

**Promoting youth employment through information
and communication technologies (ICT)
Best practices examples in Asia and the Pacific**

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Promoting youth employment through information and communication technologies (ICT): best practice examples in Asia and the Pacific

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*Whatever its stage of development, no country can afford to ignore ICT. Although this technology may not be of decisive importance to the very poorest countries, it may still exert a major influence on their ability to acquire knowledge and tap into global networks. Without minimal levels of competence in ICT, poor countries may find themselves excluded from markets which they are otherwise competent to supply.*²

Executive summary

The focus of this paper is on best practice examples from mainly Asia-Pacific ILO member countries of the use of information and communications technologies (ICT) to generate youth employment. The initiatives are presented against a background that acknowledges the differences in the technological and socio-economic capacity between countries.

Examples of ICT-related employment opportunities for young people are used to illustrate the following best practice principles: promoting youth entrepreneurship; promoting public-private partnerships; targeting vulnerable groups of young people; and bridging the gap between the digital economy and the informal sector and putting young people in charge.

The third part of the paper discusses, in more general terms, some common misconceptions about the use of ICT in developing countries, the potential gains ICT offers in relation to youth employment and society more widely, and the obstacles developing countries in particular face in trying to realise these benefits.

The best practice initiatives confirm that several constraints to access, which apply in high-income countries, are much less important in the different social context of developing countries.³ The best practice examples cited show that ICT access does not require personal ownership of a computer; nor does it require the use of expensive computers. The initiatives also show the potential that the widespread use of mobile phones offer for young people both as an income generator in its own right and as an alternative to fixed line telephones to gain easier access to the Internet. Some best practice examples show that other infrastructure constraints such as electricity supply can also be addressed. Evidence is also presented to show that the use of the Internet is not limited to the literate or to English users.

The final part of the paper offers fourteen recommendations aimed at promoting ICT-related opportunities for young people. The digital divide is real and best practice examples of ICT-generated employment for young people are not necessarily easy to repeat elsewhere. This paper seeks to balance optimism about ICT's potential with an awareness of the constraints that obviously exist for many countries in the Asia-Pacific region.

¹ The author would like to acknowledge the assistance received from Elizabeth Morris in terms of her close reading of the text and valuable suggestions on how to improve its readability.

² ILO (2001): *World Employment Report 2001: Life at Work in the Information Economy*, Geneva, p. 52.

³ Prahalad, C.K. (2000): "Let 's focus on the digital dividend: Conventional mental models may be an impediment to the diffusion of internet benefits to poorer countries", in *European Business Forum*, (http://www.ebfonline.com/at_forum/at_forum.asp?linked=32&id=26).

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Introduction

The Heads of State and Governments in the United Nations' Declaration at the beginning of the new Millennium resolved, among other things, "to develop and implement strategies that give young people everywhere a real chance to find decent and productive work." The Secretary General of the United Nations, in his report to the Millennium Assembly, highlighted the need to "explore imaginative approaches to this difficult challenge."

The potential of information and communication technologies to improve the livelihoods of people in developing countries has been highlighted by two major international reports recently.⁴ International attention has also been directed at ways to address the digital divide in relation to the information rich and the information poor both within and between countries.⁵ A panel of eminent persons, set up by the UN Secretary General as a part of a Youth Employment Network Initiative, has specifically recommended a focus on information and communication technologies (ICT) as a means of creating more jobs for young people.⁶

This paper, with its focus is on the potential for ICT to generate employment opportunities for young people, is a response to this recommendation of the eminent persons' Youth Employment Network report. However, it is more specific in two ways: (1) in relation to its geographic focus, the Asia-Pacific region; and (2) its emphasis, the use of five principles to highlight different aspects of best practice.

Part 1 sets the context by showing the importance of young people in the demography of Asia Pacific countries, the broad definition of information and communication technologies used in the analysis and a categorisation of Asia Pacific countries according to their differences in technological and souci-economic capacity. Part 1 concludes with information about the Youth Employment Network's recommendation on the potential of ICT and the five key principles that are used to highlight different aspects of best practice.

Part 2 presents the details of the best practice initiatives under the headings of promoting youth entrepreneurship; promoting public-private partnerships; targeting vulnerable groups of young people; bridging the gap between the digital economy and the informal sector and putting young people in charge. Part 2 also points to some of the difficulties young people face in setting up their own enterprises, such as the lack of access to credit.

Part 3 the paper discusses, some common misconceptions about the use of ICT in developing countries, the potential gains ICT offers in relation to youth employment and to society at large, and the obstacles developing countries in particular face in trying to realise these benefits. The final part of the paper offers a set of fourteen recommendations aimed at promoting ICT-related opportunities for young people.

⁴ ILO (2001): *World Employment Report 2001: Life at Work in the Information Economy*. Geneva. See also UNDP (2001): *Human Development Report 2001: Making new technologies work for human development*, Oxford University Press, for the United Nations Development Programme, New York.

⁵ OECD (2001): *Understanding The Digital Divide*, Paris (www.oecd.org). See also The Digital Opportunity Task Force (DOT Force) (2001): *Digital Opportunities for All: Meeting the Challenge: including a Proposal for a Genoa Plan of Action*, 11 May, for G8 Heads of State, Genoa.

⁶ "Recommendations of the High-level Panel of the Youth Employment Network" General Assembly of the United Nations, 28 September, A/56/422, para. 19, p. 6.

The digital divide is real and best practice examples of ICT-generated employment for young people are not necessarily going to be easy to repeat elsewhere. This paper seeks to balance optimism about ICT's potential with an awareness of the constraints that obviously exist.

Part 1: The context

1.1 Young people in the Asia-Pacific region

Young people represent an important statistical grouping in most Asia-Pacific countries. In 1995, young people aged 15 to 24 years numbered more than 650 million in the region. Of these, over 200 million live in urban areas (see Table A1 in Attachment 1).⁷ Young people, as a proportion of the total population in each country, range from just over a fifth (21 per cent) in Mongolia, Indonesia, Thailand and the Solomon Islands to a sixth or below in Japan and Australia (15 per cent) and Singapore (14 per cent). The most populated countries in the region, the People's Republic of China and India, have nearly a fifth (18 and 19 per cent respectively) of their populations aged 15 to 24 years (see Table A1 in Attachment 1 also for details of forecasted size of the youth population in the region in 2030).

1.2 ICT defined

ICT can be broadly defined as a set of activities that facilitate, by electronic means, the capturing, storage, processing, transmission, and display of information.⁸ This paper uses the term information and communication technologies (ICT) to encompass the production of both computer hardware and software as well as the means of transferring the information in digital form (see Attachment 2 for a more precise definition).

Another term commonly used to describe the changes produced by information technology is the digital economy. This expression emphasises the new opportunities created by transforming information into a binary digital code. The digital economy refers to more than the boom and bust cycle of many new ventures aiming to tap the potential of the Internet for commercial purposes. The more profound effect of ICT is likely to be in improving the efficiency and reach of the mainstream production of goods and services, in both the public and private sectors of the economy.

1.3 Socio-economic differences and ICT capacity

Clearly not all countries have an equal opportunity to generate employment opportunities for young people through ICT. Countries vary widely in their capacity to participate in technological innovation. The UNDP's Human Development Report computes a "technology Achievement Index" to show how well a country as a whole is participating in creating and using technology.⁹ The Technology Achievement Index is based on four components: the capacity to create new products and processes through research and development; the capacity to diffuse new and old technologies in production and consumption (viewed as two separate capabilities); and having the skills for technological learning and innovation.¹⁰ Given the data available, the index can only be calculated for 14 countries in the Asia-Pacific region (see Table 1).

⁷ The UN defines "youth" as persons aged between 15 and 24 years inclusive. This definition was first used for 1985 International Youth Year. However, a working group for the UN's World Youth Forum in Dakar, Senegal, August 2001, requested that the UN reconsider its 15-24 years definition of youth and raise the upper limit to age 30 "to meet the challenges of young people specifically in developing countries." See <http://www.un.org/esa/socdev/unyin/forum/>.

⁸ OECD definition cited by Cynthia Hewitt De Alcántara (2001): *The Development Divide in a Digital Age: An Issues Paper*, UNRISD, Technology, Business and Society Programme Paper Number 4, August 2001, United Nations Research Institute for Social Development, Geneva, p. 3.

⁹ UNDP (2001): *Human Development Report 2001: Making new technologies work for human development*, Published for the United Nations Development Programme (UNDP), Oxford University Press, New York.

¹⁰ *Ibid*, p. 39.

Table 1: Four groupings of Asia-Pacific countries based on the Technology Achievement Index

| Category | Brief Definition | Countries in Asia-Pacific region (where data available) |
|-------------------|--|--|
| Leaders | High achievements in technology creation, diffusion and skills – at cutting edge of self-sustaining technological innovation | Japan, Republic of Korea, Australia, Singapore and New Zealand |
| Potential leaders | Have high-level human skills but limited capacity to innovate. Low ranking in diffusion of recent innovations or of old inventions | Malaysia |
| Dynamic adopters | Have important high-technology industries and technology hubs, but diffusion of old inventions is slow and incomplete | Thailand, Philippines, China, Indonesia, Sri Lanka and India |
| Marginalised | Technology diffusion and skill building limited – population has not benefited from diffusion of old technology | Pakistan and Nepal |

Source: UNDP (2001): *Human Development Report 2001: Making new technologies work for human development*, published for UNDP, Oxford University Press, New York, pp. 39 & 45.

Table 1 shows that five ILO member countries in the Asia-Pacific region are in the “leaders” category according to their ranking on the Technology Achievement Index. In order of their ranking, these are: Japan, Republic of Korea, Australia, Singapore, and New Zealand. In these countries, technological innovation is said to be self-sustaining, with evidence of high achievements in technology creation, diffusion and producing the appropriate skills. Two countries, Korea and Singapore, have in recent decades advanced rapidly in their use of technology.

Malaysia is in the so-called “potential leaders” group of countries in the Technology Achievement Index. The “potential leaders” group of countries has invested in high levels of human skills and diffused new technologies widely but still needs to show that they can innovate in their own right. The third grouping, classified as “dynamic adopters of new technology,” include Thailand, Philippines, China, Indonesia, Sri Lanka, and India. These countries have important high-technology industries and technology hubs, but the diffusion of inventions is regarded as slow and incomplete. A fourth group of countries is defined as ‘marginalised’ because their scores on the index reflect low technology diffusion and low levels of skill building. Pakistan and Nepal fall within this grouping.

Another indicator of country differences in ICT capacity is income per head of population. This offers a cruder but more encompassing grouping of countries in the region. According to this indicator, the full range from ‘low income’ and ‘lower middle income’ to ‘upper middle income’ and ‘high income’ countries is represented in the Asia-Pacific region (see Table A2).¹¹ Clearly, low-income countries are not likely to have the same potential to make use of ICT as an employment generator as the higher income countries. This is due to differences in ICT infrastructure such as access to computers and capacity to connect to the Internet.¹²

¹¹ The World Bank has classified each the 26 countries in the region in terms of their gross national income (GNI) per capita, using 2000 data. Four groups of countries are identified from “low income” (US\$ 755 or less per person per year), to “lower middle income” (US\$ 756- US\$ 2,995), “upper middle income” (US\$ 2,996- US\$ 9,265) and “high income”(US\$ 9,266 or more). The first group of countries are: Afghanistan, Bangladesh, Cambodia, India, Indonesia, Laos, Mongolia, Myanmar, Nepal, Pakistan, Solomon, Islands, and Vietnam. The second group are: China, Fiji, Iran, Kiribati, Papua New Guinea, Philippines, Sri Lanka, and Thailand. The third group are: the Republic of Korea and Malaysia. The fourth group are: Australia, Japan, New Zealand, and Singapore.

¹² See Attachment 3 for details of the significance of ICT in Asia-Pacific countries. The information refers to hardware and software production as well as the extent of Internet access per country.

However, income per head of population is not necessarily the best indicator of a country's ICT employment potential. Income per head of population does not take into account the differences in income levels within countries. Each country has differing proportions of its population who are highly skilled workers, lesser-skilled workers and the marginalised who often have low levels of education or illiteracy.¹³ In the large population countries of India and China, the highly skilled group is larger than the size of the total population of many smaller countries. At the end of 2000, the Indian IT software and services sector employed 410,000 professionals.¹⁴ In 1998, India's 350 universities and engineering colleges and 700 private colleges and technical institutes produced 65,000 engineers at university-degree level or higher.¹⁵ India's pool of engineering skills is said to be second only in size to that of the United States.¹⁶

1.4 Best practice initiatives and different income groups

Therefore, differences in income levels are a useful starting point for distinguishing between types of best practice ICT initiatives related to youth employment opportunities. This applies not only to countries as a whole but also within countries, particularly in the case of the large population countries. Employment opportunities, for example, are open to young people with high tech skills such as software engineering in countries in India and China or abroad in high-income countries. However, these opportunities are relatively few in number compared with the overall size of the youth population in the countries under consideration (see Table A3).

