Background Paper for HDR 2001

People's Initiatives to Use IT for Development

By Nadia Hijab

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Introduction

The importance of information technology (IT) to developing countries is still hotly disputed. Some quarters view new IT tools as a luxury for people living in poverty.[1] Others argue, equally passionately, that IT opens the door to economic opportunity, social and political mobilization, health care, and education. They believe that people's inability to use IT is a disadvantage serious enough to set alongside economic, social, and other factors in the way of rights and development.

For a growing number of people around the world, the question has been settled. They have made it their mission to enable those disadvantaged by poverty, gender, ethnic background or geographic location to use IT to access information and knowledge, with the aim of opening the door to economic and other opportunities. This paper reviews experience from 18 such initiatives to bridge the digital divide. Most have been organized independently by individuals or groups; a few have been supported by international organizations.

The initiatives were selected after discussion with individuals familiar with the use of IT at the grassroots level, as well as an extensive review of websites and networks.[2] Two of the most useful sites to track interesting initiatives are those of the Stockholm Challenge (www1.challenge.stockholm.se), and *Info*Dev/IICD (www.iicd.org/base/stories) set up by the Netherlands-based International Institute for Communication and Development and the World Bank's Information for Develoment Program.[3] The United Nations Development Programme's system of sub-regional resource facilities (SURFs) was helpful in reaching field staff in touch with local initiatives. The UNESCO/Woyaa TOP50 African web sites (www.woyaa.com/topweb) was also a useful source.

Out of several hundred initiatives reviewed, 25 were identified for further contact. They were selected because of the quality and range of new information to which they provided access; their creativity in overcoming obstacles to access; and the potential impact on people's lives. Of these, 18 were selected for detailed questioning and interviews and included in this report. Four are from Africa, and there are three each from Latin America, Asia, Arab States, and Europe; one is American, and one global.

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[1] Except where appropriate, the term "information technology" is used in this paper rather than the now more common "information and communication technologies" (ICT), since the latter includes existing mass media tools and this paper focuses on the advantages brought by new IT tools. I am grateful to Gabriel Accascina for clarifying the distinction.

[2] I would like to thank the following for their generous time and support during the preparation of this paper: Gabriel Accascina, Mona Afifi, Roberto Bissio, Hakan Bjorkman, Pieter De Zwart, Manuel Fernandez, Marc-André Franche, Anne Githuki, Geoff Prewitt, Jana Ricasio Jennifer Sisk, Casper Sonesson, Thierry Lemaresquier, and Raul Zambrano.

[3] The IT Stories site enables IT practitioners from around the world to post their experiences, and are "not edited by the staff of the IT Stories Project, unless otherwise noted". Thus, the site serves a rough guide to where "micro-initiatives" are flourishing today. Of the stories posted in September 2000, 39 were from Asia and the Pacific, 38 from Africa, 31 from Latin America and the Caribbean, 21 from Europe and CIS countries, and seven from the Middle East and North Africa (three from Egypt and three from Israel).

The objectives vary from one initiative to another: two were established to provide access to IT; three promote health; three support education; three relate to economic opportunity; four deal with agriculture and the environment; and three support political and social mobilization. The nature of the disadvantages that these groups address include disability (two), limited economic opportunity (six), gender discrimination (three), geographic location (five), and the technology gap (two).

Use of IT// Nature of Disadvantage	Economic	Agriculture/ Environment	Social/ Political	Health	Education	Access
Disability				Improving the Quality of Life for the Blind and Deaf – Kuwait		
				Multimedia Internet System of Testing Hearing – Poland		
Limited economic opportunity	Ethiogift - Ethiopia				LAcNet – Sri Lanka	Village Internet and Computer Programme - Bangladesh
	Virtual Souk - Arab region				Teaching Matters Inc - USA	RDS - Sustainable Development Network of Honduras
Gender discrimination	Mujeres y Negocios - Argentina	Council of Women Farmers of Ukraine	Women'sNet – South Africa			
Geographic location		Rural Radio Network and Centres for Development Information - Niger	Across Borders – Palestine	HealthLink – South Africa	Miksike - Estonia	
		Agri-News, Gobi Wave, Umnugovi Internet - Mongolia				
Technology gap		SPRING - Brazil	Association for Progressive Communications - Global			

The questions asked of the founders and/or managers of these initiatives covered three clusters of issues:

- obstacles to access (like infrastructure, the policy framework, literacy, language, and others), as well as experiences in bringing new users on board;
- the use made of IT to improve people's lives and to overcome disadvantages; and
- the kinds of partnerships necessary to access IT, as well as any vested interests that may be threatened.

Part II draws some of the common threads from the 18 initiatives, while Part III describes the experiences of each initiative in dealing with these issues in more detail.

II. Five Findings from the Field

In looking at the work of these 18 initiatives, certain common themes emerge. The first is the practical approach adopted to the use of technology, which most of these initiatives see as a tool to achieve other objectives, rather than as a stand-alone objective in itself. The second is that an important obstacle to use of IT is the lack of investment in training. The third is the powerful boost being given to the English language. The fourth is the absence of efforts to document impact on the people served and to learn from experience in this new area. And the fifth is the speed of growth and change.

1. Technology as a Tool, No More, No Less

A common theme that cuts across the work of these 18 initiatives is that they deal with technology as a tool to support other objectives. They are well aware that it is an important and valuable tool - indeed many are imbued with a sense of mission in their drive to disseminate use and access, and invest heavily in awareness-raising - but they never lose sight of the fact that IT is not an end in themselves but rather a means to achieve economic, social, and political gains.

Thus, for many, the approach to bringing new users on board is to show them how IT relates to and is relevant for their work and lives. "We show businessmen the bottom line", says Dawit Bekele, one of four Ethiogift founders. "They are all entrepreneurs and small business owners", says Judith Ovadia, co-founder of Mujeres y Negocios, "They only need to use the Internet as a tool, and they don't need to know anything more".

Candy Day of HealthLink in South Africa notes, “We try as far as possible to introduce IT with a real purpose – not just dumping the equipment there, but integrating it with other programmes so that use of the system brings some benefit to the health worker themselves". In Ukraine, Lyudmila Klebanova of the Council of Women Farmers finds that the best way to bring people on board is “by showing them concrete practical examples, and offering plenty of training”.

And in the United States, Sue Bastian, president of Teaching Matters Inc says, “We have a set of principles here that we live and work by. One is to find a compelling reason. In the case of literacy for example, we identify what is difficult to teach and to learn, plus what we know about technology - and then if it helps, we use it. Otherwise it's a waste of time".

2. Training: Essential But Overlooked

Judging by these experiences, the most problematic issue is the lack of support to training and maintenance. This was emphasized even more frequently than cost or lack of infrastructure, by groups throughout the world. "Training, training, training", says Mike Jensen, one of the first activists in the Association for Progressive Communications.

Out of the 16 Internet Service Providers (ISPs) in Honduras today, Red de Desarrollo Sostenible is not just the least expensive, it is also the only one that provides added value in training and preparation of content. In Sri Lanka, there is no plan - and there are limited resources - to train people on IT, according to the Lanka Academic Network.

HealthLink encourages a "mentor/supportive" approach to training, doing as much on site as possible, and following up with repeat visits. "We've had a lot of success with identifying champion users, and investing in these people, so that they can encourage and assist colleagues".

Many of the initiatives found no age or gender difference in bringing people on line, but some were conscious of these issues. A study - *Net Gains* - conducted on the experience of 41 NGOs in Africa found that women prefer structured courses that they could fit into their busy schedules, while men did better by "learning through tinkering" with the technology. In the Ukraine initiative, it was found to be easier to bring young people on board, especially boys. When using IT to test hearing in Poland, boys are "much more eager to act, but girls are better focused and usually demonstrate more accurate results in testing".

Older people faced more of a challenge, particularly when the technology was unreliable, which added to the sense of disempowerment. Here, mentoring approaches are more successful. In some cases, older people are not even making use of the technology - RDS in Honduras reports that almost no one over 30 uses its telecentre. HealthLink did not find a gender or age gap, but noted that the level of education made a difference to ease of use.

3. English Over All

A clear finding from the work of all these initiatives is the strong push given to the English language as a result of IT, with French and Spanish struggling to keep up. As Irina Orellana of RDS in Honduras puts it, "Most of the search engines are in English, and they are the most popular ones. Even we don't know many Spanish-language engines, although they are increasing. The Internet is definitely driving the use of English - it's one of the reasons to learn English. Graduate students tell us that one of the first things their teachers tell them is that a lot of the information they are going to cover will be in English".

Synfev was established by women in Francophone West Africa to address the problem of lack of content in languages other than English - and received essential technical support from Women'sNet in South Africa, which had already set up its website in English.

In the Across Borders project for Palestinian refugees, language is a problem since "the language of technology is English" - but users are determinedly improving their English language skills by using IT. Similarly, in Sri Lanka "the thirst amongst the student population is for increased competency in English". In Poland, language is a major

obstacle to use of the Internet by older people, whose second language tends to be Russian or German “while the Internet is mostly in English”.

In the Grameen Village Computer project, most users of email use “Benglish” – the English alphabet to write Bengali - and the project plans to start an English language course at the center. In Ukraine, a translator is used to access content.

Many of the sites run in two languages: the Virtual Souk uses French and English (though much of the region served speaks Arabic); HealthLink uses English and Afrikaans. The Estonian education initiative Miksike runs several languages on its sites.

Some try to overcome the language problem in other ways: HealthLink develops and promotes local networks and support groups, within which people can use whatever language they like to communicate and exchange information. The geographical information systems project SPRING in Brazil has prepared manuals in Portuguese that are available on-line. Gilberto Camara notes, “The response from GIS users in Brazil has been extremely positive, including not only GIS students and government officials, but also from small private companies, start-ups on the GIS world or small surveying firms that wanted to enhance their capabilities”.

4. Uncharted Waters

The newness of this field can be gauged from the fact that few of the initiatives have assessed the impact of their work in terms of people's lives, whether in quantitative or qualitative ways. Many are able to report user figures or to guesstimate the potential impact - for example, HealthLink has had between 400 to 1,000 users at any one time which adds up to several thousand people over the years. The Virtual Souk has now engaged some150 artisans in three countries. But few can provide a concrete report on an increase in assets or influence as a result of the initiatives.

Two formal surveys have been conducted by groups involved in these initiatives. RDS in Honduras has just conducted a survey of users of its recently opened telecentre in order to provide better service. And Collen Lowe Morna and Zorha Khan of South Africa had compiled a survey of 41 African women's NGOs (*Net Gains: African Women Take Stock of Information and Communication Technologies*).

5. Growth and Change

Many of the initiatives start up and record rapid growth within a short space of time. In January 1999, Miksike's Estonian language site had 150 visitors a day; by April 2000, the number was over 5,000 and growing. The "I Can Hear" initiative was piloted in some Warsaw schools in 1999; so far, some 30,000 people have been reached through the initiative, with a target of a million planned for 2001. The project became self-financing after just three months, with local health service centres finding the cost of using the new system far lower than that of standard hearing tests. In Argentina, the Mujeres y

Negocios portal has grown by 360% in the year 2000; it is now serving some 3,000 women, and is self-financing.

In e-commerce initiatives, middleman appear to be a threatened species as producers find direct access to information about prices, products, and markets. The Virtual Souk has also been able to reintroduce quality; middlemen's interventions had not just been leading to loss of income for poor artisans but also lower quality products for mass tourism markets. In Bangladesh, the Village Computer project is already enabling producers and consumers to check current market prices, enhance their marketing potential, and reduce the role of middlemen.

Some initiatives are careful not to threaten existing bodies. For example, both Miksike and Teaching Matters Inc. present their work as a support to the teacher. "We never say that no teachers are needed – we will always have teachers" Miksike's Mikhel Pilv explains. "Nor is our goal to be the only source teachers will use. We simply explain that our approach is supportive of teachers and helps them in their work".

Many initiatives involve North South partners. A major exception is in the one case where sophisticated technology is at stake - the SPRING GIS software developed in Brazil. "When developing countries want to understand the technology and not only to be passive users, it is very difficult to establish fruitful North-South partnerships", says Gilberto Camara.

As APC Director Anriette Esterhuysen puts it "At a very fundamental level, the way the world operates is unequal. There is a lot of talk about access to IT, but it is all done within a framework where one part of the world can control everybody else. The gap in access to technology mirrors the gap in access to power and resources at all other levels".

III. People's Initiatives to Use IT for Development

Africa

1. Ethiogift - Ethiopia

a. Background Ethiogift is one of the first ventures into electronic commerce in Ethiopia, providing a way for Ethiopians and others living anywhere in the world to send gifts to families and friends in Ethiopia, using a credit card or money transfers.[4] Goods that can be delivered range from cakes and flowers to live sheep.

The website was established by four IT professionals - Daniel Yacob, Dawit Bekele, Kebadu Muluken, and Menbere G/Mariam - in September 1998 with the "objective of introducing new Internet services in Ethiopia". The Internet had been introduced in Ethiopia in February 1997, but according to the founders there was no indigenous

[4] This section is based on phone and email interviews with one of the four Ethiogift founders Dawit Bekele, and on materials he provided, as well as the website www.ethiogift.com See also the Stockholm Challenge site.

application for nearly a year. They established a company to create Internet applications, starting with e-commerce.

The four men, all in their late 20s, had extensive experience in the technology but no experience in commerce. Their voluntary work made up for their lack of capital. The business started slowly, with just one client in the first month. The team began to advertize, and word of the service spread. By Christmas 1998, there were 20 orders, then hundreds by the following Easter. A year later, the first staff member was hired. The site now gets some 12,000 hits a day, and the company is profitable.

b. Access to IT The Ethiogift team faces many problems in using IT, as does Ethiopia itself. There is a very low rate of Internet connectivity, with only 3,000 Internet accounts in the country to date. The team estimates that another 10,000 people are waiting for access. "And many others have not even registered, the waiting list is so long". The infrastructure needs to be greatly improved.

The team also faces problems as a new business, because of the inadequacy of the legal framework, which is "conservative" and "unclear when it comes to new kinds of businesses". One example they give is that export of items by the post office is not taken into consideration by the export regulations. The founders initially found it hard to establish the trust of their customers in something as new and intangible as web-based commerce. In fact, many of their clients assumed that the company was based in America.

The team dream is to use electronic tools to spur commerce within Ethiopia itself. To date all users of the service are outside Ethiopia. But they recognize this will be difficult in the absence of law reform and infrastructure development. Another problem is that credit cards are not available in Ethiopia – even checks are rarely used - and other payment methods have to be found.

c. Use and Impact of IT Commerce was not the founders' only objective. They also wanted to help rebuild ties amongst families separated by migration due to war and economic problems; introduce e-commerce as an approach useful for businesses previously run on traditional grounds; open new markets; and create jobs.

