provision of personalized **advice online**, where users determine the kind of information they need and interact directly with advisors, is a promising emergent application. Advice is available for a fee from Google Answers (http://answers.google.com/answers/), at US$ 2.50/query. Agricultural extension advice online services are also being experimented with in India, by the International Institute of Information Technology, Hyderabad, (http://agriculture.iiit.net/agrids/); and by IIT-Madras, and n-logue Communications (www.n-logue.com/services.htm).

62.   The experience of Chile's Technical Cooperation Service, SERCOTEC, with advice online stands apart from other online business development service initiatives. First, Redsercotec is a public service provided at no charge to small and micro-entrepreneurs. Second, it is directed to serve not just a narrowly defined group (e.g. farmers) but all of Chile's small entrepreneurs with a broad range of interests and needs for information and services (e.g. legal advice, training, entrepreneurship, information on specific sectors like agriculture). Third, to be able to meet a broad range of interests, SERCOTEC has partnered with many other institutions to provide expert advice. This exemplifies an effective use by the public sector of the low-cost networking power of the Internet. Fourth, the system has been operational since March 2002 and was upgraded in 2004, and SERCOTEC thus has had time to garner experience. Through trial and error and careful monitoring, the agency has drawn on this experience to increase reach and effectiveness. Fifth and most importantly, the system is low cost, easy to implement and requires low maintenance. It has significant potential for replication elsewhere, to help public agencies increase their reach and become more citizen-oriented, transparent, and accountable at reasonably low cost, provided minimum conditions of literacy, a single language and access to ICTs apply.

63.   Users registered in Chile' Redsercotec's website may send specific queries to any one of about 90 specialists (57 SERCOTEC staff members plus those of 29 partner public and private institutions) covering 45 thematic areas. For each advice category, the site gives the user a choice of several specialists, showing for each of them his or her picture, location, summary *curriculum vitae*, a record of the questions that the specialist has previously received and answered, and of the ratings that previous users have given to each response. An answer to each query is given within 48 hours. Upon receiving the advisor's reply, users are invited to rate the response on a 4-level scale from excellent to unsatisfactory.

Box 1. Sample Question and Answer – Agriculture and Livestock
26 November 2004 Query by Gladys del Carmen Almuna

Market consultation

I need information about how to start looking for markets for exclusive products (honey, home made marmalade). Is there some web page or something similar?

Thank you in advance for your kind and timely response.

Answer:

Dear Gladys,
In reference to your query it is my pleasure to inform you of the following web pages related to the market for honey and inputs for the activity:
www.apicultura.cl; www.propais.cl; www.colmenareswerner.cl

In most of these pages you will find information regarding markets, training, seminars and the cost of national and imported inputs.

Thank you for your visit, I greet you cordially,

Claudio Roa Suazo,
Business Admin. Engineer
SITEC Operator, Region VIII
Tel. 41 240062 Extension 8849
email: croa@minagro.gob.cl

64.　　　An advice online system similar to the one used in Chile would be suitable for most countries of the region which have relatively high literacy rates and, for the most part, rely on a single language. Unlike other kinds of e-government services, no major re-engineering of procedures is required; but success will require political determination to institute the system and to encourage staff participation. Chile's system is managed by a small office staffed by three people and costs of development and maintenance are low.

65.　　　Advice online is one of Redsercotec's more popular services, but it is not the only service provided. Other services include training, a list of competitive funds to which entrepreneurs may aspire, stories of successful entrepreneurial experiences, agenda of coming events, tools and diagnostic tests for entrepreneurs, and a newly established seed capital fund to help new entrepreneurs apply online for funding that will help them carry out a new project. All of these online services are well integrated into SERCOTEC's mainstream activities. Training modules available through the portal are used by Sercotec staff in their face to face training courses. The advice online service supports other activities, as advisors recommend other parts of the site and give support to the agency's regular programs. Redsercotec is closely monitored to better know the agency's clients and to get a better understanding of what services are demanded. The face to face clientele of Sercotec numbers 10,000; the number of Redsercotec's registered users as of July 2005 is nearly 30,000.

66.　　　Additional details on Chile's advice online system and some of its other online services is presented in Annex D.

State Purchases from MSMEs

67.　　　Peru's extensive telecenter network is making it possible for the Government to support MSMEs through online services. Peru's proactive approach is low cost and does not introduce distortions in market signals nor compromise the quality of products purchased. Instead the system makes effective use of the Internet, to help overcome the information barriers that traditionally prevented small enterprises from taking advantage of the enormous purchasing power of the State.

68.　　　Peru's State Purchases Law which became effective early in 2001 has significantly increased commercial opportunities for Peruvian MSMEs employing fewer than 40 workers. The law provides that these small enterprises be favored in the event of a tie in a public tender process, and, more importantly, it requires that every State agency notifies PROMPyme (the government sponsored MSME support agency) of those tender processes involving small amounts. Low value purchases matter the most, because those are the kinds of purchases that small enterprises are in a better position to supply competitively. Once PROMPyme receives the calls for proposal, it immediately notifies enterprises. A total of 14,709 users have subscribed to the PROMPyme portal and have asked to receive notices of State purchases from PROMPyme by e-mail. More suggestive, the proportion of central government purchases that were supplied by small enterprises has risen from 23 percent in 2001 to 39 percent in 2004. In 2004, US$ 756 million of goods and services purchased by State agencies were supplied by small enterprises. A more complete description of Perú's system is given in Annex E.[7]

Education

69.　　　Teachers in many public school systems of Latin America and the Caribbean 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.

70.   Regional deficiencies in education are accentuated in rural communities, with appalling results in some cases (Table 10). Rural schools are numerous in most countries, but tend to be small and to have few and poorly trained staff. It is not uncommon for a rural school teacher to have to teach several grade levels in the one and only school classroom. Rural schools are limited in terms of equipment, access to electricity and connectivity infrastructure and to the qualified services needed to maintain ICT equipment. Rural schools operate in a different cultural environment with strong links to a small poor community that is also limited in professional expertise and access to services. Geographic isolation imposes costs and limitations on students' ability to attend regularly, and on teachers' possibilities for updating their knowledge through formal training or through a professional support network (Hepp et al, [2004]).

Table 10. Illiteracy in Bolivia (1992) and Guatemala (1994) in Urban and Rural Settings

	Male		Female	
	Urban	Rural	Urban	Rural
Bolivia (1992)	3.7	23.0	13.5	49.4
Guatemala (1994)	11.2	38.5	21.6	56.9

Source: FAO-UNESCO [2003]

71.   Traditional broadcast technologies - interactive radio instruction (Dock and Helwig [1999] and interactive television programming (Castro, Wolff and García [2001]), have proven to be effective means of addressing the quality limitations of rural education at an affordable cost. These technologies are interactive in the sense that the programming plans for and allows pauses that enable students and teachers to respond, emphasize a point and learn. Modern, truly interactive ICTs, have the potential to lower the costs of improving the reach and the quality of education even further. Some regional institutions like the Fundación Cisneros are combining the power of the Internet with Television to enhance the quality of teacher education in the region.

72.   In countries where school connectivity is widespread, government portals to serve teachers and education have gained in importance. In Argentina, Educ.ar (www.educ.ar), and in Chile, Educarchile (www.educarchile.cl) are exemplary, for the quality of their offerings and their popularity amongst users. The Chilean government has made available to other governments of the region the technological platform, the educational contents, the software developed by the Fundación Chile, and the necessary technical assistance, to enable Latin American countries to adapt Educar.cl's developments to their own curricular setting. The site www.educarecuador.ec/ was the first one established under this cooperative program. In May 2004 the Ministers of Education of Argentina, Colombia, Chile, Ecuador and Mexico, agreed to establish a network of education portals throughout the region (www.educarchile.cl/ntg/docente/1556/article-90998.html).

73.   ICTs are nevertheless still scarce and expensive. Their introduction requires careful planning to avoid waste and failure. Computers at home or in the classroom may be distracting and even detrimental to students, unless put to good use through educational material available in the Internet or educational software (Fuchs and Woessmann [2004]). It is unfortunately common to find rural schools connected to the Internet, provided at high cost by public administrations, where the computers and the Internet remain unused, poorly used, or used with little link or impact on education.

74.   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 delivers services to over 50% of Costa Rica's

primary schoolchildren, in rural and urban fringe areas. (Verdisco and Navarro [2001]). A similar comprehensive long term approach to ICT use in education has been successfully followed by the Enlaces program in Chile (Hepp, et al [2004]).

75.   The introduction of ICTs in education requires no less than a "cultural change" at the school level in order for the technology to be effectively used. It is not enough to train only one or two teachers per school. A large proportion – perhaps at least over two thirds - of the teachers and administrators need to be trained in the use of ICTs at the same time in order to create the attitudinal change that encourages regular use of ICTs by the majority of the staff and generates the necessary cultural shift. A complete ICT development package designed for schools, that combines connectivity with training, and curriculum and content development is required. Rural schools pose special challenges that require plans to share scarce connectivity resources, train teachers in the use of ICTs and of digital teaching materials, and the gradual introduction of technology into the school and the community.

Local Content Development

76.   The most valuable content to a person or an enterprise is the one that set up by that person or enterprise, to advertise own products, offer services, or publicize or publish own literary, professional or artistic expression. Furthermore, the sites that are more readily maintained and updated are precisely those in which individuals or enterprises have a direct vested interest.

77.   Chile's BiblioRedes (www.biblioredes.cl) is a project of the *Dirección Nacional de Bibliotecas, Archivos y Museos*, supported by a US$ 10 million grant from the Bill and Melinda Gates Foundation. The project's objective is to provide community access to computers and the Internet through all of Chile's public libraries. BiblioRedes has a network of 368 libraries and 17 regional training laboratories providing public access to computers and the Internet and computing training to the communities they serve.

78.   The Biblioredes website (www.biblioredes.cl) enables registered Chilean users to set up their own website using a simple interface. More than 10.000 sites set up locally by people or community organizations throughout the country, many from low income users and small entrepreneurs from rural communities, are presently hosted in the portal. The sample sites listed below give a notion of the breadth of interest and local content sites that are being enabled and hosted by Biblioredes.

> **Community Organizations and Preservation of Heritage**
> > Region IX: Asociación Indígena "Antü Ñi Fotüm"
> > > (www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/Asociacion+Indigena+Chile+Chico/Portada.htm)
> > Region IX Aonikenk
> > > (www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/Gente+del+sur/aonikenk.htm)
> **Institutions**
> > Region X Legal Aid Corporation Panguipulli
> > > (www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/cajpangui/consultorio.htm)
> > Region IX Elderly Adults "Father Las Casas"
> > > (www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/adultomayorplc/adultomayorplc.htm)
> > Region VI Assistance to the Impaired Peñaflor
> > > (www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/OASIP/oasip.htm)

Entrepreneurs

Region X Heavy Machinery (operator of heavy machinery)
(www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/maquinarias/Informacion.htm)

Region XI Boat Travel Jorge Montt (operator of small 15 person boat)
(www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/ventisquero/inicio.htm)

Metropolitan Region: Flor de Liz" Reiki Academy (natural healing training school)

(www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/Gladys+Jeannet/Que+es+el+Reiki)

Region IX NYCRA Products (Born and Raised in Aysen Products; fish products)
(www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/nacido+y+criado+en+Aysen/NYCRA.htm)

Artistic Expression

Region IV: Religious Dance "St. Peter's Guardians"
(www.biblioredes.cl/BiblioRed/Nosotros+en+Internet/caleta+san+pedro/Baile+Religioso)

79.   The possibility to make their own website and have it hosted at Biblioredes is a service provided free of charge to Chileans. It is a low-cost public service that gives individuals and small profit and not for profits organizations the means of having their own presence in the World Wide Web. The Biblioredes project includes an important research component that will help determine the impact that these websites are having on people's livelihoods. For now, the enthusiasm shown to date suggests that users have a high esteem for the service.

ICT Applied Research and Innovation to Serve the Poor

80.   Much of India's recent ascent to prominence in the field of ICTs finds its roots in the highly subsidized system of 11 technology centers of innovation and excellence known as the India Institute of Technology. In all, there are 11 of these centers distributed throughout the country. A 60 Minutes characterization of the IIT is that of a University where India's brightest secondary graduates apply as their top choice, with the US Massachusetts Institute of Technology as a second option just in case IIT does not accept them.