Other employment opportunities created by ICT are middle income in focus. These are options better suited to young people with upper secondary or tertiary qualifications more generally. Examples of these employment opportunities are call centres and remote processing in developing countries, which provide services directly to customers or to service providers between countries.

A third broad category of employment options created by ICT can be termed low-income options. As explained further below, these include the use of mobile phones to generate income. Other low income opportunities can be generated through micro and small enterprises providing access to a wider range of ICT services such as faxes and the Internet through telecentres or cyber cafes in Asia and Africa.

1.5 Sources

The best practice examples cited below draw heavily on web-based information and from recent reports by the ILO, particularly its comprehensive 2001 World Employment Report entitled *Life At Work in the Information Economy*. The CD-ROM version of the report also includes a number of relevant country-specific and general background papers. Another valuable source of information on best practice ICT projects is the finalist and winners list for the 2001 Stockholm Challenge Award, based on 742 entries from 90 different countries. The Stockholm Challenge Award focuses on the positive effects of the information society. An international jury judges best practice in IT projects largely in terms of the social benefits produced.

1.6 Perspective based on five key principles

As noted in the Introduction, the UN Youth Employment Network, an initiative of the UN, in collaboration with the World Bank and the International Labour Office, has produced a series of recommendations in relation to youth employment.¹⁷ These recommendations urge

¹³ Butler, C (2000): "Inequality, global change and the sustainability of civilisation," in *Global Change and Human Health*, Vol. 1, No. 2 (<http://www.baltzer.nl/kaphtml.htm/GLOB1>).

¹⁴ National Association of Software and Service Companies (India): "Domestic Software" (http://www.nasscom.org/it_industry/domestic_sw_services.asp#statistics).

¹⁵ Rohwer, J (2001): *Remade in America: How Asia will Change Because America Boomed*, John Wiley and Sons (Asia), Singapore, p. 247.

¹⁶ Ibid

¹⁷ See <http://www.un.org/esa/socdev/youthemployment/yenpr.doc>.

Governments to incorporate youth employment goals into comprehensive employment policies and to stimulate broad-based employment-intensive growth as the best means of creating employment for young people. In particular, four areas are highlighted for national action:

- **Employability:** the need for governments to invest in education and vocational training for young people, and improve the impact of those investments;
- **Equal opportunities:** the need for governments and enterprises to give young women the same opportunities as young men;
- **Entrepreneurship:** the need for governments to make it easier to start and run enterprises to provide more and better jobs for young women and men; and
- **Employment creation:** the need for governments to place employment creation at the centre of macroeconomic policy.

As noted above, Recommendation 5 of the High-level Panel emphasises the importance to youth employment prospects of tapping the potential of ICT. Seven specific ways are proposed for governments to give effect to this recommendation. The first is the need for governments to provide opportunities for young people to acquire ICT literacy, technical skills in ICT, and to look to ICT industries to provide employment or entrepreneurial opportunities for young people. Governments are also exhorted to make greater use of both new and traditional information and communication technologies as tools for development and to close the ICT gender gap in terms of access to ICT. Governments are encouraged to use infrastructure development and appropriate trade and fiscal policies and legislative frameworks to create an enabling environment for ICT diffusion. Finally, governments are urged to use public-private partnerships to bridge the digital divide (see Attachment 3).

The following principles, first proposed by the author in a background paper for the Secretary General's Youth Employment Network, serve to highlight key themes in the recommendations of the High-level Panel.¹⁸

- (i) the importance of the role of youth entrepreneurship in creating employment opportunities from ICT;
- (ii) the value of public-private partnerships in making the most of the employment potential of ICT for young people;
- (iii) how ICT opportunities can also assist vulnerable groups of young people;
- (iv) ways that ICT can help link the informal sector to opportunities in the world economy, and;
- (v) the importance of putting young people in charge, starting with young people's input and to ensure that they have a key responsibility for the outcomes.

The five best practice principles are explained in more detail in Attachment 4. Part 2 of the paper presents best practice examples of the five principles in operation. In some instances, the examples illustrate only one principle; in other instances the initiative illustrates several of the principles.

¹⁸ Curtain, R (2000): "Identifying the Basis for a Youth Employment Strategy Aimed at Transitional and Developing Countries," commissioned by the United Nations Social Development Division (<http://www.un.org/esa/socdev/youthemployment/research.html>).

Part 2: Best practice examples of ICT – generated employment opportunities for young people

2.1 ICT employment generation through youth entrepreneurship

Young people, for a variety of reasons, are likely to be risk takers. Young entrepreneurs have been closely identified with ventures associated with the digital economy and the spread of the Internet in particular. This has been particularly the case in countries such as Japan, China, India, and Singapore. The following section offers examples of how young people have used ICT as a launching pad for initiating a range of entrepreneurial activities. It first outlines low-income generation opportunities, involving telephony and the use of mobile phones in particular. This is followed by a discussion of the role of young people as information intermediaries and opportunities for e-commerce in remote communities. The focus then moves to middle-income entrepreneurial opportunities in the form of telecentres. The section concludes with a discussion of the obstacles that young entrepreneurs are likely to face. Specifically particular, the problem of access to credit and the role of micro credit is discussed.

Low-income ICT opportunities for youth entrepreneurship

The worldwide expansion of mobile phone networks and the growth in the number of mobile phone subscribers has been phenomenal in recent years. Between April 2000 and July 2001, the total number of mobile phone subscribers in the world increased by over a third to 860 million.¹⁹ Over the same period, in the Asia-Pacific region the number of GSM subscribers (the largest network) increased by 56 per cent to 182 million.²⁰ China has the third largest mobile telephone network in the world and by 1999 had 98.4 million subscribers.²¹

Selling telephone-based services

The availability of mobile phone networks in many low-and middle-income countries opens up many opportunities for young people. One common option is to purchase a mobile phone through a micro credit program and to earn income by providing low cost phone calls to others, as illustrated in the story below about a 16-year-old schoolgirl in rural India (see Box 1).

Box 1: On-selling telephone-based services

Every day at 8 a.m., her straight black hair tied neatly in a braid, 16-year-old Neelam Aggarwal rides almost 5 kilometers to school in a horse-drawn buggy. She would like to be a doctor someday. But for girls like Neelam, who lives in the dusty, impoverished village of Farah in India's northern state of Uttar Pradesh, such a vocation seems remote. For starters, her school—like most village schools in India--doesn't even offer science classes for girls.

Still, Neelam, one of eight daughters of a sweets maker, has no intention of becoming a housewife. "I want to make something of myself," she says. So each day after school, Neelam operates what amounts to the village's only public telephone--a cellular phone owned by Indian cellular operator Koshika Telecom. By charging her fellow villagers to make calls, Neelam can make as much as US\$8.75 on a really good day. She's saving the money for computer classes, which she hopes will lead to a good job....

Source: *Business week Online*, 11 October 1999.

19 See http://www.gsmworld.com/membership/ass_sub_stats.html.

20 Ibid.

21 "National report on the ICT sector in China," background paper for World Employment Report 2001, para. 1.1.

The potential of mobile phones to create low-income earning opportunities for young people is further illustrated by the Grameen Village Pay Phone program (VPP). Grameen Bank is a pioneer of small loans to the poor. Since its founding in Bangladesh in 1976, Grameen Bank has grown to lend US\$3.46 billion to nearly 2.4 million borrowers (November 2001).²² The Village Pay Phone program makes it possible for a Grameen borrower to buy a mobile phone, and then to make the telephone available for others in the village to pay for phone calls, to send short message services (SMS) and to enable villagers to receive incoming calls. Grameen Telecom charges Grameen borrowers a wholesale airtime rate.²³

Grameen Village Pay Phones operates in more than 2,000 villages in Bangladesh in September 2000 and an average of 100 additional villages are being connected each month. A typical pay phone owner can earn up to four times the average per capita income in Bangladesh (see Box 2). The phones are used for a variety of purposes. Farmers use them to find out where they can get the best prices for their crops, and relief workers are able to better coordinate disaster response measures. Villagers are also able to use the phones to communicate with local government officials.

Grameen Telecom is itself a good example of entrepreneurial activity supported by partnerships with international agencies, international companies and other funding sources. The potential of Grameen Telecom as an income generator has been acknowledged by an international consortium led by the World Bank's International Finance Corporation, which has invested US\$50 million in the project. The Norwegian company Telenor has invested US\$25 million, and the Soros Economic Development Fund invested US\$10.6 million.²⁴

Box 2: Grameen Telecom's Village Pay Phones as an income generator

Low cost communications enable rural households and small enterprises to take advantage of market information to increase profits and reduce productive expenses. A Canadian evaluation of the pilot project for Grameen Village Pay Phones found that the income that operators derived was on average about 24 per cent of their household income - and in some cases it was as high as 40 per cent of household income. The evaluation report recommended that youth be offered small loans to establish public call offices or kiosks to provide a range of services including telephone, fax, e-mail and access to the Internet as well as photocopying and computer word-processing services.

The evaluation showed that the basic Village Phone package in 1999 cost US\$310. The VP operator pays for the phone through weekly loan payment instalments equivalent to US\$4.50. These payments are made through the local Grameen Bank branch, which is responsible for collecting on the repayments. For the usage charge, the VP operators pay a minimum monthly bill of approximately US\$3.20. This includes a monthly fee for the line, Value Added Tax (VAT), a service charge, and a fee for the annual government license and a royalty fee. Actual airtime charges are added on top of all this.

Source: Canadian International Development Agency (CIDA) (2000): *Grameen Telecom's Village Phone Programme in Rural Bangladesh: A Multi-Media Case Study Final Report*, pp. 2, 11, 15. (<http://www.telecommons.com/villagephone/>).

²² See Grameen Foundation USA web site (<http://www.gfusa.org/>). In November 2001, there are 1,170 Grameen branches in Bangladesh and 105 micro credit organisations in 34 countries operating on the same Grameen model.

²³ For details, see "Grameen Telecom" (<http://www.grameen.org/>) and "Grameen Telecom Connects Thousands," in *Grameen Connections: The Newsletter of the Grameen Foundation USA*, Vol. 3. Issue 4. October 2000. (<http://www.gfusa.org/newsletter/fall00/telecom.shtml>)

²⁴ Telenor is a Norwegian telecommunications company with operations in a number of countries in Europe and Southeast Asia. The company is Norway's leading distributor of voice, information, knowledge and entertainment through a broad range of modern communications services. Telenor became a listed company in December 2000.

Young people as ‘information intermediaries’

The widespread use of English on the Internet has created the need for local content and applications to enable non-English speakers to make effective use of it. For the poor in particular, the vast amount of information on the Internet requires an intermediary to sift through it to identify what is relevant and then interpret it in the light of the local context.²⁵ Young people are well placed to perform this role of ‘information intermediary’ (see Box 3). For example, young people can use their knowledge of how to access the Internet and combine it with other forms of communication such as radio. In Sri Lanka and Mongolia, for example, local populations have gained access to information on the Internet through community radio networks. Radio stations use facilitators to search the Internet for information sought by local communities and broadcasts the information in their language.²⁶

Box 3: Young women as information intermediaries

... information intermediaries would be useful in connecting rural women with the information they need. They could be extension agents, community workers, or simply young school girls from the community who know English and can use computers, who would work at community centers to get information from international sources and relay it to local women farmers. They could also assist the farmers in two-way communication, delivering their messages transmitting indigenous knowledge, requesting agricultural advice, and sending e-mail from the farming community to the research station.

The involvement of school girls translating and passing information to their mothers might stimulate them to consider remaining in rural areas and taking up modern farming as a career. For most farming communities, a dedicated donor-financed telecenter would not be necessary to do this. All that is needed is a PC with the capacity to receive/send faxes, a telephone connection with Internet access at the community center and a small stipend for the school girls, at a cost of roughly \$1000 per community per year.

Source: Hafkin, N. and Taggart, N. (2001): *Gender, Information Technology, and Developing Countries: An Analytic Study*, for the Office of Women in Development, Bureau for Global Programs, Field Support and Research, United States Agency for International Development, June, p 46.

Another option is for young people to use their skills in information technology to develop simple web sites in local languages. For example, India’s Swaminathan Foundation has set up Village Knowledge Centres, with special websites to provide a variety of locally relevant content. Another example is Warana Nagar rural network project, in Maharashtra State in India. The district has 70 villages and is known for the strength of its cooperative societies. Villagers are using ‘facilitation booths’ to access agricultural, medical and educational information on the Internet. The technology includes 10 computer servers, two small aperture terminals (VSATs), and about 165 personal computers.²⁷

India offers several examples of web-based support for multilingual publishing on the web.²⁸ India's Centre for Development of Advanced Computing has recently launched a multilingual webware program called the iLEAP-ISP. A multilingual word processor with Internet and e-mail support in Indian languages is made available free to all Internet subscribers through their Internet Service Provider. Also in India, the Tamil Nadu Government has launched a US\$1.25

²⁵ ILO (2001): *World Employment Report 2001: Life at Work in the Information Economy*, Geneva, p. 58.