According to Dawit Bekele, Assistant Professor in Computer Science at the Addis Ababa University and Managing Director of EthioLink/EthioGift, the companies selling goods through Ethiogift have seen a 25% increase in their business. The majority of suppliers are small informal businesses (the one exception being the Sheraton Hotel, which sells cakes). The small businesses are so comfortable with the arrangement that they are willing to provide their goods on credit, and to wait for the proceeds until the end of the holiday season.

Some problems arose in working with the businessmen. For example, traditional products are not quality controlled, and may not meet the expectations of customers abroad. And some businessmen were reluctant to have pictures taken of their products,

particularly original work, for display on the website: “They thought we are trying to copy their products!”

To enable use of the e-commerce service, Ethiogift has had to introduce methods of payments like wire services rather than credit cards and money transfers, “even though it is not practical for us”. Indeed, foreign currency restrictions make it practically impossible to make payments in Ethiopia. “For someone to make a payment, whether big or small, they have to pass through a lot of brokers. So now we have a bank account in the United States, and the payments are made there”.

That created another set of issues: “To have a bank account in the United States, we had to establish a company there, and to do so we have to pay tax in America, and to know all tax rules even if we don't live there!” Members of the team studied US Internal Revenue Service regulations to identify the ones applicable to their kind of business, but to no avail. So they visited the United States to meet with Internal Revenue Service, and were told that this was a new area for the IRS itself.

Access to email is another service the team provides. “OK, we cannot be an Internet Service Provider, but at least we can be an email service provider. We have a server that dials regularly to a mail server in Vancouver, Canada, and collects emails from people abroad. People here then get their email by connecting to our server. We started this less than two months ago, and we already have 70 users, mostly companies. We charge them a flat connection fee of $13 a month. Our target is to get another 500 within a month”.

The founders are trying to introduce the small businesses to the Internet and the opportunities available by using it, but it is uphill work. “They are very much informal businesses. The people are not educated and do not know what the Internet is. All they know is that we bring them clients. They would like to come and see the site, and we invited them to do so. But they never came. They think it is too complicated”.

Still, the team is helping companies to use existing websites and to set up their own to advertize their products. “We're working hard on awareness. A lot of people do not know what the Internet can provide to them. We are showing them some of the achievements and benefits. We had one workshop for 70 people a couple of months ago, and are planning to have another soon”.

Dawit Bekele points out that the best way to convince businessmen to use the Internet is to talk to them in terms of the financial gain. He insists, “There is a wrong attitude when it comes to technology. It is always considered as a luxury. But what I always try to say is if you can use either the plane or the train to go from Addis to Djibouti, and if the plane is cheaper than the train, then the train is the luxury. So we tell them the Internet is very cheap, and give them examples of the costs of using fax versus use of email. In this case, email is not a luxury; it makes financial sense”.

He believes that “the greatest miracle created by the Internet is that it breaks the distance barrier. Distance was a major factor in creating disadvantaged people. Because of

distance, many opportunities were available only to a few people living near to the center of opportunities. But with the Internet, opportunities in education and health can be available to all".

2. HealthLink – South Africa

a. Background HealthLink is a service provided by the Health Systems Trust, an independent NGO established in 1992 to promote "a health care system which meets the needs of all South Africans".[5] The Trust is funded by overseas donations, as well as by some public sector funding, and is governed by a Board of Trustees. HealthLink is one of three programmes managed by the Trust.

The project uses a simple computer networking system and email as its main tools. Its five objectives are to: "introduce health workers to information technology; establish a basic email communication system for health services; improve management of health services through data transfer and analysis; provide isolated health workers with access to information resources; and contribute to planning of a national health information and communication system".

b. Access to IT Many parts of South Africa are "First World", with widespread use of IT, but there are several places without electricity and phone lines. In areas without telephone lines, it may take several years for one to be installed – and even then, there may be problems with the quality of the phone lines, making it nearly impossible to transfer data. Moreover, HealthLink Deputy Director Candy Day points out, "There may be just one phone line for a whole health facility so they can't tie up the line for long periods connecting to the Internet. Another common problem in public facilities is that the phones are barred for other than local calls, and if there isn't a local Internet Service Provider (which there generally isn't in these areas) then they cannot connect even for email".

In fact, even local calls are not free, but are charged by time. Since for most rural communities Internet access will not be a local call, this makes the cost of telephone calls to access the Internet almost prohibitive. Higher bandwidth technologies for more applications is also very expensive. Meanwhile, theft of copper wire is "a major problem in keeping existing telephone services operational".

Although wire services are generally limited outside of central locations and are relatively expensive to implement, HealthLink has found that effective use can be made of networking with limited resources, for example by connecting groups through Local Area Networks and using dial-up networking and Linux servers for routing of mail, file and print services.

[5] The section draws on the Health Trust website www.hst.org.za as well as on detailed email interviews with HealthLink Deputy Director Candy Day. See also the UNESCO Top 50 African websites.

As regards wireless services, the cell phone network is widespread in South Africa, although coverage to rural areas is limited. A telecommunications monopoly that will continue for another couple of years poses an obstacle, IT advocates say, to use of wireless services in more innovative ways - and stops other providers from implementing innovative solutions so as to control the market to its advantage. As for satellite networks, this is an expensive option, although there are some projects, for example in Manguzi in northern KwaZulu-Natal experimenting with use of satellites to bring IT to rural communities. On the positive side, the government has set targets to get telecommunications out to disadvantaged communities, and some activists believe the policy framework will change.

The above picture means that organizations like HealthLink have faced difficulties in "terms of getting basic telecommunications to the facilities we have been trying to support. It takes a long time and one inevitably has to access the political channels to get some response to provide services".

HealthLink reports they have been successful in using older computers to bring health workers on line, but point out that it is best to get local donations, "as donations from other countries may introduce all sorts of other problems".

From their experience, "Training is the single biggest cost and issue to successful use of IT in disadvantaged communities. Good training centres in major towns are usually largely inaccessible to rural communities and too expensive. They may not have transport to come to the cities, and they may not be able to leave their work environment to do so. One of our approaches has been to train on-site as far as possible, since this has many advantages. Major training resource problems include: high turnover of staff allocated to these functions; distances, transport, inaccessibility; rudimentary nature of the training materials that do exist".

Another major area is maintenance of the equipment. Candy Day reports, "In our project we have tried as far as possible to get maintenance of equipment to be the responsibility of the Health Department, and have put a lot of effort into working with the relevant staff to get this to be as effective as possible. However there are huge constraints, both in human and financial resources, to repair or replacement of equipment. Equipment breakdowns thus frequently take months to be resolved, during which time all connectivity may be lost. This reduces the uptake of the technology by communities, as it isn't perceived as reliable, and they have to manage without it. High turnover is also a problem as regards support staff for maintenance: they are frequently inexperienced, and move on once they do have experience".

One of HealthLink's approaches is to make the technology as easy to use and robust, since "things that break or can easily go wrong easily don't help people to be confident. We've received a lot of criticism of the technology used, which has its limitations, but on the whole has been appropriate for the poorly resourced areas where other technologies wouldn't work at all well given the current infrastructure. Our focus has been very much

on making things work now – you can't always wait the ten years until technological development will make things easier".

HealthLink have not found copyright or other issues to be major restrictions: "Obviously many good web resources are restricted, and have copyright issues. However, full access to the Internet is relatively limited at this stage, so the problem of restricted sites, multiple registrations and passwords tends to affect us more than the constituency we serve, at this stage. In addition, there are a number of really good services, and we have focused on these. For example the BMJ (www.bmj.com) site, which also provides an email table of contents with direct URLs for all articles, so it is easy to use a web-to-email tool for those with email only".

HealthLink also brokers and disseminates information resources that are customized to the interests and needs of the recipients, and make use of the open source/open document model wherever possible. It tries to make use of local knowledge sources and expertise in the community, which may be more relevant to the problems health practitioners face, although it is not yet easily accessible or organized. In turn, all the material HealthLink itself produces is in the public domain, and is readily accessible to anyone in multiple formats.

b. Use and Impact of IT HealthLink primarily supports email use. As Candy Day explains: "We do not provide direct web access. The web has some amazing resources, but it really is quite complicated and time-consuming to use these effectively. Our experience is that people mostly use email – if they have web access, they use it sparingly, due to telephone costs, telephone sharing, poor bandwidth and time constraints. We have tried to involved all of our users in some email discussion groups related to their interests – to this end we host a number of locally based groups. Some are primarily for information dissemination, some are more for discussion. These are quite popular. The moderated and locally relevant lists are of more value. Of course, the international lists hosted by SatelLife are also relevant, and we encourage people to join these where appropriate".

As in other parts of the world, language is an issue, especially in a country with 11 official languages. The people HealthLink serves have been trained in either English or Afrikaans, and use these to access the network. As is the case around the world, most Internet-based information – even email information – is in English. HealthLink has also tried to overcome language issues by developing and promoting local networks and support groups, within which people can use whatever language they like to communicate and exchange information.

To bring new users of IT on board with the technology so that they can enhance their access to information and knowledge, HealthLink adopts "very much a mentor/supportive role. We train on site as much as possible, and follow up with repeat visits. We also develop local support mechanisms with multiple options, including public sector support people, users helping each other, telephone/email support to provincial as

well as national offices. We've had a lot of success with identifying champion users, and investing in these people, so that they can encourage and assist colleagues".

HealthLink touches on a major issue regarding people's willingness to invest the time in using new technology: "We try as far as possible to introduce IT with a real purpose – not just dumping the equipment there, but integrating it with other programmes in that environment so that there is an incentive to use the system, and so that use of the system brings some benefit to the health worker themselves. We even encourage health workers to apply use of IT to non-work purposes to some extent, for example using email to communicate with a relative overseas will be an incentive to learn to use the system. Initial use of IT generally adds more workload to already busy staff, so one has to remain encouraging and supporting and identify ways that use will result in more efficient work".

HealthLink staff have not noticed an age or gender gap, but find that the education level does make a difference to how quickly people are able to use IT and integrate this into their work: "Doctors have generally pushed the limits far more than nurses or clerks".

In terms of helping people access connectivity, HealthLink has had between 400 to 1,000 users at any one time, with this adding up to several thousand people over the years. They have focused on demonstrating why and how IT is useful to health workers, and then moved out as private or public infrastructure reaches that area. This approach was particularly successful in the Free State province, which budgeted and moved to implementation of a province-wide information infrastructure after the HealthLink involvement.

However, HealthLink also provides information services to a much broader group beyond those it assists with connectivity. This has grown to several thousand people who regularly receive information. "However, we do have a limited market due to the nature of the information, and more recently there has been an increase in the number of information providers who also provide services in the health arena. This has allowed us to focus more on our area of expertise – health systems development and policy issues".

It sees itself not as a service provider, but as an agent for change, "developing systems and achieving improvement in the way health is delivered". The sustainable outcome sought is "to try and ensure that the public service is able to take on, develop and support the integration of IT into these areas". Another purpose is to create an information culture in disadvantaged areas, "raise awareness of the range of information resources out there, encourage people to make use of them, and provide the tools to do so".

In terms of making a difference to the people it serves, HealthLink has enabled health workers to: communicate, with each other (peer support, referral), with those they supervise, and with their managers; request information through numerous avenues; share information eg management or clinical information, lab results, statistics; learn about education and training opportunities, funding opportunities and other resources;

collaborate across sectors, for example, with transport workers, and the education sector; and take part in debates on policy and political issues.

d. Partnerships HealthLink is a national initiative, established without the need for international IT partnerships. They work with many local partners, including district, provincial and national departments of health. They often engage with the private and telecommunications sectors to urge provision of service. In terms of international partners, they work closely with SatelLife as well as with Tufts University in Boston, sharing resources and working on improving medical informatics in developing countries

Still, given private sector reluctance to move into low (or non-) profit areas, Candy Day believes that donor funding and to some extent donor expertise is needed to make a difference. Otherwise, "it will take far too long for natural market forces to reach these areas, and the gap between the groups will continue to increase. Not every resource from the North is always useful or applicable, but where assistance is given sensitively, and in collaboration with people working on the ground in the South, this partnership can be very valuable".

There is clearly a long way to go to meet the need. Candy Day shared an email she had just received from a health worker: "I would be very interested in receiving a copy of the medical director programme to try it out. But I'm actually looking for paper records, as the rural clinics I'm working in don't have a reliable supply of electricity, telephones, let alone faxes or computers".

3. Rural Radio Network and Information Centres for Development - Niger

a. Background Niger is one of the poorest countries in the world, and is ranked 173 out of 174 countries in the Human Development Report. In this difficult setting, Government, civil society, and international donors launched the Rural Radio Network and Information Centres for Development to provide rural communities with access to information and communication technologies, using solar power.[6]

A radio broadcasting network, composed of 160 self-managed solar units covering most of the country, is being established. Information centres for development are being set up around the rural radio units, promoting solar energy for several uses, including television, telephones, computers, water pumps, mills, and other functions. Local communities are also supported in production and management of information in local languages. The eight year project is just completing its pilot phase, which involves a network of seven self managed solar rural broadcasting units, in each region except the capital.

b. Access to IT The Niger experience demonstrates that absence of infrastructure need not be an obstacle to access of information and knowledge. Lisa Slifer-Mbacke of the Washington-based WorldSpace Foundation noted that, in addition to using solar

[6] This section is based on materials provided by Djilale Benamrane economist at the UNDP Niger Office, and email interviews with Lisa Slifer-Mbacke of WorldSpace Foundation.

power to address the lack of electricity, community groups are using satellite and terrestrial broadcast systems to get around the obstacles of non-availability of phone lines. Technology companies in Niger are providing free and concessionary rates for activities.

One of the seven pilot sites is Bankilare, a poor village some 240 km west of Niamey, and another 120 km away from Tera, the district capital. According to a report on poverty alleviation through use of IT by the economist Djilali Benamrane (September 18, 2000), the Bankilare population of 2,000 has no easy access to water, and lives without electricity and telephones. Another 10,000 nomads live in the area around Bankilare. The population has little access to information. They face difficulty in receiving national or regional radio broadcasts, which in any case are not available in languages they understand (Tamacheq, Songhaï, Peulhou, Arabic).

A local community association was established and registered with government (of the 17 members managing the initiative, six are women), and community members received training on management, broadcasting and content creation. The authorization to broadcast was secured, and the frequency was assigned. The first Self Managed Solar Rural Radio in Bankilare was established at a cost of $10,000 for the equipment (transmission panel, antenna, solar panels, mast, and multimedia equipment), in a facility constructed by the community ($2,000). A hundred free play manual and solar FM receivers for collective listening were distributed ($3,000). The seven broadcasters (three are women) now earn an income 7,500 FCFA a month (about $12).

