DEVELOPING INFORMATION TECHNOLOGY, INFORMING TECHNOLOGY FOR DEVELOPMENT:
A study of ICT and rural development in Sri Lanka

REPORT FOR
TIER GROUP, U.C. BERKELEY
AND
SARVODAYA SHRAMADANA MOVEMENT
OF SRI LANKA

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I. INTRODUCTION

This study is a critical analysis of the deployment of information and communications technology for development (ICT4D) in Sri Lanka. I provide some background information on the development situation in Sri Lanka, as well as the status of the ICT industry. I focus in on the main ICT4D program in the country, run by the Sarvodaya Shramadana Movement of Sri Lanka, the country's largest and oldest rural development NGO. I analyze this project for its achievements, plans, and challenges. I also discuss and analyze some projects of the Information and Communication Technology Agency (ICTA) of Sri Lanka, a government agency, as there are obvious links between Sarvodaya's and ICTA's ICT4D projects. I find that the Sarvodaya (and some ICTA) projects are making significant inroads into addressing development needs in a sustainable and replicable way, but much more can be done. Specifically, more focus is needed on designing ICT4D projects that contribute directly to Sri Lanka's key development needs, which I identify as rural employment, peace building and political empowerment. There is little doubt that ICT can contribute substantially to meeting these needs, and I provide a set of recommendations to NGOs, government agencies and researchers on this matter. My conclusion is that there is a huge potential in Sri Lanka for deploying ICTs for rural development, thanks, in large part, to the social infrastructure that Sarvodaya has put in place over the years. The challenge now is to interweave technology and information systems into this social infrastructure in ways that bring concrete benefits to rural populations.

This report is organized as follows:
- Section 1 provides background on the development situation in Sri Lanka. The aim is to highlight the critical development needs in the country. This section also provides basic information on ICT infrastructure, regulation and deployment in Sri Lanka.
- Section 2 describes the various ICT4D initiatives in Sri Lanka. I cover programs of the government, multilateral and other funding agencies, the private sector and NGOs. This section includes a detailed description of Sarvodaya's Telecenter Project.
- Section 3 is the analytical gut – I analyze Sarvodaya's Telecenter Project, as well as ICTA's ICT4D initiatives, for their achievements and challenges.
- Based on my analysis in section 3, I provide recommendations in Section 4 to NGOs, government agencies and researchers, on designing ICT4D projects so that they better address Sri Lanka's development needs.
- Section 5 contains my conclusions.

The study is based on the following research:
- A review of reports and papers written on ICT4D in Sri Lanka, and ICT4D more generally;
- Interviews with key players at Microsoft, ICTA, UNDP, and the NGOs Sarvodaya and the LIRNEasia Foundation;
- Attendance at a workshop for NGOs organized by Microsoft, and discussions with many NGO representatives present there;

- A detailed study of Sarvodaya's Telecenter Project, which includes visits each to 2 district Telecenters and 5 Village Information Centers, interviews with staff and volunteers at these centers, attendance of an ICT awareness creation meeting in a village school, and a survey of 87 users of the Telecenters and Village Information Centers;
- Maintenance and review of a database of newspaper clippings on ICT developments in Sri Lanka since January 2005;
- A detailed study of the history and current status of development in Sri Lanka, with a focus on rural development; this includes a 1.5-year long literature-based study (leading up to my qualifying exam), and is complimented by practical work experience in rural Sri Lanka, first with a solar energy company, and more recently with Sri Lanka's largest and oldest local NGO – Sarvodaya.

II. AN OVERVIEW OF DEVELOPMENT IN SRI LANKA

Background

Sri Lanka is a small island country (270 miles north to south, by 140 miles east to west) located in close proximity to the southern tip of India. It has a population of about 19 million people. Ethnically, the Sinhalese (who are mostly Buddhist by religion) make up 74% of the population, Tamils (mostly Hindu) comprise 18%, Muslims 7%, and other minorities make up the remaining 1% (Central Bank of Sri Lanka 2005).

Compared to other countries in South Asia, Sri Lanka enjoys a comparatively high level of development. Its rank on the Human Development Index is 96; the next highest in South Asia is India ranked at 127. The adult literacy rate is 91.8%. However, the same percent of people live below the poverty line in Sri Lanka and in India (about 25%); the key difference is rural Sri Lankans have access to adequate education and health facilities (Central Bank of Sri Lanka 2005).

Map of Sri Lanka. *Source.* Lonely Planet, 2005

Ethnic conflict

The overarching political issue in the country is the ethnic conflict between the Sri Lanka government and the rebel group called the Liberation Tigers of Tamil Eelam (LTTE) also known as the Tamil Tigers. The Tigers are fighting for a separate homeland for the minority Tamils, claiming they have suffered considerable discrimination at the hands of the Sinhala-dominated government. Since 2002, a fragile ceasefire agreement has been in effect, but most describe this as a "no war, no peace" situation. Low-level fighting continues in the north and east of the country; since the implementation of the ceasefire, there have been 3,254 ceasefire violations reported by the independent Sri Lanka Monitoring Mission (Sri Lanka Monitoring Mission 2005). Even after the ceasefire, 386,100 people were reported as internally displaced due to the conflict in 2003 (United Nations High Commission for Refugees 2004), though some are returning to their homes.

A key dimension of the ethnic conflict has been a long-standing "Sinhala only" language policy of the government. In recent years, this policy has been softened, and English has been reintroduced into school curricula. However, as a result of the "Sinhala only" language policy, the level of spoken and written English is often poor – this has direct ramifications for the spread and use of the internet, especially in rural areas, where the level of English comprehension is often close to nil.

The economy

The majority of the Sri Lankan population is engaged in agriculture, which is dominated by rice cultivation. 78.5% of the population lives in rural areas. The main exports are tea, rubber, garments, spices, coconuts, and gems. GDP growth was 5.4% in 2004, and GNP per capita stands at $935 (Central Bank of Sri Lanka 2005).

Industrial development remains low. This is partly a result of the ethnic conflict that has dominated Sri Lankan politics for the last 20 years; no investor likes to put their capital in a country consumed by war. According to a business survey published in the Central Bank Report 2004, political instability ranked as the most problematic factor (out of a total of 14 factors) in doing business in Sri Lanka (Central Bank of Sri Lanka 2005).

At the same time, the lack of industrial development is also a result of explicit government policies that favored rural development. Historically, this rural bias was partly a function of a government attempting to garner support amongst the rural masses for the civil war (Brow 1988; Tennekoon 1988), on both an ideological and material level – the armed forces are largely manned by people from rural areas. However, this bias also meant that rural Sri Lankans enjoyed a level of education and health services unmatched in South Asia.

The lack of any substantial industrial development has resulted in very high unemployment especially amongst educated youth. On one hand, rural youth, now educated, are not interested in pursuing the (often subsistence) agricultural work of the previous generation. On the other hand, employment opportunities are extremely limited. Unemployment in Sri Lanka is at 8.4%. But youth in the age range of 15-24 years make up 65% of the unemployed population. The unemployment rate in the age group 14-18 years is 34.2% and 28.5% for the 19-25 year group (Central Bank of Sri Lanka 2005).

The problem of unemployment is not unique to Sri Lanka; a recent study by the Asian Development Bank states that jobless growth continues to plague Asian countries (Asian Development Bank 2005). This is true even for countries with high rates of economic growth. The study says that lack of productive work and less than fair wages are they key reasons why million of Asians continue to live in poverty.

Since 1977, Sri Lanka has pursued an open market economy. The one industry that did develop in this context is the garments industry, exclusively for export to European and American retailers. However, it is currently facing stiff competition from cheaper Chinese products. Studies have shown that the benefits of the open market economy have been largely captured by the wealthy, and inequality in Sri Lanka has increased substantially since these policies were introduced ((Brunton, Abeysekera et al. 1992; Dunham and Kelegama 1997; Stokke, Yapa et al. 1991; Stokke 1994; Yapa 1998).

The open market economy gave a great boost to tourism. While tourism suffered substantially in the war years, it is picking up again. The number of tourist arrivals increased 27.3% from 2002-2003, and by 13.1% from 2003-2004 (this figure is low

because the tsunami greatly reduced the end-of-year arrivals). In 2004, tourism provided employment to more than 75,000 people in the country (Central Bank 2005).

One of the largest sources of employment for Sri Lankans comes from outside Sri Lanka. The ethnic conflict and lack of economic opportunities at home has resulted in about one million Sri Lankans being employed as contract workers overseas (this is out of a total Sri Lankan population of 19 million), mostly in the Middle East. A large and increasing percentage of these people are women, probably as many as 70-80%, almost all of whom work as housemaids (Gamburd 2000). On average, a worker overseas could bring in earnings that are eight times greater than what could be expected at home. In the late 1990s, private remittances to Sri Lanka topped the US$1 billion mark/year, exceeded FDI inflows by 3 to 4 times, and equivalent to about 15-20% of all export earnings (one of the highest in the world), ahead of the island's traditional export industry – tea (Sriskandarajah 2002).

Even though an open-market economy is in place, the government still controls key sectors like electricity supply and distribution. It also sets the prices for crops like rice, and provides agricultural and fossil fuel subsidies.