²⁶ ILO (2001): *Generating decent work for young people: An Issues Paper*, prepared for the Secretary-General’s Youth Employment Network, p. 9. (www.un.org/esa/socdev/youthemployment/)

²⁷ ILO (2001): *World Employment Report 2001 Life at Work in the Information Economy*, Geneva, p. 59.

²⁸ See www.heise.de/tp/english/inhalt/co/5199/1.html.

million Tamil local language initiative to promote online content and has given its backing to develop a standardised keyboard for Tamil.²⁹

Opportunities for young people to improve local content may, for example, require finding partners to finance the development of a font for a local language to use on the World Wide Web. Potential partners could be a publicly funded program, private enterprise support or funding from language speakers now working in high-income countries. Local web content could include not only information on government services but also ways to develop existing income generating activities or set up new ones. The web site could also include detailed information about NGO programs to address poverty.

In association with the agency responsible for delivering a program, an information intermediary could also use the web site to invite the poor to offer feedback on specific local issues of concern to them. For example, the people who are the target group of a poverty alleviation program could be invited through e-mail to comment on the limitations of a current poverty program and to suggest improvements.³⁰

Opportunities for e-commerce-based entrepreneurship in remote communities

Other low-income generating opportunities are available to young people in remote locations. The Los Angeles-based Greenstar Foundation is setting up self-contained, solar-powered community centres in remote communities on the West Bank, India, Jamaica, and Ghana.³¹ Each centre offers an Internet connection, health facilities, including telemedicine, a classroom complete with distance learning equipment, and a business centre, through which traditional cultural products can be sold via the Internet. Traditional art, music, photography, legends, and storytelling in small villages can be recorded and brought to global markets through the Internet. Revenues are returned to the village to support their ongoing, independent development.

The projects are deliberately targeting areas without electricity. The approach is to use this market mechanism to sell cultural products in digital formats to pay for the hardware and connections needed and to produce ongoing revenue without the need for external funding. The projects are the product of public-private collaborations between governments, local ICT companies and international funding sources.³²

To demonstrate what it is seeking to do, the Greenstar Foundation web site offers for free download more than 40 compressed music files made in a Bedouin village on the West Bank, a mountain village in Jamaica and a tribal village in central India.³³ The technology for the Indian Greenstar centre consists of a 600 watts peak photovoltaic Solar Power Array to power a Pentium III computer, a small, portable satellite terminal to provide wireless Internet connections and a 16-track Digital Audio Tape recorder (see Box 4).³⁴

Box 4: Start an E-commerce Movement: Greenstar India introduces solar power, the Internet and “digital culture” to rural India

New Delhi and Los Angeles, October 2, 2000: Greenstar India announced today that it will build 50 solar-powered community and e-commerce centres in remote villages throughout India over the next three years. To generate income through e-commerce, Greenstar villages focus on India's vivid traditional culture -- authentic art, music, legends, literature, history and sacred way of life, long a source of fascination by people everywhere in the world. Greenstar is employing a team of artists and teachers to record elements of rural Indian culture, working closely with the people of each village.

29 Accenture, Markle Foundation and UNDP (2001): *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*, footnote 73 (<http://www.opt-init.org/framework/pages/notes.html#73>).

30 ILO (2001): *World Employment Report 2001: Life at Work in the Information Economy*. Geneva, p. 59.

31 See <http://www.greenstar.org/>.

32 For details of the support for the Indian Greenstar project, see <http://www.e-greenstar.com/>.

33 See <http://www.e-greenstar.com/>.

34 See <http://www.e-greenstar.com/India/launch/Press-release.pdf>.

This original concept is already working in the Palestinian Authority and Jamaica. The result will be a powerful, unique collection of 'digital culture' -- a gallery of music, artwork, photographs, video, poetry and other arts, which can be distributed in high-resolution digital form throughout the world, instantly and efficiently.

The revenues from digital culture will be used to fund basic needs of each village for its future, as decided by the people themselves -- deploying tools that include clean solar power, telemedicine and vaccination resources, basic education, micro-credit, community organizing, and a high-speed, two-way connection to the world through the Internet.

Source: <http://www.e-greenstar.com>.

Middle-income entrepreneurship opportunities for young people

Middle-income entrepreneurial opportunities can also be identified involving the use of ICT in the service sector focusing on domestic markets. The ILO, in a paper entitled *Generating decent work for young people*, notes that some developing countries have been able to create employment for thousands of women and men through community-access points and telecentres.

Such facilities can also offer small and micro-enterprises that do not have their own private facilities, the opportunity to use ICT for business purposes. ... Young people are particularly well placed to take advantage of such growth areas.³⁵

Telecentres as income generators for young people

Telecentres are being set up through public and private initiatives in many developing countries in telephone shops, schools, libraries, community centres, police stations, and clinics. Sharing the expense of equipment, skills and access amongst an ever-increasing number of users also helps to cut costs and make these services viable in remote areas.

UNESCO have produced a user-friendly manual on how to set up several different types of community-based Telecentres.³⁶ It is aimed at telecom operators, NGOs, community groups, local government or someone wanting to establish a small business. The manual outlines how to set up four types of telecentres. At the most basic level, 'micro telecentres' use only pay phones and possibly a smart card reader and a receipt printer. They are usually housed in a shop or other business and some are outdoor kiosks. 'Mini telecentres' usually offer a single phone line (possibly mobile phone) with a three-in-one scanner/printer/copier, a fax machine and a PC with a printer, Internet access and a call meter. A 'telecentre' offers a number of phone lines, a call management system, fax machine, photocopier, several PCs with a printer, Internet access and perhaps a scanner. Finally, a 'full service telecentre' offers many phone lines, and multi-media PCs with Internet access. Other equipment can include a high-volume black and white and/or colour printer, a scanner, a digital camera, a video camera, a TV, an overhead projector, a photocopier, a laminator, meeting rooms, and a video conferencing room.

³⁵ ILO (2001): "Generating decent work for young people: an issues paper prepared for the Secretary-General's Youth Employment Network," p. 8.

³⁶ Jensen, M & Esterhuysen, A (2001): *The Community Telecentre Cookbook for Africa Recipes for self-sustainability: How to Establish a Multi-purpose Community Telecentre in Africa*, UNESCO, Paris.

Telecentres in India

India has seen a rapid growth in 'cyber kiosks' or 'telekiosks' which can provide access to business support services for underprivileged groups.³⁷ These 'internet kiosks' are often upgraded STD (Subscriber Trunk Dialling) booths that are common in India. These are small street shops, offering access to public phones for long distance calls. They number about 300,000 and have generated more than 600,000 jobs.³⁸

The Indian Ministry of Information Technology has ambitious plans to convert over 6,000,000 public call offices (PCOs) into public 'tele-info-centres' offering a variety of services such as Internet browsing, fax, e-mail and long distance phone calls. The Maharashtra State government has plans to link 40,000 villages with Agronet, a specially developed software package for farmers, which aims to provide the latest information on agriculture.³⁹

Communal access to Internet facilities through telecentres or Internet kiosks offers opportunities for informal sector workers such as plumbers, vendors, roadside restaurant owners or garment makers to obtain information on markets or administrative procedures, and to publicise their services to a wider clientele.⁴⁰ Communal access to the Internet is also useful for self-employed professionals such as journalists and accountants. These professionals may not have the funds to purchase equipment and technical support to communicate with distant clients.

Telecentres or Internet kiosks offer a good opportunity as they involve fairly low start-up costs. Equipment costs in India are about US\$10,000 and the telecom service provider's investment in a telephone line is about US\$ 1,000.⁴¹ Young people especially have a particular advantage in being able to set up such enterprises because computer literacy and familiarity with maintaining computer hardware are required to operate such kiosks.

Income generation through cable television

Another related opportunity for ICT-generated self-employment for young people is through the purchase of satellite antennas to provide fellow villagers with paid access to cable television. Cable TV systems (government authorised or otherwise) have been installed in many developing regions to provide access to TV channels (typically from a satellite) for a fee. The most striking current example is India, where cable TV systems have sprung up in urban neighbourhoods to deliver programming from AsiaSat.⁴²

One micro credit case study from India reports that a loan of 80,000 *taka* (US\$1,569) was sufficient for a Grameen borrower to purchase two satellite antennas. These satellite antennas are able to supply an eight TV channel service to 30 houses at a fee of 200 *taka* per month per connection thus generating income of an average of 12,500 *taka* (US\$245) per month.⁴³

Government's role in promoting ICT related entrepreneurship: promoting 'Technopreneurship' in Singapore

³⁷ Mitter, S. and Millar, J: (2001): "The impact of ICT on the spatial division of labour in the service sector - Employment and trade in the digital economy," Background Paper, in *ILO World Employment Report 2001*, section 4: From teleworking to tele-networking.

³⁸ ILO (2001): *World Employment Report 2001*, p. 38.

³⁹ Lobo, A. (2000): "Taking IT to the villages," in *ZDNet India*, 6 November, (<http://www.zdnetindia.com/news/features/stories/2033.html>).

⁴⁰ ILO (2001): *World Employment Report 2001*, p. 37.

⁴¹ Mitter, S. and Millar, J: (2001), *ibid*, para. 4.

⁴² Hudson, H. (2001): "The potential of ICTs for development: Opportunities and obstacles," Background Paper, in *World Employment Report 2001*, section 5.6.

⁴³ "Grameen Telecom Connects Thousands," *Grameen Connections: the Newsletter of the Grameen Foundation USA*, Vol. 3., Issue 4., October 2000, (<http://www.gfusa.org/newsletter/fall00/telecom.shtml>).

The Singapore Government has launched the 'Technopreneurship 21' (T21) program to foster entrepreneurship in a variety of ways. One aspect of the program is to inject a greater emphasis on entrepreneurship into the education system to encourage creativity, risk taking and a spirit of lifelong learning (see also Box 6 for details of a similar program in Ugandan schools).

Another aspect is to make it easier for new enterprises to obtain start-up funding through a US\$1 billion venture fund to support local entrepreneurs or to fund foreign entrepreneurs attracted to Singapore. Related to this is a review of existing laws and regulations, such as those governing the taxation of stock options. The program is also improving the physical infrastructure for start-ups, such as enhancing technology park facilities.

The Economic Development Board of Singapore has set up a 'Technopreneur' Investment Incentive Scheme to ease the difficulty faced by high-tech start-ups by providing loss insurance to a maximum investment of S\$3 million for investors funding start-ups. Another program to assist young entrepreneurs in particular is the Technopreneur Home Office Scheme. This scheme makes it easier for technology entrepreneurs to use their residential premises as home offices and hence reduce costs significantly. To gain approval, the business activities must be technology-based and knowledge-intensive. Examples of these activities are: developing prototype of application software; designing electronic circuits using computer software; e-commerce portals and other web content providers. The Scheme also covers people working from home who provide related support services such as patent lawyers and venture capitalists.

Another initiative under the Technopreneurship 21 program is the Enterprise Challenge (TEC), which seeks to encourage social entrepreneurship in the better provision of publicly funded services. This is a S\$10 million fund for projects to improve collaboration between public agencies.

The Economic Development Board of Singapore together with private sector partners such as Ernst and Young and the Singapore Venture Capital Association has also instituted the Phoenix Award. The Award recognises entrepreneurs who have failed previously and then found success, either by starting a new technology venture, or by using technology to succeed. The Phoenix Award aims to change public perceptions of business failure and is designed to encourage more entrepreneurs to take necessary risks and persevere in achieving their goals despite setbacks.

Box 6: Promotion of youth entrepreneurship through ICT in schools

The Schoolnet Internet Learning Centres in Uganda have been set up by the country's Education Department to promote youth employment through giving young people entrepreneurship and leadership skills using ICT-based training and resources. The project was one of 100 finalists for the 2001 Stockholm Challenge.

Some thirty ICT resource centres, each comprising ten networked computers and a server, with printers and modems, have been set up in Ugandan schools. The resource centres service between 200 and 1000 young people per month.

The goals of the project are to: develop youth leadership, team building and business skills; promote youth employment through linkages with local industry/business; create new youth-led business opportunities and encourage young people to exchange business ideas and information via e-mail. Youth who participate in the project are given an opportunity to develop business concepts and plans that draw upon the ICT resources available at the centres.

Sources: http://www.challenge.stockholm.se/new_tavlande_index.html,
<http://www.learn.org/home.html>.