Given their training – and their investment in the creation of the Community Investment Centre – the community maintains the equipment and facility. However, additional training is a constant need. They overcome language barriers by broadcasting in three out of the four local languages. As for the obstacle of literacy, local members of the community translate the content for local people who are illiterate.

Access to content may be an obstacle given the cost, but many foundations have a policy of providing content for no fees. WorldSpace Foundation itself collects content that is provided free of charge to end-users.

The next stage is to form a network of community broadcasters, who will submit programming to a radio bank in Niamey. There the best programmes will be selected for broadcast, making them available to all community stations in Niger and West Africa.

The cost of regular access to the Internet is high, and access is in fact extremely limited in rural areas. However, it is not impossible to download web-based content, and this can be done through simple equipment – computer, receiver, multimedia adapter card, and solar panel. The Government has deregulated the broadcast policy, and opened broadcasting up to local communities.

c. Use and Impact of IT Lisa Slifer-Mbacke says that her experience in Niger shows that "people in the rural areas know what they want and are not scared of new

technology. They are the ones that most easily manipulate new technology for their environment. It was not the international donors that wired a WS receiver to a solar panel; it was the members of a rural village. It is important for people to see the technology and understand its capacity. This gives them time to think about ways they can use the technology to support themselves and their community''.

People in rural communities are now getting information on weather patterns and agricultural development which helps them plan more efficiently for crops. Another area opening is support of micro-enterprises. Not much difference has been observed in gender or age terms. Women were found to be just as eager as men to use the technology. Evidence of the community's interest in getting access to information comes from the fact that they mobilized to petition the national government for broadcast licenses. Women and men from Bankilare have gone to the capital to petition the government directly for the right to broadcast. "It has empowered people to demand access that never existed before".

Currently, there are 17 units like Bankilare are operational, 50 more are expected by the end of 2001, and 160 by the end of 2002.

d. Partnerships The United Nations Development Programme, the African Center of Meteorological Applications for Development, and the Dutch cooperation agency SNV have partnered Government in the pilot phase. Current partnerships include other UN system agencies, bilateral donors, multilateral institutions, and private foundations like Wintock International, which provides a "radio in a suitcase", Freeplay Foundation, which provides wind-up AM/FM radios, and WorldSpace Foundation which provides airtime for audio and multimedia broadcasts and satellite receivers and equipment on an at-cost and concessionary rate.

4. Women'sNet – South Africa

a. Background Women'sNet is an Internet-based communication and advocacy project. It was launched by the Southern African Nongovernmental Organisation Network (SANGONeT), an Internet Service Provider that "aims to meet the specific needs of people and organisations concerned with development and social and environmental justice in the Southern African region", and the Commission on Gender Equality in South Africa, one of the six "State Institutions Supporting Constitutional Democracy" called for in South Africa's 1996 Constitution.[7] The idea was developed at the Women'sNet Brainstorming Workshop in June 1997. It is managed by a large network of women from government and non-governmental organizations, the media, and other fields – some 30 women are involved in management or as resource persons, together with five staff members.

[7] The information in this section draws on the research paper *Net Gains: African Women Take Stock of Information and Communication Technologies* written by Colleen Lowe Morna and Zorha Khan, as well as the Women'sNet website http://www.womensnet.org.za

It aims "to empower South African women to use information and communications technologies (ICTs) towards advancing women's equality". Women'sNet Director Sarita Ranchod says: "Women'sNet aims to create a women's space in cyberspace – acknowledging that ICTs to date have been a male domain". The main programme areas involve applications of ICT in provincial training; elections; community radio; HIV and AIDS; Beijing Plus Five in Africa; and women and human rights.

The Women'sNet website contains a range of information resources on which women can draw: a newsletter, calendar, information on jobs, announcements of programmes and events, a bulletin board, archives, and links to other websites. Women'sNet links with other forms of media through its Community Radio Project which re-packages information to make it radio-ready and accessible to people who may not have Internet access (currently 98% of the population – whereas 89% have access to radio). The full methodology used to create the Women'sNet is available on the site for use by other organizations.

b. Access to IT In their very useful study, *Net Gains: African Women Take Stock of Information and Communication Technologies*, Colleen Lowe Morna and Zorha Khan identify several uses of and obstacles to access drawing on the experience of 41 NGOs and individual activists across Africa. Some of their findings are extracted below:

- Most African women's organizations use IT for communication with other NGOs, funders, regional and international organizations rather than with their members, or with government departments (South Africa and Uganda are exceptions).

- The degree of access within organizations varies considerably. In many NGOs there is still only one computer and modem, limiting access and the ability to gain greater ease with the technologies through "tinkering". The majority only use IT at work.

- The majority had not received formal training or had received only minimal training. Some complained of gender insensitivity in the training. Those who feel most comfortable with IT have had a friend, reliable service provider or partner who provide ongoing support. There needs to be gender sensitivity in the design of training, and innovative forms of adult training like mentoring.

- Older women conveyed a sense of alienation and frustration with the new technologies - especially in countries where frequent technical problems add to the sense of disempowerment.

- Those who have now had exposure to and are comfortable with IT were effusive in their praises of the difference it has made to them personally, the most common response being IT "ended my isolation and made me feel part of the bigger world."

- The most commonly cited advantage of IT in organizations is in cutting the costs of communication - but few organizations had costed this advantage or sought to maximize it.

- Use is still largely confined to email. Even then, the interactive applications of email are limited, for example, for conferencing. The web was described by many as frustrating and inaccessible - often due to technical problems and high costs of access; but also lack of training and knowledge.

- The gender dimensions of IT and work have barely been explored. For example, there was no mention of the possibilities for tele-work, flextime and work from home arrangements that would assist women in coping with their dual home and work responsibilities.

- Although it is quite common for women to manage telecentres (for which there are up to 36 models), emerging evidence suggests that the facilities are more patronized by men than women. Simple considerations like the times when training is held are not taken into account. Indications are that women prefer structured courses that they can fit into their busy schedules, while men do better by learning through tinkering with the technology.

- None of the NGOs were involved in policy debates - although this is a critical area, since as long as governments have restrictive policies and do not subscribe to the principle of universal access or access to information as a basic human right, existing projects will not be sustainable or replicable.

c. Use and Impact of IT The social and political initiatives supported by Women'sNet include:

- Challenging the media to cover the release of the South African budget in March 2000 in a gender sensitive way. Women'sNet also created a bulletin board where South African women were invited to comment on the budget.

- Disseminating information on women in the 1999 elections, and providing a platform for women to air their concerns to politicians.

- Creating an information and networking hub for the [year 2000] local government elections in South Africa - publicizing gender and local government issues in various media, developing a "how to" manual on using the Internet to coordinate a political information and advocacy campaign, publishing a plain language elections bulletin, and facilitating discussion around election issues.

- Piloting the Community Radio Project in Guateng province in March 2000, which involved training community radio station staff on gender sensitivity, training women's organizations on preparation of radio-ready content and improving their communication skills, and establishing an Internet-based clearing house for radio-ready content. Participants in these activities reported that they had found them useful

in their work, and the content is changing to include women's perspectives and voices (see http://radio.womensnet.org.za)

Plans include a comprehensive Internet training programme for women, regional technical support centres in South Africa's nine provinces, a programme of women's information resource development, and a web clearinghouse of relevant information and tools.

Women'sNet has learned many techniques through the process of establishing their website, which puts them in a position to advise others. For example, workshop participants not only planned the Women'sNet site, they were trained in basic Web site design and document preparation to use these skills in their own women's information networking work. SANGONeT, as an NGO ISP, played a major role in technical assistance.

Women'sNet impact has reached beyond the borders of South Africa. For example, the Senegal-based NGO ENDA established a communications programme for women - SYNFEV (Synergie Genre et Developpment) – soon after the Beijing conference to get information on major international events in languages other than English. Synfev brought Francophone African women together to address the issue of IT for the first time.

According to Synfev coordinator Marie Helene Mottin Sylla, the initiative is "greatly indebted to Women's Net in South Africa" which has provided "technical help and ideas on women and IT." Representatives of this initiative participated in the 1997 workshop on building the Women'sNet website in South Africa. They established a website and an electronic discussion group called "Femmes Afrique" with 45 members. The number of visits to the website has increased from 4,500 per week to 6,000 per week

d. Partnerships Women'sNet sponsors include: the Charles Stewart Mott Foundation, the Commonwealth Secretariat, the International Development Research Centre, the Konrad Adenauer Stiftung, and the Department For International Development.

Arab States

5. Across Borders – Palestine

a. Background Across Borders was established in May 1999 to give Palestinian refugees access to the Internet, enabling them to document their experience through websites, put refugees in direct touch with one another through email, and provide Palestinians with new skills to generate income.[8]

[8] This section is based on email interviews with Across Borders staff in different countries; see also Stockholm Challenge website. The situation will have changed since the second uprising against the Israeli occupation of the West Bank and Gaza began in September 2000.

The idea was sparked when Muna Hamzeh-Muhaisen, now the project's public relations coordinator, decided in 1998 to create a website for Dheisheh refugee camp on the outskirts of Bethlehem. Adam Hanieh, then webmaster at Birzeit University in the West Bank, got the idea for starting the Across Borders Project, which has been put together through the efforts of a small team of dedicated individuals and activists from around the world. So far, the team has set up computer/Internet centres in refugees camps in the occupied Palestinian territories of the West Bank (one) and Gaza (one), as well as in Lebanon (two), and plan to establish such centres in Jordan and Syria.

b. Access to IT David LeDuc of Oxfam-Quebec, who coordinates the Across Borders project in Bourj Al-Shamali refugee camp in southern Lebanon, describes the problems in access to IT. It took almost nine months to have a telephone line installed. He pointed out, "It is illegal, as a rule, to improve upon the infrastructure of the refugee camps. This includes the construction material as well as the telephone lines. Special permission is required in order to bring such materials into the camp or to have telephone lines installed. It is not illegal for refugees to have cellular phones, but the cost is prohibitive". As the Internet in Lebanon is fairly new, "systems and servers often break down and the connection is often terribly slow - much like it was in Europe or America some five years ago". Many programmes need to be reinstalled after network problems.

Nevertheless, the center in Bourj Al-Shamali opened on 30 September 2000, equipped with 12 computers and a server. The project has installed a cable system, which involves a fixed monthly fee for an unlimited 24 hour connection. The cost of the phone line runs at around $1.40 an hour, "which ends up being expensive if you spend more than an hour a day on the Internet". The project began by offering two initial training courses (most people in the camp were seeing computers for the first time), 40 hours each, in Website design and in programming and networking. Those who took the courses, which were free, agreed to volunteer for 25 hours, and are now teaching courses at the center. They have also been working together to repair problems as they arise and to update the website. When problems are too complex to be fixed by local staff or volunteers, an expert is contacted.

The center is reaching out by offering workshops to different groups and ages who are members of clubs or institutions, inviting them to the camp for short sessions on the Internet and its possibilities. The workshops focus on email, searches, and "other things that will generally appeal to a first timer".

According to the activists, legal matters can be confusing in Lebanon, because the growth of the Internet is expanding faster than rules and regulations can be put in place to address it. Literacy is a problem amongst young girls and adults, but IT is not currently employed as a tool to overcome this problem – although it might be as people become more familiar with the technology. Currently, as many women use the center as men, although conservative traditions means that women need to get home before the sun sets.

Language is a problem since "the language of technology is English" and with many employment opportunities barred to Palestinians in Lebanon, few can afford to send their

children anywhere other than over-crowded schools run by the UN Relief and Works Agency (UNRWA). On a more positive note, students have found a tool to improve their English skills, by chatting with others and surfing areas of interest.

In the Israeli-occupied Palestinian territory of Gaza, obtaining the infrastructure had not been a problem before September 2000. Power in refugee camps can go out for several hours at a time, which has made it necessary to purchase a UPS system in order to protect the computer equipment. Several families in the refugee camps inside the Palestinian Territories have home computers, and, according to Muna Hamzeh-Muhaisen, most "would love to have a connection to the Internet but shy away from obtaining the connection because the monthly subscription cost is $25, plus the cost of keeping the phone line open". In those refugee camps where the Across Borders project has opened centers, it has enabled use of the Internet for low fees, hooking via a lease line.

As amongst Palestinians refugees in Lebanon, the number of Palestinians determined to become computer literate is helping them improve their English language skills through the use of IT, Hamzeh-Muhaisen reports. The UNRWA schools have just introduced English as a second language in the first rather than 5th grade.

In the West Bank and Gaza refugee camps, people help each other out in using the technology. Sometimes, says Hamzeh-Muhaisen, "When I walk into Across Borders' Project center at Ibdaa in Dheisheh, I find five people gathered in front of one screen, learning from someone how to go about doing something". Asked about the fear barrier to use of new technology, she retorts, "What fear barrier? I haven't seen anyone, not even 5-year-old kids, showing this type of fear. On the contrary, they are so hungry and eager to get their hands on a computer, it is really incredible".

c. Use and Impact of IT Within six months of the Across Border project launch at the West Bank refugee camp of Dheisheh, youngsters at the Ibdaa Cultural Centre had created an English/Arabic website, the first ever website in a refugee camp. It is constantly updated with information about Dheisheh and its refugees. As a result, several university students and professionals in Europe and the US expressed interest in volunteering at the camp. Four Americans and a German were amongst the first volunteers, the latter helping to translate the website into German. Children in Dheisheh made new friends with children at Shatila camp in Beirut, Lebanon – and kept in touch with new friends in Europe and the US that they met during their cultural performances abroad. Elderly refugees contacted family members with whom they had almost lost touch. University students looked for information for their studies.

By the end of 1999, nearly 10 Internet and computer (Windows 98) courses had been taught at the Center. Both males and females, young and old, signed up and many were waiting to sign up for more advanced courses, such as web design.

In the Bourj Al-Shamali refugee camp in Lebanon, groups and committees have been set up to address advertising and promotion to enable the center to earn money for self-sufficiency. With the eruption of the Palestinian uprising against the Israeli occupation in

September 2000, people in the Lebanon camp have been in daily contact with Palestinians across the border to get up to the minute information about the conflict, as well as to send letters of support.

d. Partnerships The Bourj Al-Shamali project was funded by the Canada Fund Lebanon, which supplied $30,000 to cover the capital costs, and by Oxfam-Quebec, which provided $9,000 for training cost as well as running costs such as salaries and monthly Internet fees for the period of six months, and the salary of the coordinator for one year. Other support was provided by Oxfam Great Britain and the Australian Community Aid Program. A Canadian Intern is presently living in Bourj Al-Shamali and helping with the transition from a "supplied computer room" to a sustainable business. Le Duc believes that "the cost of creating a center properly and one that is structurally viable is such that it can only be achieved through the assistance of large donors. Private donors have also helped with other centers in the West Bank and Gaza, and in Syria".