Infrastructure
Sri Lanka's paved road network is fairly limited; the majority of villages are connected to major roads via unpaved roads.

Another key dimension of infrastructure is electricity – about 40% of the population still lacks access to grid power. A small but vibrant rural market for renewable energy technologies like solar PV and microhydro systems serves a small percent of the population which lack the grid.

Since the focus of this paper is ICT4D, I elaborate on ICT infrastructure and regulatory issues in the next section.

Developments in the sector of Information and Communications Technology
The level of ICT deployment in Sri Lanka is very low. The key statistics on ICT usage are as follows (selected from Central Bank of Sri Lanka 2005; Information and Communications Technology Agency of Sri Lanka 2005):
- The number of telephones per 1000 persons is 122 (this includes cellphone connections). In the country, 44% of fixed access telephone connections are in the capital Colombo.
- 4 in 100 households own a computer. However, computer ownership is heavily concentrated in urban areas in and around Colombo in the Western Province, which accounts for 8% of computer ownership. In the poorest province in the country – Uva – computer ownership is about 0.4%.
- Nationally, 18% of the population in the age group of 5 to 69 years is aware of at least one application of computers.
- At national level, 10% of the population in the age group of 5 to 69 years is computer literate, that is, they can use a computer on their own.

- From a sub sample of households without computers, 64% reported that they did not feel the need of acquiring a home computer soon.

The Government of Sri Lanka liberalized the telecom market by introducing reforms in the Department of Telecommunications in the early 1990s (Dharmawardena 2004). In 1991, The Telecom Regulatory Commission of Sri Lanka was correspondingly restructured. However, critics argue that this is only a partial liberalization approach, which has thwarted competition and good service, and produced no incentives to invest in necessary infrastructure (United Nations Development Programme 2004b).

In recognition of the need to tap into the development potential offered by ICTs, the Government of Sri Lanka established the Information and Communications Technology Agency (ICTA) in July 2003. Its mandate is to set ICT policy and direction for the country. The stated goals of ICTA are in Box 1. Under the purview of the Information and Communications Technology Agency (ICTA), all ICT policies are undergoing a massive review and revision.

My impression of ICTA is that it is a very professionally managed body, free of political interference that often plagues government agencies, and managed largely by people with considerable private sector experience. However, its sparkling new office is symbolic of the status of ICT development in Sri Lanka – it is in its baby stage. The positive side of this is that there is considerable potential for groups like TIER to link into and directly influence the ICT development process in Sri Lanka in multiple ways. I discuss potential research areas in the field of ICT4D in section V on recommendations.

The Information and Communications Technology Agency of Sri Lanka has the following goals:
- Aggressively build the necessary connectivity infrastructure throughout the country to connect villages and towns to the world
- Create the enabling environment including the enactment of regulatory reform together with the acceleration of enabling laws for e-government and e-commerce
- Develop human resources at multiple levels to support national development
- Modernize the public sector and deliver citizen services through e-government constructs
- Promote Sri Lanka as an ICT destination renowned for producing best-of-breed in niche global markets through the use and adoption of technology
- Bridge the digital divide with applications aimed at poverty reduction and social development

Box 1. Goals of ICTA. *Source.* ICTA, 2005

At the same time, ICTA is not without its problems, as two of my interviewees pointed out. Its unique institutional status – it comes under the purview of the Prime Minister's Office, but is not a Ministry – gives it very limited policy-making powers, and it is still largely functioning as a project implementer, when the need is for ICTA to be a policy making and facilitating organization. The challenge is to provide ICTA with the necessary powers without converting it into yet another politicized government

bureaucracy. Further, ICTA is engaged in a legal battle with the Telecom Regulatory Commission over roles and functions, which need to be ironed out and clearly defined.

The ICTA's plans for infrastructure development include building a fibre-optic network that will connect all district-level government offices in the country (the current fibre-optic network only covers a few key cities around Colombo). ICTA is offering least-cost subsidies to mobilize the private sector to build RTNs (Regional Telecommunications Networks) in the north-east and deep south of the country, each with a population of around 1.5 million (Samarajiva 2004).

In addition, Sri Lanka Telecom is involved in the SEA-ME-WE-IV (South East Asia-Middle East-Western Europe-IV) submarine cable project, to enhance quality and bandwidth of Sri Lanka's telecom system (Central Bank of Sri Lanka 2005).

III. ICT4D PROJECTS AND PROGRAMS

In this section, I describe ICT4D initiatives of the government, large agencies like UNDP, World Bank, ADB and USAID, private sector and NGO initiatives. The focus is on rural development-related projects. That is to say, while many of these organizations have a wide range of ICT programs and projects which include technological, legal/regulatory, and private sector development programs, I limit my discussion exclusively to those projects that have direct bearing on the use of ICT for rural development.

Government Initiatives

e-Sri Lanka initiative

The ICTA's main program is called the e-Sri Lanka initiative. The goal of the e-Sri Lanka initiative is to use ICT to develop the economy of Sri Lanka, reduce poverty and improve the quality of life for people. e-Sri Lanka has a 5-program strategy, which encompasses:

- building the implementation capacity
- building information infrastructure and an enabling environment
- developing ICT human resources
- modernizing government and delivering citizen services
- leveraging ICT for economic and social development, through public-private partnerships (ICTA 2005)

There is little doubt that all focal areas of the e-Sri Lanka initiative affect rural development directly or indirectly. For example, building the information infrastructure has direct bearing on rural people's ability to access the internet. However, in the interest of staying focused, I describe 3 projects under the e-Sri Lanka initiative, which I believe to have the most direct and immediate ramifications for meeting Sri Lanka's rural development needs. These projects are the "Nanasala" (formerly known as Vishva Gnana Kendra, or VGK) project, the Govi Gnana Systems project, and the e-Government initiative.

Nanasala Project

Nanasala literally means "knowledge center." The Nanasala project is focused on bridging the digital divide. Under this project, NGOs, private companies and individual entrepreneurs apply to ICTA to establish a Nanasala. Once selected, ICTA provides the organization/entrepreneur with computers, a printer, a scanner, telephone/fax, photocopier and a VSAT internet connection for 4 years, free of cost. The NGO or private company has to cover all operating costs, including rent. The VSAT link provides relatively high speed internet access, but is very expensive - $300/month (this is covered by ICTA). The idea is that within 4 years the Nanasala will be able to get a high-speed internet connection much cheaper by utilizing the local ICT infrastructure. The Nanasalas provide people access to the internet, to other ICT services, and training. In the first phase of the current plan, it is estimated that around 100 Nanasalas will be created in by the end of 2005.

Since one of the Sarvodaya telecenters that I covered in my research is also a Nanasala, I will discuss the Nanasala project in more detail below in my section on Sarvodaya's Telecenter Project.

Govi Gnana Systems Project
The Govi Gnana Systems is a pilot project. Its goal is to reduce rural farmers' exposure to price volatility by providing them with information on spot prices in large trade centers. It is being implemented by e-Development Labs Interblocks Ltd. and Pricewaterhouse Coopers. The Govi Gnana system phase I has established display screens at the Dambulla and Meegoda Dedicated Economic Zones (these are large agricultural market towns) to publish transaction prices of agricultural produce and then make them accessible through telephone and the Internet. Prices are collected at the point of conducting trades from selected trader terminals. There are also personnel conducting spot prices capture using hand-held devices. These are projected on display terminals and kiosks and published via the Internet. The aim of this sharing of information is to reduce price volatility and bring stability to agricultural prices to help farmers get into forward sales contracts that can be eventually used as collateral for additional funding. While this project is only in its pilot stages, it bears further analysis, as there is much interest the world over in providing farmers with access to price information. I discuss this project further in section IV.

e-Government Initiative
This program is designed to provide citizen services in an efficient way by improving the way government works, by re-engineering and technologically empowering government business processes.

The key citizen service areas identified are: eMotoring, ePension, eCitizen ID, eForeign Employment, Ministry of Public Administration and Home Affairs. Many of these come under one project called the e-DS. DS stands for Divisional Secretariat, which is the government administrative body just above the level of the village; it overseas the administration of a group of villages. The Divisional Secretariat is identified as the "one stop shop" for delivering most critical government services to the citizen. The main services which are delivered by the DS are registration of persons and their life events, pensions, social benefits, motor vehicle registration, motor vehicle driving licenses and renewal of motor vehicle revenue licenses, passports, and issuance of various permits. The goal of this project is to develop ICT solution for DSs to carry out all these citizen oriented functions in a more efficient and transparent manner.

 The e-Foreign Employment Project for the Sri Lanka Bureau of Foreign Employment is also likely to have an impact on rural areas. The project aims to provide ICT-enabled registration facilities for people seeking employment overseas, agencies providing employment services, linkages between employment agencies overseas and in Sri Lanka, facilities for the registration of complaints and requests for welfare assistance, and information on training for overseas jobs.

All e-government projects are in the very initial stages of development. Currently, those e-government services which are available are purely informational services. These

include publishing the results of high school examinations on the internet, sending postal money orders electronically (one has to still go to the post office for this, and pay over the counter), and accessing information and application forms for applying for passports. Interactive and transactional services are as good as non-existent, especially where citizens (rather than businesses) are involved. (Samarajiva 2004)

Initiatives of Large Funding Agencies

All the large funding agencies have ICT4D programs. These agencies include the World Bank, Asian Development Bank (ADB), USAID, United Nations Development Programme (UNDP) and the United Nations Industrial Development Organization (UNIDO). All funding agencies programs are streamlined under ICTA's broader program.