81.   The Department of Electrical Engineering of IIT-Madras (www.iitm.ac.in/) and its research group (www.tenet.res.in/) have developed a program dedicated to bringing ICT services to all of India's villages. Its work covers: i. Development of applications that add value to the ICT experience of low-income rural users; and ii. Incubation of business enterprises, based on the commercial exploitation of the technologies developed. The Tenet website (www.tenet.res.in/Activities/Products/index.php) describes the principal technologies that have been developed, some of which include:

(i)   Wireless connectivity CorDECT technology developed and commercially exploited by Midas Communication Technologies (www.midascomm.com/). CorDECT functions as a telephone exchange to distribute Wireless connections;

(ii)   Low bandwidth videoconferencing system that enables medical consultations, agricultural technical assistance online (Box 2), and distance learning;

(iii)   Medical diagnostic kits to serve rural communities remotely;

(iv)   Banking teller machines suitable and secure to service rural areas.

Box 2. Technical Assistance through Videoconferencing
Because India is a land of many languages, a purely text based system of advice online (as Chile's Redsercotec) would be impractical. Instead, n-logue's provision of technical advice using ICTs uses a low bandwidth videoconferencing application developed by IIT Madras and commercialized by Oops (www.oops-india.com/), as well as through the exchange of highly compacted videoclips.

82.   One of the enterprises launched by the Tenet group is n-logue Communications (www.n-logue.com/). n-logue has installed 2,400 rural kiosks, each equipped with a computer, a digital camera and a printer. n-logue runs as a three-tired commercial franchise. In order for each kiosk in the franchise to be sustainable, company officials estimate that each kiosk should earn an average of about US$ 90/month. This is a low value, achievable in India where the optical fiber network reaches close to every village, but also thanks to a technological innovation, CorDECT, also developed at IIT-Madras.

83.   Through its operating 2,400 kiosks in Southern India, n-logue is showing: i. that rural telecenters can be commercially viable, ii. the importance of combining access with the development of suitable applications that address the specific needs of the poor and increase the value of their Internet experience, and iii. that, contrary to popular belief, the rural poor can afford and are willing to pay for telecenter services that are of practical value. (See Table 11; and review also Table 7).

84.   Some universities and research centers in Latin America and the Caribbean – e.g. Reuna and UFRO in Chile, Unicamp in Brazil, U. Los Andes in Colombia - are engaged in innovative ICT research, but there appears to be nothing similar to IIT Madras' dedication to developing sustainable low-cost applications to serve the needs of the poor. Given the inequality in the region's distribution of income, and the tendency of ICT development to be lopsided and tend toward increasing income inequality, a similar center serving all countries of the region could fill an important gap in research for sustainable and innovative high productivity development.

Table 11. Price List for Chiraag Kiosk Services (n-Logue, Madras)

No	Name of Product/Service	Unit	(US$)
	Education		
1	Blue Certified Computer Course (6 – 9 yrs)	Per student	1.72
1	Blue Plus (6 – 9 yrs advanced)	Per student	5.74
2	Green Certified Computer Course (10 – 16 yrs)	Per student	2.30
3	Red Certified Computer Course (17 & Above)	Per student	6.89
4	Spoken English	Per student/month	5.74
5	Online Test and Tutorial for Class 10	Per student/month	0.69
6	Chiraag Children's Centre	Per Student for 2 weekdays, Sat & Sun	0.23
	Careers		
1	Chiraag Resume-maker	2 sets of printouts	1.15
	Chiraag Studio		
1	Color Passport Size photographs	Set of 5 Nos	0.46
		1 Photo	0.11
2	ID card with lamination – single	1 no.	0.34
3	ID card with lamination – bulk order	1 no.	0.28
4	Visiting card	1 no.	0.28
	Browsing		
1		1-15 Minutes	0.23
2		16-30 Minutes	0.34
3		31-60 Minutes	0.57
	Email		
1	Email – text	1 mail	0.23
2	Video Mail	1 mail	0.34
	Queries to Experts - email or Video-conferencing		
1	To government officials		
2	Health	Per Query or Session	0.23
3	Agriculture		
4	Veterinary		
	Astro-Vision		
1	Lifesign Full Horoscope	40 pages	4.13
2	Lifesign Horoscope with predictions	25 pages	2.99
3	Lifesign Basic Horoscope (charts)	16 pages	1.84
4	Lifesign Single Page report	1 page	0.57
5	Horoscope Matching (Porutham)	40 pages	0.69
6	Numerology	8 pages	1.38
	Matrimonial		
1	Entering profile	Per profile	1.15
2	Viewing Profiles	As per time used	

Source: Courtesy of n-Logue Communications; www.n-logue.co.in

e-Government Content Development Processes

85.   Lack of coordination between government agencies is a major cause behind the failure of many e-Government initiatives. Lack of coordination commonly leads to: duplication of effort and excess investment, duplicate offers of public content by different agencies, the development of expensive data systems using specialized protocols that do not interact with each other, and the establishment of government sponsored telecenter initiatives that either undermine private development, do not make full use of scarce connectivity resources (a public sponsored telecenter is set up in the vicinity of the school, but has no link to the school) or follow dissimilar rules and send different signals to the public.

86.	There are many instances of interagency coordination failure in ICT development in the region. There is, for instance, little interaction between the agencies that plan and execute telecenter and rural connectivity initiatives in Nicaragua (Mannila [2003]). Telcor's telecenters do not charge for services, whereas the CIDELs aim to reach full operational sustainability. The four regional nodes of the *Sistema Nacional de Información Ambiental* (www.sinia.net.ni/que_es_sinia/nod_reg.htm) look like telecenters, have several workstations, for the most part underutilized, but are not open to the public. While there may be good reasons for this, the search for ways to make more intensive use of the facilities would seem warranted. There is also no evidence that the few existing telecenters are providing scarce connectivity resources to support of the work of schools, notwithstanding the intent of the Ministry of Education and the World Bank's PASEN project [2004c] to do so in the future.

87.	Similarly, weak coordination between rural and agriculture development agencies is considered to be a major constraint on SIA's ability to collect and offer valuable content from partners.

88.	Successful interagency coordination in e-government requires the establishment of a central clearing house to peer-review and vet e-government initiatives. These units generally rely on committees with broad participation of all segments of society and, when effectively structured, ultimately lead to the establishment of binding e-government protocols and procedures to which all public agencies adhere. There is not a single unique formula for the underlying institutional arrangements, but they tend to be prominent, well funded, and have full backing from the highest government authority.[8] In Chile the Ministry of Economy plays a major coordination role; in the U.K the lead agency is the Office of the Chief Envoy; in Colombia, it is the Connectivity Agenda; in Canada it is Industry Canada; and in the US it is The Office of Management and Budget (OMB).

IV. DIGITAL LITERACY AND COMMUNITY DEVELOPMENT

The Human Side of Access

89.   Throughout the world in countries with low digital literacy, the difference between adults who use ICTs and those who do not are striking. The following situations have been encountered in the past 12 months:

> - In Nicaragua, an on the spot survey (10 November 2004) of about 20 participants during a local training meeting of the Muy Muy UCODEL reveals that all of the participants were appreciative of the project sponsored telecenters (known as CIDELs) as an important agent of "progress and modernization"; yet only about 8 of them had actually used the CIDELs telephone services and none had used the Internet (although apparently some of their children had). All of the meeting participants lived farther than 2 km away from the CIDEL.
>
> In Jequitinhonha, a poor and remote area of Minas Gerais, Brasil, three different instances were found in which computers and connectivity were installed in suitable premises (1 primary school, 1 center for disabled students, and 1 community center), the need to use the facilities was palpable, yet the equipment was not being used because no one nearby knew how to.
>
> - A high ranking public official in Jakarta, manager of a nominal staff of over 30,000 people, does not use email, is not familiar with the Internet, and finds little use for computers or the Internet either for either personal or work related purposes.
>
> - At a meeting of the Farmer Leader's Organization (the one sponsoring the primary school), representatives in attendance are asked if they have used the computer and the Internet. Their response: "Why ask such a silly question? We all use computers and the Internet for at least for 2 hours a day."

90.   No verbal explanation or practical demonstration of the marvels of ICTs can substitute for sitting down in front of a computer connected to the Net and working yourself with it for a few days. Furthermore, ICT use is subject to network effects. If only a few friends and associates use the telephone, telephony is of limited value. It is when the network is large that it makes sense to use the telephone, the computer or the Internet. It is when many family and friends may be contacted through the phone or through email that people find a reason to learn how to use the technology. When it comes to computers and the Internet, attaining access by adults often requires overcoming computer anxiety, a phenomenon which affects adults more often than children.

91.   Through market forces alone the use of computers and the Internet will eventually reach a critical mass of micro-entrepreneurs and rural poor, and network effects will accelerate the process making it appealing for the majority of the rural and micro-entrepreneurial population to use the technology. The process could take several generations.

92.   To reduce the lag time, funding of digital literacy campaigns to train select low-income groups has become part of national efforts to further ICT development and is usually incorporated into broader ICT programs. Digital literacy program stimulate demand, and tend to be self-targeted, as high income people do not generally need ICT training.

93.   In Korea, Government carried out mass media informatization campaigns (Park [2001]) and established Education Information Centers in schools and post offices, used to provided free or low cost information education to an estimated 10 million people, mainly students, government staff, soldiers and housewives (Lee [2002]).

94.   Chile's national digital literacy campaign (Gobierno de Chile [2004]) provides for digital literacy training of 500,000 people in 2003-2005 (www.alfabetizaciondigital.cl, www.mineduc.cl/alfabetizacion/). The program runs in parallel with its telecenter program and includes digital literacy training to users of public library telecenter users (www.biblioredes.cl) as well as specific efforts directed at farmers (Subsecretaria de Agricultura [2004]). For additional details of the program see Annex F.

Community Development

95.   Civil society organizations in many countries are beginning to make effective use of ICTs (Boxes 3, 4 and 5).

The e-Sri Lanka Development Project (World Bank [2004]), and the Jamaica Information and Communication Technology Project sponsored by the IADB [2002], provide small grant funding to innovative uses of ICTs that benefit low income communities. A similar program should be considered for other countries in Latin America and the Caribbean, using suitably transparent competitive funding mechanisms.

Box 3. ICTs and Women's Empowerment in Ecuador

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, and 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.

Box 4. Air Putih in Banda Aceh , Indonesia

Air Putih, started as an online chat group of IT professionals. When the Tsunami hit Aceh 26 December 2004, some of its members decided they had to do something to help the victims: "We just had to".

With assistance from Indonesian Information Technology Federation, they formed the Aceh Media Center, and set up wireless Internet kiosks across the city for aid groups and journalists. Their website (acehmedia center.or.id/eng/) had over 100,000 hits in its first month of operations. The site includes frequent news updates and a database of missing persons. Relief groups say that the service has been invaluable to their relief work.

Unfortunately, Air Putih has also had to face a regulatory nightmare in regard to the importation of specialized equipment in terms of the licensing, tax exemption, frequency allocation etc. that in many ways has hampered effectiveness. Getting approval of the fiber optic equipment for example, involved getting the approval of 23 government departments which took 3 months (in part on account of security concerns in the area). On account of the delays in getting tax exemption status, Air Putih now faces a bill of 290 million rupiah from the Ministry of Finance that has yet to be resolved.

Sources: Christian Science Monitor, January 25, 2005; Air Putih presentation at ICT Workshop, Jakarta, June 7, 2005

Box 5. Empowerment through ICTs in Cotahuasi, Perú

Cotahuasi is one of the most economically depressed, remote areas of Perú, situated 400 Km away from Arequipa. Per capita income is about US$ 150/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.

AEDES (www.aedes.com.pe), a lead NGO working in Cotahuasi, has used computers and the Internet to identify buyers for the local organically produced *Kiwicha* in European markets, and has organized local producers to supply that market, and gradually built up an export business that in 2002 enabled 270 families to sell abroad about US$ 400,000 worth of produce.

V. RECOMMENDATIONS

Access

R1 To promote rural access to ICTs Governments should, first and foremost, focus on creating the conditions necessary for private investment in infrastructure by fostering **facilities-based competition** in the country's telecommunications sector.

R2 **Regulations** that limit the ability of new entrants into the telecommunications sector to compete effectively should be eliminated. This is particularly true of restrictions on the use of Internet telephony. VoIP is one of the services that is most valued by the poor, and limits on its use also dampen potential returns to rural investments in infrastructure.

R3 **Telecenter development** is a potentially powerful way of expanding ICTs to rural areas, but it is also a high risk undertaking. Governments and donors considering a telecenter initiative, would do well by:

> i. starting in mid size towns that offer the greatest prospects of sustainability over the short term but that are presently not being served by the private sector;

> ii. to avoid undermining private initiative, including as prior condition to the establishment of any new telecenter, certification that there is no cybercafe present within a radius of 2 km;

> iii. applying smart subsidies that in essence outsource establishment and management of telecenters to private entrepreneurs;

> iv. the simultaneous launching of a parallel program of digital literacy is important, to ensure that the facilities established are actually used for practical purposes by the intended beneficiaries.