Meanwhile, as the Across Borders project took shape in Bourj Al-Shemali took shape, the Palestine Liberation Organization opened its own Internet Shop in the camp. Suddenly, the camp has two computer centers which, Le Duc says, "will allow for some healthy competition".

Things at the Ibdaa Cultural Center on the West Bank took a more sinister turn. A few months after the Internet center was established, unknown persons set fire to the Center. Within 24 hours, friends of Dheisheh had sent email reports to worldwide email lists reporting, "Last night arsonists attacked the Ibdaa Cultural Center in the middle of [Dheisheh] camp, destroying the computer center and the children's library, and seriously damaging the rest of the building… The attackers carried away the main computer, with the Internet provider and home of the kids' amazing website, then burned the 15 other computers, and torched a pile of books in the library. Help is needed to rebuild - and of course the more rapid the rebuilding the stronger the message to those responsible that this won't stop the work. … Just one more story - the Ibdaa kids have developed strong ties with the children from Shatila, where camp conditions are even worse than in Deheisheh. They had just started a fundraising project to help the Shatila kids, but when Shatila got the news about the Ibdaa fire, those kids, already incredibly impoverished, began a campaign to raise money to rebuild Ibdaa".

6. Improving Quality of Life of the Blind and Deaf - Kuwait

a. Background The Kuwait Institute for Scientific Research (KISR) Quality of Life Programme provides people disadvantaged by blindness with bilingual Arabic and English facilities to use for day to day computer applications - Braille printing (hard copies available in both Braille and black print), news media access, and computer-skills.[9] It also provides people suffering from deafness with a dictionary and educational computer applications based on Arabic Sign Language. The applications were developed by Kuwaiti computer engineers, and the initiative has been running since 1985.

[9] This section draws on email interviews with Hani Qasem. See also the Stockholm Challenge website.

As Hani Qasem of KISR put it, “We believed then, and still do, that this sector of society is very disadvantaged when it comes to receiving their share of the information revolution, especially in our part of the Middle East”. The initiative was sparked as a result of a joint project for a voice training system between KISR and IBM-France Scientific Center.

The Braille Word Processing System was used as the base of text books for blind students in 1992, and after that the Kuwait Association for the Blind contacted KISR for assistance in publishing for all their Braille publications. As technology became more advanced, the project team worked on access to newspapers for the blind, and developed software to store, retrieve and print transferred articles in Braille. It also organized workshops at both girls’ and boys’ schools for the blind to teach young people how to access the Internet, using the Arabic windows environment and supporting Braille manufactured terminals. Since 1998, the applications have been used in Bahrain, Gaza, Lebanon, Libya, Qatar, Morocco, Oman, Saudi Arabia, the United Arab Emirates, and Yemen.

The KISR team also developed two computer programmes – an educational sign based application and an interactive Arabic Deaf Sign Language Dictionary – both of which have been operational in special schools since 1999. The sign based application provides teachers with tools for exercises, while the dictionary can be used by any deaf person to learn sign language. There is already great demand in the region for these applications, and both are being made available internationally. KISR is now working on programmes to address the needs of persons handicapped by physical and mental disability.

KISR is a government organization, and staff salaries are covered by the government. Yet they need to raise funds from special projects, both for capital investment and for running costs, and this is "hard work", Qasem declares, "which can sometimes take years". The team has grown from one to eight members since the project was initiated in 1985, mostly computer engineers. They are one of three groups in the Systems and Controls Department, which is in turn one of three departments in the Engineering Division - one of the six KISR research divisions.

b. Access to IT Internet service is not currently available for students at the special schools. And when it is available, the service is not cheap, running at $120 per month, although the cost of a telephone line is reasonable, at around $100 a year.

Maintenance is a major problem KISR faces in providing facilities to persons with disabilities. As Hani Qasem notes, “Since most of the equipment is imported from Europe and the US, local maintenance is not always available. Sometimes we have to train a staff member to maintain equipment such as Braille computers and terminals”.

Literacy is a special issue for people with disabilities, and can only be overcome through specialized training courses, for which IT have not yet proven helpful. Language is a

problem, as few people afflicted with blindness or deafness know English or another second language.

KISR staff do not find it too much of a challenge to bring new users on board, and achieve good results by showing them the relevance of the technology to their work and daily life – and "how easy it is to use such systems".

c. Partnerships Apart from the initial partnership with IBM-France in the mid-1980s, KISR worked with its own funds and technical teams to develop its products. As a non-profit organization, KISR does sometimes compete with private companies, which on occasion creates an uncomfortable environment for research and development.

Overall, Qasem says, "One needs to have patience, persistence and time to succeed in this area. For example, the idea of having a sign dictionary for the deaf started in 1994, but the project was only completed in 1999, after which it rapidly spread".

7. The Virtual Souk – Arab Region

a. Background The Virtual Souk was consolidated in January 1998 by national non-governmental organizations in Morocco, Tunisia, and Lebanon, with a Paris-based Lebanese businessman serving as the focal point, and support from multilateral organizations like the World Bank.[10] The idea came about when the Moroccan NGO Aït Iktel organized an exhibit to sell the products of low income artisans at the first Mediterranean Development Forum sponsored by the World Bank Institute in Marrakech in May 1997. The NGO and the Bank established a temporary website to provide more information on the products and artisans. So much interest was generated by both the exhibit and the website – everything was sold - that the decision was taken to establish the Virtual Souk. The first display of the Souk's website was at an exhibit in Tunisia some months later.

The aim of the e-commerce initiative is to give small artisans who have long produced high quality products, access to new markets, and, by so doing, break the hold of middlemen whose interventions were leading to loss of income for poor artisans as well as lower quality products. The partners are supporting the artisans' access to information about new markets and opportunities, new technical skills, and financial services. The effort is also building the capacity of local NGOs in web design and maintenance, digital photography, electronic commerce, access to information, and overall management. The Souk has already been expanded to include Tunisia, and plans are underway to extend it to Egypt, Palestine and Jordan, with catalogues already established in Egypt and Jordan.

b. Access to IT The cost of establishing an e-commerce initiative was relatively low when the partners started in 1997, because it was one of the first e-commerce

[10] This section is based on phone interviews with Maurice Hazan and the Virtual Souk website. See also the IT Stories site and the Top50 African websites.

initiatives in France. The cost was some $200,000 over a period of three years, funded partly by the World Bank, and partly by Hazan and the NGO partners. Hazan says they were able to keep costs low by investing their time. The biggest costs are Internet development, training, trouble-shooting, logistics, marketing, and maintenance.

There were no Internet cafes in the areas where the initiative started, and no familiarity with the Internet. Yet the NGOs expressed a high level of interest from the start in this tool for e-commerce, and in being trained on how to use it and how to create pages and content. Now that a certain level has been reached, the next steps will address privacy and secure payments.

Whenever training was conducted for NGOs, efforts were made to include the artisans themselves. The partners were careful not to raise expectations, and to say that this was one channel amongst many that could be used to market products. In Tunisia there is now an annual one-week exhibition, where some 200 women artisans sell to the local market in the afternoon, and take sessions in the morning on commercial issues, management of grassroots organizations, the Internet, legal issues and other areas.

There are problems with literacy, and when communities are really poor the problems of communications are most difficult, Hazan says. Often discussions are based on pictures, and transactions are conducted orally and based on trust between the NGO and the artisan.

Language is an issue: the partners have chosen to run the site in two languages, French and English, which adds extra work. And although many people in the Arab region are comfortable with one of these two languages, the language of the majority is Arabic.

Although the situation differs from country to country, by and large the infrastructure in terms of electricity and phone lines is reaching even remote rural areas. Hazan says cheap connectivity is now available through Internet cafes in almost all the countries the Souk works in.

One problem at the start was faced in some countries where e-commerce was the property of the government. The regulations were due to be changed, but "the legislation never came". The partners pressed ahead anyway, since "the Internet enables us to sell, with payment for the products made in Paris and repayment made locally. Once we showed it worked, the governments were really interested. They said, if a bunch of NGOs can do it, why not us. The prime minister of Morocco has expressed interest in replicating the Virtual Souk for agricultural producers". The main challenge now is to work on secure payment issues, which are still not resolved in the region.

c. Use and Impact of IT In Morocco, the partners identified artisans producing quality products in Fes (copper and pottery) and the High Atlas (carpets). In Fes, many of the artisans had to hold down "day jobs" as hotel doormen and cooks to make ends meet. In the High Atlas, the carpet making skills had almost died out. The partners began by explaining the Internet and the concept of the Virtual Souk, and then identified

a catalogue with each artisan. The women of the High Atlas were also provided with micro credit to buy raw material.

Once the catalogue was decided, the NGO Aït Iktel enhanced its electronic skills, and established a commercial network in Fes, the High Atlas, and Casablanca, signing agreements with 11 other NGOs to include their crafts on the site. The network transmits the orders from the website to the artisans, secures the products, conducts quality control, and packages and ships to clients. About half the products are sold internationally, the rest locally.

For Lebanese artisans, operations with the Artisanat du Liban were launched during an exhibit about Lebanon at the Institut du Monde Arabe in Paris. The Artisanat was a well established enterprise, but had been badly hit during the 15-year Lebanese civil war, losing both local and international custom. The partners installed a computer featuring the website, with background notes on the artisans and traditions. The exhibit generated $500,000 worth of sales for the Artisanat du Liban during three months. A catalogue of over 100 Lebanese products has been placed on the web, and business-to-business electronic links have been established with several shops in Europe.

Now the international operation is the biggest part of the business. "The Internet helped in several ways", Hazan explained. "It helped to test the market in Paris, making agreements with different shops in France that knew about the products before they saw them, and the access to information about international prices which helped in building up the catalogue".

To date, there are over 700 artisans involved from Lebanon, 50 from Morocco and 25 from Tunisia. Three training workshops have been organized in each of Tunisia, Lebanon and Morocco on the Internet, e-commerce, marketing, basic management skills, and micro-credit. A fourth was held at the March 2000 Mediterranean Development Forum. The website is well linked to both commercial and development sites in the region and throughout the world. The Virtual Souk has a decentralized electronic catalogue of artisans and crafts, with each participating NGO responsible for updating its catalogue. Hazan notes that, since the site is established, the cost for NGOs is relatively small, and has been built into the final price. Ait Iktel has combined its Virtual Souk operations with the creation of a telecenter offering low cost communication and Internet training in villages.

Hazan notes that e-commerce may take a while to generate substantial revenues for the artisans, so it is being combined with exhibitions at fora, where the potential of the Internet is explained alongside the physical presence of the products and artisans.

Dealing with a wide network of producers spread over remote areas has its own problems, and it can be a struggle to get the product from the artisan to final clients. Other problems that arose included not knowing which products would attract international customers – the only way to find out being to produce them and post the information on the web.

d. Partnerships Ait Iktel is a village association, and all village inhabitants are members. It forms part of the associative network Migration and Local Development. The office is run mostly by young people, who work together with the jmââ (the traditional assembly of heads of family). The Association's achievements include drinking water, health care, roads, and education projects.

In Lebanon, the Artisanat of Lebanon is an initiative of the NGO Mouvement Social Libanais founded in 1977. The Artisanat shops sell the output of over 700 artisans, and has networked artisans with young Lebanese designers to continuously enhance the quality and originality of the products.

Maurice Hazan runs an Information Technology company – W.A.X. - and has for some time been interested in how the Internet can be used in development. "The real work is done by the NGOs who work in the field", he says; "I'm just a facilitator on how to use technology in different areas of development". The World Bank has supported the project since its inception.

Asia

8. Agri-News, Gobi Wave, and the Umnugovi Internet Center - Mongolia

a. Background Three information and communication technology initiatives in Mongolia – a radio service, a news service, and an Internet service - joined forces in the year 2000 in order to survive. By drawing on each other's strengths, they have enhanced the services they provide to Mongolians living in the Gobi desert, which covers the southern half of Mongolia and is the country's least densely populated region.[11] Layton Croft, program director of information systems at the USAID-supported Gobi Regional Economic Growth Initiative, notes that "for herder families who live several hundred kilometers from the nearest telephone or Internet center, receiving timely, accurate, and relevant information is often as vital as food, shelter, and clothing".

One of the three actors is the Gobi Wave Information Center, which is managed by Ms. Naranchimeg, a native of Umnugovi Aimag. The Center is based in the province capital Dalanzadgad, and used to be a state-run organization producing a bi-weekly newspaper as well as a twice-weekly radio programme using a regional radio transmitter station built by the Soviet Union in the 1970s. Due to the 1998 Free Press and Media Law, the Center lost its source of revenue – and the resultant loss of information was a serious problem for herding communities, who strongly protested.

Ms. Naranchimeg led four other colleagues in the move from state to private sector. They registered as an NGO, and focused on the radio business, shutting down the

[11] The information on these initiatives was provided by Layton Croft in email interviews; see also the IT Stories site.

newspaper and generating revenue by selling ads. The major problem they faced was in securing content to serve the potential market of 200,000 listeners in six Gobi provinces. The Gobi Wave Information Center currently provides updated price information for key commodities in the region as well as weather forecasts. It has plans for programmes directly aimed at herder needs.

The second actor, Mr. Ariunbat, used funds generated from his own efforts and personal investments to establish the online newspaper AgriNews from his base in Ulaanbaatar, as well as an NGO, the Fourth Estate Media Center. ArigNews is delivered in either Mongolian or English languages, and serviced by journalists filing from across Mongolia's rural regions. The problem this initiative faced was securing paying subscribers as well as relevant regional and rural news. To date, AgriNews and Fourth Estate barely break even, but this is an example of "vision and spirit proving that an indigenous Mongolian media enterprise can survive without significant donor support", according to Layton Croft, who has followed the efforts of all three actors from his vantage point.

The third actor is the Umnugovi Internet Center, which was opened in Dalanzadgad, and was one of several Internet centres established in the country with initial grant funding from the Mongolian Foundation for Open Society (the Soros Foundation). The problem this group faced was the lack of knowledge in the community on how to use computers as well as the uses to which they could be put, and the need to sustain the Center through user fees.