The World Bank directly supports ICTA's e-Sri Lanka initiative.

The United States Agency for International Development (USAID) has recently launched what it calls the "Last Mile Initiative" in Sri Lanka. Under this program, USAID funds computers and internet connections in private bank branches in small towns, for people to access the internet at times when the banks are closed; USAID is also planning to fund the development of content focusing on jobs, work force development skills, "English as a Second Language" training, and up-to-the-minute crop price information for farmers.

The ADB has funded the establishment of community information centers and village information centers, and plans to work with government agencies on an ICT-enabled skills development project.

UNDP has a program which operates at 3 levels: generic UNDP programming (i.e. using ICTs to enhance UNDP's own program activities), the use of ICTs in the thematic area of governance, and ICT for development as a practice area (where UNDP funds or partners with organizations to implement ICT4D projects; it also facilitates partnerships and organizes knowledge production and sharing events). This last thematic area is still in its infant stages, UNDP is seeking currently partners for the same.

UNIDO has very recently established a program to fund the implementation of ICT projects that are powered by decentralized renewable energy technologies in places which lack access to grid power.

Private Sector Initiatives

Microsoft 'Unlimited Potential' Project
Of the large private companies, Microsoft is the only one which has a dedicated project to bridge the digital divide. It should be noted that Microsoft has only had an office in Sri Lanka since 2004, and currently employs only 4 full-time staff.

Microsoft's ICT4D project is called "Unlimited Potential." Under this project, Microsoft partners with NGOs with a goal to increase computer literacy in the country. The Unlimited Potential project extends grants, software donations and assists in curriculum development. Currently, Microsoft's main project under Unlimited Potential is the Sarvodaya Telecenter Project which I discuss in some detail in the next section.

NGO Initiatives

Of NGO initiatives in ICT4D in Sri Lanka, Sarvodaya's Telecenter Project is by far the largest, best established and best known in the country. Sarvodaya's initiative is supported by ICTA, Microsoft, UNESCO, Pricewaterhouse Coopers, IDRC and the UNDP is also looking to partner with Sarvodaya.

Their project currently has three components: the main project currently operational is the Telecenter Project. This project will be enhanced and developed further under a UNESCO-funded initiative. There is also a research component in partnership with IDRC, Canada.

There is little surprise that all agencies wish to partner with Sarvodaya, the NGO has an extremely well developed and vast rural social organizational capacity, which is the bedrock of any good development project. Since this is the largest ICT4D project in Sri Lanka, it is also the central focus of my analysis. In this section, I provide some background information on Sarvodaya, describe the projects, and provide an analysis of the project in terms of its achievements and challenges. I also include some analysis of ICTA's ICT4D projects where relevant.

About Sarvodaya
The Sarvodaya Shramadana Movement is a rural social movement, and Sri Lanka's largest local NGO. Sarvodaya has been active in Sri Lanka since 1958, and has a reach covering 15,000 villages (which is close to half of all the villages in the country). The core philosophy of the organization, based on Gandhian and Buddhist principles, is the concept of empowering the village community to "awaken" to its full potential.

Village communities chose to join Sarvodaya. Once they do so, village leaders are identified and provided with leadership and management training, as well as basic accounting and financial management training. A village society is established, and the village comes together to define their needs, and identify ways to meet these needs. A village-level savings account is set up, and all income-earning villagers start saving in this account, which is then used to make loans.

The village is supported in all these efforts (in terms of training, expert advice and inputs, building materials, and partial funding) through three arms of the organization – Sarvodaya Social Empowerment Division (the arm that is responsible for organizing the community, and training the village executive committee), Sarvodaya Rural Technical Services (the arm that provides all technical and engineering inputs to village

development projects like building wells, houses, roads, gravity water systems, etc.) and Sarvodaya Economic Enterprise Development Services (the microfinance and enterprise-training and development arm, also known as the Sarvodaya Bank).

In this way, the village goes through what Sarvodaya calls a "5-step graduation process", each step being defined by key indicators. The ultimate or 5th step is "Grama Swaraj," where the village community is economically self-sufficient in all its needs, and is able to share its experience, knowledge and resources with other villages.

The Telecenter Project
Sarvodaya initiated its ICT4D program in 1997. This project called 'Sarvodaya – Telecentre Project' was launched initially with the partnership of University of Colombo School of Computers (UCSC) and CeyCom Global Communication (Pvt.) Ltd. Under this project, Sarvodaya currently operates 13 District Telecentres, which support about 300 Village Information Centers (VIC), maintain by village youth groups attached to the village Sarvodaya Societies.

I visited and conducted research in 2 telecenters, and 4 associated VICs. One telecenter and 2 VICs are in the coastal district of Puttallam, and the other telecenter and 2 VICs are in the central hill district of Nuwara Eliya. In addition, I visited the office of the President of one Sarvodaya village society, whose office effectively functioned as a VIC.

District telecenters
District telecenters are located in the main town of a district, and house computers, printers, UPS systems and have internet connectivity (largely through dial-up connections). They support Village Information Centres, conduct computer courses, provide related services (e.g. printing, email, CD writing), and work towards creating awareness about the use and value of information and technology at the grassroots. The Sarvodaya telecenter in the hill-station of Nuwara Eliya is also an ICTA Nanasala.

The telecenters are the central storehouses of information which is then distributed to the VICs. The information is collected by the telecenter coordinator from a variety of sources: internet, newspapers, advertisements, govt. agencies, NGOs, and Sarvodaya head office (which houses a Learning Resource Center to generate relevant information for telecenters and VICs). The key issue is that all the information is paper-based, and currently not computerized.

The telecenters support the activities of Village Information Centers, or VICs. VIC coordinators meet with the district telecenter coordinator about once a month to exchange information, and discuss plans for development of the VICs.

While the cost of all equipment is borne by donors, telecenters have to cover their operating costs by charging small amounts of money for the various services they offer. In general, however, their charges for services such as courses and printing etc. are much lower than other communications and computer training centers in the country.

Village Information Centers
Village Information Centres or VICs are located in villages, and are managed by a village youth group (called the "Village Information Circle") attached to the Sarvodaya village society (all Sarvodaya village societies are legally registered entities), on a purely voluntary basis. The most enterprising VIC volunteer is appointed as VIC coordinator by the telecenter coordinator.

 VICs function as information houses, and are in constant communication with the district telecenters through what Sarvodaya calls a "human interface" – volunteers and Sarvodaya telecenter staff going back and forth between the VICs and district telecenters, carrying and updating information.

A plan is currently underway to equip some VICs with laptops and other equipment. Pricewaterhouse Coopers has donated 300 laptops towards this purpose, and ICTA will also donate some equipment.

Of the 4 VICs I visited, one in Puttallam had 6 computers. This however, was a wealthy village, and the village community had paid for the building and equipment out of the Sarvodaya village society funds. The other 3 VICs had no computers or equipment (which is the norm). Two had no electricity, and were located in villages which were a ½ hour to 45 minute walk up steep hills on unpaved roads, from the nearest paved road. Both these villages did not have a single functional telephone, and no cell phone reception.

At VICs, all the information is on paper, and organized in separate files, or pinned onto notice boards. The variety of information is impressive; see Box 2 for a list of information categories maintained by the VICs. The VIC volunteers collect it from a variety of sources, ranging from the district telecenter, government offices, magazines and newspapers.

Box 2.

General list of information categories being maintained at Sarvodaya Village Information Centers (note: while much of this information is carried by all the VICs I visited, some categories are only present in one or two VICs; this is an aggregated list)

About their village:
1. Village demographics – population by gender and age, numbers of people employed in different occupations, number of disabled people, number of people on government welfare
2. Size and number of land holdings
3. Type and amount of crop production
4. Village map
5. A list of basic needs of the village in order of priority
6. Name list of registered voters in the village
7. Structure of Sarvodaya village society
8. Pre-schools and Sunday schools in the area
9. A video about their village (unique to one village)

About the district and country:
10. Demographic and census data for their district
11. District map with divisions
12. Posters and information leaflets on water falls and birds of Sri Lanka, and natural parks of Sri Lanka
13. Contact information for government offices, universities, computer training institutes and large banks in Sri Lanka
14. A booklet from an old Sarvodaya exchange program containing information about two Tamil districts
15. List of Presidents and Prime Ministers of Sri Lanka
16. Information on the tsunami– statistics and data by district
17. Bus and train schedule
18. Historical sites of interest in Sri Lanka
19. History of the village

Government-related information:
20. Application forms and procedures for a wide variety of purposes: applying for a telephone service, for government welfare, for registering a business, for land transfers, for disability allowance, for ID cards – new and replacement, for permit for cutting trees, for putting parents' names of ones birth certificate, for govt. assistance, for changing land use, for transferring money from dead relatives, for permit for transport timber, for obtaining birth, death, and marriage certificates – first time and replacements, for registering a death (some time after it occurred), for registering an NGO
21. Different local government offices and their activities