Problems faced by young entrepreneurs

Entrepreneurship is not an easy option and is best suited to those with the necessary skills and acumen. Young people starting their own businesses are likely to experience a range of problems. Many of these problems apply to anyone starting a new enterprise but some problems are related to the youthful age of the entrepreneur. Young people are likely to have limited business networks and contacts compared with older people. They also are likely to have fewer financial resources as they have had less time to accumulate personal savings or acquire property. They may also experience age discrimination from customers, suppliers or finance lenders.⁴⁴

A number of common problems faced by young people in business can be identified.⁴⁵ One fundamental problem is the inability to secure start-up funds leading to under capitalisation (starting a business without enough funds).⁴⁶ Other problems commonly encountered are managing cash flow, especially dealing with bad debts and late payments; and coping with stress, especially without the support of friends who understand the demands of self-employment. Once under way, problems can arise with managing the expansion of the business such as working out how to employ the right staff and managing other people for the first time.

Governments, the private sector, non-government agencies and local communities can, each in their own way, promote efforts to support young people starting up enterprises based on ICT. However, enterprise support programs run by governments or international agencies have often had high failure rates. Particular problems have been insufficient resources and staff and overly rigid and inappropriate procedures.⁴⁷

A recent paper for the International Labour Office suggests that enterprise-based employment programs for young people need to have several key features.⁴⁸ First, the external assistance provided by governments or NGOs needs to have a commercial orientation. This means acknowledging that the venture being assisted has the productive capacity to create profit, repay loans and expand to employ others. Second, the assistance needs to help young people manage risk more effectively. Third, the assistance needs to be tailored to meet the needs of individuals in terms of their skills, work experience, aspirations and capacity to obtain resources. Finally, the enterprise support program needs to be cost-effective and not rely on a single source of external support, be it technical, organisational or financial.⁴⁹

Micro credit and young people

Micro credit refers to the provision of small loans to the poor without requiring security for the loan (i.e., collateral free). It is potentially an important vehicle for young people to obtain the funds needed to start in self-employment. The micro credit has achieved considerable success through tapping the social networks of borrowers to encourage high repayment of loans. The poor are able, through the use of mentors and the acceptance of mutual responsibility, to obtain credit based on their accumulated social capital.⁵⁰

⁴⁴ Kenyon, P. and White, S. (2001): *Enterprise-based youth employment policies, strategies and programmes*, International Labour Office, Geneva, p. 7.

⁴⁵ Ibid, pp. 7-9.

⁴⁶ OECD (2001): *Putting the Young in Business: Policy Challenges for Entrepreneurship*, p. 40.

⁴⁷ Ibid, p. 8.

⁴⁸ Kenyon, P. and White, S. (2001), p. 9.

⁴⁹ Ibid.

⁵⁰ Larance, L.Y. (1998): "Building Social Capital from the Center: A Village-Level Investigation of Bangladesh's Grameen Bank," Washington University, St. Louis, Missouri.

van Bastelaer, T. (2000): "Imperfect information, social capital and the poor's access to credit," Center For Institutional Reform And The Informal Sector, University of Maryland, College Park, Working Paper No. 234 (<http://www.iris.umd.edu/publications/detail.asp?ID=wp&number=234>).

Micro credit is based on the assumption that the poor are the best judges of their own situation and know best how to use credit when it is available, especially when they are being supervised and encouraged by their peers. The success of micro credit programs for the very poor shows that, when properly administered, they reinforce entrepreneurial behaviour and self-sufficiency rather than promoting dependency.⁵¹

However, micro credit appears to have been much less successful in involving young people.⁵² Attachment 5 highlights the problems faced by young people in obtaining credit and suggests eight ways that micro credit programs could better assist young entrepreneurs. The following box offers details about how a Government agency in Jamaica assists small entrepreneurs in Jamaica, with its emerging focus on young entrepreneurs.

Box 6: The Micro Investment Development Agency (MIDA) of Jamaica

The Micro Investment Development Agency (MIDA) of Jamaica offers loans to micro entrepreneurs. The agency provides not only wholesale credit funds to approved lending agencies, but also offers business advisory services and appropriate training to these agencies and to final borrowers. Some \$547.9 million has been disbursed, involving over 9,180 micro businesses since inception.

The agency's total profit has been in the order of \$76.0 million while carrying most of the credit risk. Repayment arrears on its own loans portfolio is less than 4 per cent of total loans outstanding while 86.5 per cent of all outstanding loans are performing satisfactorily. In 2000/01, the agency will also widen the access to micro business credit through a special 'venture window' by granting collateral free loans to young people.

The Agency is seeking to lend \$140.0 million during the 2000/2001 fiscal year. This will finance approximately 1,800 micro enterprises, with projected employment for 3,060 persons.

Source: Micro Investment Development Agency, Jamaica (<http://www.mct.gov.jm/midi.htm>).

2.2 Promoting public-private partnerships to generate ICT-related employment

The second best practice principle highlights the use of public-private partnerships to create ICT-related employment opportunities for young people. Public-private partnerships refer to collaborative arrangements between governments and private enterprises or the NGO sector to generate employment or to deliver better services. One use of public-private partnerships by governments is to leverage additional investment to build public infrastructure or to deliver public services using private providers. Public-private partnerships can help leverage additional funding to build roads, expand public transport or set up a communications infrastructure. Public-private partnerships can also be used to fund and operate education and health services.⁵³

The UN ICT Task Force, in its report to the Secretary General in May 2001, has emphasised the value of partnerships between governments and the private sector to “enable real, tangible and sustainable transfer of knowledge and technology, especially ICT, to developing countries.”⁵⁴

The private sector has at its disposal the financial strength and technological wherewithal which, if utilised appropriately within the context of a genuine

⁵¹ Grameen Foundation USA: “Eight reasons why micro credit is a viable and powerful anti poverty tool,” (<http://www.gfusa.org/microcredit.html#info>).

⁵² Curtain, R. (2000): “Background Paper: Identifying the Basis for a Youth Employment Strategy Aimed at Transition and Developing Economies” (<http://www.un.org/esa/socdev/youthemployment/>).

⁵³ UK Treasury (2000): *Public Private Partnerships: The Government's Approach*. (<http://www.hm-treasury.gov.uk/mediastore/otherfiles/80.pdf>).

⁵⁴ UN ICT Task Force (2001): Report of the Secretary-General: *The role of the United Nations in promoting development, ... especially information and communication technologies, ... through partnerships with relevant stakeholders, including the private sector*, E/2001/59, 2 May, para. 70, p. 33.

*partnership, can make a positive contribution to the development process.*⁵⁵

Public-private partnerships enable governments to increase public infrastructure or public services by using fewer of their own resources while maintaining or even improving the quality of the standards offered (see Box 7).⁵⁶ Public-private partnerships are particularly suited to the generation of ICT-related employment because Governments need to attract not only investment funds but also the knowledge and expertise required to operate complex ICT facilities. Young people are well placed to benefit from such partnerships in terms of improving their employment prospects, particularly where they involve the transfer of knowledge and expertise.

Box 7: Public-private partnership to fund ICT infrastructure in Korea

...Joint public and private sector funding of a new five-year investment plan will enable the expansion of Korea's high-speed fibre-optic network. With US\$30.7 million coming from the government, and the private sector contributing US\$22.7 million, the project will create a more stable infrastructure that will transmit data at 100 times current speeds and will incorporate 475 counties across the country, including smaller communities in rural areas.

Source: McConnell International (2001): *Ready? Net. Go! Partnerships Leading the Global Economy*, May, (<http://www.mcconnellinternational.com/ereadiness/ereadinessreport2.htm>).

Public-private partnerships to generate employment through ICT facilities

A number of ILO member countries in the Asia-Pacific region have entered into public-private partnerships to set up ICT-related production facilities. In China, for example, Motorola has a US\$ 3.5 billion investment in semiconductor manufacturing facilities. Nokia, the Finland-based telecommunications company, has nine joint ventures in China to manufacture mobile phones and transmitting stations.⁵⁷

The establishment of ICT-based remote processing facilities usually involve public-private partnerships where governments provide incentives and infrastructure to encourage overseas enterprises to invest in such facilities. These facilities have become important to major international companies seeking to lower their information technology processing costs. As many as 185 of the Fortune 500 companies are said to have outsourced their software requirements to Indian software houses.⁵⁸

Both the Indian and Chinese governments have in recent years set up ministries to further promote ICT industries through attracting international companies. India's Ministry of Information Technology was established in October 1999 to coordinate initiatives focused on ICT between the Central Government, the state governments, academia, and the private sector. Specific attention has been given to accessing the expertise and capital of successful Indian IT professionals abroad.⁵⁹ The Ministry aims to achieve a target of US\$50 billion in software exports by 2008.

The Chinese government in 1998 combined previously separate ministries into the Ministry of Information Industries. A key focus of the Ministry has been to establish economic zones devoted to the growth of start-up ICT ventures. Another function of the Ministry has been to set up a nationwide integrated multimedia communication infrastructure.⁶⁰

⁵⁵ Ibid, p. 33.

⁵⁶ The Canadian Council for Public-Private Partnerships, see <http://www.pppcouncil.ca/whoweare.htm>

⁵⁷ "National report on the IT industry in China," Background Paper, in *World Employment Report 2001*, para. 2.4.

⁵⁸ See http://www.nasscom.org/it_industry/indic_statistics.asp.

⁵⁹ Ministry of Information Technology, (2000): *Annual Report*. Government of India (www.mit.gov.in).

⁶⁰ ILO (2001): "National report on the ICT sector in China," Country Study, in *World Employment Report 2001: Life at Work in the Information Economy*, section 2.1.

Several other Asian governments are also actively promoting technology pilot projects and the creation of national IT corridors in partnership with major overseas enterprises. The Government of Hong Kong is developing a \$1.7 billion 'Cyberport' and Malaysia is setting up a multimedia super corridor (MSC). The latter is linked with the new administrative centre of the Federal Government of Malaysia, "Putrajaya".⁶¹ It also encompasses 'Cyberjaya', a new city housing multimedia industries, R&D centres, a Multimedia University and operational headquarters for multinationals wishing to direct their worldwide manufacturing and trading activities using multimedia technology (see Box 8). Supporting the MSC is a high capacity, fully digital telecommunications infrastructure designed to the highest international standards in capacity and reliability.⁶²

Box 8: Employment objectives of Malaysia's multimedia super corridor initiative

A key objective of Malaysia's multimedia super corridor initiative is to generate local employment opportunities for its educated workforce. One of the conditions that companies have to meet to set up operations within the multimedia super corridor (MSC) is to employ a substantial number of knowledge workers. ...

Companies granted MSC status are eligible for a package of financial and non-financial incentives. Non-financial incentives include the unrestricted employment of foreign knowledge workers, the freedom to source capital globally and freedom of ownership.

As at mid-May 2000, 326 companies have received MSC-status. Of these, 192 companies are fully owned by Malaysians. The number of companies participating in the initiative so far is beyond the original target of 50 companies by the end of the year 2003.

Source: 'National report on the ICT sector in Malaysia', *ILO World Employment Report 2001*, para. 2.1 Comprehensive ICT policy initiatives, strategies and programmes.

International agencies have also fostered public-private partnerships as a means of accelerating the take up of ICT-related opportunities in developing countries. A good example of this approach is a joint venture project between the International Finance Corporation (IFC) of the World Bank and SOFTBANK Corporation, a Japan-based global Internet company (see Box 9).

Box 9: An international public-private partnership to assist local entrepreneurs to close the digital divide

SOFTBANK Emerging Markets is responsible for incubating Internet companies in some 100 developing countries. It aims to establish Internet-related businesses in developing countries by establishing a wide series of partnerships with key industry players. ...

The initiative brings successful leading-edge Internet models to developing markets and fosters local enterprises, through the incubation approach which allows entrepreneurs to focus on business concepts while a core of centrally based experts handles many of the ancillary business start-up requirements. The project seeks to improve Internet access levels in targeted countries by generating investor interest in emerging markets, which in turn should help lower the price of Internet access and increase the number of subscribers. SBEM also promotes free or subsidized Internet service to schools and other educational institutions to increase knowledge and access for people in developing countries.

Source: UN ICT Task Force (2001): *Report of the Secretary-General: The role of the UN in promoting development, ... especially information and communication technologies, ... through partnerships with relevant stakeholders, including the private sector*, E/2001/59, 2 May, p. 30.

⁶¹ The MSC covers a 15 by 50 sq km area which begins with the Kuala Lumpur City Centre in the north and extends to the new K L International Airport at Sepang in the south. See <http://www.pjholds.com.my/intro/introfrm.html>.

⁶² See http://www.cyberjaya-msc.com/project/1_project01.html and National report on the ICT sector in Malaysia, in ILO (2001): *World Employment Report 2001*, Geneva.