In the spring of 2000, the founder of ArigNews met with the staff of Gobi Wave while on a work trip to Dalanzadgad. He also came across the Internet center and learned of the problems this faced. The three operations met the next day and decided to draw on each other's strengths:

- AgriNews and the Internet Center staff agreed to train Gobi Wave staff in basic computer, email, and Internet skills;

- The Internet Center agreed to waive user fees for Gobi Wave staff in return for free advertising on the air;

- Free ArigNews subscriptions were provided to Gobi Wave, by daily email, as well as permission to include any of ArigNews' content in its radio programmes, with due attribution; and

- Gobi Wave agreed to send weekly Gobi news reports and market price information via email to ArigNews, with due attribution.

b. Access to IT Telephone communication to Mongolia from the outside world is difficult, and reaching rural Mongolia by phone from the capital is a real challenge. Once the connection is secured, email and Internet are relatively problem free, except for slow connection speeds. Power outages outside Ulaanbaatar are common, and also occur

in the capital. Cell phones are growing in popularity as they outperform the land line systems.

c. Use and Impact of IT The local partnership has served Gobi Wave, AgriNews and the Umnugovi Internet Center well. They communicate regularly and frequently assist each other. AgriNews' Ariunbat has trained Gobi Wave staff in both email and Internet skills, while Gobi Wave has provided AgriNews with timely and accurate news from the region for its online newspaper. The number of Internet Center users is growing.

The Gobi Wave audience is estimated at around 100,000, and 500 people use the Internet Center on a regular basis, and both are breaking even. AgriNews has around 500 subscribers but finds it a struggle to break even.

Today both Gobi Wave and the Umnugovi Internet center have websites, and Gobi Wave was slated to receive a grant of a new $20,000 FM radio station, courtesy of the Mongolian Foundation for Open Society, which is expected to raise revenue for both local and regional operations (the Foundation has also granted two FM stations to independent media in Northern Mongolia). The Station will be equipped with technology to stream and share programs via the Internet. Gobi Wave has successfully lobbied the Aimag Government and received title deeds to its own space in a private building. Layton Croft describes this as “a huge victory for Gobi Wave who only nine months ago did not own any property other than two chairs and a table”. Other Gobi Wave products will include a customized information service for fee-paying customers. Participants at an October 2000 rural radio workshop held in Dalanzadgad decided to form a rural independent radio association to support producers and generate funding.

But it was not all plain sailing, and certain misunderstandings had to be cleared up. For example, the Internet Center’s offer of a free email account and Internet access to Gobi Wave was not fully appreciated by the latter at the start, because “they simply didn’t know what email and the Internet were”. Another problem was that the Internet Center was slow to understand the need to become financially sustainable.

d. Partnerships AgriNews has received no donor funding support. GobiWave operates the radio station on loan from UNESCO, and recently received the FM Station grant from the Open Society. It has a technical partnership with the Gobi Initiative, with the latter advocating Gobi Wave’s potential to national and foreign donors. The Initiative also pays Gobi Wave to broadcast its Gobi Business News, which is published by the Gobi Regional Economic Growth Initiative, a five-year rural development programme launched in January 1999 with funding of $10 million from USAID, to address agricultural development, enterprise development, rural financial services, and market infrastructure.

The Mongolian Foundation for Open Society (Soros Foundation) provided the funding to establish the Umnugovi Internet Center, and the new FM station for Gobi Wave.

9. LAcNet (The Lanka Academic Network) – Sri Lanka

a. Background The Lanka Academic Network was established in 1991 by a group of Sri Lankan students, teachers and professionals living all over the world.[12] It evolved from Sri Lanka Network (SLNet), "an electronic gathering of people from and/or interested in Sri Lanka" news and information. The LacNet "mission is to enhance educational opportunities in Sri Lanka by increasing the accessibility of the Internet to its students. We also provide news and information about Sri Lanka through this website".

The virtual community now numbers some 3,500 people, the vast majority of whom have never met. The non-profit organization is run by volunteers (about 100 core members run and operate it). LAcNET now has a local "land-based" project in the form of a computer center in the Nivaththaka Chethiya High School in Anuradhapura in rural Sri Lanka. Vice President Chulie de Silva, who has been a volunteer with LAcNET since 1998, is the project coordinator.

The current Board consists of seven members. The president is in Canada, the treasurer in the US, and the other members live in the US, the UK, and Sri Lanka. Major decisions are circulated to the Board for comment, and replies are expected within 24 hours, or the decision moves ahead. Board elections are held by email.

LAcNet is registered as a non profit organization in the United States (501c3) and has tax exempt status in the US. The strategic plan, formulated at an e-meeting of LAcNet directors in February 1996 and drawing on input from the academic in Sri Lanka, focused on seven areas, including technical and operational support for users of its network, collaboration in research and curriculum innovation, and infrastructure for web related projects. Much of this has already been achieved.

b. Access to IT Obstacles to access to IT in Sri Lanka include a highly congested telephone network, lack of access to phone lines, lack of steady electricity services, and the fact that ISPs are not willing to provide services outside the main cities. Nor do the main computer vendors offer service facilities outside the main cities.

Other issues, according to Chulie de Silva, include the high cost of computers, high ISP charges (the ISP license fee is $4,000, which they pass on to the consumer, and leased lines are not available outside the main cities), high telecommunications charges (for dial-up connections, metered telecom charges are high, and even for the affluent in major cities the cost of connecting is high), poor quality lines, lack of technical skills, and insufficient competence in the English language. There are few computers available through local public facilities such as libraries and community centers.

[12] The material for this section is based on email and phone interviews with LacNet Vice President Ms. Chulie Kirtisinghe de Silva, materials she provided, and the LacNet website www.lacnet.org See also the IT Stories site.

Monopolies are also an obstacle, although the dominant provider Sri Lanka Telecom recently introduced a local charge for connecting to the Internet from cities outside the capital, whereas earlier they had to pay national rates every time they connected to an ISP. The biggest Internet use in the country is email.

In the absence of a structure policy, small groups like LAcNET which are unfettered by regulatory constraints have important functions: to evaluate the role and best use of computers and to develop programmes attractive to the general public.

There are limited resources to train people in use of IT. "There is much talk but no structured government plan in operation at the moment", she says. LAcNet's Computers for Schools pilot project, established with a two-year budget of $8,000, has concentrated on training the teacher-in-charge, a volunteer who will act as the information intermediary. The wider LacNet team contributes advice and support. The teacher-in-charge has followed one course in network maintenance, while six teachers from the school received training from I*EARN on using e-mail and Internet.

LacNet's plan for the pilot is to maintain the computers for the first two years. Currently, the pilot has "to rely on a private computer vendor in the area and voluntary assistance for trouble shooting. Voluntary community assistance is often rewarded by a free English lesson by the teacher-in-charge. By 2002, LAcNet hopes that teachers trained will have enough skills and/or develop a voluntary community support services to be responsible for maintenance".

Another issue is community concern about e-mail communications between school children in Sri Lanka and in other countries, in terms of social and cultural acceptability. " For example, U.S. children will write about their boy friends, but dating and boy friends is a subversive topic for Sri Lankan school children".

Literacy rates are high in Sri Lanka, so this is not an issue. However, "the lack of English skills is an issue. The thirst among student population is for increased competency in English. Hopefully use of Internet will increase proficiency in English. Local language fonts are available and currently some information is available in these scripts and the future will see more content in local language script, by the use of an information intermediary who interfaces with the local community".

c. Use and Impact of IT The LacNet website is a goldmine of information. In addition to the newspaper, it offers an email-based news bulletin, and a digest of news links on Sri Lanka. It opens the opportunity for Sri Lankan volunteers with expertise in news reporting or various softwares "and tons of volunteer spirit" to offer their skills to others on line.

LAcNet funded and operated the telephone/modem electronic mail relay for the Lanka Experimental and Academic Research Network (LEARN) from 1990 to 1995, drawing primarily on donations from the readership of SLNet. In November 1995, LEARN obtained direct Internet access through Sri Lanka Telecom, and is operating a 64Kbps

line from its hub in Colombo, to the University of Moratuwa, with the cost underwritten by the University Grants Commission and the Computer and Information Technology Council of Sri Lanka.

LacNet negotiated with Wijeya Newspapers and InfoLabs Ltd of Sri Lanka to post a weekly online edition of the Sunday Times of Sri Lanka on the web, which was launched in 1996. This now has a weekly readership of about 8,000 (over 200,000 hits per week). The production costs of the first year were supported by LAcNet, which continues to host the edition. In addition to the LacNet and Sunday Times sites, the server is a mirror site for the Island Newspaper of Sri Lanka; a few academic institutions in Sri Lanka; the Virtual Gallery of Art from Sri Lanka; and Lankan in CyberSpace.

At the pilot school project described above, nearly 90% of over 4,500 children had never seen a computer before; approximately 200 children have so far had hands-on basic introductory training. “Next year we hope to have a more structured program aimed at a 16+ select group”. They are also pushing ahead with fundraising: “There is such demand for computers for rural schools”.

Chulie de Silva proposed a pilot before moving further because, “We had several enthusiastic LAcNET members who wanted to put a computer in each school in Sri Lanka. I said, let’s pilot it first. If you send just one computer to the school, it will end up in the principal's office”. There will no shortage of technicians to backstop maintenance for the schools project. “Any technician can just send an email, and there are lots of engineers out there who can help”. The project was to be expanded in June 2001, but establishing a computer center at the Sri Lankan Malay Association Vocational Center in Colombo in order to provide children with basic computer literacy skills, and to broaden their horizons through access to the Internet.

Other school-related projects include a two-year grant to the Asia Foundation to distribute science and technology books to Sri Lankan schools, putting model exam answers on the website, and promoting unusual writing or music on the site.

The use of the Internet in political and social mobilization is an interesting area to monitor by observing the progress of LacNet. Chulie de Silva comments, “There are several instances of certain community sectors using the Net for political and/or social mobilization and activism and this is gathering momentum. The expatriate Sri Lankan communities have had a big impact in this arena”. Indeed, the Lanka Academic Network recruited journalists during the last national elections and ran an election monitoring site which generated intense interest.

d. Partnerships The LacNet partners are indigenous to Sri Lanka, although living all over the world. The organization is determined to be as self-sustaining as possible, and the website actively invites continued contributions from existing and potential members and supporters. It also generates an income by inviting supporters to use the services of several national and global companies who “will donate a fraction of their profits to

LAcNet when tell them that you want to make a donation to LAcNet. Be sure to send us an email to tell us about your donation".

Given the membership base, the LAcNet server (lacnet.org) has a prestigious history. Between 1994 and 1998, the computer (purchased through donations from SLNet) holding the LacNet server was hosted by a member at Stanford University; until March 2000, the server was hosted by a member at the university of Maryland. In March 2000, a new computer was acquired and was hosted by a member at MIT, while the old server migrated to a host at the University of Western Ontario in Canada. An important non-Sri Lankan global partner is I*EARN.

10. Village Computer and Internet Program - Bangladesh

a. Background The Village Computer and Internet Program was launched in June 1999 with two staff members, and a budget of some $8,000, at Madhupur in Tangail district, which is about 160 kilometers away from Dhaka.[13] It is an initiative of Grameen Communications, a part of Grameen Bank, which was established as a "non-profit organization committed to poverty alleviation and promotion of democracy", according to its mission statement. The goal of the Village Program is "to provide multipurpose information services for isolated regions to promote poverty alleviation, reducing migration from villages to cities, creating IT related job opportunities for the rural poor and creating familiarity with computers among the rural population of Bangladesh." It is a challenge given that Bangladesh today has some 50,000 Internet users and the population of Bangladesh is over 120 million.

The project is currently providing off-line Internet facilities, with the aim of establishing more Internet centers in rural areas by next year with on-line facilities. It provides information regarding health, education, agriculture, environment, access to product price information on the market. Currently, the initiative reaches around a thousand people, with the usage increasing by about 10% a month. The initiative has been featured in a CNN documentary on 25 June 2000, "Global Challenges: Virtual Villages".

In an answer to the skeptics about the value of providing IT to the rural poor, the Grameen Communications website points out that, some 20 years ago, the concept of "micro-lending to eradicate poverty was a myth". Today, Grameen Bank annually disburses some $360 million to about 2.3 million borrowers, for a total cumulative disbursement of $283 billion. As for the value of IT to the rural poor, the project managers note that information regarding government, the private sector, education, environment and other issues must be available to all people, and at present is only available in cities and major districts. "The ability to choose the right idea and option can change the world around us in our own way. It is not the abundance of resources that will make this planet a poverty free one, but the appropriateness of the ideas to harness these resources to bring forth the required change".

b. Access to IT Many villages in Bangladesh still do not have access to electricity, but the main obstacle to access according to project manager Tariq Alam is the telecommunications infrastructure. There are only six telephone lines for every 1,000 people in Bangladesh overall, and one per 1,000 in rural areas. In addition to electricity and phone lines, uninterrupted power supply equipment is necessary.

The costs are expensive, both in terms of telephone and Internet usage, and as a result 90% of users use the Internet just to send and receive email . Cost is the reason why the

[13] This section is based on email interviews with project manager Tariq Alam, and information on the Grameen website. See also IT stories.

project offers off-line email services, although it has downloaded websites to the local hard drive, so that people can access the information.

In the year 2000 the Government deregulated satellite networks, and many companies have begun to operate wireless services. There is not yet a defined policy on information technology, although there are some restrictive regulations to protect monopolies. For example, voice cannot be used over the Internet. Moreover, the Bangladesh Telegraph and Telephone Board is the only provider of telephones in Bangladesh. As the provider of phone lines to ISPs it is able to control the licensing and VSAT of ISP businesses. Now the Board itself is also an ISP, and is thus reluctant to provide telephone lines, although it is not necessarily difficult for them to do so.

There are, in Tariq Alam's view, sufficient resources to train people on the new technologies, and to maintain the equipment. Literacy is a problem: "At present, we are providing email services to rural people and our operators write and read for them. Training and other programs are mostly offered to students".

Language is a problem. Most users of email use "Benglish" – the English alphabet to write Bengali. Training programmes are offered in Bengali as well as in English for those who understand it, and the project plans to start an English language course at the center. They also use multimedia CDs to teach Bengali and English, a programme offered especially to children. Some parts of the website use Bengali.

The project meets with different categories people to explain the benefits of IT, and organizes exhibitions and seminars. There is a lot of discussion about IT in the media, and most newspapers have a special page on IT, which has sparked people's interest. Tariq Alam believes the project is financially sustainable: "If we can provide on-line services, I am sure we can make a business model".

c. Use and Impact of IT The project is providing a basket of services to rural people, including information services about health, education, employment, agriculture and other areas; low-cost email services; computer training, including on operating systems, typing, work-processing and accounting software, visual basic, web design, graphics, and hardware trouble-shooting; printing services to produce letters, applications, newsletters, and announcements; a village database with information on government, NGOs, and economic and social data, including fisheries, livestock and other data; computer lab facilities; computer education and games for children; and publishing services.