Social information:
22. Booklet on human psychology prepared by Sarvodaya Early Childhood Development Programme
23. Public awareness posters on child protection and the evils of child labor, on the evils of drinking liquor and smoking
24. Information on how cigarette companies are targeting young people
25. Leaflet on how to lead a happy family life
26. A leaflet on attributes of a good person
27. Information on asthma and on vaccines
28. Women's protection and rights

(contd.) General list of information categories being maintained at Sarvodaya Village Information Centers (note: while much of this information is carried by all the VICs I visited, some categories are only present in one or two VICs; this is an aggregated list)

Information on the VIC:
29. Dates of meetings, names of members

Economic development and agriculture-related information:
30. Magazines relevant to agricultural communities
31. Data on main exports of Sri Lanka
32. Booklet (from the telecenter) on what is information technology and why it is useful
33. Old computer magazines in Sinhala
34. SEEDS document on how to create a business plan
35. Leaflet on an employment development fund
36. Government Gazette
37. Information on a weaving course
38. Leaflet on broiler diseases
39. Labor rights of garments workers
40. Courses by institution and subject, and how to apply
41. Booklets on growing corn, manioc, potato, ginger
42. How to use fertilizers
43. New agricultural techniques for growing vegetables
44. How to prepare a field for growing rice
45. How to prepare and market dried fish
46. Crop diseases and how to manage them
47. Chamber of Commerce publication on qualifications needed for different types of jobs

Lionel, a VIC coordinator in Nuwara Eliya district, stands in front of an information board at his VIC. He dreams of running a fully-equipped telecenter with a telephone and a computer here, someday.
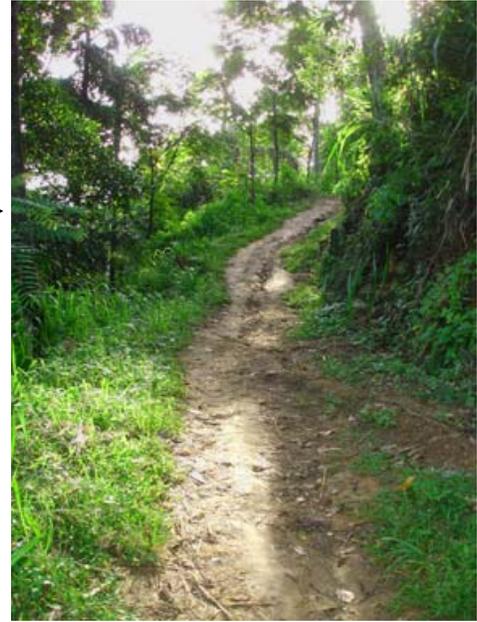

The VIC signboard of a wealthy village in Puttalam district. This VIC has 9 computers.

An advertisement for Sarvodaya courses, sponsored by Microsoft

Access road to one village I visited; basic infrastructure is clearly a prime development need here!

Projecting a film on child labor on a village school wall

Nadika (on left), a coordinator of a VIC in Nuwara Eliya district, explains the information categories they maintain here, as others look on

Asiri, the Nuwara Eliya telecenter coordinator, creates awareness about the VIC at the village school where the above film was shown
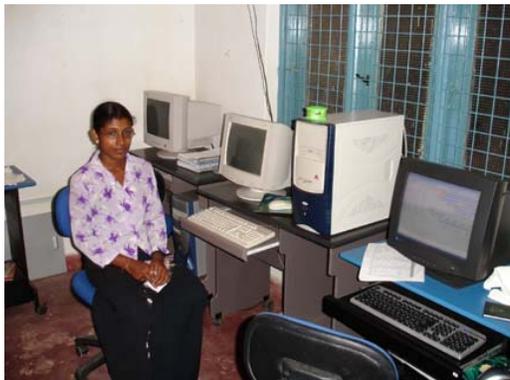
A wealthy VIC I visited: the Sarvodaya Bank, the VIC, a library and an auditorium are all housed in this building paid for entirely by the village Sarvodaya society funds

A user at the Puttalam telecenter; she came in to prepare a CV, and also look for jobs in the government gazette

The UNESCO Project

Under this project, Sarvodaya is obtaining funds from UNESCO to enhance the ability of telecenters and Sarvodaya village banks to function as economic enterprise development resource and training facilities. This project will include the development of databases and online training modules on all aspects of small enterprise development – from business plan development and market research, to production methods, quality control, training in English, project and financial management, information on credit schemes, and links to buyers. This will involve the creation of a market database, a producer database and a technology information database (on technologies required for various production processes). All Sarvodaya bank staff and volunteers will also be provided with computer training. The reach of this program will be enhanced with the help of a mobile multimedia unit, which will have an inbuilt IT laboratory, and carry relevant information to villages.

The project has just started, and therefore it is not possible to do any evaluation or analysis. Given that Sarvodaya has a reach covering over 15,000 villages, this project, if well implemented, has the potential to dramatically improve small enterprise productivity in the country.

The IDRC Project

This is a research project, conducted by the International Development Research Council (Canada), in association with Sarvodaya. Under this project, 2 communities – one semi-urban, and one rural – have been provided with internet-enabled computers, connected to each other by local wi-fi. The computers are provided to the local physician, school, and temple. The research includes a socio-economic component, where studies are conducted to reveal the demographics of the users, and to understand what people are using the computers and internet for. There is also a technical component to the research. Sarvodaya's role in this project is one of facilitator, as both communities have active Sarvodaya societies. The research is still underway, and no findings have been published as of date.

IV. ANALYSIS OF THE TELECENTER PROJECT:
ACHIEVEMENTS AND CHALLENGES

This section is an analysis of the Telecenter Project. It presents the issues, challenges and successes as recounted to me by the staff, volunteers and users at these centers.

In addition to having detailed discussions with telecenter staff and VIC volunteers, I conducted a survey of 87 users of the 2 telecenters and 4 VICs I visited. The goals of the survey were to try and understand:

- The demographics of the users, in terms of age, occupation, education and socio-economic status
- The main reasons for which they come to the telecenter/VIC
- Whether or not they get any economic benefits from using the telecenter/VIC
- Whether they are satisfied with the services they receive
- Whether they believe they can get the same services elsewhere
- The kinds of information/services they would like to have
- How they heard about the telecenter/VIC

While some of this information can be presented quantitatively, I must point out that there are several unavoidable shortcomings in the survey, which makes it difficult to call the sample representative. For one, since VIC users are few and far between, it was not practical for me to wait several days at the VIC surveying about 2-3 users a day. So I conducted the first few surveys at each VIC and then handed over the remaining to the staff/volunteers to conduct. As a result, information has been reported in different ways in different places for open-ended questions, which makes it impossible to codify. Second, the sampling method, while practical for a short-term research project, is likely not representative. I essentially surveyed (and got the staff/volunteers to survey) the first 15-odd visitors to each VIC/telecenter.

Finally, I cannot report in any quantitative way the main reasons why people come to the telecenters/VICs, and the kinds of information they would like to have, as the telecenters and VICs differ substantially in the types of services and information they offer, and equipment they have. Each center is fairly unique; for example, the Nuwara Eliya telecenter was started earlier than the Puttalam one, and has a high speed internet connection, which the latter does not. When I visited the centers, the Puttalam center had not started offering courses yet, while the Nuwara Eliya one was offering several courses. Further, the VICs are also very different from each other – one has computers, the other three do not. Two lack electricity connections. All the VICs were opened on different dates, and so are in different stages of development, and carry different information.

In spite of these problems, the surveys did yield a lot of information. Some of this I present here quantitatively. The rest I analyze qualitatively in combination with interviews with telecenter staff and VIC volunteers, to inform my sections on achievements and challenges.

Main survey results

- Majority of users surveyed (56%) are in the 15-25 age range. 45% are male, and 55% female.
- The majority of users are students (47%). VIC and telecenter staff confirmed that majority of users are students. The next largest user group was "unemployed." (12%)
- The survey did not include any direct questions on income, but did include questions as to whether respondents had electricity, a telephone, a cell phone and a television in their home. The response reflects urban/rural disparities in terms of access to these services. Amongst the users of telecenters (located in medium/small towns) surveyed, 100% had electricity, 68% had telephones, 49% had cell phones and 100% had televisions. Amongst users of VICs, 85% had electricity, 15% had telephones, 24% had cell phones, and 83% had televisions. These figures are higher than national averages for the same, but as this sample is not representative, it is not possible to say anything conclusively.
- In terms of education levels, the largest group has completed their A-levels (41%).
- 89% of respondents said they were satisfied with the service. Those who were not satisfied, as well as many who were satisfied said there was not enough information at the centers, and/or expressed a need for computers (at VICs).
- More than half – 57% – said they can get same information or service elsewhere, either at other communications centers, or from newspapers, via the radio and television, from public libraries and government agencies. At the same time, the majority of respondents reported time and money saved by having access to so much information at one place – see next point.
- 56% of respondents said they gain some economic benefit from the telecenters or VICs. However, nobody reported a direct economic benefit. 88% of those that reported an economic benefit said it was because of the cheap prices for services and courses (at telecenters) and time saved (by having the information, they did not have to waste time making several trips to a government office, or a doctor's clinic, for example). The remaining 12% said they gained some benefit by obtaining information about jobs, in the government gazette, via the internet, or in the form of useful advice, such as how to prepare a CV.
- In terms of where they found out about the telecenter and VIC, 52% said they heard about the telecenter or VIC from friends, 39% heard from Sarvodaya staff or village society executives, and 8% said they saw the signboard, or read a flyer.