These initiatives by Governments to work in partnership with leading international companies have been described as pursuing a ‘leapfrogging’ development strategy. This refers to the potential for developing countries to ‘leapfrog’ traditional stages of development into a higher value-added, knowledge-intensive growth path.⁶³ The ILO’s World Employment Report 2001 on *Life at Work in the Information Age* notes that because ‘no nationality has a monopoly on brilliant insights, there are real prospects for developing countries to generate commercially significant new ideas about ICT applications’.⁶⁴

Need for Public-private partnerships to create ICT related employment opportunities

As noted above, young people have the opportunity to gain employment through the growth in remote processing facilities that are located outside the high-income countries. These provide a range of services from help lines, technical support, and handling reservations and sales to data conversion including voice to data transcription. Other remote processing includes payroll accounting to internal auditing and credit appraisals. High-end remote processing includes creating digitised maps of townships, utilities, roads, and other facilities. It is claimed that back office functions likely to grow in importance are settling insurance claims and summarising legal documents, such as witness depositions.⁶⁵

However, ‘teletrade’, as remote processing between countries has been called, is only possible when a country has the necessary telecommunication infrastructure. These links require installing and maintaining a sophisticated network both within a remote processing facility and between countries. This equipment is not only expensive, it also requires supporting maintenance skills and reliable infrastructure, conditions which many developing countries require external assistance in the form of public-private partnerships to provide.⁶⁶

Some small states such as Jamaica in the West Indies, nevertheless, have been successful in setting up ‘Digiports’ (Free-Trade Zones for digital work) to create jobs through attracting information processing work. Incentives provided by government to foreign-owned data-entry firms in Jamaica’s Montego Bay Free Trade Zone have included: low cost premises, tax benefits, and the right to repatriate all profits and dividends to home countries.⁶⁷ The type of ICT-related remote processing work that small island countries have attracted is diverse. It ranges from relatively low-skilled operations, such as data processing to more skilled tasks, such as assessing and authorising insurance claims.⁶⁸

Call centres

A related source of ICT-generated employment for young people is through Call centres. These offer telephone-based services from a central office to customers in a variety of business sectors. Call centres handle telephone calls, fax, e-mail and other types of customer contact - in live and automated formats. They have expanded rapidly in Europe and are important sources of work in Hong Kong (China), Taiwan (Province of China), South Korea, Malaysia and the Philippines.⁶⁹ Many young people in both high income and developing countries have found work in call centres. In Malaysia and Nepal, for example, call centres have attracted diploma and degree-holders, the majority of whom are working full-time.⁷⁰ Box 10 presents information about the services and employee skills offered by an international call centre in Nepal as well as some information about its employment practices.

⁶³ ILO (2001): *World Employment Report 2001*, p. 57.

⁶⁴ Ibid.

⁶⁵ Mitter, S. and Millar, J. (2001): “The impact of ICT on the spatial division of labour in the service sector,” Background Paper, in *World Employment Report 2001*.

⁶⁶ Ibid, Section 4: “from teleworking to tele-networking”

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ ILO (2001): *World Employment Report 2001*, p. 37.

⁷⁰ Ibid.

Box 10: ServingMinds: An International Contact Centre in Nepal

Our vision is to become the premiere multimedia Contact Centre providing the best customer relationship management services for businesses and organization all over the world. Our mission is to provide the highest level of professional and quality customer services for organizations seeking to improve customer loyalty and acquisition....

Operational and manpower costs being significantly low in Nepal, the cost effectiveness for the service rendered will definitely increase. Moreover, our high quality service of direct interaction with the customer for a long-term relationship will give you value for money. Our software enables the client to access a day-to-day analysis on the customer feedback, queries, customer information etc....

Our employees have the technical and behavioural expertise and skill to bridge the gap between the client and its customers. The agents who interact with the customer are highly trained and committed, with a minimum qualification of graduation and specialization in different disciplines.... Constant learning, coaching, monitoring various motivational practices, effective recruitment and appraisal system, communication system, open feedback culture, recognition, good remuneration are some of the HR activities which have been instrumental in creating a healthy and bright working environment and to work as a unified team to go that extra mile to care for the customer.

Source: <http://www.servingminds.com/mainfeature.htm>

ICT skills provision and public-private partnerships

There are a number of public-private partnership arrangements in the Asia-Pacific region related to ICT skills transfer involving governments, local educational institutions and international companies. Cisco Networking Academies, for example, operate in 24 Asia-Pacific countries with 28,823 students enrolled.⁷¹

Box 11: Cisco Networking Academies

The Cisco Networking Academy Program is a [computer] networking education program developed by Cisco Systems especially for non-profit, public education institutions. These institutions can join either as Regional Academies or Local Academies. Students will only be able to enroll with institutions that have joined the program. Private and commercial companies or organizations may participate in the Program as sponsors.

The Cisco Networking Academy Program teaches students to design, build, and maintain computer networks. The Academy curriculum covers a broad range of topics, from basic networking skills such as pulling cable to more complex concepts such as applying advanced troubleshooting tools.

The curriculum assumes no prior knowledge of computer or networking. Basic reading, writing and math proficiency (including binary mathematics) are expected. The curriculum is designed for expanded delivery in an education environment. Generally, universities and technical institutions deliver the curriculum in 9-12 months, while colleges and high/secondary schools deliver the curriculum in 2 years.

Using Web technologies, the Cisco Networking Academy Program is also a valuable model for successful e-learning. Web-based delivery of educational content is supplemented by numerous online tools that empower Academies to manage all aspects of the program. In addition to the networking curriculum, it provides online testing,

⁷¹ The countries listed as having academies are: Australia, Bangladesh, Bhutan, Cambodia, China, Fiji, Hong Kong SAR, India, Indonesia, Malaysia, Mongolia, Nepal, New Zealand, Papua New Guinea, Philippines, Singapore, Republic of Korea, Sri Lanka, Taiwan, Thailand, and Viet Nam (<http://www.cisco.com/asiapac/academy/>).

student-performance tracking, and a Quality Assurance Plan.

Source: <http://www.cisco.com/asiapac/academy/program.html>.

Another example of a public-private partnership to generate employment opportunities for young people involves Oracle Corporation of the USA and the Punjab Provincial Government in Pakistan.⁷² This partnership with the second largest software company in the world is seen as an important step in positioning Pakistan on the global IT map.⁷³

To implement the initiative, the Punjab Government formed the Punjab Information Technology Board (PITB) and to advise the government in the field of IT. PITB is a government agency designed to work as a private sector organization. The PITB model of public-private partnership is being followed at the federal level in Pakistan as well as in other provinces of the country.⁷⁴

In March 1999, the PITB negotiated with Oracle Corporation to commit US\$13.5 million in free software and courseware to launch the Oracle Academic Initiative and to train within a year over one thousand IT professionals in Oracle Database Management software. The specific objective of the initiative was to develop the capacity of a set of partner educational institutions to prepare students to become Oracle Certified Professionals (OCPs) involving skills for which there is a global shortage.⁷⁵ In less than twelve months, the initiative was judged a success and Oracle Corporation increased its investment in Pakistan to US\$20 million (see Box 12).⁷⁶

Box 12: Second Launch of the Oracle Program

31 March 2000

The Punjab Government has taken several steps to strongly support initiatives to promote Information Technology manpower development in the province. This includes initiatives to introduce new technologies for faculty training, curriculum development, infrastructure development and student scholarships.

The second PITB Certificate in Oracle Database Management is being launched. The scope of the second launch has been broadened and improved to include sixteen partner institutions and five cities.

Faculty training programmes are also being conducted under the \$150 million agreement signed by Microsoft Corporation with Punjab Government last year. ...Negotiations are also underway to partner with other international agencies to introduce new technologies like Cisco and Sun in the near future.

Source: <http://www.pitb.gov.pk/31mar2000.html>.

Public-private partnerships in other countries in the Asia-Pacific region are also increasing the opportunity for young people to compete in the global ICT labour market. Sri Lanka's University of Colombo, for example, has created an "External Degree Program" resulting in a Bachelor of Information Technology. While university staff members conduct the examinations, the program is linked with research facilities and private sector training institutions to design jointly the curriculum and provide the actual instruction. The program aims to produce 3,000 graduates in the next three years 100 times the capacity of that the university alone could have produced.⁷⁷

⁷² Khurshid, A. and Ghani, J. (2001): "Lahore: A public-private partnership to enter the global IT market," Background Paper, in *World Employment Report 2001*, para. 3.1.

⁷³ PITB (2000): "An effort to position Pakistan on the global IT map," Press Release, 2 April (<http://www.pitb.gov.pk/2apr2000.html>).

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ McConnell International (2001): *Ready? Net. Go! Partnerships Leading the Global Economy*, May, p.

2.3 *The potential of ICT to assist the vulnerable*

The third key best practice principle concerns the use of ICT-based employment opportunities to assist the most vulnerable among young people. One way this can be done is through the use by young people of acquired ICT skills to assist local development agencies and operators to deliver services to those most in need.⁷⁸ For example, the Internet can be used to deliver health care training to remote locations. A leading non-profit organisation in the field of reproductive health, has developed for delivery via the Internet a course in infection prevention designed for health staff who work in developing countries. Topics include disease transmission, aseptic technique, use and disposal of needles and other sharp instruments, and waste disposal.⁷⁹ However, access to this course and others like it requires people with the technical skills to show health care workers how to use the Internet.

Other potential ICT applications in health care include the use of relatively simple Internet-based data management systems to exchange information such as patient records between health care professionals. Tele-medicine applications now available also make it possible to deliver health care to people in isolated locations.⁸⁰ The use of low-cost communication based on the Internet in the health system will create the need for young people with ICT skills in rural locations. The skills required are to be able to establish a local area network or at least, once it is set up, to be able to maintain the network and to provide 'help desk' assistance for health staff to enable them to use the system easily.

Box 13: ICT skills training for disadvantaged youth

The Vaancha ICT Association project in India seeks to assist socially and economically disadvantaged youth in remote areas through ICT skills training.⁸¹ It is doing this through using broadband ICT centres to bridge the gap between villages and cities. Solar-powered Desktop PCs are linked to the Internet through broadband wireless technology. The project is also using a simplified ICT skills training methodology with special emphasis on income generation, small enterprise development, workplace education and online self-directed learning using print manuals and multimedia.

The project has already trained 457 youth in ICT skills. Of these, 211 have already found work in various private and public organisations and 38 started their own business facilities, such as telecentres, cyber cafes and computer training centres. The income range per month of the livelihood generated is R5,000- R25,000.

Source: <http://www.challenge.stockholm.se/projects.asp?ProjectId=2736>.

Other uses of ICT- related skills to assist the most vulnerable

Young people with the required skills in ICT are well placed to generate their own jobs by identifying for governments or international agencies a range of other uses for geographical information systems. It is possible, for example, to combine non-spatial data on access to welfare services, telephone availability, education levels, access to health services, water quality and income levels with spatially referenced data using geographical coordinates. The resulting information can be used to identify where the incidence of poverty is greatest. The data can be stored, retrieved and processed in various ways to produce summaries, statistics and maps.⁸² In particular, maps based on digital data are a valuable way to make displays of relationships between spatial and non-spatial data to pinpoint where efforts to reduce poverty need to be

¹⁸ (<http://www.mcconnellinternational.com/ereadiness/ereadinessreport2.htm>).

⁷⁸ ILO (2001): *World Employment Report 2001*, p. 59.

⁷⁹ Ibid, p.60.

⁸⁰ Ibid.

⁸¹ See <http://www.hindustantimes.com/nonfram/120901/hth11.asp>.

⁸² ILO (2001): *World Employment Report 2001*, p. 60.

directed. The following illustration of the use of digital mapping shows in a forceful way how ICT has great potential to help the most vulnerable.

Using ICT to help find unexploded bombs

Countries in the Asia-Pacific region that have experienced aerial bombardment now have the opportunity to use digital technology to locate unexploded bombs. A project in Laos, which uses digital mapping and global positioning systems to identify areas the location of unexploded bombs, has generated significant local employment, including jobs for young people. Some 628 Laotian bomb technicians and 23 foreign advisers are working for a countrywide program called UXO.⁸³

US-made aerial bombs account for much of the unexploded ordinance in Laos as it is estimated that a third of the bombs dropped did not explode. As a result, over 10,000 people have been killed or maimed in Laos and valuable flat land rendered dangerous for cultivation. Digital technology is being used in two ways. One is through the manipulation of databases to produce digital maps based on the records of US bombing runs in the late 1960s and early 1970s to pinpoint the likely location of bombs. The second is to use handheld Global Positioning System (GPS) units taking readings from navigational satellites to pinpoint the coordinates on the ground. The maps, which also include information gathered in the field, show the bomb technicians what they might find as they move through villages and rice paddies (see Box 14). The data used so far have been accurate and have led to the discovery of unexploded bombs where the coordinates indicate the bombs were dropped. It is also hoped that the databases will be used to help identify where unexploded bombs might lie in Cambodia and Vietnam as well.⁸⁴

Box 14: Risky work to save lives and reclaim arable land

Chanthavong Inthavongsy is a 22-year-old Laotian woman who heads a team of four technicians whose job it is to locate, transport and detonate unexploded bombs.