E-Government at the Service of the Poor

96.   Promising e-Government applications require institutional leadership, specialized development and regular upkeep. Those considered here are medium to low-level in terms of institutional complexity. Applications requiring substantial changes in the law, customs or administrative procedures are shunned, even if they might otherwise hold promise in the future. The recommendations made have been crafted so that the immediate implementation steps do not involve complicated changes in administrative procedures. Where possible, the practical considerations that made adoption feasible in other developing countries are outlined.

97.   By facilitating management and by giving support to local initiatives, most of the proposals recommended will help further communications and enhance decentralized governance. As all powerful content is, these applications are meant to empower citizens by enabling interaction with government and with the rest of the world.

Agricultural Marketing

R4   i. Systems that enable the posting of offers to buy and sell agricultural products are easy to establish, require little maintenance and provide a way for Governments to serve their citizens and learn basic principles and experiment with e-commerce. They are generally not very effective and are unlikely to substitute commercial market websites. It would be unwise and wasteful for Governments to try to compete with such private market initiatives.

ii. Some agricultural marketing services will continue to be provided by government, as is the case with prices collected at wholesale produce markets. Monitoring of ongoing experimentations that seek to improve the reliability and reduce the costs of data gathering is recommended, for possible application in the region.

iii. Given the rapid expansion of mobile telephones throughout the region, it may be advisable in particular country settings to expand the reach of existing online price information systems through SMS messages sent to registered mobile telephone.

Micro, Small and Medium Enterprise Development

R5   A feasibility study geared to finding ways of using ICTs to contribute to a reduction in informational and transaction requirements associated with doing business and exporting is recommended. The main focus would be on requirements that directly affect informal and Rural MSMEs.

R6   Most countries of Latin America and the Caribbean would benefit from the establishment of an **Advice Online** system geared to provide practical advice to small existing and aspiring entrepreneurs, including farmers.

i. Such advice online systems should aim to serve a broad spectrum of small entrepreneurs and not focus exclusively on a narrowly defined sector group. The public sector will thus engage the full power of networking that ICTs offers, across government agencies and with civil society. Farmers and other users will also benefit, for they will be treated as entrepreneurs with a broad range of interests that goes beyond agriculture technology or agricultural marketing. Farmers and other entrepreneurs will thus be served with the advice they need, not that which a particular agency can offer, all through a single convenient easy to use portal. And individual agencies will retain their own institutional identity.

ii. The larger countries (e.g. Mexico, Brazil, Colombia, Argentina) are in a position to afford to establish their own national systems, and may find that it institutionally viable to do so.

iii. Smaller countries with weaker public services may also set up their own systems. One possible option, however, would be to partner with Sercotec in Chile, and with other systems as these are developed, to join forces in serving the micro, small and medium entrepreneurs of the region.

iv. English speaking countries in the region could also establish their own system, perhaps under the sponsorship of a regional entity such as CARICOM.

R7 The introduction in other countries of Latin America and the Caribbean of programs similar to the Peruvian State purchases system deserves consideration.

Such a system would reinforce present regional efforts to fight corruption. It would also increase competition for State purchases, increase the demand for goods and services from the formal MSME sector and, by stimulating Internet use through a very practical application, help MSMEs lower their overall communications and transaction costs and thus strengthen their competitiveness. Actual implementation of the system would not be technically demanding for participating agencies, but the passage of legislation sanctioning the new system and requiring notification to a centralized agency would be indispensable. Given the increasing use of mobile phones, notification through SMSs should be considered.

Education

R8 A **comprehensive operational program** that covers all aspects of ICT in education deserves consideration in some countries. This program should envisage the provision of connectivity combined with support for teacher and administrator training, and the development of curriculum and teaching materials. Proper sequencing of activities needs to be planned for to ensure full utilization of ICT equipment. Rural schools will need to address special requirements.

R9 The **development and dissemination of educational content** online deserves support to expand the present offerings aimed at students, teachers and parents. Ideally, content development should be part and parcel of comprehensive national programs (as recommended in R8), but this may not always be feasible and content in itself may help those teachers, parents and students with connectivity. Educational content development will enhance teacher and student experience and simultaneously encourage and help school administrators and teachers to get a better grasp of the advantages of using ICTs for educational purposes.

R10 Support of the Regional Network of Educational portals is recommended, especially to aid in the development of specific content that serves rural communities.

Local Content Development

R11 Public agencies can and should make it easier for citizens to set up and host online simple web pages, to enable micro and small enterprises and civil society organizations advertise their goods and services and put on display the work they do on behalf of the community. It is a fairly low cost and effective way to increase the value of the Internet and empower low-income communities.

ICT Applied Research and Innovation to Serve the Poor

R12 It is recommended that donors encourage innovation for poverty reduction in Latin America and the Caribbean, through a competitive grant awarded to a regional research institution (or consortium) with the best proposal for establishing a Center for Innovation in ICTs for Social Development. The winning proposal should follow a business incubation approach, focus on innovations that benefit the poor (urban and rural); and have good prospect of long term sustainability. The main challenges to address are: i. development of technologies to expand low-cost access in rural communities; ii. applications that serve the needs of the poor.

e-Government Content Development Process

R13 Some of the "best practice" principles recommended for adoption in the development of e-Government applications throughout the region are:

> i. a citizen oriented approach, under which ministries coordinate closely to avoid duplication of effort and so that a citizen is not required to navigate through a jungle of sector sites in order to get the service that she needs;

> ii. the adoption of nation wide interoperability framework that enables sector ministries to develop their own systems according to their expertise and requirements, but that also follow a set of general standards and guidelines that enable these systems to "talk" to each other and share data[9];

> iii. stepwise gradual developments in e-government services are generally preferred to large mega projects, and the latter, when necessary, should be subject of a rigorous system of peer review involving experts from several ministries, academicians and civil society.[10]

> iv. ICTs make it easy and low-cost to monitor impact and effectiveness. Further experimentation with e-Government initiatives should emphasize user registration and user monitoring and feedback, including periodic surveys of user satisfaction.

Digital Literacy and Community Development

R14 In many countries of the region funding of a digital literacy training program deserves consideration, in order to promote widespread, equitable, accelerated use of computer and the Internet. The bulk of these programs are likely to be self-targeted, but experience in some countries (e.g. Korea) suggests that high impact can be effected by targeting government officials, micro-entrepreneurs, farmer leaders and leaders of women development groups and grass roots organizations.

R15 The establishment of competitive grant funds, to encourage the implementation by civil society organizations of high impact ICT applications for rural poverty reduction is recommended. In principle, these initiatives could be funded through ongoing community development projects. In practice, some form of stimulus will be needed; either separate funding, or, if existing community development funds are used, through awareness raising and training of program staff or NGOs in the possibilities offered by ICTs.

Impact, Sustainability and Institutional Feasibility of Recommendations

98.   Table 12 presents a **subjective** assessment of the potential effect on the rural poor, sustainability and governance, and of the institutional complexity and risk of failure, of the principal recommendations made in this report. Recommendations R4, R5 and R13, offer guidance based on lessons of experience but are not considered here. Table 12 focuses instead on recommendations that could result in significant State interventions. The recommendations are for "national initiatives" that could be implemented in each country, except for R10 and R12 which propose support to regional initiatives. Given regional variety in the ICT development and Governance in the region, the assessment is very preliminary and highly subjective, and therefore subject to different interpretations and adjustment from country to country.

Table 12. Subjective Assessment of Impact, Institutional Feasibility Governance and Risk of Recommened Initiatives

		Potential Impact on			Institutional Complexity/ Risk
		Rural Poor	Sustainability	Governance	
R1 R2	Promotion of facilities-based competition. Elimination of barriers (e.g. on VoIP)	Very High	Medium	High	High
R3	Establishment of telecenters in medium size towns, relying on smart subsidies and private sector mgmt.	High	Medium	High	High
R6	Advice Online for SMSEs	Medium - Low	High	High	Low
R7	State purchases from MSMEs through online info.	Low	Medium	High	Medium
R8	Comprehensive ICT use in Education Program.	Medium - Low	High	High	High
R9	Dev. & dissemination of educational content.	Medium - Low	Medium	Low	Medium
R10	Support Regional Network of Educational Portals	Medium - Low	Medium	Low	Medium
R11	Facilitation of local content	Medium	High	Medium	Medium
R12	Center ICT innovation for poverty reduction.	High	Medium	Medium	Low
R14	Digital literacy training.	High	High	Medium	Low
R15	ICT development for poverty reduction by civil society.	Medium	Medium	Medium	Medium

Access

e-Government

Digital Literacy & Com. Dev.

Impact on the Rural Poor

99.   The most important set of actions that Governments in the region can take is to promote rural access to ICTs through the promotion of facilities based competition in the telecommunications sector (**R1**), in part by eliminating barriers to new entrants in the sector (**R2**). Only after the telecommunications sector is subjected to vigorous competition, will infrastructure expand and the costs of connectivity in rural areas decrease. Once this occurs, the other recommendations appearing in Table 12 will immediately gain in importance in terms of their potential impact on the rural poor.

100.	A rural telecenter program could have significant impact on the poor, but only if it is carefully crafted and if the risk of political manipulation can be warded off. Experience shows that this is a major challenge.

101.	The impact of any digital literacy campaign will be limited to areas where connectivity is available and relatively low-cost. Presently, a few rural areas in the region meet these conditions and, where they do, digital literacy training directed at key potential users, can have a major effect on the rural poor, especially when run in parallel with a rural telecenter initiative.

102.	Because of widespread lack of access and high cost of access; all other interventions are rated low or medium in terms of their rural impact. The impact on the rural poor of these other interventions is conditional on access to ICTs, and rural access will expand very slowly until Governments come to terms with the need to expand competition and eliminate barriers to services that are useful to poor people like VoIP. These recommendations are proposed here, because they will have considerable impact on low income urban populations with access to the Internet and because they represent important first steps to increasing the value of connectivity for low income rural dwellers.

Sustainability

103.	The design of each of the interventions proposed will very much affect its prospects for sustainability. The assessment given is an approximation based on experience in other countries. Where they have been put into practice (Chile, United Arab Emirates), once they have been instituted the Advice Online system (R8) is not costly or difficult to maintain. Local content pages (R11) are maintained regularly by the owners themselves. (facilities based competition), and the impacts of well designed educational ICT (R8) and digital literacy (R14) interventions can lead to lasting increases in productivity. The remaining interventions have all been assigned "medium" level sustainability, as a catch all category, for lack of specific information about country or program design.

Impact on Governance

104.	The first six recommendations appearing in Table 12 (R1, R2, R3, R6, and R8) will have a significant impact on Governance, if their implementation is successful. The difficulty lies precisely in that some of these are also the most complex and challenging to implement. R1 and R2, for example, require a good and independent telecommunications regulator, and are often subjected to the challenge of powerful economic interests with a lot of resources and a lot of money at stake. R8 requires complex planning of many simultaneous activities covering a broad range of fields in order to implement a comprehensive and effective ICT educational program.

Institutional Complexity - Risk of Failure

105.	Introducing the proposed changes will require leadership of high order, and will not always be easy. The adoption of an aggressive pro competition policy for the telecommunications sector (R1 and R2) will be extremely difficult. Many powerful agents with diverse interests have very high stakes in keeping the present state of affairs unchanged.

106.	The risk of failure on account of political meddling will be high for any telecenter program adopted by Government (R3).

107.   The establishment of an advice online system will not be difficult. Interagency coordination, however, is often complicated, even though highly desirable in order to offer the public a unified single entry point for advice online covering a broad range of topics.

108.   The establishment of an information system which advices small entrepreneurs of State tenders of small quantity purchases is not itself complex; but the passage of a law requiring public agencies to inform a central service unit will require the political determination to do so (R7). The establishment digital literacy campaigns (R14), and of competitive grant funding to stimulate community development initiatives that make effective use of ICTs (R15) are also regarded as having a low level of complexity.

109.   Both regional proposals are regarded to have medium risk. Support to the exchange and adaptation of educational content and materials through the Regional Network of Educational Portals merits consideration, because it is a clear need and one in which countries have agreed to cooperate and network. With respect to R12, there are centers of academic excellence in the region that could be ready to establish a regional ICT Center for innovation for poverty reduction (R12). The fact that there is a fairly successful model already in place in India is encouraging. The planning of the proposal could be carried out with assistance from IIT Madras, which may also be interested in partnering and staff exchange with the proposed Latin America and Caribbean Center.

Concluding Remarks

110.   There is considerable room for government action and World Bank support to help leverage the economies of scale and public goods attributes and externalities that are common features of ICTs, and that could help increase the competitiveness and redress rural poverty in Latin American and the Caribbean.