Achievements of the Telecenter Project

In a country where the general level of ICT deployment and awareness is extremely low, the Sarvodaya Telecenter project is doing exceptional work. As per my analysis, the achievements are as follows:

The project provides multiple development benefits

a) People are better informed to evaluate their own development needs:
All the VIC volunteers I spoke to agreed that the process of documenting information about their own village and demographics allowed them to better evaluate their own development needs. For example, one VIC coordinator told me they had no idea how many disabled people lived in their village before this information-collection exercise. They now recognize the need to provide some facilities for them.

Importantly, having village youth collect, categorize and disseminate information about their own village makes the whole development process much easier, more sustainable and participatory for the concerned NGO. As opposed to having Sarvodaya (or any NGO) staff visit each and every village and conduct surveys or studies, the community performs this task itself, and stores data and information in a public place which all community members and visitors have easy access to.

The best example of using IT in a village to identify and track development needs and progress is in the village of Bohagawalla. The enterprising Sarvodaya village society President in this village in Nuwara Eliya district has all the information about his village in an html document on a Pentium 4 machine, created by his 15-year old son. He bought the computer with his own money, and his son developed the system single-handedly. Using this system, they can track information on each and every family in the village. With a few clicks, he can track information in aggregate, or by individual family, or by needs (e.g. who needs a well, who needs a toilet, etc). The society President claims this system has made it much easier for him to establish development priorities, and keep track of village development activities.

Above. The Sarvodaya society President in Bohagawalla stands in front of information displayed on the walls of his office.

Below. A snapshot of the html system created by his son to track development progress in this village.

One could argue that the same exercise is possible without the VIC, but there is little doubt that the VIC serves as a catalyst for this process to occur (unless the village has an especially enterprising leader, like the one in Bohagawalla), as young people take this on as a group activity, and are motivated by the idea of developing the VIC and eventually having access to computers and learning IT skills.

Documenting this information is also the first essential step towards any web-based activities, such as creating a website for the village, which can serve as a portal to advertise their products (such as handicrafts, for instance), and communicate with other villages and the outside world.

b) There are many indirect economic benefits in the form of saved time and effort:
56% of users surveyed claimed they get an indirect economic benefit, either from saved time and effort, or (in the case of telecenters only) from having access to cheap services.

For example, people who need to carry out certain official activities like register land, register a business, apply for government welfare, apply for birth, death and marriage certificates, etc., can now know in advance what documents, forms and payments they have to provide to the relevant government office to carry out this activity. This saves them considerable time and effort. VIC users can also get information on the location and consulting hours of specialized doctors in the vicinity, and bus and train schedules, which were previously not available in their village. Students can get all the information they need to write school projects, without traveling many hours to public libraries in the towns.

c) There are some direct income-enhancing benefits:
In some VICs and telecenters, people can access information on new agricultural practices and techniques, and new programs offered by NGOs and government, which can directly contribute to income enhancement. People also benefit in their job hunt from information such as guidelines on preparing a CV, for instance.

In one VIC, the VIC volunteers borrowed a video recorder, and made a short film on a waterfall located near their village. This fall, named Kurundu-O-Ella, is one of the highest falls in Sri Lanka, but is in a jungle, and so rarely visited by tourists. The VIC volunteers believe it can be developed as a tourist destination. They converted the video into a VCD at the Sarvodaya telecenter, and plan to disseminate copies of this VCD to local travel agents and tour guides. This project was entirely initiated and carried out by the VIC volunteers with no assistance from outside. It has the potential to help them generate income for the community.

In general, it must be pointed out that given the current information VICs and telecenters have, there are not many direct income-enhancing benefits. However, this is likely to change once the UNESCO project is implemented; as the goal of that project is specifically to use ICT to enhance and facilitate entrepreneur development.

d) There are many social benefits:
The VICs and telecenters provide considerable information on public health and nutrition, including on topics like psychology and HIV which are normally taboo in Sri Lanka. They also facilitate access to medical services, by providing people with information on specialist doctors and their consulting times and locations.

The VIC also helps create awareness about environmental issues, and disseminate information on the value of local plants and animals. People also obtain information about events in their own country and abroad from the VIC; many VIC users told me they obtained information about the tsunami. The tsunami information at the VIC had been downloaded from the internet at the telecenter, printed out and sent to the VICs.

The project also educates people on social topics such as child labor and corporal punishment. When I visited one VIC, the telecenter coordinator traveling with me carried a laptop and multi-media projector, along with multiple VCDs and DVDs. He organized an event at the village school, and showed the children an ILO-produced film (in Sinhala) on child labor and corporal punishment. He also showed a film on environmental issues. The telecenter and VIC coordinators then used the event to advertise the VIC, and requested young people to get involved in developing the VIC.

The very act of involving village youth in running the VIC has a social function – it gives them a productive activity, which is an important thing in a country with record-high youth unemployment.

The Sarvodaya telecenter model is sustainable and rapidly replicable
This dimension cannot be understated – the vast majority of NGO projects tend to be entirely dependent on donor funds throughout the life of the project. While indeed the initial equipment in the telecenters is donated, after this initial donation, the project sustains itself in the following ways:

a) The telecenter is income-generating:
Even though the telecenters charge very low rates for courses and services like printing, scanning, etc., they can cover their operating costs. The Nuwara Eliya telecenter makes a profit of about Rs. 25,000 ($250) a month.

b) Profits from the telecenter can be ploughed into developing the VICs:
The Sarvodaya district coordinator at Nuwara Eliya has an excellent idea for doing just this. One of the courses conducted by the telecenter is on hardware assembly. At the end of the course, the students have assembled a few new computers from components. With a little extra money, it is possible to buy a keyboard, monitor and mouse, and provide these newly assembled computers to the VICs.

c) The growth of the project is not dependent on the availability of large capital investment:
This is because the VICs can be developed at virtually zero cost, with the help of motivated youth volunteers in the villages. These youth join partly because they recognize the importance of information, but also because they realize that the VIC can potentially be a revenue-earning facility in the future. And they are right - as and when funds and/or equipment are available, equipment can be provided to the VICs, which can then become income-generating units in their own right.

Reaches poor people, even without IT
In the case of ICT projects, the vast majority are restricted to areas where electricity and other infrastructure like telephones and motorable roads are available. While there is considerable talk of using renewable energy like solar PV systems to power computer, in reality this takes the cost through the roof, and can only be done as one-off donor projects.

In countries like Sri Lanka and India, where about 40% of the population lives in places where there is no electric grid (and often no paved road), this effectively means ICT projects do not reach these people, who are generally the poorest and most disadvantaged to begin with.

In contrast, the telecenter-VIC model reaches the most remote, poor villages. Since the emphasis is on information, rather than technology, the telecenter-VIC model can provide benefits to remote and poor rural communities even without the technology. Of course, access to technology can greatly enhance the benefits. However, the "human interface" dimension of this project ensures that even without direct access to IT, people in remote areas can access information one can get thanks to technology. For instance, when the VIC volunteers need information about certain issues or topics, they can ask the district telecenter coordinators to obtain it. Sometimes this information is on the internet, sometimes on DVDs or VCDs produced by government agencies (e.g. the Agricultural Department produces many VCDs on improved crop production). When the information is on DVD/VCDs, the district telecenter coordinator will loan their LCD projector and a laptop to the VIC coordinators to screen at a venue such as a school or community hall.

In some ways, one could say that the Telecenter Project is also contributing to the creation of equity. For example, students who can afford and access the hardware courses in the Nuwara Eliya telecenter essentially end up building computers that can be then given free of charge or at a very low cost to VICs in poor villages.

The telecenters themselves make facilities available to people at costs that are much lower than any competing institution, which means that a poorer section of society can access these services.

Challenges and Needs

This section focuses on challenges faced by the Sarvodaya Telecenter Project. Some of these challenges, like the lack of ICT infrastructure, are not issues that Sarvodaya can overcome independently; it requires considerable government involvement. Others are challenges that Sarvodaya could tackle independently, or with other NGOs.

ICT infrastructure is very poor
This is of course a key challenge in many rural areas of developing countries – the communications infrastructure is very poor. Two of the VICs I visited in the hilly areas did not even have telephone (or cell phone) reception.

However, it would be safe to say that in Sri Lanka, given the pace at which cell-phone coverage is increasing, and with the advent of WLL telephones, it is likely that the majority of villages will have some access to some form of telephone reception in the near future.

The question remains, of course, that once service is available, will it be affordable for the masses? The costs of WLL telephones are very high. At one VIC in Nuwara Eliya, the volunteers are very keen to establish a phone service for the community (there is no functional telephone in the village). To raise money to purchase the telephone, the organized a "raffle", where they sold tickets for Rs. 10 ($0.10), and promised a fan, and irons as prizes. But they could only collect Rs. 5000 ($50), which would not even cover the cost of the prizes, let alone the phone! This is in spite of the fact that the community has identified a telephone as their most pressing development need. However, the VIC volunteers are ever-enterprising – they have requested the district telecenter coordinator to lend them a multi-media projector and laptop computer, and they plan to show popular movies in their and near-by villages, and charge for the ticket; the proceeds for which will go towards a phone.