Families are interacting with immigrant members much more regularly, and discussing ways to better spend remittances. The project website, Tariq Alam reports, enables village producers and consumers to check current market prices, and to acquire better bargaining capacity in selling their produce, reducing the middlemen involvement in the market. Individuals and NGOs are accessing new information.

Although the project has started small, the staff have big dreams, given the potential impact of the Internet on people's lives in terms of economic opportunities, and social and political change – as well as disaster management.

d. Partnerships The programme was initially funded by International Development Research Center, Canada, through the Pan Asia Networking project. There are currently no partners for the Village project, but another project to provide a Grameen Digital Center in rural Bangladesh is partnered with Hewlett Packard. That is scheduled to start in 2001, and to provide e-services like, e-education, tele-medicine, e-commerce, and e-banking etc.

Europe

11. Council of Women Farmer's of Ukraine

a. Background Together with the State Committee of Ukraine for Entrepreneurship Development, the Council of Women Farmer's of Ukraine launched an integrated initiative in June 1999 to improve the status of rural women.[14] Among other things, the project introduced telecentres to facilitate the exchange of market information and experience, provide services in agri-tourism, and carry out electronic commerce. Computers were established in the Council's offices in eight Ukranian oblasts, and networked through a server in Kiev.

b. Access to IT Access is facilitated by the high level of education and the availability of basic telecommunications infrastructure. But according to Council President Lyudmila Klebanova, there are several obstacles: people do not have enough money to buy computers, which are expensive. The only type of connection to a rural area is a telephone connection, but few people have telephones – for example, there are only one or two phones in a village of 400 people, which makes access difficult. Moreover, the women find the cost of connectivity too high. In addition, there are insufficient resources for training, and maintenance requires bringing specialists in from a special firm, at high cost.

Although literacy is high, knowledge of English is very limited, which makes it difficult to access much content "although we do have a translator". Lydumila Klebanova finds that the best way to bring people on board is "by showing them concrete practical examples, and offering plenty of training". In there experience, it is easier to bring young people on board, especially boys.

c. Use and Impact of IT Currently, there are some 4,500 women farmers in the Ukraine. The initiative now serves the population of five villages, and the rate of usage has grown by 50%. Consultations with the women farmers identified the areas that could be addressed through access to information: laws and legislation on taxation,

[14] The information in this section was collected through email and phone interviews with Lyudmila Klebanova, Council President, and material on the Council's website www.cwf.org.ua

privatization, land ownership and agricultural know-how, as well as sharing of experience and networking. Training sessions on IT were conducted alongside business lessons, and the farmers learned how to work with personal computers, Internet email, and troubleshoot software as well as minor hardware problems.

At a later stage, training will be given on online content creation in the national language, and on e-commerce. It is envisaged that the telecentres will become self-sustaining by charging user fees or subscriptions to services, and that they will also create jobs, eg. by creating websites for various enterprises.

The women farmers are using the technology "to manage economic and financial problems, and to run their businesses more effectively. New entrepreneurial bodies have been established, and information has been exchanged". They disseminate the new information accessed through advertising, training, seminars and booklets.

d. Partnerships The overall project is supported by UNDP, and the IT component is supported by both UNDP and the Government of Japan.

12. Miksike – Estonia

a. Background Miksike is a new approach to lifelong learning pioneered in 1994 due to a happy coincidence of three circumstances: the newly independent status of Estonia and thus the call for new school curricula; the need for families living far apart from each other and from schools for distance learning materials, and the availability of excellent and cheap telecommunications.[15]

The basic concept is simple, but the potential of the application is revolutionary. The Miksike Learning Environment gives away worksheets in HTML – called eWorksheets – which are then adapted by students as well as by teachers to their specific learning requirements at that point in time, whether in schools or in home-schooling families. The worksheets are free; they are created by teachers all across the country and are shared free of charge.

The initiative began when a non-profit-making organization "A Why'n'Not Education" started to create original learning resources for K-12 schools, with the help of teachers and local community activists and grants from the Estonian state and other sources. The structure was formalized into a profit-making venture as Miksike in 1998. It won the Stockholm Challenge Award (2000) and was also selected as one of the best educational practices in the world by Conexiones project (2000) and Best Practices in Education (1997).

[15] The material for this initiative was collected in phone and email interviews with Miksike Learning Environment Director Mihkel Pilv and material he supplied. See also the Stockholm Challenge website and the IT Stories website.

b. Access to IT The telecommunications infrastructure is "the same in Estonia than in the rest of the Western world", explains Director Mihkel Pilv, "We have three as many Internet plugs for computers as Italy or France; 80% of Estonian schools are on line in one or another way; every third Estonian has a mobile phone". One reason for this state of affairs is Estonia's proximity to Finland and Sweden, and the movement of substantial capital from these two countries to Estonia. As for literacy, "this problem was overcome by the end of the 19th Century, and the population is practically bilingual, with English being the language of choice for younger people, "so the generation of up to 30 years can speak English".

Unlike other countries, the cost of connectivity is not just cheap, it is currently free. "Three major companies are fighting for the phone market, and giving free Internet connections as part of their marketing. The Estonian telephone company was given a 10-year monopoly which ends this year, and Swedish and Finnish companies are poised to compete for market share. When the monopoly was granted, it did not include Internet connections since no one expected such growth. So the phone competitors are trying to convince customers to choose them by providing Internet services free for a year – all you need to pay is the cost of a local call".

Currently, Miksike employs four full-time people, but hundreds of collaborators who are regular teachers in schools participate. "We compare ourselves to Linux - we give away the worksheets free, and people contribute their products free. Lots of stuff can be done free online. Before, when a teacher produced a paper for her class, only the class made use of it. Now, they send it to the website for many more people to use". Miksike worksheets are approved by government from grades 1 to 3, and they are currently getting approval for grades 4 to 6.

c. Use and Impact of IT The purpose of the project is education, and Miksike is careful never to give the impression that they are about access or about promoting IT in education. The key, Mihkel Pilv says, is that the "educational vision comes first, then technology follows". In this case, the driving vision was that "learning materials must be flexible from the learners' point of view. This is what will work in the future, because the amount of information is growing very rapidly, and our brains are not growing any larger. In the 17th Century, a really wise man got as much information in his life time as is packed into the Sunday edition of the New York Times. In the past, one could read a book and consume information written by others. But, today we must create study materials that support learners' needs in real time, and focus more on the individual for results. Thus, the student is not just a consumer of information but a creator of information. With worksheets, the learner can modify knowledge, which cannot be done with a book".

He explains, "We may compare IT to a super modern jet engine, but our schooling model can be compared to the biplane, which was used in the middle of last century. If we attach the jet engine to the biplane, then the system will blow up. What we really need to do now is to modify the old biplane so that the jet engine suits them – and this process is

much more painful in the Western world, then in our country where the need for change is more urgent because of the problems faced in rural school".

To date, 20,000 eWorksheets have been created and distributed by over 100 teachers and "educational activists" in Estonia (http://miksike.ee for sheets in Estonian, which are also translated into Swedish http://eleverkstan.org, Russian http://miksike.net, and English http://miksike.com). "The use of information technology changes the situation. eWorksheets move the class electronically and one may think of them as drafts and templates. eWorksheets also raise collaboration between teachers to a new level and integrate different subjects and various disciplines. The learning materials are formed into study cycles that contain additional materials and teaching ideas". The system is supported by "Miksilitators", who are specialists in their own fields and act as assistant-teachers, tutors, and composers of study material. With the Internet, they support some twenty or thirty classes at a time.

Miksike is now working with the Estonian Ministry of Education to help smaller schools in rural areas to raise their quality of education, and has offered a full package to 31 such schools. It has been of service to nearly 80% of the 700 Estonian schools in some way. In January 1999 the Estonian language sites had 150 visitors a day; by April 2000 the number was over 5,000 and growing.

Two unusual factors played a part in the initiative's success. For one thing, the Director is not an educator, and so he was not hampered by any preconceived notions of what education should be or look like. In fact, neither was Mihkel Pilv an information specialist. He had just graduated in veterinary medicine when he was pulled in to serve as a manager at a local private Catholic school. "I thought I would be there for six months but this is now the 9th year – I never worked as a vet. The idea started at the school. We opened the school just when the new Estonian state was born. Teachers said we need a new curriculum, and we started to create new study materials - and then others liked the materials and wanted to use them too".

The second factor was that schools in rural areas have a greater need for change to survive. They faced a shortage of both pupils and teachers. "They can't continue to provide education in the old-fashioned way, with a school house, an administrator, many teachers and so on, because it is too expensive". They were open to a shift from a classroom based approach to a networked approach. Yet, although the needs of rural schools were the driving force behind the Miksike Learning Environment, but the vision applies to all educational levels and locations.

What the technology has made possible is the electronic distribution of materials, and to enable students and teachers to change and adapt worksheets. It has also enabled a network of educators to quickly share experience and new products.

Teachers are not threatened by the new approach. "We have been very careful", Pilv explains. "We never say that no teachers are needed – we will always have teachers. We

simply explain that our approach is supportive of teachers and helps them in their work. Our goal is not to be the only source teachers will use".

Miksike has come a long way. "Three years ago, many people who knew us said you have to do something more serious, this is too funny. Today, everybody in Estonia - and in many other countries – says this is where education is heading in the coming years".

d. Partnerships In the mid-1990s, students in Germany collected money for the non-profit initiative by singing on the streets of their home towns. Today, the biggest organizational partners are Renovabis (Germany), Open Estonia Foundation, the Estonian state, the Information Office of the Nordic Council of Ministers in Estonia, the Tiger Leap Foundation, and Schoolsisters. Other partners include Heartsound Program (USA), LINCT Coalition Schools (USA), Innova Multimedia (Canada), Action Leanring (Ireland), World Association for Online Education/WAOE (International). Some of these partners intend to adapt and use Miksike themselves. Agreements have been made with LINCT Coalition Schools, Innova Multimedia, and Action Learning Ireland.

Miksike is also working, on a non-profit basis, with Russian-speaking minorities living in the Baltics in collaboration with the Royal Netherlands Embassy, OSCE, and others (http://miksike.net)

13. Multimedia Internet System of Testing Hearing - Poland

a. Background This tele-medicine project enables mass screening to identify people who are suffering or may suffer from deafness, using a standard multimedia PC terminal, and to direct those identified to appropriate centres for medical care. "Hearing impairment is one of the fastest growing diseases in modern societies", according to its Director Prof. Andrzej Czyzewski, Ph.D., D.Sc., Eng, who heads the Sound & Vision Engineering Department at the Technical University of Gdansk, Gdansk, Poland.[16]

The system was developed in collaboration between the University of Gdansk and the Warsaw-based Institute of Physiology and Pathology, which was set up in 1996. Each body has assigned five part-time people to the initiative, which was also supported by the Ministry of Health.

The project involves a systemic approach, and needed the cooperation of people from many disciplines, namely information technology and sound engineers, medical doctors, audiologists, and medical service organization specialists. It addresses the technical difficulties of organizing mass screening tests of hearing caused by the low number of audiometric equipment and high cost. The Internet offers "the fastest way to organize mass testing, for example in schools".

[16] The information for this section was provided by Prof. Andrzej Czyzewski in email interviews; see also the Stockholm Challenge site.

The plan is to expand the scope of the tests by incorporating speech, vision, dyslexia and other problems, thus enabling schools to use the system to detect obstacles to learning, and directing specific medical problems to the network of medical consultants. The network, Prof. Czyzewski explains, provides the "link between the virtual reality of cyberspace and real life, with its existing medical personnel and facilities. Not that many Internet applications have such a philosophy, so we believe that our project adds value to this domain".

The project was piloted in some Warsaw schools in 1999, together with a consciousness-raising campaign through the media. So far, 30,000 people have been reached, with a target of a million planned for 2001. There are plans to establish an "International Academy of Telemedicine" in order to teach telemedicine. The team also plans to submit their initiative to the European Research and Technology Development Programme in the hope that it will spread beyond Poland; some interest has already been expressed by Eastern European countries, African countries, and China.

The project was nominated as one of 10 best Internet projects in the category of Health & Quality of Life by the Stockholm Challenge Award, and as one of 5 best projects in the category of Empowering Citizens & Democracy by the jury of "Europe's Best in Multimedia - Europrix 2000".

b. Access to IT In Poland, the availability of computers in schools is concentrated in large towns and computers are rare in rural areas. The Polish parliament recently launched a programme to bring computers to the majority of remote village schools before the year 2003. The subject is taught in most school curricula, and informatics teachers maintain the computers. In some schools, there are not enough telephone lines to easily connect to the Internet.

The situation is likely to improve soon due to the rapid growth wireless and wired private sector network access. An ultra fast fiber optic network now links all major towns in this country. "Therefore, one can foresee that the present ratio of 12% of people using the Internet will grow rapidly in coming two to three years", Czyzewski says.

However, there are other problems. "In my country, the cost of the local phone connection is one of the highest in the world. It is caused by the de facto telecommunications monopoly – which must be overturned by the year 2003 if Poland is to join the European Union".

Illiteracy is very low in Poland, but language is a major obstacle to use of the Internet by older people, whose second language tends to be Russian or German "while the Internet is mostly in English".

Where there is no access to the Internet, the initiative provides a CD-ROM-based software, and the results of screening is sent on diskettes to the nearest medical outlets. Of course, this can only be done if a computer capable of running multimedia software is available.

c. Use and Impact of IT The initiative disseminates the tests through school headmasters and the Ministry of Education, who then decide to "put their pupils on-line". TV stations are advertising the service free of charge, because of the children's welfare. PITograms instead of text are used for young children, and the screening tests are supervised by adults.

There is rarely a fear barrier amongst the children, but the project finds that, although boys are "much more eager to act, girls are better focused and usually demonstrate more accurate results in testing". Parents are engaged in the process by completing questionnaires, which heightens their awareness of possible problems.

The test includes interviews, electronic questionnaires and three tone audiometric tests. Persons showing signs of difficulty are then referred to specialized centres which have been connected via the Internet and provided with special database access that allows them to automatically register and track patients.

The project became self-financing after just three months. The cost of the operation is paid on the basis of the number of tests registered at the local health service centres, which found that the cost of hearing using the new system is far lower than that of standard hearing tests. They also took into consideration the costs of patients who are not diagnosed at an early stage. The human cost of suffering through loss of hearing cannot, of course, be calculated.

The project has not only improved the lives of people through early diagnosis. It has also changed the way the Institute of Physiology and Pathology of Hearing works. It now has "Internet patients", who are diagnosed over the Internet and directed to the Institute by the medical consultation centres. The Institute re-examines those with a negative diagnosis. The project has also elaborated three other systems: for testing vision over the Internet, to examine people suffering from inner ear noise, and to examine children for speech fluency.

d. Partnerships The project's partners include the European Union, the Technical University of Gdansk, Wuerzburg Universitaet, the University of Antwerp, and local medical care centres.