111.   Moving forward requires ICT development, but also involves the adoption of a parallel agenda to overcome limitations in spheres that have little to do with technology or connectivity, but that are nevertheless fundamental. Competitive countries are those that vigorously pursue ICT development, but they are also those that have sound macroeconomic management, solid institutions that protect the rule of law and property rights, public agencies that are effective and transparent and experience low levels of corruption, and in which all citizens feels and take part in the decision making process and share in the fruits of growth and prosperity.

112.   ICT development requires a comprehensive integrated approach, wide participation and close communication and interaction among the different social stakeholders and a streamlining of the organizational structures and functioning of the public agencies in the region. These are fundamental changes in which international cooperation can make an enormous contribution. They are also likely to require profound changes in the way in which donors approach a field that cuts across and requires cooperation across several sectors.

Notes

1. The term "telecenter" is often used in connection with donor sponsored multipurpose community centers. Here the term is used more broadly, in reference to locales that provide public shared access to ICT services, regardless of services provided or who "owns", sponsors or manages the center. (Proenza [2001]).

2. The experience of the Gyandoot and the Sustainable Access in Rural India (Sari) projects illustrate the point.

> For encouraging reviews of the Gyandoot experience see (www.dhar.nic.in/GYANDOOT.htm) and Gamos & Big World [2003]. For a more sober update see IIM-Ahmedabad [2002].

> For a review of how the Sari project managed to provide valuable e-government services for a while but subsequently faltered, see Srinivasan [2004] and Kumar and Best [2005].

3. 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].

4. See examples in Badshah, Khan and Garrido [2004] for Asia, and, for South America, in IADB [2004]). A listing of telecenter programs in South America is given in Annex A.

5. The UN [2004] report does not calculate the ranks presented on Table 9. Instead, it estimates a Web Presence Index, a Human Capital Index and a Telecom index in order to derive a composite e-Government readiness index which is estimated by assigning 1/3 weigh to each of the 3 base indices. In this report we have used the Web Presence Index to rank countries.

The Web Measure ranking provides a measure of how different countries fare with respect to the offer of public services by their national governments via the Web. The UN [2004] estimates the Web presence indexes through a careful analysis of national country portals. For details, see UN [2004], especially pages 163-165.

6. The detailed review of these 4 sites is available in Proenza [2004] and Proenza [2005].

7. Valuable resources on e-procurement are available in the Electronic Government Procurement (e-GP) Portal (www.mdb-egp.org/data/default.asp) sponsored by the Multi-lateral Development Banks.

8. Well documented examples of suitable institutional arrangements are available, for instance from RAND (Anderson, et al. [2003]), in reference to State e-government initiatives in the US. See also Schware [2000], [2003].

9. Examples include, for the UK (Office of the e-Envoy [2004]), for Colombia (Agenda [2004]) and for Brazil (Governo Brasileiro [2004]).

10. For an example see the UK's Gateway Review process at: www.ogc.gov.uk/index.asp?id=377.

Works Cited

Apoyo, Uso y Actitudes hacia Internet, 2004.

Agenda de Conectividad, "Mejores Prácticas y Estándares para la implementación de Tecnologías de Información y Comunicaciones (TIC) en el Estado colombiano", 20 May 2004. (www.agenda.gov.co/documents/files/InteroperabilidadParaIG.DOC)

Anderson, Robert, Tora K. Bilkson, Rosalind Lewis, Joy Moini, and Susan Straus, "Effective Use of Information Technology: Lessons about State Governance Structures and Processes", RAND Corporation, Science and Technology study prepared for Bureau of State Audits, 2003. (www.rand.org/publications/MR/MR1704).

Asia Foundation, "Streamlining Business Licensing and Registration", July 2004. (www.asiafoundation.org/pdf/indo_StreamliningBusiness.pdf)

Barrett, Christopher, "Smallholder Identities and Social Networks: The Challenge of Improving Productivity and Welfare", April 2004. (www.he.cornell.edu/cfnpp/images/wp152.pdf)

Badshah, Akhtar, Sarbuland Khan and María Garrido, Connected for Development: Information Kiosks and Sustainability, UNICT Task Force Series No. 4, Department of Economic and Social Affairs, November 2003. (www.unicttaskforce.org/wsis/publications/Connected%20for%20Development.pdf)

Canada Radio-television and Telecommunications Commission (CRTC), "Regulatory framework for voice communication services using Internet Protocol", 12 May 2005. (www.crtc.gc.ca/eng/NEWS/RELEASES/2005/r050512.htm)

Castells, Manuel, Mireia Fernández-Ardevol, Jack Linchuan Qiu and Araba Sey, The Mobile Communication Society: A cross cultural analysis of available evidence on the social uses of wireless communication technology", Annenberg Research Network on International Communication, 2004. (http://annenberg.usc.edu/international_communication/WirelessWorkshop/MCS.pdf)

Chamy, Ben, "Canada Regulation Free for VoIP Startups", CNet, 12 May 2005. (http://news.com.com/Canada+regulation-free+for+VoIP+startups/2100-1037_3-5705216.html)

Cho, C. M., "Korea's Effort to Build Telecenters as a Tool to Close the Digital Divide", September 2004. (www.adbi.org/conf-seminar-papers/2005/03/17/963.korea.telecenters.tool/)

CONATEL, "Resolución -073-02-CONATEL-2005", 25 January 2005. (www.conatel.gov.ec/descargas/formatopdf/resolucion73-02-2005.pdf)

Conley, Timothy G. and Udry, Christopher R., "Learning about New Technology: Pineapple in Ghana", July 2005 (www.econ.yale.edu/~cru2//pdf/july2005a.pdf)

de Moura Castro, Claudio, Lawrence Wolff, and Norma García, "Mexico's Telesecundaria: Bringing Education by Television to Rural Areas", in <u>Making Technologies Work for Education in Latin America and the Caribbean: Notes on Issues, Policies and Innovations,</u> December 2001.
(www.iadb.org/sds/publication/publication_2690_e.htm)

Dock, Alan, and John Helwig, Interactive Radio Instruction: Impact, Sustainability, and Future Directions, 1999.
(www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000094946_9911010 5304461)

Fuchs, Thomas, and Ludger Woessmann, "Computers and Student Learning: Bivariate and Multivariate Evidence on the Availability and Use of Computers at Home and at School", CESifo Working Paper No. 1321, November 2004.
(http://papers.ssrn.com/sol3/papers.cfm?abstract_id=619101)

Fukuyama, Francis, <u>State-Building: Governance and World Order in the 21st Century</u>, Cornell University Press, May 2004. (www.sais-jhu.edu/Faculty/fukuyama/State-Building)

Gamos Ltd. and Big World, Sustainable Initiatives: Gyandoot, Madyha Pradesh, Information and Communication Technology Case Study, 2003.
(www.sustainableicts.org/Gyandoot%20F.pdf)

Garrido, Rodrigo, Manuel Morales y Alejandra Villarroel, "Aportando a la Disminución de la Brecha Digital en Comunidades de Bajo Desarrollo Humano de la Araucanía: El Rol de la Red de Operadores de Telecentros Comunitarios", 2002.
(www.virtualeduca.org/virtual/actas2002/actas02/513.pdf)

Gobierno de Chile, "Campaña Nacional de Alfabetización Digital", 2004 (www.alfabetizaciondigital.cl).

Governo Brasileiro, e-PING: Padrões de Interoperabilidade de Governo Eletrônico, 31 Maio 2004.
(www.governoeletronico.gov.br/governoeletronico/publicacao/down_anexo.wsp?tmp.arquivo=E15_24115_1e-ping_minuta_v0_31052004_consulta.pdf)

Hepp K., Pedro, Enrique Hinostroza S. Ernesto Laval M. Lucio Rehbein F., "Technology in Schools: Education, ICT and the Knowledge Society", October 2004.
(www1.worldbank.org/education/pdf/ICT_report_oct04a.pdf)

Humphrey, John, "Business-to-business e-commerce and access to global markets: exclusive or inclusive outcomes?", Institute of Development Studies, January 2002.

Humphrey, John, Robin Mansell, Daniel Paré and Hubert Schmitz, " The Reality of E-Commerce with Developing Countries", March 2003.

Indian Institute of Management Ahmedabad (IIM-Ahmedabad), Rural Cybercafes on Intranet: Dhar Madhya Pradesh, India – A Cost Benefit Evaluation Study, October 2002.
(www.iimahd.ernet.in/egov/documents/gyandoot-evaluation.pdf)

Inter-American Development Bank, Information and Communication Technologies in Support of South American Competitiveness and Integration, December 2003.
(www.iadb.org/regions/re3/pdf/IIRSA0204.pdf)

Inter-American Development Bank, Jamaica: Information and Communication Technology, Loan proposal (JA 0116). Project approved, 2002, (www.iadb.org/EXR/doc98/apr/ja1438e.pdf)

International Telecommunications Union, "Cellular subscribers", 2004.

International Telecommunications Union, "Information technology", 2004a.

Kraemer, Kenneth L., and John Leslie King, Information Technology and Administrative Reform: Will the Time After E-Government be Different?, *Center for Research on Information Technology and Organizations. I.T. in Government*. Paper 337. August 2003. (http://repositories.cdlib.org/crito/government/337/)

Kumar, Rajendra, and Michael Best, "Impact and Sustainability of E-Government Services in Developing Countries: Lessons Learned from Tamil Nadu, India, Forthcoming, The Information Society, 2005.

Lee, Nae-Chan, "Broadband Internet Service: Korea's Experience", February 2002. (www.mic.go.kr/eng/res/res_pub_db/res_pub_sep_brd/Broadband_Internet_in_Korea_2002.pdf)

Moodley, Sagren, and Mike Morris, "Does E-commerce Fulfil its Promise for Developing Country (South African) Garment Export Producers?, Oxford Development Studies, Vol. 32, No. 2, June 2004.

Office of the e-Envoy, e-Government Interoperability Framework, 30 April 2004. (www.govtalk.gov.uk/documents/e-gif-v6-0.pdf)

Ordanini, Andrea, "The Effects of Participation on B-to-B Exchanges: a Resource-Based View", Center for Research on Information Technology and Organization, CRITO, September 2003.

Paré, Daniel J., Does this Site Deliver? B2B e-Commerce Services for Developing Countries, The London School of Economics and Political Science, 28 October 2001. (www.gapresearch.org/production/DanArticleFIN.pdf)

Paré, Daniel J., B2B e-Commerce Services for Developing Countries: Disentangling Myth from Reality, The London School of Economics and Political Science, 23 September 2002.

Park, Han Woo, "The Korea Information Society and Mass Media", 2001.

Priowirjanto, Gatot Hari, "ICT Development in Indonesian TVET, Power Point Presentation (undated, circa 2005).

Proenza, Francisco J., "Telecenter Sustainability: Myths and Opportunities", Journal of Development Communication, December 2001 (www.fao.org/Waicent/FAOINFO/AGRICULT/ags/Agsp/pdf/ProenzaTelecenter.pdf)

Proenza, Francisco J., Argentina: Establecimiento y experiencia inicial de los Centros Tecnológicos Comunitarios, May 2003a. (www.e-paratodos.org/pdf/CTCsPrimerosAnos.pdf)

Proenza, Francisco J., State Purchases from Micro, Small and Medium Enterprises - The Peruvian Experience, November 2003b, in <u>Connected for Development: Information Kiosks and Sustainability</u>, November 2003b.
(www.unicttaskforce.org/wsis/publications/Connected%20for%20Development.pdf)

Proenza, Francisco J., Nicaragua Case Study: Review of Agricultural Information System and Proposals for Future Development, FAO Investment Centre Report, November 2004.
(www.e-forall.org/pdf/NicaraguaCaseStudy_14Dec2004.pdf)

Proenza, Francisco J., Ecuador Case Study: Information and Communications Technology in Support of Local Development, FAO Investment Centre Report, May 2005a.
(www.e-forall.org/pdf/EcuadorCaseStudy_May2005.pdf)

Proenza, Francisco J., The Road to Broadband Development in Developing Countries is through Competition Driven by Wireless and VoIP, October 2005b.
(http://arnic.info/workshop05.php)

Rodríguez, Francisco, Does Information Technology Raise Inequality?, Working Paper, University of Maryland.(www.bsos.umd.edu/econ/rodriguez/information.pdf)

Schware, Robert, "Information Technology and Public Sector Management in Developing Countries: Present Status and Future Prospects", Indian Journal of Public Administration, October 2000.
(www1.worldbank.org/publicsector/egov/Schware.pdf)

Schware, Robert, "Information and Communications Technology (ICT) Agencies: Functions, structures, and best operational practices", September 2003.
(http://wbln0018.worldbank.org/ict/resources.nsf/InfoResources/73F31A6AF7FC3E5E85256DA400504B5F)

Srinivasan, Janaki, Sustainable Access in Rural India (SARI) project, Madurai, Tamilnadu. 2004.
(www.iiitb.ac.in/ICTforD/SARI%20final.pdf)

Tiff, Jeanne D. Summative Evaluation: Bulgaria Public Computer and Communication Center (PC3) PROJECT, Academy for Educational Development, 2002.