50% of the rural population in Sri Lanka also lacks access to grid electricity. However, given that the country is small, most places that lack access to the grid are not more than a 2-3 hour-long drive away from places with grid electricity. While there is a lot of hype surrounding the use of solar PV systems to power computers and equipment in remote locations, in reality, this is still an extremely costly option. However, given the rapid pace at which prices of computer and solar PV equipment are dropping, there is a good chance that the economics of using solar PV to power computers in places where there is no grid may look much more favorable in about 5 years.

Language barriers are high
A UNDP study states that "In the case of Internet diffusion, a consistent finding of surveys of Internet users and providers in developing countries is that the lack of local language and locally relevant content is a major barrier to increased use."(Harriss 2004: 17)

I would argue that in addition to developing content in local language, it is important to teach people English, as focusing on local language content without teaching English will always limit people from fully accessing the immense resources available via the internet.

Most rural people in Sri Lanka speak either Sinhala or Tamil (and rarely, both), but little or no English. English has been recently reintroduced in schools as a second language, but the quality of teaching and learning in rural schools is often poor, and most people emerge from high school able to read the Latin script, but with very low comprehension. This greatly hampers their ability to learn computers, and especially to take advantage of the internet.

At the VICs I visited, nobody spoke English; many telecenter coordinators themselves have a limited grasp of English. However, all the young people I spoke to realize the importance of learning English, largely in the context of being able to master computers, and use the internet.

Few are able to afford expensive English classes, far from their villages. At one VIC I visited in Nuwara Eliya, the VIC volunteers told me they are very keen to learn English and even had 50 other young people ready to attend a class, but they can't find a good English teacher willing to come all the way to their village. This is not a big surprise: from Nuwara Eliya town, we traveled for two and a half hours on three different buses, followed by half an hour in a 3-wheeler to reach their village (we were lucky to have the 3-wheeler; most people have to walk the last 45 minutes up a very steep hill). This probably seems too arduous to good local English teachers.

Teaching English is by no means a substitute for developing local language content. It should be mentioned that in Sri Lanka, both Sinhala and Tamil fonts are widely available, and Microsoft has come out with an MS Office package in Sinhala. However, the Sinhala fonts are not standardized; for different Sinhala website, one often has to download a different font. Font standardization is something that ICTA is looking into.

Need more focus on critical development needs
While the Sarvodaya telecenter project, and some of ICTA's programs are laying important groundwork in making ICTs work for development, I would argue that these projects in and of themselves do not yet address Sri Lanka's key development needs to their full potential. However, the Sarvodaya Telecenter project certainly has the potential to provide more effectively for these needs. I categorize these unmet development needs as employment, peace-building and political empowerment; though the three are interrelated in many ways (e.g. it is difficult to talk of employment in a war zone).

The fact that there are unmet development needs is supported in my analysis of the demographics of VIC users, who are currently mainly students. The VIC volunteers and Telecenter coordinators expressed a strong desire to have strategies and relevant information for farmers, small businesspeople, and provide employment information for young people. The Sarvodaya UNESCO project will be a step towards meeting these needs; however, the potential is much greater.

Employment
As mentioned earlier in section, unemployment in rural areas of Sri Lanka is extremely high, especially amongst youth. All VIC volunteers and telecenter coordinators told me that something needs to be done to help job seekers. They have many ideas, including the establishment of job banks and databases, to help connect potential employers and employees.

Indeed, a job bank has already been established by the government, through project funded by the International Labor Organization (ILO) called "Jobsnet". Jobsnet is an online job database, where potential employers and employees are matched up through an

automatic process. Recently, ICTA has also established a similar online job bank, although this website is focused largely on IT-related jobs.

I would argue that projects such as Jobsnet and other job banks and databases are superficial treatments of a much deeper problem, and not likely to make any substantial difference to the unemployment situation in the country. This is because the lack of employment is not so much an issue of lack of information as it is a structural problem in the country's economy. There just aren't enough jobs to go around. This is amply demonstrated by the Jobsnet own website, which states that their database contains profiles of 119,456 jobs seekers and had only 4,387 open jobs listed (Jobsnet, 2005). This essentially means that at least 115,069 of the job seekers listed will not find jobs through Jobsnet.

Endeavors like Sarvodaya's UNESCO project can definitely help alleviate this problem to some extent, but I would argue that such projects cannot solve the problem completely. This is because they are focused entirely on small entrepreneurs, and do not fully address the needs of labor. There is a problematic assumption in rural development practice that all rural people are able to be entrepreneurs; this is not true. Being an entrepreneur involves exposing oneself to considerable risk, and a poor agricultural laborer who earns a daily wage of $4, and is often in debt to a moneylender just to meet their daily needs, or pay for unforeseen medical expenses (in the village where I am doing my PhD fieldwork, a staggering number of people are in debt to moneylenders, paying about 10% interest per month on their loans) is likely to be unwilling or unable to take on another loan to start a business.

Further, the key dimension of enhancing the ability of entrepreneurs to develop economically is market linkage. If producers can only access local markets comprising mainly of other poor people, their market is severely limited, as their customers' purchasing power is limited. Connecting producers to larger markets is absolutely critical to the success of entrepreneur development programs. The Sarvodaya UNESCO project must ensure that this market linkage development is given adequate attention.

The key development need in the country is therefore the active creation of more employment/self-employment opportunities. If this is not achieved, training people to use computers will only result in continuing disappointment, as they find that their new skills don't really help them get ahead.

I would argue that ICT4D projects can actually contribute to changing the structure of the economy, and creating jobs in rural areas, even where English skills are lacking. I elaborate on this in my section on recommendations.

Peace Building
Without long-lasting peace, all talks of economic development cannot be expected to come to much. While some investment is forthcoming in the south, the north and east regions of the country which are former conflict-affected areas suffer from abject poverty and record-high unemployment. The majority of people are just subsisting. In the areas

controlled by the LTTE, the LTTE itself is the only real source of employment. While "formal" peace between the Sri Lankan government and LTTE is important, building peace at the grassroots, between Sinhalese and Tamil people, is equally important. No common language exists between these two groups (except for the minority on both sides who speak English), and an entire generation has grown up cut away from, and deeply ignorant and therefore suspicious of the "other" side.

A microcosm of this problem exists in one the villages I visited. The village, in the hill district of Nuwara Eliya, had a Tamil and Sinhalese community living side-by-side. There are many problems between the two communities, and the young people I met there expressed a desire to use the VIC to help overcome these problems and enable the community to live in harmony.

Sarvodaya has long recognized the need to build peace at the grassroots, and has an excellent grassroots peace-building program. Sarvodaya youth groups throughout the country form what is known as Shanti Sena, or the Peace Brigade. They engage in various exchanges between Sinhala and Tamil villages, conduct shared work camps and participate in other peace-building activities like workshops. I believe these peace-building activities can be enhanced through ICT4D projects. I elaborate more on this in my section on recommendations.

Political empowerment
In Sri Lanka, programs of structural adjustment have had large detrimental effects on rural economies. Rural communities have little or no involvement in the policy process, and yet bear the brunt of the negative effects of policies which liberalize agricultural markets, for instance, offering no protection to farmers who are then unable to compete with cheap imported produce.

In this context, it is useful to examine the development impacts of project like the Govi Gnana Systems Project, where farmers supposedly benefit from having access to spot prices of various crops. I would argue that such a project is unlikely to benefit poor farmers. While I have not personally visited this project, I have spoken to many rural farmers in the course of my research and work, and find that the main problem faced by poor farmers is not so much a lack of knowledge of prevailing prices. It is the fact that they cannot afford their own transport, and so are entirely dependent on middle-men to transport their produce out of their villages. Further, they are very often in debt to these middle men, which makes them beholden to them, and forced to accept whatever price the middle man offers. These factors allow middle-men to take advantage of poor farmers. Under the Govi Gnana Systems Project, the display boards are not in rural areas, but in large agricultural towns. The benefits are therefore likely to be captured by the larger farmers and middle men, who can transport produce to the town.

Providing farmers with price information bears further discussion. In the context of ICT4D projects, a lot of attention is placed on providing farmers with access to spot prices of agricultural commodities. The question remains however, as to whether the prevailing prices actually allow farmers to come out of poverty. In the context of

liberalized agricultural markets, the problem may not be the lack of information about the prevailing market price, it may be the fact that the price is too low for a smallholder to compete and survive economically, or that his/her landholding is so severely fragmented that he/she cannot produce enough to survive. This is of course not true for all crops, but in Sri Lanka, producers of staples like rice are finding it increasingly hard to survive.