Inthavongsy's colleagues hoist the rusted bomb into the back of a GPS-equipped Toyota pickup truck and head for a demolition site a few miles away. At the site, a remote jungle grove with a nearby protective log bunker, the crew follows a routine procedure to destroy the battered MK-81 bomb. Its goal is to avoid a so-called high-order detonation, in which the bomb explodes at full force. Instead the team will attempt to set off a low-order detonation that will quickly burn the bomb's contents and produce a relatively small blast....

After a countdown by Inthavongsy, a zipping sound rings out from the hand-cranked switchbox as an electrical charge shoots down the wire and unleashes a thunderous boom. Pieces of shrapnel shriek through the air. Moments later Inthavongsy and her colleagues emerge from the bunker and return to the site. The demolition is successful. The ground is charred, and the grass flickers with small fires, but the area is largely intact.

Source: Lovering, D (2001): "Taming the killing fields of Laos," *Scientific American*, August, p. 58-60.

Marketing pro-poor tourism

Pro-poor tourism aims to generate net benefits for the poor through expanded opportunities for economic gain, other livelihood benefits, or engagement in decision-making.⁸⁵ Pro-poor tourism strategies can "tilt" the tourism sector at the margin to expand economic opportunities for the poor by increasing demand for their goods and services and enhancing the asset base of poor people.⁸⁶ Pro-poor tourism has the potential to play a significant role in increasing

⁸³ Lovering, D. (2001): "Taming the killing fields of Laos," in *Scientific American*, August, p. 58.

⁸⁴ *Ibid*, p. 59.

⁸⁵ See http://www.propoortourism.org.uk/what_is_ppt.html.

⁸⁶ Ashley, C., Roe, D. and Goodwin, H. (2001): *Pro-Poor Tourism Strategies: Making Tourism Work For The Poor a review of experience*. Pro-Poor Tourism Report No. 1, April 2001, p. ix.

livelihood security of vulnerable groups, including young people (see Box 15). Tourism directed to poor areas can generate employment opportunities, especially for young people with education as well as generate earnings for the wider community.

Box 15: Pro-poor tourism: bringing tourists to the remote Humla District of north-west Nepal.

The Dutch development agency SNV works with local communities... in a very poor and remote area of Nepal. The aim of the project is to produce and supply locally the goods and services required by the tourism industry rather than from Kathmandu

SNV's strategy revolves around developing tourism initiatives that benefit poor and disempowered groups as opposed to the Kathmandu-based trekking agencies. The focus of the initiative is... at the local level - on specific enterprises and communities along a trekking trail.... The emphasis of the Pro-Poor Tourism strategy is on social mobilisation through the development of community-based organisations; business planning and training designed to enable the poor to develop micro-enterprises and to take up employment opportunities.

Source: http://www.propoortourism.org.uk/nepal_sum.html.

However, the marketing of the pro-poor tourist facilities has to be a key feature of any strategy. The aim should be to work out ways to establish a secure and appropriate market rather than simply attracting more tourists.⁸⁷ This can be done in a variety of ways such as brochures, trade fairs, and advertising. The Internet can also play a pre-eminent role in a pro-poor tourism marketing strategy by providing information about remote tourist locations, including photos of key features as well as providing a ready means of low cost communication via e-mail.

The Namibia Community-Based Tourism Association in south-west Africa assists local communities to set up tourism enterprises in the previously neglected rural areas of Namibia. The Association has set up a web site with detailed information including a map about each of the seven regions in rural Namibia and the community-based tourism facilities in each region (see Box 16).⁸⁸ Young people are well placed to acquire the skills to set up or at least maintain a web site as well as respond to e-mail inquiries for remote tourist facilities.

Box 16: Pro poor tourism: From the Namibia Community-Based Tourism Association web site

Why visit Nyae Nyae Conservancy? The Ju/'hoansi have organised themselves to form the first communal area conservancy in Namibia. Meet the people and experience their traditions and culture in this remote and beautiful corner of Namibia.

What can you experience? Go on a traditional hunt with Ju/hoansi hunters. Experience the tracking of elephants or simply view the wildlife that frequent the seasonal pans Witness the gathering & cooking of veld (bush) food! Enjoy traditional dance & music. Enjoy birdwatching!

What facilities are available? Campsites at Djokhoe & Makuri with very basic camping facilities, fireplaces and toilet Please bring your own water Prices: On request at the Conservancy Office in Tsumkwe. Nearby attractions include: Kaudom National Park (1-2 hrs 4x4 required)

Your support of these enterprises also makes a crucial contribution to rural development in Namibia. It allows communities to take part in the tourism sector and to develop businesses, which will provide employment opportunities and generate income in the region where they live. This in turn provides communities with another livelihood

⁸⁷ Ibid, p. 31.

⁸⁸ NACOBTA currently has approximately 45 members including campsites, rest camps, traditional villages, craft centres, open museums and tour guide associations. Of these, about 25 are currently (August 2001) open for business whilst the others are in development.

strategy and gives them more control and choice over their own development. Thank you for your support.

Source: NACOBTA (Namibia Community Based Tourism Association) web site (<http://www.nacobta.com.na/en/About.htm>).

ICT skills and enhancing access to education

Governments are in a position to provide opportunities to use ICT to assist the most vulnerable by connecting schools to the Internet. Some middle-income countries, such as Malaysia, and Thailand, are making good progress in connecting their schools to the Internet. Where there is a government program to increase schools' access to computers and the Internet, scope exists for young people to be trained as computer technicians to maintain a bank of networked computers within a school.

In Malaysia, as part of the drive to narrow the digital divide within the country, the Government has launched its Computers-in-Education program to improve digital literacy education in schools. The initiative aims to create 'smart schools' that foster a new learning environment by adopting new teaching methods and curricula, and training teachers to use ICT effectively.⁸⁹

Box 17: Internet learning centres in Lao high schools

We are ... helping the people in this very rural country use the IT tools of the 21st century to maintain their traditional agricultural-based culture. We are doing this through collaboration, education, self-sufficient Internet learning centre planning and implementation, and e-commerce.

We are building on the success of our first internet learning centre at Phon My High School in Lao PDR.... Our internet learning centre design combines computer training from turning the machine on to webpage design and basic database management, parent-led computer business and training at nights and weekends for profit to maintain the ILCs, and collaborative, project-based learning with schools in other countries, especially around the commercialization of organic agriculture....

This first project is in a rural setting that has demographics very like the country as a whole, consistent electricity, and spotty telephone service (we improved the landline service for the site and have an alternative, cell phone service through an antenna). The students tend to be 15-16-year-old farm kids. The collaboration in this pilot spot is between this school and a school in rural India with interest in organic agriculture.

Source: <http://www.challenge.stockholm.se/projects.asp?ProjectId=2764>

Training young people to recycle PCs for distribution to low-income communities

Another best practice initiative that combines several key principles involves the employment of disadvantaged young people and bridging the digital divide between the poor and the rest of the society. Green Peripherals and Components, otherwise known as Green PC, is a social enterprise aimed at helping the long-term unemployed young people obtain IT maintenance and repair skills.⁹⁰ The project won the prestigious Stockholm Challenge Award for Information Technology projects. The Green PC project employs former long-term unemployed young people to refurbish second-hand computers donated by the corporate sector, government departments and educational institutions.

⁸⁹ ILO (2001): *World Employment Report 2001*, p. 63.

⁹⁰ The following information on Green PC and reach for the clouds is drawn from The info Xchange's web site (<http://www.infoxchange.net.au/>) and from an article by Maria Hinas "IT for homeless - Can we use Technology to Create Social Justice?" posted on the Stockholm Challenge web site (<http://www.challenge.stockholm.se/challenge.html>).

In Australia, over 200,000 computers are retired every year. The aim of the project is to donate or resell the computers after refurbishment to low-income families to enable them to access the Internet. The project started with more than 1000 redundant computers from the State Government of Victoria. Info exchange Australia has also entered into partnership agreements with the State Government Department of Human Services, the University of Melbourne and a number of other large corporations to receive their redundant hardware on a rolling basis.

The project has received funds from the State Government's Community Jobs Program in January 2001 to employ long-term unemployed people by training them to refurbish the "retired" computers. Up to 33 people have been employed for a period of six months. The average age of the people employed is 20 to 21 years. They are employed in apprenticeship type employment and training arrangements to refurbish the equipment. Other young people are undertaking training in web page design.

Info Exchange Australia has also initiated the 'The Reach for the Clouds' project to enable low-income communities to access computer connected to the Internet.⁹¹ The project has provided computers and connected 800 residents to the Internet in four high-rise towers in a public housing project in inner city Melbourne. Six Aboriginal communities along the Murray River have also been provided with networked computers. Its best practice status is reflected in the fact that the project was also a finalist in the top 100 projects selected for the 2001 Stockholm Challenge.

The project is to act as a model for similar developments in other public housing estates. The aim is to assist those who otherwise would not have the resources to participate in the information age, to develop IT skills and establish opportunities that may be otherwise denied. A computer-training centre has been established in the ground floor of the high-rise complex. Residents are able to attend classes, which are conducted twice daily for durations of two hours for five days a week.

2.4 Bridging the gap between the digital economy and the informal sector

The fourth best practice principle concerns the use of ICT to help bridge the gap between young people's opportunities for self-employment in the informal economy and the high growth sectors of the world economy. Reference has already been made above to how informal sector workers can gain easy access to the Internet through telecentres to obtain information on markets or administrative procedures, and to publicise their services to a wider clientele. For example, the Foundation of Occupational Development in India, which operates eleven telecentres, has also established a website called *IndiaShop* to provide a market outlet for indigenous crafts people. As a result, an isolated community is able to fetch much higher prices from international customers than from retailers in nearby cities.⁹²

Reference has also been made to how communities in remote locations can make use of self-contained, solar-powered ICT centres to sell, among other things, traditional cultural products such as art, music, photography, legends and storytelling via the Internet. This is being done on a pilot basis in remote communities in India, Jamaica, Ghana, and the West Bank.

Another example of the use of ICT to help bridge the gap between employment for young people in the informal sector and the mainstream economy is India's Self Employed Women's Association (SEWA). Its 220,000 members are women and young women who earn a living through their own labour or through small businesses.⁹³

⁹¹ See <http://www.infoexchange.net.au/highrise/>

⁹² Hudson, H.E. (2001): "The potential of ICTs for development: Opportunities and obstacles," Background paper, in *World Employment Report 2001*, section 7 - The contribution of ICTs to development.

⁹³ Nanavaty Reema, General Secretary, SEWA personal communication, bdmsa@ad1.vsnl.net.in.

SEWA has been one of the first organisations in India to realise the potential for harnessing ICT to help women in the informal sector. It has sought to develop the organisation's capacity to use computers by conducting awareness programs and imparting basic computer skills to its team leaders, 'barefoot' managers and members of its various member associations. Many of SEWA's member organisations have launched their own websites to sell their products in the global virtual market place.⁹⁴ Since the entire membership of SEWA consists of poor self-employed women, giving its members access to software in the 'language of daily use' is of great importance. Hence, efforts are being made to develop software to enable grass-roots workers and members to make the best use of the tools provided by ICT.

Recently, SEWA has started using telecommunications as a tool for capacity building among the rural population. SEWA uses a combination of landline and satellite communication to conduct educational programs on community development by distance learning. The community development themes covered in the education programs delivered include: organising; leadership building; forestry; water conservation; health education; child development, the Panchayati Raj System and financial services.⁹⁵

An Internet gateway to promote sustainable livelihoods

The potential for ICT to bridge the gap between young people's self employment opportunities in local informal sector markets and the wider domestic and international economy is amply demonstrated by India's TARAhaat.com. TARAhaat or *Star Marketplace* is an Internet gateway that connects the village user to information about social services, health, entertainment, and to markets, through a network of franchised cyber centres, customised in the language of their choice. The website attracts between 5000 and 25,000 contacts per month.

The project illustrates a number of best practice features, which won it the 2001 Stockholm International Challenge prize as best practice in the category of a Global Village.⁹⁶ The first feature worth highlighting is that it is targeted at the poor by seeking to create sustainable livelihoods for people located in areas with limited economic opportunities and harsh living conditions. Second, it has been designed using extensive market research and socio-economic surveys, including a house-to-house survey of selected villages in the region. Third, its format aims to cater for the needs of people with wide variations in literacy, language, financial liquidity, and levels of understanding.

Fourth, the project is supported by partnerships with enterprises in the public and private sector including the Indira Gandhi National Open University. Fifth, the project has support from youth organisations through the National Youth Cooperatives.