Tregurtha, Norma, and Nick Vink, " B2B E-Commerce and the South African Horticultural Export Industry: current status and future directions", University of Stellenbosch, August 2002.

Udry, Christopher R. and Conley, Timothy G., "Social Networks in Ghana", May 2004.
(http://papers.ssrn.com/sol3/papers.cfm?abstract_id=555699)

Verdisco, Aimee and Carlos Navarro, Costa Rica: Teacher Training for Education Technology, 2001 in <u>Making Technologies Work for Education in Latin America and the Caribbean: Notes on Issues, Policies and Innovations</u>, December 2001.
(www.iadb.org/sds/publication/publication_2690_e.htm)

World Bank, "e-Sri Lanka Development Project", Project Appraisal Document, August 24, 2004.
(http://web.worldbank.org/external/projects/main?pagePK=104231&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P081771)

World Economic Forum, Global Competitiveness Report 2004-2005, (www.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme%5CGlobal+Competitiveness+Report)

Annex A. Telecenters in South America

Information and Communication Technologies at the Service of the Rural Poor of Latin America and the Caribbean

Annex A. Public Sponsored Telecenter Programs in South America

				No. of Telecenters	
Country	**Sponsor**	**Target Group**	**Implementation**	**In operation**	**Total 2003/04**
Argentina	Presidencia (2000); Sec. Comunicacines (marzo 2001)	comunidades marginales; 40% rurales	Esquema de selección privilegió criterios políticos; gran variedad de instituciones locales seleccionadas	1281 CTCs, 1745 bibliotecas populares. Se desconoce cuantos operan.	(entre US$ 20 a 40 millones)
Bolivia	Viceministerio de Transporte, Comunicación y Aeronáutica Civil	poblaciones con hasta 10,000 habitantes	Concurso declarado desierto; a ser relanzado por nuevo gobierno		340 (US$ 30 mill.)
Brasil	Prefeitura São Paulo	comunidades carentes ubicadas en zonas de mayor pobreza en la ciudad,	Ubicación determinada por Indice de Desarrollo Humano; administrado directamente por Prefeitura, con apoyo de Consejo Local	20 en operación, todos usando sistema Linux	80
	SEBRAE - Ministério de Industria y Comercio - Comite para Democratização da Informática (CDI)	micro y pequeño empresario	Concurso público, seleccionando instituciones locales como ejecutores aplicando metodología CDI	Proyecto comienza con un esquema piloto donde se pone a prueba la metodología combinada CDI - SEBRAE	108
	Correios do Brasil	usuarios del servicio postal en todo el país			4176 kioscos de acceso a Internet en 3759 agencias
	Ministério das Comunicações	ciudadanía en general	Concurso público, adjudicado a empresa Gilat		2,800 kioscos/ 369 centros
Colombia	Programa COMPARTEL de Secretaría de Comunicaciones - Telefonía ampliado a incluir puntos de acceso a Internet	660 centros (2 computadoras) en comunidades rurales < 1000 hab	Concurso público adjudicado a Gilat	670 en operación (Sept. 2002); subsidio de US$ 40 millones	
	COMPARTEL - Internet Social	265 Centros (5-12 computadoras) en 261 cabeceras municipales de > 10,000 habitantes	Concurso adjudicado a consorcio (Telefónica) utilizando equipo satelital Hughes	265 en operación (Sept 2002)	
	COMPARTEL - Telecentros	500 Telecentros en cabeceras municipales y centros poblados	Concurso adjudicado a Gilat		500 subsidio de US$ 40 millones

Public Sponsored Telecenter (w. Internet access) Programs - South America (page 1 of 2)

Information and Communication Technologies at the Service of the Rural Poor of Latin America and the Caribbean
Annex A. Public Sponsored Telecenter Programs in South America

Public Sponsored Telecenter (w. Internet access) Programs - South America (page 2 of 2)

Countru	Sponsor	Target Group	Implementation	No. of Telecenters In operation	No. of Telecenters Total 2003/04
	Subsecretaría de Telecomunicaciones	áreas rurales	concurso público en nodos de 8 comunidades cada uno - requiere alianzas y aporte local	78	83 1er concurso; 211 2o concurso; inversión: US$ 4.1 millones; subsidio/centro: US$ 14,000 (est.)
	Programa Enlaces y Min. de Educación	apertura a comunidad de escuelas conectadas a Internet	concurso entre escuelas de la Red Enlace		500
Chile	Dirección de Bibliotecas, Archivos y Museos (DIBAM)	usuarios de bibliotecas	Ejecutado por DIBAM, en consorcio con las municipalidades del país, de las cuales dependen las bibliotecas, y con apoyos de otras entidades para elaboración de contenidos.		368 (US$ 20 millones; incluyendo donación de 9.3 millones Fundación Gates y US$1.2 millones en software de Microsoft)
	Servicio de Cooperación Técnica (Sercotec) y Min. Economía	micro y pequeño empresario	concurso público - requiere alianzas y aporte local	61	110
	Fondo Solidario de Inversión Social (FOSIS)	micro y pequeño empresario		55	
Guyana	Presidencia - Proyecto BID (aprobación prevista Dic. 2002)	comunidades rurales	Concurso público		25 puestos de correo; 33 rurales próximos a escuelas secundarias
Paraguay	USAID - Municipalidad de Asunción	Ciudadanía - municipalidad Asunción	por Municipalidad, con Comité de Apoyo en cada Centro	12 establecidos (1998-2000); 11 operando (2002)	
	Fondo de Inversión en Telecomunicaciones (FITEL) - Telefonía Rural	Capitales de Distrito (Telefonía con cabina de Internet en algunos sitios)	población en capitales de distrito (500 hab, circa)	494 cabinas (FITEL II y FITEL III; a partir de 2000, aun en ejecución)	
Perú	FITEL - Cabinas de Internet en Capitales de Distrito (CABINET)	Capitales de Distrito - (Concurso público bajo consideración)	911 capitales de distrito: 272 con 1400 hab y más; 504 con entre 500 y 1400 hab; 135 con menos de 500 hab.		911 US$ 28 millones (monto referencial)
Venezuela	Centro Nac. de Tecnología del Min. de Ciencia y Tec.	áreas rurales y desfavorecidas	instituciones descentralizadas de gobierno	240 establecidos (2000-2001)	

Annex B
Technology Primer for Rural Connectivity

Telecenters are very sensitive to distance. It is easy to occupy an urban telecenter with paying customers, but people will not walk more than 1 km - 2 km at most - to make regular use of a telecenter. This is why commercial telecenters (cybercafes) thrive in urban areas, but require some sort of subsidy in rural communities.[1]

The difficulty posed by a sparse population is generally overcome through wireless connectivity and by planning your program to serve small, say 1-4 computer telecenters. A second worthwhile strategy is to aggregate demand from a combination of public rural users (e.g. schools, municipalities, health clinics). This has been proposed in connection with operations for Guyana (www.iadb.org/EXR/doc98/pro/uGY0066.pdf) and Sri Lanka. A third more experimental option is to use the rural telecenter as a base, from which you can retransmit the connectivity to service other users in neighboring areas.

Technological Options

VSATs have proven to be the most effective wireless technology to serve rural telecenters in the region. Practically all of the subsidies granted competitively to service rural telecenter programs in the region - mainly in Chile, Colombia, Perú and Brasil, have been awarded to companies using VSAT technology. These auctions have in principle been "technology neutral", but VSATs have won because they are cost effective in serving rugged terrains. Also, because VSATs have been successful in the region, the main VSAT companies (mainly Gilat, but to some extent also Hughes) have developed an extensive marketingand service network that enables them to offer competitive prices. The cost of operation and the subsidy awarded depends on the degree of remoteness of the towns to be served, their size, and on the way that the tender is structured.[2]

WiFi (Wireless Fidelity based on the IEEE 802.11 standard) is an appealing technology for serving rural areas. It operates in the range of the electromagnetic spectrum that in many countries is unregulated and that is used by microwave ovens and cordless phones. *WiFi* can in principle be used to expand the range of connectivity within a relatively broad radius of about 300 feet; i.e. to retransmit connectivity from a telecenter or any other base station. Last year Intel partnered with a Spanish company to provide connectivity to Zamora, a small town of 64,000 people, using *WiFi* to connect paying customers. A system of about 300 hundred antennas were installed throughout the town. For a small initial investment of Euro 100 to purchase of a small box ("somewhat larger than a pack of cigarettes") connected to a computer's USB port, plus a monthly fee of $10/month, customers could achieve broadband speeds of up to 2 Mg/s. Unfortunately, recent news accounts report the commercial failure of the enterprise, as a result of overuse of the system and poor maintenance of the facilities. There are also some efforts on the part of the municipality to revive the project.
 (http://www.zamoraes.com/modules.php?name=News&file=article&sid=284).

Another ongoing experiment with WiFi is taking place in southern Chile, in Valparaiso and Temuco (www.inalambrico.reuna.cl/). In contrast with the Zamora experiment which was basically a for-profit operation, the Chilean experience is being carried out by an academic institution with funding awarded by Corfo.

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[1] When planning a arural telecenter program you are trying to do two things: (i) provide a subsidy that is not too expensive (you cannot afford to serve very small sparsely populated communities with telecenters); (ii) make sure that you do undermine private enterprise by subsidizing telecenters in communities that are sufficiently large to support commercial operations.

[2] The IIRSA study previously cited gives some actual figures for some of these awards.

WiMax is another promising technology based on the IEEE 802.16 standard. It is expected to deliver broadband over an average area of 3-5 miles at relatively low cost. It is still under development and commercial deployment is expected in 2006-2007 in the US. (http://www.intel.com/netcomms/technologies/wimax/).

The Institute for Connectivity of the Americas (ICA) is promoting e-Link Americas, an initiative to provide 256/128-256-1 Mg kbps connectivity to rural communities, using **Digital Video Broadcasting with return channel via satellite (DVB-RCS).** The cost at each connect point is estimated at US$ 1,500/hardware and service expenses in the $75-400 range. DVB-RCS may be characterised as "a marriage between VSAT and TV. It's the easy way to provide interactive broadband over satellite."
(www.dvb.org/documents/white-papers/DVBRCSbkgrbk1sted20021126.pdf, page 13). E-Links Americas hopes to begin selling its services to NGOs throughout region, starting in Bolivia.

The use of electricity grid to transmit broadband (Powerline Communications or PLC) is another interesting technology, which has not been much utilized in practice.

There is some ongoing experimentation with ad hoc solutions. ITU has for instance developed a radio packed technology to retransmit connectivity from their telecenters in Valle de Angeles, Honduras. Their experiments are promising, but have been carried out in a highly subsidized and in a community, Valle de Angeles, that is relatively well off.

Regulation

The extent to which regulatory regimes allow the use of new innovative technologies is a critical issue. Most telecom markets in LAC have been privatized and the regulatory regimes are fairly well developed. Still, one often encounters regulations that encumber the adoption of new technologies. Finding out which are feasible and which are not generally requires considerable investigative work. For example, WiFi is presently limited in Peru, because, apparently, in the interim period between Fujimori and Toledo, the bandwidth where WiFi operates operates was exclusively granted to one operator. To be able to use WiFi technology and the required bandwidth will require migration of the license that was granted to another bandwidth.

The e-Links Americas initiative plans to pursue what would appear to be a reasonable strategy for dealing with regulatory issues: (a) Partner with *existing licensed operators* in each country; (b) work with the regional consortium (REGULATEL) and individual regulators to *modernize regulatory and licensing* for broadband wireless internet access; and (c) obtain special access licenses where warranted.

Concluding Remarks

There is a need to expand experimentation with new innovative technologies. Relatively little monies are presently being spent on experimentation and development, to serve the rural low income settings that are typical in Latin America.

Annex C. Indonesia's Market Online Service

Indonesia's Ministry of Agriculture has instituted a Market Online service, which appears prominently in its website (http://agribisnis.deptan.go.id/FORUM/default.asp). The service enables the posting of offers to buy and sell products. The service is not moderated and users need not register in order to make a posting. The site shows the most recent postings. Replies to postings may be made directly through a simple form available in the site, or through email, the telephone or other means. The number of postings grew rapidly during the system's first year.