How does this relate to political empowerment? One of the reasons why poor farmers are finding it increasingly difficult to manage has to do with government policies. For example, the Sri Lankan government, in the face of high inflation, and under pressure to bring down the cost of living for consumers, allows the import of cheap rice, which negatively affects Sri Lankan farmers. The problems faced by farmers are compounded by policies like the removal of fossil fuel and fertilizer subsidies, which multilateral agencies like the World Bank and ADB are pressuring the government to do. Note that I am not making an argument against policies that encourage globalization, I am only making the point that currently, those policies are designed in a way that prevent poor rural communities from accessing the benefits that globalization can bring.

This could be changed if communities could access information in advance about such policies, and have their voices heard in the policy-making process, not only in the government, but in organizations such as the World Bank and IMF, which are often the places where such policies are first formulated.

Another dimension of political empowerment has to do with reducing corruption. Right now, people often have to pay bribes to conduct official transactions, including tasks like registering a business or land, getting a permit for harvesting timber, registering for government welfare. The e-government program of the ICTA can, in principle, help alleviate these problems, but each project needs to be carefully examined for its content and processes, to assess whether they really serve to remove the opportunities for corruption.

More attention to long-term sustainability of VICs is needed
Currently, all VICs are managed by young part-time volunteers, who are in, or have just finished high school. Unless the VIC proves to be income-generating, this management structure may not be sustainable in the long-term, as volunteers too eventually need to make a living, and will leave to look for better prospects.

There are also security issues once VICs are provided with equipment like computers, it may not be secure enough to have part-time volunteers manage the VICs.

This is not a critical problem, as the goal of the Telecenter project is to eventually make all VICs self-sustaining. However, actions to implement this goal should be undertaken sooner rather than later, before the volunteers lose enthusiasm and momentum.

In this section, I attempt to make a case for looking beyond the kinds of development applications that ICT is currently being used for. This is not to under-value the usual sets of applications. For example, using technology to allow patients to talk to doctors in cities, or providing farmers with access to information on agricultural prices, has its obvious benefits. However, as I have argued in the last section, the key needs of creating unemployment, building peace, and empowering rural communities politically are not being adequately addressed by existing ICT4D projects. At the same time, projects like Sarvodaya's Telecenters can, with some effort and modifications, serve to meet these needs.

In this section, I first organize recommendations by concrete actions areas, and then provide specific recommendations to policy makers, NGOs/private sector, and researchers.

Build the required ICT infrastructure
This goes without saying, but at the same time, is worth mentioning, because it really is the first step towards utilizing ICT to its full potential. Currently, two of the five villages I visited don't even have a functioning telephone connection; the VICs themselves do not have electricity (although there is an electric grid line coming to their village).

While building the ICT backbone is the job of the government, there are some things that NGOs like Sarvodaya can do to connect up their VICs which do have telephone and electricity access. For example, given that the Nuwara Eliya telecenter is also an ICTA Nanasala, in concert with ICTA, this Telecenter could be converted into a local internet service provider. Currently, ICTA is paying a hefty $300 a month for the VSAT connection to the telecenter. The telecenter itself does not utilize the 128 kbps available to it. It could therefore offer internet service to a few VICs, which could dial in.

WLL connectivity also offers interesting prospects. In India, a company named N-logue is providing smooth and fast internet access with WLL.

Eventually, once ICTA has built the fibre optic network connecting all district government offices in Sri Lanka, these too can function as local ISPs.

Build capacity to use the technology
This has 3 aspects to it:
a) Teach English:
Organizations like Sarvodaya and ICTA should fund English classes. English can also be taught in the computer training institutes. With a large variety of computer-based English language educational tools available on the local market, the instructor does not need to be an expert in English or in the field of teaching, he or she simply has to work through the material on the CDs/DVDs with students. One instructor with a multi-media projector and laptop with a set of English instruction CDs could cover several villages in one week.

b)   Build Sinhala and Tamil keyboards, and translation tools:
Packages that can translate between Sinhala, Tamil and English would be extremely useful.
c)   Provide cheap computer training for the masses: Sarvodaya is already doing this, conducting classes for different groups (e.g. Sarvodaya staff, farmers, and children) and applications (MS Office, hardware course, and graphic design). The government should fund large-scale computer education, just like it does regular education.

Utilize ICT as a tool to transform the rural economy
A UNDP report identifies three ways in which ICTs contribute to economic development. First is the contribution that the ICT sector can make to the overall economic growth of a country. Second, ICT enables productivity gains in every sector. And third, ICT enables the expansion of human choices through increased access to information and knowledge (United Nations Development Programme 2004a: 18-19).

I would argue that while all these 3 dimensions can contribute to *overall* economic development, they can also greatly increase inequity, if the benefits are captured by the elite. Indeed, programs need to be specifically designed to ensure that all these dimensions of ICT's contribution to economic development serve rural areas and poor people. I propose some ways in which such programs can be designed:

a) Create rural employment
While the number of ICT-related jobs are growing in Sri Lanka, and exploding in India, these jobs are largely confined to urban, English-speaking people. However, with the right set of incentives and policies, it is possible to create ICT-based jobs in rural areas, even where people do not speak much English. To give one example, one entrepreneur in Sri Lanka has developed a business plan to establish a business process outsourcing unit in a poor rural area of Sri Lanka (he is yet to finance this plan). The goal is to provide services that require minimal English skills (e.g. medical transcription or digitizing libraries). He also has a plan to teach employees basic English, using a DVD-based English teaching course.

The kinds of incentives that the government provides could be similar to those given to the garments industry in the 1980s in Sri Lanka, thanks to which 200 garment-manufacturing businesses were established in rural areas of Sri Lanka. These policies could include tax holidays, broadband connections at subsidized rates for the first 5 years of operation, cheap electricity rates, cheap or free training, establishing BPO zones in rural areas with good infrastructure, and organizing trade fairs overseas.

The VICs themselves, of course, can employ people once they are income-generating, just like the Grameena Phone model in Bangladesh. Incentives for establishing VICs could include providing access to capital (low-interest loans), and necessary training. Through Sarvodaya alone, if one VIC could be established in every village where the organization is active, and if each VIC employs 1-2 people, this would generate between 15,000-30,000 jobs in the country.

The potential for rural BPOs is large in Sri Lanka, assuming the necessary infrastructure can be built. Language is a problem, but people can learn enough English in a year to manage many business process activities. On the plus side, Sri Lanka has a highly-educated work force, and even if there is no infrastructure in the villages, people can commute to small towns for jobs, as distances are not very large.

Another under-explored idea for generating rural employment is community tourism. Once again, ICTs can play an important role in facilitating the development of this sector. Tourism is one of the fastest growing industries in the world, and many tourists are looking for "alternative" holidays. Sri Lanka is an excellent tourist destination, with outstanding natural beauty, and a well-preserved architectural and cultural heritage.

The idea behind community tourism is that rural communities develop facilities to cater to tourists who are looking for something different, or to the millions of people who like to volunteer in developing countries. Sarvodaya has launched a Community Tourism Initiative, aiming to do exactly this. Under the guidance of a former managing director of a UK-based travel agency, Sarvodaya is developing 10 rural villages to cater to tourists.

Such an initiative could be greatly enhanced by using the internet to reach travelers and volunteers in the west, and provide village communities access to information about setting themselves up to become tourist destinations. The Sarvodaya Telecenter project should coordinate with the Community Tourism Initiative to develop this.

b) Enable self-employment
Sarvodaya already has a long and very successful history of supporting self-employment based development in rural Sri Lanka. Sarvodaya Economic Enterprise Development Services (SEEDS) extends microfinance, conducts vocational, skills and entrepreneur/management training programs, and assists people in developing business plans. SEEDS is undoubtedly the most successful rural economic development organization in Sri Lanka today. The activities of SEEDS, however, can be greatly enhanced with the help of ICT in the several ways. The UNESCO program aims to do just this. Here, I list some ideas for using ICT to enhance the work of organizations such as SEEDS; some of these are within the purview of the UNESCO project, others are not.

Establish interactive IT kiosks at SEEDS Banks (and other rural development bank) offices to provide the following services:
▪ Online banking: information on pros and cons of different credit schemes, instant online credit evaluations, etc.
▪ Online training toolkits: convert SEEDS training programs (vocational, accounting, management, etc.) to web-based easy-to-use modules, which people can search, download, and print.
▪ Information on how to export products: this should include information on strategic export sectors (e.g. organic produce, flowers, tropical fish, handicrafts, furniture), contact information for local consolidators and purchasers, and overseas buyers.

- Raw material supplies and supplier database for various industries, e.g. suppliers of paper for those involved in manufacturing exercise books, suppliers of produce for those engaged in making jam, etc.
- Quality control and management, contact information for local and international buyers in each sector, legal, tax and regulatory issues pertaining to exports.
- Ad-maker: an easy, online system for creating websites to advertise (and search) village enterprise products such as processed foods (like jellies, milk products, etc) handicrafts, pottery, furniture, art, rugs, garments, etc.

As I mentioned earlier, the emphasis must be on building market linkage which calls for much more than just technology. SEEDS will need to utilize the skills of qualified people who specialize in developing strategic export sectors. A lot of work will also have to go into quality control and certification, especially for products such as fresh and processed foodstuff. This system would call for considerable content management and continuous updating, and therefore a full-time staff of capable people. Sarvodaya/SEEDS or another organization could fund such a content management center by charging users a small fee for various services. The project could be started on a pilot basis, focusing on a few strategic sectors which offer good potential for self-employment and income.