Sixth, the project is based on features that go beyond simply using the Internet to communicate with its target audience. TARAhaat covers all three components for rural connectivity: content, access and fulfilment. Content in relation to law, governance, health and livelihoods is provided by the TARAhaat.com mother portal. Access is provided through a network of franchised local enterprises. Delivery of information, goods and services is provided by local courier services or franchised TARAfans. The revenue streams of TARAhaat provide for profit generation at each step of the supply chain, serving to further cement its networks.

The project, although still in its pilot stage, is said to have increased the economic opportunities for the physically disabled and the franchisees, as well as to have improved access to education for rural girls. Other benefits include the generation of alternative sources of income for young people through desktop publishing.⁹⁷

⁹⁴ ILO (2001): *World Employment Report 2001*, p. 60.

⁹⁵ *Ibid.*

⁹⁶ See http://www.challenge.stockholm.se/new_tavlande_index.html.

⁹⁷ *Ibid.*

2.5 Putting young people in charge

The fifth best practice principle in the use of ICT to generate employment for young people relates to the importance of their participation in the design and implementation of ICT-based initiatives. The value of participation can be justified on a number of grounds.⁹⁸ However, in pragmatic terms, evidence exists to show that participation is a crucial ingredient in achieving program effectiveness.⁹⁹

It is not only that such participation brings to the project relevant information that outside development agencies (or even governments) are not likely to have. Participation also brings with it commitment, and commitment brings with it greater effort—the kind of effort that is required to make the project successful.¹⁰⁰

The importance of the principle of youth participation is stressed in the Dakar Youth Empowerment Strategy, the product of the deliberations of 350 representatives of youth organisations at the UN's World Youth Forum in August 2001.¹⁰¹ The Strategy urges governments and international agencies to support initiatives that “empower young people to have greater control over their individual and collective destinies, and their ability to effectively contribute to the advancement of the global community.”¹⁰²

Technical, human and financial support must be focused on assisting marginalized and vulnerable youth to organize themselves in order to address their own needs and interests, and make their particular contribution to social progress... Young people and youth NGOs are the best agents for delivering change for other young people...¹⁰³

As noted above, a limitation of many government support programs for youth enterprises is the failure to recognise that the initiative that comes from young men and women, based on their assessment of its viability and motivation to succeed rather than as a product of the program itself.¹⁰⁴

Youth Access Program

A project in Australia offers a good illustration of youth input at the design and implementation stages. Located in regional Australia, the project is based on the principles of self-help, self-financing and self-mentoring. The project developed because of a failed grant application to repair “retired” computers. When the computers became available, the young people themselves decided to start the project without external funding.¹⁰⁵

The thrust of the project is for young people themselves, using recycled computers and free software, to teach each other skills such as networking computers, how to repair computers, and

⁹⁸ Narayan, D., Chambers, R., Kaul Shah, M., and Petesch, P. (2000): *Voices of the Poor: Crying Out for Change*, Published for the World Bank, Oxford University Press, New York.

⁹⁹ Isham, J, Kaufmann, D. and Pritchett, L. (1997): “Civil Liberties, Democracy, and the Performance of Government Projects,” *World Bank Economic Review*, Vol 11, No 2, pp. 219-42.

¹⁰⁰ Stiglitz, J: (1999): “Participation and development: perspectives from the comprehensive development paradigm,” *The World Bank*, February 27, Seoul, Korea, pp. 10-11.

¹⁰¹ The 2001 Dakar Youth Empowerment Strategy builds on earlier World Youth Forum Declarations, follow-up work by the UN and the resultant national youth policy and action plans developed by governments. See UN (n.d): *Youth Participation Manual & Youth Policy Formulation Manual*. Human Resources Development Section, Social Development Division, United Nations & Economic and Social Commission for Asia & the Pacific.

¹⁰² World Youth Forum (2000): *Dakar Youth Empowerment Strategy*, para. 16 (<http://www.un.org/esa/socdev/unyin/forum/dakar.doc>).

¹⁰³ *Ibid*, para. 43 & 44.

¹⁰⁴ White, S and Kenyon, P. (2001): *Enterprise-Based Youth Employment Policies, Strategies and Programmes*. International Labour Office: Geneva, p. 14.

¹⁰⁵ See http://www.challenge.stockholm.se/new_tavlande_index.html.

how to design start-up IT projects to provide themselves and others with employment. Refurbished computers are given to other members of the group without a computer. Other recycled computers are made available to regional schools, youth groups, and handicapped and indigenous youth. Network members are expected to actively seek out recycled hardware, refurbish it and make it available to others.¹⁰⁶

The self initiated actions of a Nepalese teacher shows how the Internet can benefit a remote village, even though he has to have to walk down for a full day to the nearest city where an Internet service is available to communicate with people from around the world (see Box 18).

Box 18: Village in the clouds embraces computers

Mahabir Pun is a Nepalese educational pioneer who is trying to break the cycle of poverty in his mountain village of Nangi by taking it into the computer age. Having founded Himanchal High School, he sees the Internet as the way to improve the children's education.

The Internet has been a great help for Nangi, even though we do not have a connection here. One of my professors had helped me to put a simple website about my village and school on the web in 1996. That website has connected my village to the outside world, and I think my village is the first one in Nepal to be on the Internet.

With the simple website we have now, people from around the world have been able to locate my village and have come to volunteer. We regularly get volunteers from America, Britain, Australia, Singapore, Switzerland and Malaysia.

Those who have not been able to visit have also helped in different ways, such as sending books, teaching materials, and money as a donation. Moreover, students from Australia and America have been writing letters to our pupils as penpals through ordinary mail.

... I have installed two small hydro-generators in the stream near our village for power for the school. We got some computers from Australia, Singapore and Malaysia as donation. I also collected some used computer parts in the US and took them to the village and assembled the parts in wooden boxes, building 14 computers.

Now we have 15 computers in our school, which has about 300 students from six neighbouring villages. As far as I know this is the only community school in the entire country that provides computer classes for high school students.

I have seen that even a small village like mine can benefit a lot from the Internet. We can use it to generate money for the village, to provide quality education for our children, to provide information about our culture to children all over the world, and to invite volunteers to come to our village.

Source: BBC News, 22 October, 2001
http://news.bbc.co.uk/1/hi/english/sci/tech/newsid_1606000/1606580.stm

¹⁰⁶ *Ibid*

Part 3: Some general considerations

3.1 How ICT use differs in developing countries

The best practice examples of the uses of ICT to generate employment for young people have demonstrated that technology is a tool that can be applied in a variety of ways. The challenge for each country and for different socio-economic groups within a country is to work out the most cost effective way to use ICT. The ways that high-income countries use ICT need not apply to middle-or low-income countries of socio-economic groupings within countries. Four common but incorrect assumptions about the use of ICT in middle-and low-income levels have been identified.¹⁰⁷ These are:

1. ICT access requires personal ownership of a computer.
2. ICT access requires use of expensive computers.
3. The infrastructure commonly used in rich countries to access ICT is not readily available in many developing countries.
4. The use of the Internet is text-based and is English dominated which means that users need to be literate and literate in English in particular.¹⁰⁸

The best practice examples show that access to ICT does not require personal ownership of the computer. CK Prahalad points out that while it may be common for people in wealthy countries to own a computer for personal convenience reasons, the poor in developing countries may decide to make an equally rational trade-off offering low-cost access (and no cash investment) for a level of personal inconvenience.¹⁰⁹ This different approach to access means that a range of telecommunications-based services such as making telephone calls, sending faxes or using the Internet can be used on a fee-for-service basis through facilities known variously as cyber cafes or telecentres. The more common pattern of ICT usage in developing countries, therefore, is likely to be access through community facilities, as with many other services in these countries, rather than through personalised access for individual families.

The second incorrect assumption is that ICT access requires use of expensive computers. This assumption is being challenged in Brazil, India and China where simplified, low-cost versions of computers have been or are being developed.¹¹⁰ In India, the first working prototypes of the Simputer have been developed. The Simputer will cost around US\$200 and will run on widely available AAA batteries. It is slightly larger than the popular Palm handheld computers, and has a built-in web browser, e-mail software, a text-to-speech program for several Indian languages and a sound player. A feature of the Simputer is the use of a Smart Card to enable individuals to use and store data utilising a community-based machine (see Box 19). The machine is planned to be available for sale by March 2002.¹¹¹

¹⁰⁷ Prahalad, CK (2000): "Let 's focus on the digital dividend: Conventional mental models may be an impediment to the diffusion of internet benefits to poorer countries," *European Business Forum* (http://www.ebfonline.com/at_forum/at_forum.asp?linked=32&id=26).

¹⁰⁸ *Ibid.*

¹⁰⁹ *Ibid.*

¹¹⁰ Anderson, Rachel 2001: "Low-Cost Computers for the People," *Benton Foundation*, August 27, <http://www.digitaldividenetwork.org/content/stories/index.cfm?key=178>

¹¹¹ *Ibid.*

Box 19: The Simputer: “radical simplicity for universal access”

The Simputer is a low-cost portable alternative to PCs.... It has a special role in the Third World because it ensures that illiteracy is no longer a barrier to handling a computer. The key to bridging the digital divide is to have shared devices that permit truly simple and natural user interfaces based on sight, touch and audio.

The projected cost of the Simputer is about Rs 9000 at large volumes. But even this is beyond the means of most citizens. The Smart Card feature that the Simputer provides enables the Simputer to be shared by a community. A local community such as the village panchayat, the village school, a kiosk, a village postman, or even a shopkeeper should be able to loan the device to individuals for some length of time and then pass it on to others in the community.

The Simputer, through its Smart Card feature, allows for personal information management at the individual level for an unlimited number of users. The impact of this feature coupled with the rich connectivity of the Simputer can be dramatic. Applications in diverse sectors such as micro banking, large data collection, agricultural information and as a school laboratory are now made possible at an affordable price.

Source: <http://www.simputer.org/simputer/about/>

The third assumption that the infrastructure required is not available in many developing countries is also easily challenged in many low-and middle-income countries as the spread of mobile phones has opened up access to telephony in place of fixed-line telephones. Mobile phones in Bangladesh, China, Philippines, Indonesia, Sri Lanka and Malaysia are often a substitute for fixed-line telephones, rather than a complement as in high-income countries.¹¹² In these countries, fixed-line telephones are regarded as expensive and unreliable whereas mobile phones are viewed as more reliable and easier to use.

The fourth assumption about IVT usage in developing countries is that the Internet is only for the literate and within this group, those who are literate in English. However, literacy is not required to gain access to information. It is possible to send e-mails that consist of voice messages. However, it needs to be acknowledged in relation to ICT that “literacy multiplies the potential gains – and multiplies the channels through which such gains can be received,”¹¹³

Literacy in English is also not an essential precondition for use of the Internet. The dominance of English on the Internet is receding. It is estimated that English is now the mother tongue of less than half of all Internet users, and the proportion is falling all the time.¹¹⁴ Other languages such as German, Russian and Spanish are said to be spreading at exponential speed on the Web. The Internet is also said to be helping to revive minority languages and cultures.¹¹⁵

However, much still needs to be done to develop relevant content in local languages for use by those who would otherwise be excluded. This applies particularly to the availability in local languages of information from government sources. The opportunities for young people to act as “information intermediaries” was highlighted above.

3.2 Inequalities in access to ICT skills and employment

It is important to acknowledge that not all young people have an equal opportunity to acquire ICT-related skills or to benefit from ICT-generated employment opportunities. Access to

¹¹² Canadian International Development Agency (CIDA) (2000): *Grameen Telecom’s Village Phone Programme in Rural Bangladesh: A Multi-Media Case Study Final Report*, p. 16 (www.telecommons.com/villagephone/finalreport.pdf).

¹¹³ ILO (2000), *World Employment Report 2001: Life at Work in the Information Economy*. Geneva, p.62.

¹¹⁴ James Barry, 2001, “Online, and Off, English’s Hegemony Is Challenged Globally”, *The International Herald Tribune*, February 12, (www.iht.com).