Latin America

14. Mujer y Negocios

a. Background Mujer y Negocios® was established by two women information specialists, Judith Ovadia and Beatriz Calatayud in October 1997.[17] They had originally established a business in 1991 to offer corporate information services, Consultores de

[17] The information in this section is based on email and phone interviews with Judith Ovadia, and material from the Mujeres site www.mujerynegocios.com.ar See also the Stockholm Challenge site.

Base S.R.L., and introduced Mujeres as a portal for women in business, offering a "directory where women are given the opportunity to introduce their small and medium-sized enterprises, business activities, the services and products they offer, as well as their professional skills and activities".

Mujeres has now become their main activity. The team has grown to five people with a network of freelancers to support web design, content and technical backstopping. They have spent about $500,000 to establish the project to date, including all the hardware, software, and time and energy invested. The use of the portal has grown by 360% in the year 2000, and they expect it to continue to grow, given that women entrepreneurs account for 50% of the total in Latin America.

In addition to providing space for businesswomen to advertize their products and services, the directory also provides information about women's organizations, business associations, educational alternatives, the job market, potential investors, business opportunities, as well as manufacturing, franchising, and related news. On November 1999, the initiative was awarded with the Silver Mate.ar prize (women's chapter), presented by the five Argentine Informatics association, and in June 2000 it won the Stockholm Challenge Award in the "New Economy" category.

The association's approach is collaborative, says Judith Ovadia, "Far from having a competitive spirit in mind, we have signed several cooperation agreements with many women's organizations, giving their members a chance to have space on the Internet. We have developed a great women's network. Part of the income of Mujer y Negocios® is donated to NGOs that focus their work on needy children". Mujerynegocios.com is self-financing, and growth depends on income from the user businesses.

b. Access to IT Many Argentinians are trained in new technologies. The greatest obstacles to access and use of IT are phone lines and Internet services: both are expensive. Most of the portal's users have access to Internet and email. Some have only email, and a few have neither access to email or the Internet.

English is also a problem since 90% of the content is in English. But the women are able to sell their products to other Spanish-speaking countries.

c. Use and Impact of IT By now, the initiative is serving some 3,000 women. Of these, 300 are full members and pay $23 a month to be on the portal, which enables them to display products, enterprises, and services in four places. Some of the women have their own website so they pay an additional $16 to cover hosting and maintenance costs. Company banners are also displayed on the portal.

On the other hand, some women are able to display their products for free: "If we notice it is something that is of value to the community, we do not charge", Judith Ovadia explains. Mujeres y negocios covers its cost, but finds it very difficult to grow with the revenue generated, particularly given the need to upgrade hardware and software. "As a result, we are slow to put out more services".

The women sell both within and outside Argentina, generally beginning with the smaller Latin American countries. One business was run by two women who made children's satchels; they now sell their products to Uruguay, Paraguay, Columbia and Venezuela, even though when they began two years ago they had neither a computer nor email. They had gone to France for a competition and needed an email address, which they acquired at the portal. Mujeres also designed a website for them with photographs of the satchels. The women only bought a computer two months ago, but had been receiving and sending information through the portal. This enterprise employs about five people, with a wider network of women working at home.

Another businesswoman whose 10-person company produces women's underwear is now selling to Spain, Morocco, Mexico and Colombia. Judith Ovadia reports, "She told us that the national economy was so bad this year that the only reason she was able to keep her head above water was because of the sales to Spain and Morocco".

Another of the founders' objectives is to enable female entrepreneurs to use technology tools, "which are not frequently used at women-led enterprises. This is one of the reasons why Mujer y Negocios® has become an excellent venue and tool for women to receive help and advice at starting and/or developing their own enterprises and professions".

The project provides training for women, although only as much as they need to run their business. "They are all entrepreneurs and small business owners. They only need to use the Internet as a tool, and they don't need to know anything more. What they need is to know how to use the Internet to see what other companies are doing and how other countries work. We give courses all over Argentina. Sometimes chambers of commerce invite us to give our course".

The course covers ways to do business through the Internet, how it can help women's enterprises, getting new clients, using email, and so on. In Buenos Aires the women quickly grasp the technology and the concepts. It is less easy in other cities, where out of a hundred people in the course, only 30% may have ever seen the Internet. The courses are open to both women and men, although they do give specific courses to women's groups. So far this year, they have reached 1,400 people. In previous years the numbers averaged around 900.

"Mujer y Negocios®" publishes a free weekly newsletter that is sent to over 4,300 persons with information about business and educational opportunities. By the end of October 2000, 169 editions had been published.

d. <u>Partnerships</u> The initiative is entirely financed by the two founders, with no support from external donors. "When we went to Stockholm because we were finalists, we went to a lot of places – the government, the banks. Everyone was very happy for us but nobody helped us with the project, neither government nor private sector. The $500,000 was our own money, earned from our informatics company". The Stockholm Award did at least generate a lot of free publicity for the project.

Judith Ovadia adds, ”In any case, the government today cannot help anybody. Things are very difficult here. There is a serious deficit, and so the government cannot help small and medium enterprises. As for the private sector, the target group we are working with does not interest them. I’ve seen a lot of projects that don’t break even and that are not as interesting as this one receive help from private groups. And I think that women in general and women in business in particular are not interesting for private sector. They don’t believe there is any money in it”.

15. RDS (Red de Desarrollo Sostenible de Honduras)

a. Background RDS (the Sustainable Development Network of Honduras) was established in 1994. Today, the NGO provides email service and Internet access to 449 organizations throughout the 18 Honduran provinces, of which 60% are NGOs, many of which represent clusters of NGOs.[18] They see themselves as "the information system of civil society" putting people who have information in touch with those who need it, and people with needs in touch with resources.

There was no national email providers when RDS was established, and it is still the only server that provides UUCP email access. Email channeled through the Internet is too expensive for many NGOs. RDS now has four computers and 30 employees, up from just one old computer, one UUCP store-and-forward server and two staff-members as was the case between 1994 and 1997.

RDS gained local and international recognition when its networks enabled state and civil society to respond much more quickly to the aftermath of Hurricane Mitch in 1998, and enabled information from external agencies to reach local actors.

b. Access to IT When RDS started, they had to convince almost everyone of the potential benefits. Every Thursday for four hours RDS staff held a workshop in their office on how to use the Internet. They also held workshops on creating websites, and on the Internet and micro-credit, among other subjects. They conducted extensive outreach and demonstration programmes. Out of the 16 ISPs in Honduras today, RDS is not just the least expensive, it is also the only one that provides added value in training and preparation of content.

RDS succeeded in convincing quite a few NGOs of the benefits of the Internet to their work, but it took Hurricane Mitch to convince a critical mass, and the number of members soared thereafter. Indeed, life in Honduras is demarcated by Hurricane Mitch. Pre-Mitch, the services available from the phone company were poor. Post-Mitch, they have been upgraded, and there are no problems, RDS reports. Their dedicated lines are "pretty quick".

Few people know how to use the Internet to support their research, a problem especially acute for students. Language is an obstacle to use. As Irina Orellana puts it, "Most of the search engines are in English, and they are the most popular ones. Even we don't know about many Spanish-language engines, although these are increasing. Many students have to take English classes at university, so they can read even though they can't speak. The Internet is definitely driving use of English - that's one of the reasons to learn English. And up to date information about interesting topics is only available in English. Graduate students tell us that one of the first things their teachers tell them is that a lot of the information they are going to cover will be in English".

[18] The information in this section is based on email and phone interviews with RDS Director Raquel Isaula Peralta and her colleagues Irina Orellana and Peter Gawienowski. See also the RDS site http://rds.org.hn

Women appear to be more familiar with the technology than men, having first used it as secretaries. Seven out of the 10 RDS trainers are women. The attitude to the computer as just a glorified typewriter is one thing RDS is trying to change. Overall, although there is increasing use of and advertizing for computers, "people here are wary and don't want to jump on a bandwagon if they don't see how the Internet can help in their business or lives", explains Peter Gawienowski, who serves RDS as an expert volunteer.

c. Use and Impact of IT In addition to providing email and Internet access at affordable rates, RDS also established 21 discussion lists that enabled NGOs to share experience in specific areas. It also shares information itself, and holds "virtual fora" on specific issues, enabling dispersed groups and individuals to develop positions and agendas on specific issues. The website contains a wealth of information on projects, reports and plans relating to different themes, such as external debt, government transparency and efforts to eliminate corruption, as well as reconstruction, gender, the environment and others. NGOs particularly value the ability to access information and to connect to other organizations on pilot projects and projects in other countries. They have also found it a very useful tool in looking for funders.

RDS provides services not just to NGOs but also the Government. For example, the Ministry of Education, has 58 interconnected offices and projects, each with email service provided by RDS. It has also trained government in over 15 government agencies, and its server hosts a number of government websites.

The latest RDS initiative is a telecentre in a poor part of Tegucigalpa, launched in August 2000, and it has plans to open three more in rural areas, once they secure funding. The whole RDS team was responsible for setting up the telecentre, and they run it in shifts. It cost about $20,000 in total to set up, including equipment, furnishing the new office site, and all the wiring.

The telecentre began with 15 computers and 28 members a month. By November, the number of users was 768 although they had only expected to have 700 users by the end of the year 2000. The number is growing by word of mouth although RDS has not publicized the centre yet. They change $1.56 per hour for access to the Internet, and also offer workshops on electronic communications, charging $5 for a two-hour workshop. There are about 10 cyber cafes in the capital as well as in other main towns, but the RDS centre is the only one offering training and assistance. The commercial cafes are also more expensive.

RDS just completed a user survey on its telecentre conducted by Naveg@ Telecentre. Nearly half had been using the centre for over three months; 48.6% said their knowledge about computers and the Internet had changed significantly as a result of their visits. Of the users, 78.4% valued the low price. The majority - 97.3% - used email, while 88.9% of those who surfed the Net did so for entertainment, and another 75% did so for research. Nearly 60% were male, and only one person was over 30.

RDS is now working with a group of crafts people to enable them to sell their products through the web. The site is already developed - ecommerce.rds.org.hn – and they have trained a team of webmasters. The only outstanding issue is setting up credit card use. Most of the craftspeople are women and the project will benefit some 17 families in the area. The project also involves improving production processes so that the products can compete in other countries.

RDS is now financially sustainable, having introduced a system of user fees of between $6 and $20 a month, depending on the service used, as well as fees for seminars and workshops. This generates some $70,000 a year, which covers expenses.

d. Partnerships UNDP's Sustainable Development Networking Programme provided a grant of $200,000 to enable the establishment of RDS, which transformed itself from a UNDP-supported project to a legally registered NGO in 1997. CIDA served together with UNDP on the Steering Committee of local civil society and government actors which provides guidance to the initiative. Current partners include: Strategic Profits Inc a Canadian NGO, that is helping RDS with its e-commerce project. FAO is funding a number of national and local radio spots informing the public about RDS activities.

The RDS network sometimes "shows government up" in terms of openness with information. For example, during preparations for a conference in Sweden on post-Mitch reconstruction, NGOs openly circulated their project proposals, and called on Government to share its proposals, but it was reluctant to do so. For many users, RDS is a trusted public space in an area where dissent and debate are still not greatly encouraged.

16. SPRING - Brazil

a. Background SPRING is a geographical information system (GIS) developed by Brazil's National Institute for Space Research and launched in November 1996.[19] The system, which required some 170 person/years of development, integrates and processes different types of spatial data, and is freely available on the Internet.. It aims to "empower policy makers, scientists and NGOs of the less developed countries of the world, to help them better understand and manage their natural and human resources".

Its designers argue that it is "the most powerful free GIS available on the Web", plus being accessible, capable and easy to use. The comprehensive set of functions include Satellite Image Processing, Digital Terrain Modelling, Spatial Analysis, Geostatistics, Spatial Statistics, Spatial Databases and Map Management. There are versions for Windows 95 and NT, Linux and Solaris. Examples of the uses to which SPRING has been put is the monitoring of forest fires in the Amazon, ecological and economic zoning

[19] This section is based on an email interview with Gilberto Camara, Coordinator for Research and Development for GIS at the Brazilian National Institute for Space Research, materials he supplied, and information from the website http://www.dpi.inpe.br/spring See also the Stockholm Challenge site.

of Brazil, monitoring of climate risks for agriculture, and mapping of social exclusion in São Paulo. See Camara, Gilberto et al for a selected list of Brazilian state and non-governmental organizations using SPRING.

The Institute is funded by the Brazilian government, through its Ministry for Science and Technology. It has been involved in the reception and application of earth resources satellite since 1974, and established an Image Processing Division, which led the effort to develop the GIS. The team includes 12 PhDs and 22 MScs, as well as 10 senior engineers. Their annual budget is some $600,000.

b. Access to IT In the case of SPRING, the most serious obstacle is the access to reliable and cost-effective data. Gilberto Camara, Coordinator for Research and Development for GIS, at the National Institute for Space Research in Brazil, notes that "developing countries, such as Brazil, have been slow at adopting policies for handling and dissemination of data and of accessible technologies. This situation is partly caused by lack of understanding of the issues involved and partly by pressure from the US to increase the market for their companies".

Training on the use of advanced technology is an issue, although the situation is improving. The current emphasis on PC and Windows technology has reduced the complexity of maintenance and network management. Yet the issue of human resources remains problematic. "During the 1980s and most of the 1990s", Camara explains, "a large portion of public and private resources in the area was destined to hardware and software acquisition, with not enough resources being set aside for human resources qualification. In many cases, this situation has been provoked by policies from international funding agencies, such as the World Bank. Not only have they in many cases provided funds which cover only hardware and software acquisition, with very little provision for training, but also their consultants have, in many occasions, actively lobbied in favour of complex and sophisticated solutions from US companies, even when simpler alternatives were available".

Language is a serious problem, since most of the relevant material on GIS is in English. Thus, the Institute and its partners have developed a comprehensive reference work on GIS written in Portuguese and available on-line. "The response from GIS users in Brazil has been extremely positive, including not only GIS students and government officials, but also from small private companies, start-ups on the GIS world or small surveying firms that wanted to enhance their capabilities".

c. Use and Impact of IT GIS users are organizations (public, private and NGOs) at various levels in Brazil, ranging from nation wide to local government and small companies. For these users, the obstacle to effective use of IT is related to human resources, data access, and use of information technology for decision making. Usually such technology is too costly and/or too complicated.