For villages which do not have SEEDS Bank offices, people can still access this information at the nearest VIC with a computer, or at district telecenters. A lot of this information can also be put onto CDs, for those places where internet access is poor or unavailable.

Such a system would greatly expand the local market for small producers in the country, given that Sarvodaya is active in 15,000 villages. Even if each village has 10 entrepreneurs, this would generate an online database of 150,000 producers and products. People from different Sarvodaya villages can link up and support each other's enterprises. For example, a community close to tourist areas could purchase handicrafts and art from villages far away, and market them to tourists.

This would also help expand the export market overseas, if people could access information on quality management, advertise their products to the world, and locate buyers to export their wares, which could be greatly facilitated by the establishment of centralized purchasing and quality control.

c) Facilitate Overseas Employment
As discussed in section, the ICTA already has a plan to use ICT to facilitate overseas employment. Sarvodaya could link into this system (there is no point in duplicating the system), and utilize the IT kiosks at the SEEDS banks for this purpose as well. Right now, there is a considerable problem with unscrupulous agents, who take money from rural people seeking jobs overseas, and disappear. A database system with lists of all registered agents would help to minimize this problem. The system could also provide information on organizations and groups that people can contact if they get into trouble, or face harassment in their job overseas, as well as information on the process to get visas.

Political empowerment
Centers such as VICs could be a storehouse of information on government, World Bank, IMF and WTO policies and activities that affect rural livelihoods. They can also maintain updated information on labor and employer rights, and if the internet is available, provide access to online legal advice on related issues.

With computers and the internet, various people's movements and community-based organizations around the world are already linking up to share experiences, advice, and articulate their concerns and views on WTO rules, globalization and related topics. Websites for sharing and discussing are many; the World Social Forum open space, and the websites of consortiums like Third World Network, International Forum of Globalization, and globalpolicy.org are some examples.

In Sri Lanka, groups like The Green Movement of Sri Lanka, and the Movement for National Land and Agricultural Reform are working to empower rural communities in this manner. However, they do not have the kinds of rural outreach that Sarvodaya has. There might be fruitful alliances to be made between Sarvodaya and such groups. Sarvodaya has the great advantage of having an immense social infrastructure in place through its village societies. These societies could be empowered information about policies, and provided with forums for comment, discussion and feedback. Sarvodaya could link up with programs such as UNDP's governance program, to work on linking communities to the government policy formulation process.

Another key dimension of political empowerment is to facilitate various government activities with ICTs; this is precisely the goal of the ICTA's e-government program. However, all the e-government programs need to be closely examined to see whether they do indeed help reduce opportunities for corruption. Many of the information-based activities do not: for example, a system may provide information on the requirements for applying for a national ID card, or for registering land, but the applicant may still have to pay a bribe when he/she processes his/her application. E-government should focus on enabling computer-based transactions which remove such opportunities for corruption. This is easier said than done – one is dealing with deeply entrenched systems which have survived over decades if not centuries, and often the political will to change is minimal. However, there are projects in India that the Sri Lankan e-government initiative could learn from. For example, the Bhoomi project in Karnataka with an electronic database of 20 million land records has greatly streamlined the process of obtaining a land title. The first-in, first-out (FIFO) aspect of the automated system reduces the likelihood of corruption, as people no longer pay bribes to expedite their application (Sayo, Chacko et al. 2004).

Peace building
The precursor to peace-building is, of course, the establishment of a common language. These have already been discussed in section IV. Assuming one can accomplish this, then the internet could be used to set up chat and discussion forums for people across Sinhala, Tamil and Muslim communities. The Sarvodaya Peace Brigade could be an ideal group

for such an activity, where young members from all the Sri Lankan ethnic communities can make connections and communicate through a "Friendster"-type system. Sarvodaya could also use these forums to encourage open discussion about the ethnic conflict, people's personal experiences and fears, and potential resolutions.

In the table below, I provide a summary of key recommendations for different sectors: policy-makers, researchers and NGOs. There are obvious areas of synergy between these groups, which can yield many fruitful partnerships and joint ventures.

General Recommend-ation	Policy-makers (e.g. ICTA)	Researchers (e.g. members of TIER)	NGOs (e.g. Sarvodaya)
Build infra-structure	- Aggressively build infrastructure - Streamline regulatory structure and process - Develop appropriate policies to encourage private sector to investment in infrastructure - Publish infrastructure development plan	- Research and experiment with appropriate technologies for last-mile connectivity - Develop cheap equipment - Research and develop cost-effective renewable energy technologies for ICT applications	- Develop VICs, in preparation of receiving equipment/ connectivity - Where telephone/electricity access exists, equip VICs with telephones and computers
Build capacity to use technology	- Subsidize training programs - Standardize fonts	- Evaluate existing computer and English courses, and recommend improvements for rural applications - Develop easy-to-use English instruction CDs - Develop translation tools - Teach computer courses in holidays - Teach English in holidays	- Design training programs to suit rural needs - Conduct trainings - Conduct English classes, with or without the help of IT
Create rural employment	- Build infrastructure and BPO/technology parks in rural areas - Create incentives for private sector to invest in rural areas, like for the garments sector - Develop foreign employment portal - Develop standards and policies for safe and effective e-commerce	- Research and develop content for ICT-based enterprise development programs: focus on market linkages, key export sectors, quality control - Research and develop content for ICT-based community tourism programs - Research and develop easy-to-use systems for Sri Lankans abroad to send money home to their rural families	- Develop ICT-enabled enterprise development programs - Develop VICs to be income-generating - Develop ICT-enabled community tourism and volunteer initiatives - Help villages develop their own websites - Focus effort on helping create market linkages

Political empower- ment	▪ Develop e-government programs for transactions ▪ Develop channels for citizens' groups to provide feedback on policy in ways that feed directly into the Parliamentary process	▪ Research and develop content specific to Sri Lanka on policies that affect rural people ▪ Research and recommend strategic linkages around that globe that NGOs can make to share experiences and information ▪ Critically analyze current e-government initiatives and plans, and recommend improvements	▪ Develop information resources on policies that affect rural areas ▪ Develop information resources on employee's and employer's rights, laws, wages, etc. ▪ Link up with existing governance initiatives like that of UNDP and ICTA, to develop forums for citizens feedback on policies ▪ Link VICs to e-government portals, as and when developed
Peace Building		▪ Research and develop a "Friendster"-type system for helping Tamil, Muslim and Sinhalese youth connect up, and discuss issues like the ethnic conflict	▪ Use VIC development as a reason to bring youth groups together from different communities ▪ Create information resources on the history of the ethnic conflict, with perspectives from both sides ▪ Create incentives and programs for Tamils to learn Sinhala and vice versa

VI. CONCLUSIONS

The Sri Lankan ICT industry is very immature as compared to the stage of development in the same industry across the Palk Strait in India. While several ICT4D projects have been launched, there are many challenges ahead. For one, the lack of a substantive peace agreement between the Sri Lankan government and the LTTE will surely be a deterrent to international investment in this sector, especially when the neighboring country India is so well set up to receive ICT investment, and is much safer to boot. The lack of English skills is also a challenge to deploying computers and the internet on a large scale. The problems of rural unemployment and political corruption are deep-rooted structural problems, not easily "re-engineered" with technology.

At the same time, I would argue that Sri Lanka offers tremendous potential to make ICTs work for the rural masses. In this respect, it has many advantages over India – the country is small and is easy to travel around (and build infrastructure in), rural youth are highly educated, and there is no entrenched caste system. While traditional industries like industry and agriculture are not showing much prospect for growth, there is great scope for service sectors like tourism, and IT-based businesses.

The key factor that makes Sri Lanka a unique site for making ICTs work for rural development is the extensive social infrastructure that exists in 15,000 villages thanks to Sarvodaya. According to a UNDP report: "In rural settings in developing countries (where the vast majority of poor people live), it is always a challenge to install the technological infrastructure, but the task is relatively simple compared to establishing the information infrastructure." (Harriss, 2004: 35) I would argue, however, the most difficult task is to lay the social and organizational infrastructure needed to make any technology work for development.

This is not to say that Sarvodaya has figured it all out, their efforts are an ongoing work in progress. As I mentioned several times in this report, problems like rural unemployment, ethnic conflict and corruption are a long way from being resolved. Further, while their reach is extensive, some village societies are weaker than others, and more than half of Sri Lankan villages are not members of Sarvodaya. However, what Sarvodaya does have in place provides an incredible and *immediate* opportunity to deploy multiple development applications of ICTs on a large scale.

In his preface to a UNDP report on promoting ICTs for human development in Asia, Sir Arthur C. Clarke, one of the world's best known writers of science fiction, the inventor of the concept of the geostationary communications satellite, and a resident of Sri Lanka, wrote, "Our big challenge, therefore, is to get ICTs to solve real life problems without creating any new ones. In the early part of the last century, Mahatma Gandhi proposed a simple test for the effectiveness of any development activity: find out how the last man would be affected by it." (UNDP, 2004a: iv) We should take this to heart, and with the help of organizations like Sarvodaya, make every attempt possible to ensure that the last man, or woman, is a stakeholder in the ICT revolution.

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