Figure 2.
Ministry of Agriculture Market Data
Number of Offers to Buy or Sell in
Jan-Nov 2004
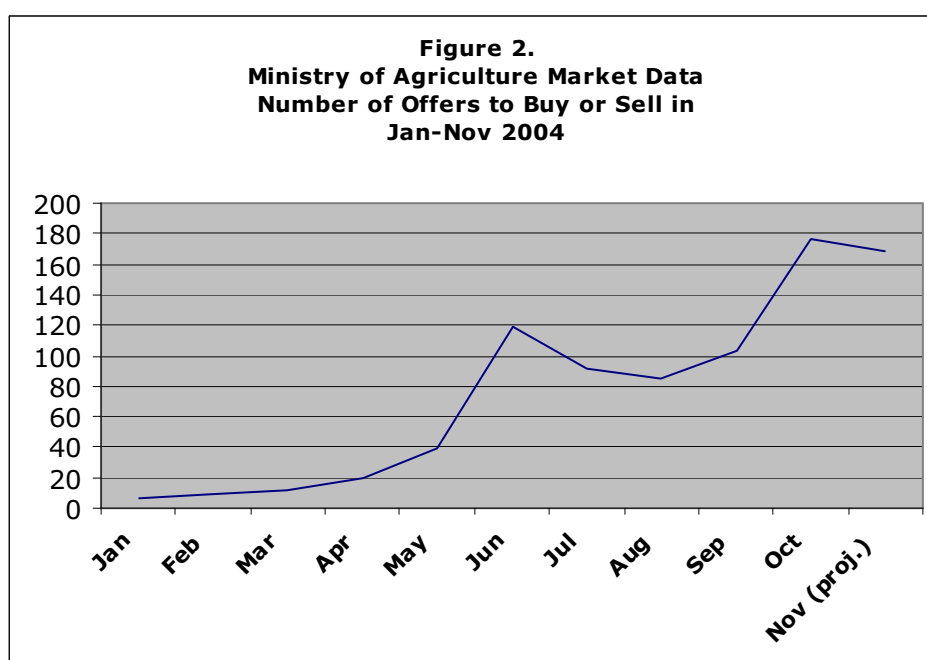
To get a notion of the extent to which these postings are actually facilitating trade, a the postings made between January and November 2004, 860 in all, were examined. The range of products referenced is very broad, about 250 different products. Most of the postings were offers to sell (77%) as opposed to offers to buy (23%). But, as shown in the table below, only 5 products were referenced in more than 20 postings; and only 18 persons or enterprises posted more than once at least one month apart.

Products Referenced more than 20 times in Market
Postings to Indonesia's Ministry of Agriculture
Market Online Service

Product	No. of Postings
Vanilla	125
Red Papua	60
Clove	25
Corn	22
Ginger	21

A follow up e-mail survey of all 860 postings made suggests that these generate some interest among buyers and sellers of agricultural products. But although the system is generating some traffic and some interaction between users, there is little evidence that much trade is actually taking place between the system's participants.

This finding is not surprising. The same occurs elsewhere. In Nicaragua, interest in a similar system subsided shortly after its institution in mid 2003. In the case of Chile, the system's limitations are recognized, and it is presently used mainly as tool for training new ICT users in the use of the Internet for online marketing.

Annex D. Chile Redsercotec's Advice Online Service*

Introduction

This paper examines the experience of a promising advice online service developed and supported by Chile's Technical Cooperation Service. SERCOTEC is Chile's agency charged with promoting the development of the country's micro and small enterprises. SERCOTEC's web portal, Redsercotec (www.redsercotec.cl), supports the agency's mainstream activities through the online provision of services and information to the agency's clients.

SERCOTEC's experience with advice online stands apart from other online BDS initiatives. First, Redsercotec is a public service provided at no charge to small and micro-entrepreneurs. Second, it is directed to serve not just a narrowly defined group (e.g. farmers) but all of Chile's small entrepreneurs with a broad range of interests and needs for information and services (e.g. legal advice, training, entrepreneurship, information on specific sectors like agriculture). Third, to be able to meet a broad range of interests, SERCOTEC has partnered with many other institutions to provide expert advice. This exemplifies an effective use by the public sector of the low-cost networking power of the Internet. Fourth, the system has been operational since March 2002 and was upgraded in 2004, and SERCOTEC thus has had time to garner experience. Through trial and error and careful monitoring, the agency has drawn on this experience to increase reach and effectiveness. Fifth and most importantly, the system is low cost, easy to implement and requires low maintenance. It has significant potential for replication elsewhere, to help public agencies increase their reach and become more citizen-oriented, transparent, and accountable at reasonably low cost, provided minimum conditions of literacy, a single language and access to ICTs apply.

How the system Works

Users registered in the site may send specific queries to any one of about 90 specialists (57 SERCOTEC staff members plus those of 29 partner public and private institutions) covering 45 thematic areas. For each advice category, the site gives the user a choice of several specialists, showing for each of them his or her picture, location, summary *curriculum vitae*, a record of the questions that the specialist has previously received and answered, and of the ratings that previous users have given to each response. An answer to each query is given within 48 hours. Upon receiving the advisor's reply, users are invited to rate the response on a 4-level scale from excellent to unsatisfactory.

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When the system was started it relied exclusively on SERCOTEC's staff, but soon was expanded by adding advisors through partnerships with other institutions. Partner advisors participate in the service at no cost to SERCOTEC. Three types of partnership arrangements are used: i. Formal Agreement of Collaboration between SERCOTEC and the partner organization; ii. Letter of intent between both parties; and iii. Word of mouth agreement, used occasionally in the case of highly qualified professionals with no formal institutional links but who offer to collaborate on a voluntary basis.

Sample Question and Answer – Agriculture and Livestock
  18 June 2004 Query
    Question:
      Greetings Dear Pedro,

      The information you gave me last time has been quite useful, thank you.

      A new doubt arose for which I have been looking for an answer but that I have not been able to resolve. This is why I take the liberty to ask you, to see if you can get a response.

      Oregano oil is not sold in its pure state, but mixed with other oils (e.g. olive) in a 40% to 60% or 50% to 50% ratio.
      Why is this? Is it that pure oil is not feasible?

      Sincerely,

      Segundo Henriquez
    Answer:
      Mr. Henriquez

      From what I have been able to find out, the reason behind the mixture is that when pure oregano oil is used on the skin or directly ingested it will most likely cause burs or strong irritation. AS you probably know oregano oil is a very powerful disinfectant, which eliminates fungus, bacteria, microbes and even viruses, and is also used to disinfect surfaces. Furthermore, it has anti-inflammatory properties and regulates digestion. For these reasons, it is commonly used mixed with other more neutral oils, generally extra-virgin olive oil.

      Sincerely yours,

      Rodrigo Salinas O.
      SITEC R. M.

Presently there are 57 SERCOTEC staff advisors supporting the system, complemented by advisors from twenty nine private, public and academic organizations (Table 1 lists the 25 active in 2005). Sometimes a partner will assume responsibility for providing the advice as an agency. In other instances individual experts within a partner organization are chosen. From a user's perspective, SERCOTEC's partnerships mean a comprehensive service, with more thematic options from which to choose. A user may for example direct his agriculture related query to a SERCOTEC agriculture specialist, or, if he prefers, to the National Institute of Agricultural Development (INDAP).

The system is user friendly with individualized interfaces for both advisors and registered users. Communication with advisors and users is via email. Whenever a query is directed to an advisor, the system sends an email to inform her. Whenever a user's query has been answered he is notified and directed to look for his answer in the Redsercotec portal. The system includes a feature that makes it easy for advisors to convert repeat questions into frequently asked questions that are useful for general reference.

Intellectual property rights are respected. An advisor will generally pass on information that he is familiar with based on his experience and expertise. He may also refer the user to a site or source where he may purchase more detailed information or reports.

**Table 1. Partner Agencies Providing Advisors to
Support Redsercotec Online Service**

Institution*	Public	Private	Academic
National Institute of Ag. Dev. (INDAP)	X		
Chilean Handicrafts Export Org. – Comparte		X	
Legal Program – University of Chile			X
Associations of Chile	X		
National Training and Employment Service – Sence	X		
Export Promotion Agency – ProChile	X		
e-Procurement (Chile Compra)	X		
Cooperatives Department – Min. Economy	X		
Dep. of Industrial Property – Min. Economy	X		
BancoEstado	X		
Banco de Desarrollo		X	
Banefe (commercial bank)		X	
Consultora B&S (consultancy firm)		X	
Subscretariat for Regional Development – Subdere	X		
National Statistics Institute – INE	X		
U. Santiago de Chile SME Program - Apyme-Usach			X
Natural Resources Information Center – CIREN	X		
Center for Dev. of Technologies for the Environment -Cedetema – U. Tecnológica			X
National Environment Commission – Conama	X		
National Institute of Norms – INN	X		
Labor Directorate	X		
Mutual Seguridad (Employment Risk Mgmt.)		X	
Inst. Normalización Previsional – INP (Soc. Sec.)	X		
National Tourism Service – Sernatur	X		
International University SEK			x

*Includes only institutions whose advisors were queried during the period July 2004-May 2005.

Anyone visiting the portal can view all questions and answers posted. Entrepreneurs wishing confidential consultation – e.g. an entrepreneur exploring a new market who may not want to share his explorations with potential competitors – may always visit SERCOTEC offices or a partner agency directly.

SERCOTEC has developed a number of manuals and procedural guidelines. An example is a set of guidelines that help orient participating advisors regarding the system and operating procedures. The system is partly written in open source code and partly in proprietary software (i.e. Cold Fusion and Breeze for e-learning).

The system operates on 48 hour response. If a particular advisor is unable to answer within the 48-hour period, (e.g. because of illness or vacation), SERCOTEC's Content Editor redirects the query to another qualified advisor.

Up to now, the personalized query system has not become a burden. The additional work load per advisor seldom exceeds answering three queries per day, and the total number of queries for the entire system is perhaps 10 a day.

A key to success is the selection of qualified professional advisors. Poor advisors with poor ratings could undermine credibility of the system, and create potentially compromising situations for the System's managers and for the advisors.

Monitoring and Evaluation

To submit a query users first need to register in the system. Registration enables Redsercotec to better know its online clients. At end of May 2005, there were a total of 29,187 registered users (Table 2), from 330 of the country's 350 *comunas*. Thirty percent of these were from the metropolitan area, Santiago, where 40% of the country's population lives; 68% were from generally poorer *communas* outside the capital. A third of registered users were women. Nearly 40 percent were entrepreneurs and 45% were would-be entrepreneurs.

**Table 2. Distribution of Registered Users of Redsercotec by
Entrepreneurial Status, Residence and Gender (May 2005)**

	Male		Female		Total	
	No.	% male	No.	% female	No.	% of total
entrepreneurs	7,480	67	3,602	33	11,082	38.0
aspiring entrep.	8,948	67	4,367	33	13,315	45.6
other	2,964	62	1,826	38	4,790	16.4
Total	**19,392**		**9,795**		**29,187**	**100.0**
Metropolitan Region	6,043	68	2,854	32	8,897	30.5
Regions I – XII	13,035	66	6,835	34	19,870	68.1
foreigners	314	75	106	25	420	1.4
Total	**19,392**		**9,795**		**29,187**	**100.0**

Only about a third of users evaluate the responses they receive. Table 3 lists all of topics presently serviced, showing first those with higher number of queries, and presents the ratings given to answers by topic. From the time that user evaluations were introduced in mid-2004 to the end of May 2005, 53% of the responses have been rated excellent; 33% satisfactory, 8.5% weak and 5.6% weak.

Monitoring of user behavior and satisfaction with the services provided is an integral part of the system. User registration helps SERCOTEC keep its clients informed of important materials, services and events through a monthly newsletter, and tailor services to meet their needs. User feedback increases transparency and enables SERCOTEC to monitor the individual competence of advisors and the overall quality of the advice imparted. It also serves as a powerful self-regulating quality control mechanism. No advisor likes to see his advice questioned or ranked poorly in public by a user. Since users vary in expertise and experience (e.g. questions from a student may require a different answer or approach than those coming from an experienced professional) SERCOTEC is planning to introduce registered user profiles that will give advisors more information about users seeking their advice.