To enable decision-makers users to best use SPRING, it is coupled with extensive documentation, tutorials and examples. To date, over 10,000 users from 35 countries

have downloaded it, at the rate of about 30 a day. Many of the registered users are from the North: the largest number of registered users are in Brazil (6,403), followed by the US (489), Spain (241), France (201), and Argentina (181). The team has trained over 500 specialists in Brazil and Latin American countries in GIS.

In addition to Government users of SPRING, NGOs also use it, including the National Council of Rubbertappers of Amazonia, the organization founded by Chico Mendes, "martyr of the ecological movement in Brazil".

SPRING partners make a "substantial effort" to sensitize decision-makers to the importance of complex technology such as GIS, raising awareness through talks at conferences, on-site visits, and seminars, one-week courses, and long-term training for degree programmes. The Institute team has produced more than 100 scientific papers, published in national and international conferences and referred journals. Many institutions in Brazil "foster the use of GIS technology, with a lot of participation from the universities". SPRING is also used as a teaching support in many universities in Brazil and Latin America.

d. Partnerships In Brazil, the development of GIS technology has been a partnership effort between many different organizations, including the Institute itself, EMBRAPA, the Ministry of Science and Technology, Brazil's Agricultural Research Agency, the International Institute for Global Change Research, the Catholic University of Rio de Janeiro, and the University of Campinas.

As regards international partnerships, SPRING founders believe that industrialized countries will not actively support the development of advanced technology in developing countries, and will seek to influence decision-makers to remain consumers of Western products. Camara says, "Private companies from the US and their local representatives have responded strongly to the local development of SPRING. Their responses include forging ties with local decision makers and trying to convince prospective local users that US technology is always and in all circumstances superior to locally developed solutions, and not even to allow a fair comparison between US and Brazilian GIS systems".

He adds, "When sophisticated technology is at stake, especially when developing countries want to understand it and not only to be passive users, it is very difficult to establish fruitful North-South partnerships between governments, aid agencies and private companies. These types of partnerships usually involve little more than making developing countries passive users of IT ('learning-by-using') and offer very few provisions for real local development ('learning-by-doing'). The more fruitful North-South partnerships are those on a person-to-person basis, as in the case of research collaborations between university professors, and agreements between NGOs. Therefore, official North-South partnerships are very often unfair and one-sided, and fail to deliver the expected promises. It is much more important for South governments to invest and believe in their local people than to expect a 'helping hand', which in most cases offers little more than rhetoric".

He also believes that there is no way other than the government for investment in advanced technology. “In the developing world, the only structure which has the capacity to really bring about change is the government (whether local elites actually choose to do so is another issue). There is a growing myth concerning Third World countries about the power of NGOs to make a difference. Although some NGOs have played important roles in specific issues, they cannot by themselves change widespread patterns of poverty and mismanagement of natural and human resources.

“Fostering the 'NGO myth' is very convenient for international aid agencies, since by funneling resources to very specific targets (oblivious to the general environment), they can produce exemplary successes, which are sufficient to produce good-looking reports, which help bureaucrats in these agencies keep their jobs. In reality, years of NGO-directed investment in Brazil have done little to change overall patterns of depletion of natural resources. Countries such as Brazil are simply too big for a small NGO (with lots of enthusiasm but limited resources) to make a real difference”.

North America

17. Teaching Matters Inc. – USA

a. Background Teaching Matters Inc. is a non-profit association founded in the mid-1990s in New York by Elizabeth Rohayton. It define its role “as the teacher of teachers to help incorporate instructional technology in the classroom”, and engages corporate, government, and private foundations in support of its efforts.[20] It works primarily in the most underserved neighbourhoods in New York (including the Bronx District 8 and Brooklyn District 19). About 70% of its clients are in disadvantaged areas. TMI is also expanding to New Jersey and other areas, under contract to several government agencies.

The idea was sparked because of Mrs. Rohayton’s involvement with the “I Have a Dream” programme, where sponsors see a whole class of 7th graders through high school and then college. She found during this time that students lacked fundamental skills and thought that technology could help.

TMI courses include introduction to computers, technology curriculum integration, a library Internet project, media literacy and the role of teachers in helping students use new technology, and several other initiatives designed to support the teacher in leadership and decision-making roles in all aspects of their careers. They have a field staff of 30 people who go into the schools and work with the teachers. Each TMI staff member works with eight teachers a day, and the association deals on average with 500 teachers a year, which means serving a total population of some 15,000.

[20] This section draws on phone interviews with TMI President Sue Bastian and her colleague Richard Dever, as well as the TMI site www.tminet.org .

b. Access to IT Literacy is very much an issue in access to IT in the urban school environment, according to TMI president Sue Bastian. This is the case with students with learning disabilities, or when English is not the language of instruction. In addition, "there are some kids in their early teens who haven't learned to read, and you can't use IT without literacy skills".

The availability of equipment is not a problem. Indeed, "Schools are buying equipment by the carload", says TMI field staff member Richard Devir. "Some schools spend millions for hardware and not a nickel for maintenance and supplies. Computers can be immobilized for weeks because of a missing cable or a mouse ball problem. As far as personnel is concerned, that varies. Some areas have good systems, while other schools go for months without any help. Some problems are not mechanical. In schools I've worked in, teachers didn't realize computers had vertical/horizontal adjustment on them".

In American schools, elementary school teachers are better able to use technology because they use the same classroom throughout the day and are used to working with students in small groups. In secondary school, students move to a different class every 45 minutes, and adaptation of the technology for small groups is harder.

TMI is very careful when it comes to addressing lack of knowledge. Most teachers easily admit they know nothing, and are grateful to have help. A small minority remain conscientiously opposed to the very idea of using technology, and a few do not want to admit their lack of knowledge

Overall, however, the motivation has changed. Whereas five years ago there was a lot of reluctance, now teachers do not want to be left behind. Besides, says Richard Devir, "Email and the worldwide web have been terrific missionaries for technology". TMI estimate they could easily double or treble their services due to demand, if they had the capacity to do so.

c. Use and Impact of IT TMI's approach to bringing teachers on board with the technology is by working with them in a customized way. "We try to identify where technology can be a help", says Sue Bastian. "We have a set of principles here that we live and work by. One is to find a compelling reason. In the case of literacy for example, we identify what is difficult to teach and to learn, plus what we know about technology, and then if it helps, we use it. Otherwise it's a waste of time. For example, in cases where you need repetition to address problems of literacy, technology works very nicely. It also has the element of privacy. And when they print it out, it's real. A lot of kids seem to be able to type more easily than they can handle a pencil".

But there are quite a few teachers struggling with how to use computers in their classroom. According to TMI staff member Richard Devir, "The most difficult task for teachers is trying to figure out how to manage the class and use the technology at the same time. Many teachers are able to prepare materials in advance, and find it easy enough to send students to the computer to type up a report. If the computer is a more integral part of the lesson, then it becomes more difficult. One of the things we do is to

help teachers figure those things out. We talk to them help them design plans that enable them to use the technology".

Another related problem is that the teachers themselves are not familiar with the possibilities offered by the new technology. Many teachers – "even recent graduates" – have not taken education technology. In some cases, this can be as basic as searching for information on the Internet with no idea on how to narrow the search. Both students and teachers then get discouraged, and abandon the attempt or simply use the computer as a hobby. As Sue Bastian points out, "Our tradition is built on using 'mediated materials', and most of us are comfortable with textbooks published by regular publishing houses. The Internet is unmediated". They thus help teachers identify the material they find on the Net, pointing out the importance of checking the source and the last update.

Global

18. The Association for Progressive Communications (APC) - Global

a. Background The Association for Progressive Communications (APC) was established in 1990 when there was no such thing as the public Internet, the idea being to use IT as a tool to facilitate communications amongst civil society organizations and individuals.[21] APC was formed by NGO networks in the United Kingdom, the US, Canada, Sweden, Brazil, Nicaragua, and Australia.[22] As APC Executive Director Anriette Esterhuysen recalls, "At that time, there was a strong culture of solidarity, with the anti-apartheid movement and the Central America solidarity actions. So there was a felt need for people to work together internationally". Its website describes APC as an "International Internet Community for Environment, Human Rights, Development and Peace".

One of APC's founding activists Mike Jensen recalls, "We were quite successful ahead of the global Internet tidal wave. We concentrated on providing connectivity at a time before Internet protocols were universally adopted, providing email across gateways and cheap connections wherever possible. The telephone lines were a lot worse than they are today. Given the high cost, we adapted systems and got protocols to compress the information and minimize the time required only. We developed some fairly sophisticated tools to mirror information on the network before the web arrived".

With the preparations for the Earth Summit in 1992, APC became the main facilitator for NGOs and activists to take part in international discussions at the cost of a local call. APC also used the global conferences to introduce NGOs and activists to the uses and

[21] The information in this section draws on email and phone interviews with APC Director Anriette Esterhyusen, and one of APC's earliest organizers and technicians Mike Jensen. See the APC website at www.apc.org

[22] In 1987, people at GreenNet in England began sharing electronic conference material with counterparts at the Institute Global Communications (IGC). By 1989 they were joined by networks in Sweden (NordNet), Canada (Web), Brazil (IBASE), Nicaragua (Nicarao) and Australia (Pegasus). In the spring of 1990, the seven organizations founded APC.

benefits of IT. It actively used the global conferences of the 1990s to set up sites at the NGO fora that were held alongside government conferences where people could learn how to use IT.

The rapid evolution and use of IT has meant that the role of APC member networks has had to evolve, as has APC's potential to generate income and survive, given the multiplicity of commercial ISPs. The characteristics of the activists in member networks is also changing. At the beginning, many APC pioneers were technicians. Now the member networks that have successfully changed with the times have a much larger proportion of managers and specialists on information content. The APC website itself is rich in content and in member network information and news about initiatives and projects in its main areas.

In October 2000, the APC Council ratified revisions to membership criteria and fees to enable any NGO that supports its mission to join. Given the lower fees, more NGOs from countries with weak economies will be able to join, with major consequences for the size and diversity of future APC membership. APC adopted three action areas at its May 2000 Council meeting to guide the association until the end of 2001. The three areas are: Internet rights for civil society (to counteract the concentration of the Internet in a few hands, as has happened with mass media); building APC information communities (that link knowledge to practice and action); and mobilizing participation (by building the number and capacity of the membership).

APC is an independent 501c3 corporation registered in the State of California, and the base of its operations shifts depending on the location of the Executive Director. The previous director lived in Brazil, the current one lives in South Africa. A small staff of three full time and one part-time person facilitate this global network of networks.

b. Access, Use and Impact of IT Given the paucity of tools and services when APC was founded, the association created many tools of its own to support information dissemination. Indeed, APC built a piece of software called “pino” which served a newsgroup function, a private space for people to talk and exchange views. It also set up email systems because the Internet was very expensive.

“As it was hard work to maintain that infrastructure”, Anriette Esterhuysen recalls, “APC member networks expanded and recruited staff with technical experience. When the Internet exploded, you suddenly had all these organizations who either had engineers or activists, but did not have people with business management skills or with broader journalistic or library skills needed to create content, and it was difficult for them to reposition themselves. This process is still taking place. We no longer need to be involved in building software or making systems, but need to have the expertise to use the systems, and good management skills to survive in a competitive sector of the economy. That been challenging for our member networks”. Training is one of the major missing elements in access to IT, Mike Jensen emphasizes, and APC plays an important role in this area.

Many APC members used to be ISPs, but found it difficult to compete with America On Line and others, so they shifted their focus to content development and telecentres. Some APC member NGOs have managed this shift more successfully than others. An APC member in Colombia that had been a struggling ISP is now flourishing by working with local government on access for poor communities (see www.colnodo.apc.org) Another APC member in Senegal – ENDA – is also working on public access and telecentre projects. The APC members that had most difficulty were large ones in the US and Canada, which had invested heavily in technology and faced stiff competition from ISPs.

Meanwhile, Esterhuysen notes, NGOs and activities in many developing countries still face the issue of access to IT, both due to issues of infrastructure and cost. Given that APC cannot create infrastructure, it sees its role in these countries as lobbying for sound government and donor agency policies that keep marginalized groups in mind. This is another shift in APC's approach, as is the need to engage in many different partnerships to "lobby for the enabling policies and investments that can make some difference in the huge gap between the haves and have-nots in terms of access to technology".

c. Partnerships There were few conflicts amongst the partners in the first six or seven APC years, partly due to the nature of NGO cooperation, partly due to the culture of solidarity that prevailed at the time, and partly due to the technical nature of APC which meant that people were dependent on each other's technical expertise and skills, which fostered collaboration.

During the late 1990s differences of opinion and style emerged around certain issues, a key issue being how APC sustained itself financially. At the start, membership fees covered the cost of maintaining the coordinating APC core of the network. The fees were high, but there were no other sources of access to the Internet, and APC's value-added in this area was clear. Currently, member fees account for far less of the income because the member organizations are struggling. Much of the revenue now is from donors for specific projects, and member fees have been reduced to enable organizations from the South to join.

Some APC members – especially from Europe – objected to APC receiving donor funding, as this raised issues of dependence. The Southern NGOs were more comfortable with donor funding, on which they themselves rely. In any case, without the donor funding, Anriette Esterhuysen notes, "We wouldn't be able to maintain the small core staff, and support capacity building and content development as we are now able to do".

Some NGO members of APC have been able to solidify cross-border partnerships within their regions. The networks in Central and Eastern Europe are particularly striking in this respect, from the global APC perspective, while the ones in Latin America seem to face the most difficulty in creating cross-border networks.

Foundations supported the work of APC in the early days. For example, the McArthur Foundation supported systems to develop network protocols. APC NGO members in Canada and the United Kingdom also raised revenue from local sources.

However, as in other areas, donor agencies often fund very successful IT projects that in the final analysis create jobs for their own companies. Anriette Esterhuysen notes that "At a very fundamental level, the way the world operates is unequal. APC faces the challenge of supporting capacity building, but at the macro level the world is a very unequal place. There is a lot of talk about access to IT, but it is all done within a framework where one part of the world can control everybody else. The gap in access to technology mirrors the gap in access to power and resources at all other levels. It is hard to make an impact and change that".

APC's commitment to open information is sometimes threatening to governments, even in developed countries. Members in Korea and Japan frequently engage with government on freedom of information issues. Members in the United Kingdom are lobbying together with many other organizations against a bill that would allow government to intercept certain emails. But the overall association has not been threatened in any way, and has built up an international reputation.

It is difficult to estimate the total impact that APC has had on the use of IT on groups and individuals that would otherwise have not had the opportunity to do so, let alone the impact in terms of supporting the evolution of international thinking on social, political and environmental issues. Several background papers are available on the APC website. Given the vast spread of member networks and the active role at international conferences, it is safe to say that APC has touched the lives of hundreds of thousands of people.

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