Table 3. User Evaluations of Advice Online Service Responses

(July 2004 - May 2005)

Thematic Area	User Ratings				No. of questions	
	Excellent	Satisf.	Weak	Unsatisf.	Answered	Evaluated
Taxation	21	7	2	1	88	31
Agriculture	13	13	4	3	86	33
Legal Advice	22	6	1	2	71	31
Entrepreneurship	11	3	2	0	52	16
Tourism	3	5	0	0	24	8
Enterprise Formation	6	4	0	0	23	10
Artisanry	1	2	0	1	22	4
External Trade	1	3	2	2	22	8
Project Evaluation	3	3	1	0	22	7
Enterprise Management	4	3	1	2	22	10
Labor legislation	5	0	1	0	16	6
Aquaculture	1	1	0	0	14	2
Costs	0	1	0	1	14	2
Financing and Credit	1	1	3	1	14	6
Technology	3	1	1	0	14	5
Seed Capital Grant	3	1	0	0	13	4
Environment	4	0	0	0	13	4
Promotion incentives	1	0	0	0	11	1
Associations	1	1	0	0	10	2
Training	0	2	2	0	10	4
Marketing	1	3	0	0	10	4
Trades and Fairs	0	2	0	0	10	2
Strategic Plan. & Oper. Dev.	2	3	0	0	10	5
Commerce	1	1	0	0	9	2
Financial Management	0	2	0	0	7	2
Marketing	5	1	0	0	6	6
Family Micro enterprise Law	1	0	0	0	6	1
Norms and Standards	0	0	0	0	6	0
Culture and heritage	1	2	0	0	6	3
Local Development Mgmt.	1	1	0	0	5	2
Informatics	0	0	0	0	5	0
Risk prevention	0	0	0	0	5	0
Labor Organizations	2	0	0	0	4	2
Wood Industry	2	1	0	0	4	3
Artisan fisheries	1	2	0	0	4	3
Industrial Property	1	0	0	0	4	1
Quality Control	0	1	0	0	3	1
Human Resources	1	1	0	0	3	2
Regional Development	1	0	0	0	2	1
Statistics	0	0	0	0	2	0
Telecenters	0	0	0	0	2	0
State Purchases	0	0	0	0	1	0
Cooperatives	0	0	0	0	1	0
Natural Resources Information	0	0	0	0	1	0
Industrial Parks	0	0	0	0	1	0
TOTAL	124	77	20	13	678	234

Other Redsercotec Services

Advice online is the focus of this study and is one of Redsercotec's more popular services (second in popularity between January – May 2005), but it is not the only one. The charge below shows the full range of services provided and the number of visits to each service in January - May 2005.

All online services are well integrated to SERCOTEC's mainstream activities. Training modules turned out to be more popular than advice online in January-May 2005, mainly because SERCOTEC has been running training courses in all of its offices and these make use of training materials made available online at the Redsercotec portal. The advice online service similarly supports other activities, as advisors recommend other parts of the site, and other online and face to face SERCOTEC activities.

Redsercotec Online Services
(Jan-May 2005)
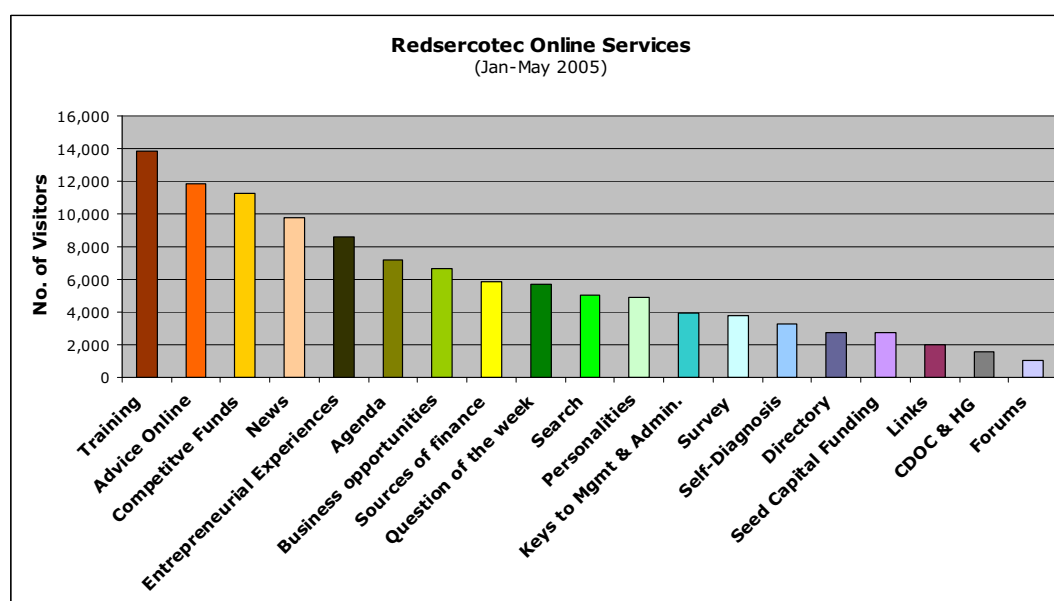
The site also gives access to valuable tools created by partners from other countries. A Self Assessment test enabling a user to determine his own capacity to become a small entrepreneur was made available by Spanish cooperation (GIPE, Gabinete de Iniciativas Para el Empleo y Universidad de Alicante). An Auto-diagnostic system developed in Mexico helps an entrepreneur identify her weaknesses and take corrective action.

Costs and Benefits

The design and development of the latest version of the Redsercotec portal was outsourced at a total cost of US$ 60,000. This includes approximately US$ 8,000 in software licenses. The entire system (which includes Advice Online as well as the other services) is run by a Unit Chief, a Content Manger and a Webmaster. In addition to staff salaries, running cash costs amounted to US$ 52,000 in the first two years of operation and US$ 35,000 in the third. Operating costs are marginal with respect to SERCOTEC's overall annual operating budget of US$ 16 million (in 2004).

The opportunity cost of advisors is not large, considering that they choose themselves when to answer the queries within the 48 hour period given. Each advisor allocates her own time to answer and it is unlikely that she will dedicate time to respond online when she has to attend pressing matters of high value. Further, many of the questions are not particularly difficult to answer, either because the answer is readily available (even within other parts of the Redsercotec's portal

or through an experienced online search), or at times simply because what a small or aspiring entrepreneur is looking for is a gentle guiding hand before they embark on a new undertaking that is challenging and important to them.

The cost of advisors to participating agencies is often more than compensated for the advertising value, prestige or personal satisfaction that comes with supporting the system. This does not mean that there is no cost involved; simply that there is an exchange in value that occurs that benefits everyone without involving the actual transfer of money. For example, some of the more difficult questions have been addressed to the legal clinic of the University of Chile. The students who serve as advisors benefit from practicing law in a real world context. The university and the professor who runs the clinic and supervises every answer also benefit from the advertising, recognition and public good will earned as a result of providing a valuable public service.

SERCOTEC's advice online system is appreciated and frequently used by its clientele. Since it was instituted in 2002 to November 2004, a total of 5,500 questions were submitted by users and answered through the system. Since the evaluation of responses started in July 2004 through 31 May 2005, 678 questions have been asked and answered and 234 have been evaluated by users mostly (86%) ranked either satisfactorily or better. From mid 2002 through May 2005, the number of visits to the advice online service section was 189,094, which represents 19% of the total number of visits (971,852) to the Redsercotec portal during this period.

The advice online system has helped improved the effectiveness of SERCOTEC's mainstream operations. The advice online system, for example, is currently being used to answer queries in relation to a new SERCOTEC program that enables users to apply online to seed capital grants that finance small entrepreneurial initiatives. There has also been an observable increase in the interaction between SERCOTEC's staff, as advisors seek help from one another in responding online queries.

The use of the Internet has also helped expand SERCOTEC's overall reach. The regular clientele benefiting from ordinary activities of the agency number about 10,000, compared to nearly 30,000 registered users of Redsercotec.

Is the System Transferable?

The provision of personalized advice online, where users determine the kind of information they need and interact directly with advisors, is a promising emergent application world wide. Advice is available for a fee from Google Answers (http://answers.google.com/answers/), presently at US$ 2.50/query. Provision of agricultural extension advice online services is also being experimented with in India, by the International Institute of Information Technology, Hyderabad, (http://agriculture.iiit.net/agrids/); and by the Indian Institute for Technology, Madras, and n-logue Communications, in the latter case using videoconferencing technology to a network of about 2,400 village kiosks (www.n-logue.com/services.htm).

Some basic conditions must be met before systems like Redsercotec's advice online can be effective. The system is practicable in countries where literacy is widespread and a single language is common – e.g. most of Latin America, the Caribbean and large countries like China, and Indonesia. It would be harder to implement in countries with multiple languages or where illiteracy is a major challenge (e.g. India, many countries in Africa). A minimum number of existing or aspiring entrepreneurs with access to and familiar with the use of computers and the Internet is also an important prerequisite. Once these basic conditions are met implementation of the system depends on public service leadership. The United Arab Emirates Ministry of Agriculture and Fisheries launched its own advice online system in March 2004 (http://uae.gov.ae/uaeagricent/AskQ/ask_you_question_eng.htm).

As of May 2005 the UAE system's five advisors had answered over 700 questions. Subsequently, as a result of a videoconference between FAO, UAE specialists visiting Rome, and SERCOTEC Management, cooperation has enabled the UAE to profit from Chile's experience. Some of the features UAE officials hope to adapt to local conditions are: the expansion to serve other entrepreneurial needs not just those of farming, the establishment of partnerships with universities and other public and private institutions, and the implementation of user evaluation of responses.

Concluding Remarks

The questions received through the advice online service are real felt needs of SERCOTEC's target audience and constitute a wealth of information that the agency is only beginning to exploit to design new programs, online content, and personalized services. It provides an increasingly important link between the demand and the provision of personalized public services on a massive scale.

Consider also the system's impact on public service incentives and the implications for public agency efficiency, accountability and transparency. Imagine you are a public servant and that every question you are asked, you are obliged to answer within 48 hours, in the understanding that your response will be placed on record identifying you as the author, and made available for everyone in the world to read. Furthermore, consider that the quality of your response will be immediately evaluated by the user and that this user's feedback will be known to your supervisor and your institutional partners and published next to your name.

Annex E.

Perú - Information Services to Increase State Purchases from Small and Microenterprises *

Peru's Contract and Purchase Law (Ley 26850) which became effective early in 2001 significantly increased commercial opportunities for micro and small enterprises employing fewer than 40 workers. The law requires every State agency to notify PROMPyme of those tender processes involving small amounts. Low value purchases matter the most, because those are the kinds of purchases that small enterprises are in a better position to supply competitively.

The law now requires every State institution to inform PROMPyme of every tender process it launches involving Low Value Purchases (*Adjudicaciones de Menor Cuantía*) as well as of Select Direct Tenders (*Adjudicaciones Directas Selectivas*). These small tenders need to be awarded expeditiously and, accordingly, do not require written public calls for proposals. Select Direct Tenders are awarded after inviting no fewer than three suppliers, in addition to the requirement of a ten day advance notification to PROMPyme. Low Value Purchases involve smaller quantities. They are more numerous and more frequent and are generally filled by awarding the purchase to the best bid from suppliers. Traditionally Low Value Purchases are filled by predetermined suppliers that are invited to submit their bid; now they also need to consider proposals submitted by enterprises that learn of the tender from PROMPyme. In this case, notification to PROMPyme must be concurrent with issuance of invitations to prospective suppliers.

Peru: Approximate Values (US$), Notification Requirements to PROMPyme and Consultation Periods of Low Value Purchases and Select Direct Tenders

		Low Value Purchases		Select Direct Tenders***	
		Mínimum*	Maximum	Mínimum**	Maximum
Civil Works		8,900	26,000	26,000	129,900
Goods		3,580	10,100	10,100	50,500
Services		3,580	4,300	4,300	21,600
Notification requirements	**Civil Works**	7 days between the call for proposals and the deadline for their presentation		10 working days between calls for proposals have been issued and the deadline for the presentation of proposals.	
	Goods and Services	Deadlines for the presentation of proposals may be set shortly after the call for proposals has been issued (even within the same day). Notification to PROMPyme must be simultaneous with issuance of invitations to tender.			
Período of consultation and formulation of tender documents		Does not apply.		4-5 days of consultation and refinement of tender documents.	

* After this minimum amount, the law requires that PROMPyme be notified.
** Under this amount, the tender is regarded to be a Low Value Purchase.
*** Should a Select Direct Tender become vacant, it becomes a Low Value Purchase.
Source: [Caroy 2002a].

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*   Based on: Proenza [2003b], updated to end 2004 with the assistance of Miguel Caroy, Chief of State Purchases, PROMPYME.

Once PROMPyme receives the calls for proposal, it immediately notifies enterprises through various means, including a one minute daily radio announcement, posting in its own premises and PROMPyme's website (www.prompyme.gob.pe/compras_estatales/).

In principle, failure to inform PROMPyme in a timely fashion may lead to the challenge and eventual nullification of a tender award. In practice, PROMPyme has been able to persuade agencies to conform with the law and the number of properly informed tenders has increased from 77 percent in September 2002 to 98.3 percent by the end of 2004. The average number of business opportunities notified per month to PROMPyme has increased from 1,273 in 2000, to 3,847 in 2004. The process is also gaining in effectiveness, as government agencies are making increasing use of the Internet to notify PROMPyme. The proportion of calls for tender received via e-mail increased from 40 percent in January-April 2002 to 81.3 percent in 2004; while at the same time calls for tender notified through other means fell in importance (32% to 8.7% by fax and 29% to 9 by courier).

Prompyme's support to small entrepreneurs using the system includes training (http://educa.prompyme.gob.pe/elearning/), a virtual forum where the main features of the system and the law are explained (http://www.prompyme.gob.pe/foro/), and an online consultation system where user's queries are answered via email User consultation system (http://otrs.prompyme.gob.pe/otrs/index.pl).

Initial results are encouraging. PROMPyme's website is by far the principal means through which entrepreneurs learn of existing small scale opportunities to sell to the State, and the number of visitors to this site has been rapidly increasing.

Number of Unique Visitors to PROMPyme's Website

	2002	2003	2004
January		18,989	28,707
February		19,868	36,346
March		21,522	46,142
April		22,368	44,155
May		24,468	51,708
June	4,306	24,548	54,280
July	8,564	24,690	51,925
August	15,332	26,417	54,693
September	18,213	29,347	64,092
October	19,452	32,668	68,796
November	17,845	34,582	70,173
December	16,344	31,643	63,156

A total of 14,709 users have subscribed to the PROMPyme portal and have asked to receive notices of State purchases from PROMPyme by e-mail. More suggestive, the proportion of central government purchases that were supplied by small enterprises rose from 23 percent in 2001 to 39 percent in 2004. In 2004, US$ 756 million of goods and services purchased by State agencies were supplied by small enterprises.

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Annex F. Digital Literacy Training in Chile by BiblioRedes

Chile's *Campaña Nacional de Alfabetización Digital* launched in May 2003 is a national effort to train 500,000 chileans in basic computer and Internet skills in 2003-2005. Several government agencies participate. The *Servicio Nacional de Capacitación y Empleo*, Sence, for instance, provides funding to help enterprises train workers. Other agencies use their own telecenters to impart literacy training. The largest is run by the Ministry of Education's Enlaces program, which initially provided connectivity to practically all of the country's schools, and has since opened up school laboratories for community service including digital literacy training. By the end of 2004 Chile's digital literacy program had trained a total of 300,000 people.

BiblioRedes (www.biblioredes.cl) is another major partner of Chile's national digital literacy campaign. BiblioRedes is a project of the *Dirección Nacional de Bibliotecas, Archivos y Museos*, supported by a US$ 10 million grant from the Bill and Melinda Gates Foundation. The project's objective is to provide community access to computers and the Internet through all of Chile's public libraries.[1]

BiblioRedes has a network of 368 libraries and 17 regional training laboratories providing public access to computers and the Internet and computing training services to the communities they serve.[2] Each library has from 2 to 7 computers. Its training program is supported by the regional laboratories each of which is equipped with 11 desktop computers. In addition, each region also has a mobile laboratory with 11 laptop computers and a projector. The mobile labs move about within the region providing training support to community libraries.

BiblioRedes Facilities used for Training Purposes

No		No. courses/week	No. of Computers	Average No. of Computers	Total No. Computers
368	Libraries	1-2	2-7	4.1	1509
17	Laboratories	4-5	11	11	187
17	Moving Laboratories	support libraries	11		187
					1900

Training cycles at BiblioRedes started on April 2002 with workshops to introduce the Project to library staff, in preparation for the arrival of the computers. Once the computers arrived, training at the libraries began in September 2002. Since then, a total of 120,000 people have received digital literacy training (Modules 1, 2 and 3; see description of Module 1 below), and an additional 21,000 have benefited from the more advanced training – Modules 4 (Spreadsheet & Word Processing), 5 (Presentations and Publishing) and 6 (Local Content Creation – through BiblioRedes portal).

As a general rule, BiblioRedes libraries and laboratories aim to keep at least 70% of the equipment fully occupied during training. Whenever a computer is not being used, however, it is made available for service to the public.

All of BiblioRedes services are provided free of charge to users, including access to the library laboratories as well as digital literacy training. As the program has advanced, it has begun to rely on local volunteers, who are happy to give back their recently acquired skills to other members of the community. This is a source of pride for new members and for BiblioRedes, as well as a way to build positive social capital.

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[1] One of the requirements of the Bill and Melinda Gates Foundation grant funding is that acess to the Internet and computers be provided free of charge by participating public libraries.

[2] BiblioRedes has a regional laboratory in each of the 12 regional capitals plus an additional one in Regions V (Los Andes), VIII (Chillán) and X (Valdivia). There are also 2 regional laboratories serving the Metropolitan Region (Recoleta and San Bernardo). Each regional supervisor is entrusted with a maximum of 26 libraries.

Principal Courses Imparted by BiblioRedes as Part of its Digital Literacy Training Program

Module	Course	Idealized schedule (which in practice is flexible)				
		Hours	Days	Hrs/day	Total	Remarks
1, 2, 3	**Basic:** Computer Use to Keep Informed and Communicate	14	7	2.0	14	contiguous days
Supplementary Applications Modules						
4	Computing for Work (Spreadsheet, Word Processing)	10	5	2	10	contiguous days
5	Computing to Present (Power Point, Publisher)	10	5	2	10	contiguous days
5	Local content (prepare own page at www.biblioredes.cl – aimed at local formal and informal organizations)	10	5	2	10	contiguous days

Some important lessons of experience follow:

1. It is important to have one student with a computer during training. Initially BiblioRedes tried to put two students per computer, but almost invariably this resulted in only one of the two students learning, and the other one left behind.

2. Enabling practice time after training sessions is also very important. Efforts to train using mobile units that travel from one place to another may increase awareness, but will not result in actual learning for subsequent practical use.

3. It is useful to first apply an initial needs assessment among the target training group. This enables instructors to plan the training modules so that it better suits the needs of the trainees; e.g. putting together people with similar levels of competence, or with similar interests. This makes for more effective and more entertaining training sessions.

4. Every training participant receives a certificate of attendance, provided that he or she attends at least 80% of the sessions of the course. No testing of competence has been introduced, to encourage potential adult trainees and let them feel confident and comfortable.

A translation of BiblioRedes Digital Literacy Training (Modules 1, 2 and 3) Curriculum, Courtesy of BiblioRedes, follows.[1]

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[1]   Additional training materials may be found at Sence's web page:
www.sence.cl/tecnologias_digital.htm.

Digital Literacy Course: Computer Use to Keep Informed and Communicate with Others (Modules 1, 2 and 3)

General Course Objective

- Demonstrate the technological and social benefits of computers, through Internet and email.
- Help new users acquire basic skills that will enable them to obtain information through the Internet and communicate via email.

Content of Course: Basic Computers + Word Processing + Internet + email

Target Trainees: The course is imparted in libraries and is open to everyone, but a special effort is made to target economically active adults 18 to 60 years of age, with little or no prior experience in the use of computers and limited possibilities for individual access to computers.

Course requirements: None

Course duration: 14 hours

Course plan:

The course generally takes the form of a 2 hour session every day for a period of 7 contiguous days. This calendar works well in terms of maintaining the interest of beneficiaries and the focus of training staff, but may be adjusted to fit specific local needs.

Flexible Implementation – Modules 2 and 3

Module 1 is designed to meet the needs of persons with no prior knowledge of computers. Nevertheless, the module is flexible and may be adapted to accommodate users with some prior skills.

For example, for users who already have some basic knowledge of computers and know how to use the mouse and the keyboard, then "Module 2" is applied. Module 2 is essentially the same as Module 1, but omits the first 4 sessions and starts with word processing (session 5 below). The latter module then only lasts between 10 and 12 hours. Similarly, for users who are only interested in learning how to use the Internet and have their own email account, then Module 3 is applied, covering only sessions 8 – 14 (about 7 hours duration).

Course Content & duration	Specific Objectives
1. Getting to know the computer 60 minutes approx.	By the end of this session users will be able to: • Visually identify and name the main computer hardware components. • Start and shut down a monitor, the computer and the printer. • Identify and name common computer peripherals: mouse, speakers, earphones, and printer. • Identify input and output devices.
2. The mouse 60 minutes approx.	By the end of this session users will be able to: • Identify parts of a mouse: buttons, sensor or displacement ball, roll. • Identify different functions of the mouse (e.g. open and close programs, turn computer off, adjust a computer's volume). • Recognize different forms of using the mouse (e.g. one click, double click). • Distinguish effects of right and left clicks of the mouse. • Drag icons along the Desktop screen.
3. Operating System Windows XP 60 minutes approx.	By the end of this session users will be able to: • Explain what the desktop is. • Understand the concept of "Operating System". • Understand basic concepts like icon, windows, folders, and direct access. • Open and close programs, folders, windows, using the mouse. • Create a personal fólder in My Documents.
4. The Keyboard 60 minutes approx.	By the end of this session users will be able to: • Identify different parts of the keyboard. • Use capital letters and accentuate. • Use space bar, enter key, Escape key, Tab key. • Write a basic text document (name, personal information) using a word processor.
5. Word processing 60 minutes approx.	By the end of this session users will be able to: • Identify ways of opening the Word Processing application. • Identify and recognize the toolbars most frequently used when using a word processor: File, Edit, Format, Tools. • Become familiar with basic functions needed to write a basic text document: letter types and fonts, alignment, tabs. • Write a basic document using a word processor. • Save a document in a floppy disk or in the My Documents folder.

Course Content & duration	Specific Objectives
6. Word Processing: Cut, Copy, Erase, and Move 60 minutes approx.	By the end of this session users will be able to: • Open a text document previously saved. • Select a part of the text, a word in the text, a sentence or a paragraph. • Use cut and copy functions to edit text. • Use paste function to add text within a document, or to a new document. • Use the move function to change the location of a word, sentence or text segment.
7. Text documents and images in a Word Processing Application 60 minutes approx.	By the end of this session users will be able to: • Modify a document using cut, copy and paste functions. • Add an image file or a graphic element to a document. • Move images or objects drawn within a document. • Change the size of an image. • Save changes made to a document.
8. ¿What is the Internet? 60 minutes approx.	By the end of this session users will be able to: • Identify the basic services and resources available through Internet. • Become familiar and recognize the structure of a suitable browser (e.g. Mozilla Firefox). • Identify what each of the icons in the Internet Tools bar is useful for. • Identify the basic elements that make up a web page. • Visit web pages with the assistance of the instructor.
9. Information Search using the Internet 60 minutes approx.	By the end of this session users will be able to: • Carry out a simple specific guided search. • Select the information desired. • Print the information that they want to have. • View a preview before printing.
10. Navigation the Internet with a purpose 60 minutes approx.	By the end of this session users will be able to: • Visit different sites of interest to the user. • Receive or obtain information from various media – newspapers, radio, and television, through the Internet. • Visit specific service sites, such as Banks and government services online.

Course Content & duration	Specific Objectives
11. email: an email account 60 minutes approx.	By the end of this session users will be able to: • Create their own email account (e.g. hotmail). • Identify and work with their own email opening page inbox. • Identify the different functions of the main page: Inbox tray, Write, exit, etc. • Write and send messages. • Become familiar with structure of Compose, e.g., To: Subject, CC: etc. • Reply and send reply and forward an email.
12. email: functions 60 minutes approx.	By the end of this session users will be able to: • Enter their email service. • Review messages from their inbox tray. • Add contacts to their contacts list. • Re-send a message. • Send messages with copies (cc) and using blind copy (bcc:)
13. email: attachments 60 minutes approx.	By the end of this session users will be able to: • Send an email with an attachment. • Open and save an attachment. • Send an email with an image file attached. • Use copy and paste in order to insert text from a source which is different from the message. • Erase the text of a message. • Delete a file attachment.
14. email: filing and managing messages 60 minutes approx.	By the end of this session users will be able to: • Manage their Entry tray: erase messages; send messages to the trash bin, empty the deleted items folder. • Search for a message. • Create a new emails fólder. • Move messages to the new emails folder created. • Order messages according to name, subject matter and date.

Information and Communication Technologies (ICTs) are a potentially revolutionary means of empowering the poor. Realizing the empowering potential of ICTs will require investments that increase access in remote low productivity areas and the development of innovative applications that cater to the needs of the poor and small firms. The costs of the investment required to redress this shortfall have been decreasing rapidly, but still yield low short term private returns. The private sector cannot alone be expected to underwrite the costs of these developments. If Government does not support these public investments, economic disparities will rise, undermining social stability and future growth.

Effective public sector action is required, to establish a regulatory and legal framework that enables the rise of a vibrant innovative competitive private telecommunications and ICT services sector, and to institute selective efficient and transparent public subsidies with high social payoff but low financial returns. This is needed most urgently precisely in contexts where public institutions are often ineffective, corrupt and unaccountable.

This study reviews recent experience applying ICTs in the fight against rural poverty and identifies ways in which donor interventions can make effective use of ICTs to improve the living conditions of rural communities in Latin America and the Caribbean and help reduce poverty.