¹¹⁵ Barry James, (2001): *Ibid*.

relevant education and training is not equally distributed according to sex. While women have made notable inroads into highly skilled ICT work, such as software programmers or computer analysts, in India and Malaysia, The number of women in the ICT sector is still far from a balance. In India, for example, women occupy nearly 20 per cent of the professional jobs in the software industry, with higher percentages found in Calcutta and Bangalore. In Malaysia, they are 30 per cent of IT professionals, including those at the professional level.¹¹⁶

*However, nowhere are these jobs the majority of those held by women in the workforce Nor are women the majority of workers in these occupations. The women working in these areas comprise a small, educated elite. However, it is an important area for women to break into and to become role models for the next generation whose numbers in these fields are likely to increase.*¹¹⁷

A recent report on gender access to information technology in developing countries notes that the jobs that women have gained through IT have been in countries with high rates of female literacy in Asia (notably in the Philippines, Thailand and Vietnam – see Table A4 in Attachment 1) and Latin America. The report concludes from this: "As information technology becomes more tightly linked with the development of knowledge economies, education for young women becomes more and more important".¹¹⁸

Another factor limiting the potential benefits of ICT-related employment for young women is likely to be workplace practices such as long working hours. These work practices serve to reproduce the patterns of gender segregation channelling young women into lower skilled, lower paid jobs with more repetitive and less creative work.¹¹⁹

3.3 The potential gains from ICT for the economy and society

ICT offers three major gains to a country's economy and society.¹²⁰ Efforts by governments, enterprises, civil society organisations and citizens to capture these benefits can produce significant employment opportunities for young people with the requisite ICT skills.

The first major potential benefit comes from the opportunity to participate in a rapidly growing sector of the world economy through the supply of hardware and software. In the Asia-Pacific region, Countries such as India, China, Malaysia, Thailand and the Philippines have been able to capture a significant share of the world market for digital computers, semi-conductors, electronic micro-circuits, and other automatic data processing (ADP) products. Exports from these countries have played a major part in promoting economic growth and creating jobs in their respective economies. Attachment 6 outlines how a number of Asian economies have benefited from their involvement in ICT-related industries.

The second area of gain that ICT offers to a country's economy and society is through the capture of information in a digital form. The benefits can extend from improvements in the production of goods and services through more efficient processes and higher quality outputs. These benefits come from more precise monitoring of production, faster speed of operations and better knowledge of customers. Other benefits to the economy as a whole can stem from more cost-effective commercial transactions related to business-to-business (B2B) such as operating supply and distribution chains or providing banking services. Business-to-customer (B2C)

¹¹⁶ Hafkin, Nancy and Taggart, Nancy (2001): *Gender, Information Technology, and Developing Countries: An Analytic Study*. For the Office of Women in Development, Bureau for Global Programs, Field Support and Research, United States Agency for International Development, June, (<http://www.usaid.gov/wid/pubs/it01.htm>) , p. 41.

¹¹⁷ *Ibid*, p. 41.

¹¹⁸ *Ibid*, p. 43.

¹¹⁹ ILO (2001): "Generating decent work for young people: An Issues Paper prepared for the Secretary-General's Youth Employment Network"

(<http://www.un.org/esa/socdev/youthemployment/Issues%20paper.doc>) , p. 9.

¹²⁰ ILO (2001): *World Employment Report 2001:Life at Work in the Information Economy*, Geneva.

transactions in the form of information about and the purchase of goods and services also offer the potential for significant economic benefits (see Box 20).

Box 20: Electronic commerce in Korea

Electronic commerce has emerged as a new growth area in Korea with 56 per cent of Internet users having purchased goods over the Internet from home. The number of Internet users in 1999 was 10 million and expected to rise to 30 million or almost two-thirds of the population by 2002.

Source: OECD (2000): *OECD Economic Surveys: Korea*, p. 258.

The third area of potential gain from ICT relates to benefits for civil society. This can come from the application of ICT to improving the lives of citizens in general and the poorest in particular. These opportunities apply to not only offering new or improved opportunities to earn income. They also relate to better information about and access to government-funded services in education and health.

The transactions involving government-to-citizen (G2C) can also be made more accessible and less costly to perform through the use of ICT. These can range from accessing information about government regulations and services through a CD-ROM or the Internet to purchasing online licences or payment of taxes.¹²¹ ICT also offers the potential for more accurate and transferable patient health records as well as providing medical staff with access to world-class medical advice. Another use of ICT is to provide on-line services for job placement through electronic labour exchanges in public employment service or other placement agencies (see Box 21).

Box 21: Use of ICT in provision of job placement services

Previously, job brokering was usually carried out as a closed system involving staff as intermediaries on behalf of their clients. The greater transparency enabled by ICT opens up possibilities for more precise information-seeking or "data-mining". Through open job seeker banks, for example, employers can search and directly access résumés which, in turn, are linked electronically to job vacancy banks. Data banks on public training opportunities or other career or labour market information are also openly available. Tools have been developed to assist employers in screening résumés, or to send e-mails automatically to job seekers when job vacancy announcements fitting certain pre-selected criteria are posted.

Source: ILO *World Employment Report 2001*, Section 8.2 "Labour market intermediation for the information economy."

Other benefits for citizens and the economy can flow from the transparency that publicly available records can provide (see Box 22). For example, in relation to the land rental market in developing countries, costless and easy access to land records via the Internet can reduce the risk of renting land by identifying conclusively who the real owner is.¹²² This is not to claim that transferring government records to a digital format is a simple or inexpensive process. However, it does highlight how ICT has the potential to deliver gains from the introduction of new systems and processes in the public sector as well as the private sector.

¹²¹ ESCAP has instituted the E- Mekong: Programme on Information Technology Development in the Greater Mekong Subregion (Cambodia, China -Yunnan Province, Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam). The objectives of the project are to strengthen IT readiness in the areas of legal and regulatory frameworks, human resources, e-commerce and e-governance capabilities in the GMS.

¹²² ILO (2001): *World Employment Report 2001:Life at Work in the Information Economy*, Geneva, p. 60.

Box 22: Use of ICT in Nepal to modernise public administration

Old records used to lie in dusty corners in Kanchanpur, a district in far-west Nepal. Now they have become part of the digital revolution. Kanchanpur is one of the areas in this mountainous country most dedicated to using information technology to modernise public administration and promote local development. Rishi Raj Lumsali, chairperson of the district development committee, has a vision of Kanchanpur as a model "information technology-friendly" district, one that is coming to life through a programme jointly supported by the Government of Nepal and UNDP.

'The old records that used to be tightly wrapped up in big pieces of cloth and piled above the cupboards have found their place on hard-disks, and there has been an enormous change in the management system,' said Mr. Lumsali. The abundant socio-economic data on the computers has brought a dramatic revolution in the committee's planning processes, and it also provides information services for all the agencies in the district. The district committee also produces colourful computer-generated maps depicting road networks, health clinics, educational centres, communication centres and other infrastructure. These transformations have made the committee a resource for activists, planners and students seeking maps and data

Source: Sangita Khadka, UNDP, Nepal, posting to GKD e-discussion, 18 Oct 2001.

Not least, ICT also offers increased opportunities for citizens to communicate with their government (C2G) as a means of holding them more accountable. E-mail campaigns against corruption influenced Korea's 1999 elections and gave rise to the recent popular movement that deposed Philippine President Joseph Estrada.¹²³

3.4 Supporting conditions needed

However, this is not to claim that use of ICT to generate employment for young people is a straightforward and easy option for governments, enterprises or NGOs. The optimism inherent in highlighting the benefits of ICT as a development tool needs to be balanced by reference to the preconditions needed for a comprehensive ICT strategy to work. A report published in July 2001 for The Digital Opportunity Initiative of the United Nations Development Program (UNDP) emphasises five key strategic elements that need to be addressed for countries to develop successful ICT strategies.¹²⁴ These relate to the provision of appropriate infrastructure, human capacity, supportive public policy, support for enterprises and appropriate content and applications. These five elements under the heading "Basic preconditions for an ICT strategy" are outlined in more detail in Attachment 7.

However, it is important for Governments to note that for these elements to have the greatest impact, they need to be addressed not in a piecemeal fashion but as an integrated strategy. The need for an integrated strategy is further highlighted by the assessment of Sanjaya Lall, Professor of Development Economics at Oxford University, in Box 23 below.

Box 23: New Technologies, Competitiveness, and Poverty Reduction: prospects for developing countries

Globalisation moves productive resources and knowledge around the world at an accelerating pace. It does not, however, reduce the need for local capabilities and institutions; quite the contrary, the strength of the local learning system becomes more and more important to attract and 'root' the mobile resources available externally.

¹²³ UNDP (2001): *Human Development Report 2001: Making new technologies work for human development*, Oxford University Press, for the United Nations Development Programme, New York, p.36.

¹²⁴ Accenture, Markle Foundation and the UNDP (2001): *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*, July, (init.org/framework/pages/contents.html).

Simply because capital and technologies are more available (and more footloose), countries have to offer stronger skills, capabilities, supply networks, institutions, and infrastructure if they are to attract high-quality resources. Simply opening up economies to global market forces without upgrading skills and capabilities may serve to exploit existing capabilities, but over the longer term may be a recipe for stagnation at the bottom of the technological and income ladder.

Source: Sanjaya Lall (2001): "New Technologies, Competitiveness, and Poverty Reduction," Paper delivered at the Asia-Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, Asian Development Bank, Manila, 5-9 February 2001, p. 14.

3. Conclusion

As noted in the introduction, governments have undertaken, as part of the Millennium Declaration, to develop and implement strategies to give young people a real chance to find decent and productive work. The Heads of State and governments have also resolved to "ensure that the benefits of new technologies, especially information and communication technologies are available to all."¹²⁵

The main aim of this paper has been to show in practical terms how ICT has been used to generate employment for young people in the Asia-Pacific region. The focus has been on identifying best practice examples in relation to five key principles: initiatives involving self-employment and entrepreneurship, the use of public-private partnerships, a focus on the most vulnerable among young people, ways to link informal sector activities with the digital economy, and the participation of young people at the design and implementation stages.

The paper has also sought to balance the optimism of much of the writing on the potential of ICT for generating employment with reference also to the barriers that many developing countries in particular have to address to realise this potential. Innovative bottom-up initiatives show what can be achieved. However, it needs to be acknowledged that stand-alone efforts to tap the potential of ICT are limited in what they can achieve.

For these best practice initiatives to diffuse more widely, they need to be linked to an integrated strategy delivered by governments and the private sector with the support of non-government organisations and international agencies. As noted above, the integrated strategy needs to encompass appropriate infrastructure provision, an adequate skills pool, supportive public policy in general, and financial support for enterprises in particular. Capitalising on the potential of the Internet also requires relevant local content and applications that are suited to the needs and capabilities of most of the country's population.¹²⁶

4. Recommendations

- 4.1 The range of initiatives outlined above shows the potential for ICT to generate employment for young people. However, this potential will not be realised unless a country has a range of supporting strategies in place.
- 4.2 The best practice examples show that ICT offers a number of opportunities for young people to become self-employed or to start up a small enterprise due to the specialist IT skills they are more likely to have. Therefore, young people could be encouraged by governments to view self-employment in ICT related activities as a viable option. This could be done by governments publicising case studies, perhaps on a web site, of

¹²⁵ UN General Assembly (2000): *United Nations Millennium Declaration 55/2* (<http://www.un.org/millennium/declaration/ares552e.htm>), para. 20.

¹²⁶ Accenture, Markle Foundation and the UNDP (2001): *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*, July, (init.org/framework/pages/contents.html).

young self-employed using ICT. These case studies could act as valuable role models for young people, presenting them with an image of success and achievement.¹²⁷

- 4.3 However, other skills are also needed to manage a small business. These include the following: managing cash flow; being able to assess one's strength and ability; learning how to seek information and advice; making decisions; planning one's time and energy; carrying through an agreed responsibility; communicating and negotiating; dealing with people in power and authority; solving problems, resolving conflict; evaluating one's performance; and coping with stress and tension.¹²⁸ Case studies of young people setting up their own enterprises in an ICT-related activity should emphasise the importance of these skills and the obstacles that were encountered.
- 4.4 National or regional competitions are a high profile way of promoting youth enterprises related to ICT. Competitions could be promoted as an opportunity for young women and men to explore and develop a business idea with the assistance of a business adviser or mentor. The competition is likely to generate significant publicity in the media.¹²⁹
- 4.5 Mentor support for starting ICT-related enterprises is a key service that governments or NGOs could organise. The role of the mentor is to offer informal advice and guidance based on relevant business experience. It may also be a means of making it easier for young people to access business networks to obtain other forms of support.¹³⁰
- 4.6 The lack of capital may be a primary constraint on a young people starting and expanding an enterprise. For several possible reasons, young people might face this constraint more than other age groups. It is recommended, therefore, that micro credit programs scrutinise their borrower profile and develop, if necessary, specific measures to make it easier for young people to obtain credit.
- 4.7 According to the UN ICT Taskforce, partnerships between governments and private sector enterprises are emerging as “essential” to enable the transfer of ICT infrastructure and knowledge to developing countries.¹³¹ It is recommended that governments explore the use of public-private partnerships in relation to ICT as the basis for creating/expanding employment opportunities in this area or in providing up-to-date ICT skills.
- 4.8 The UN ICT Taskforce has recommended that the UN and its agencies assist developing countries and regional institutions of developing countries in “building local, national and regional networks of partnerships suited to the demands of their particular challenges.”¹³² One way to assist the process of building networks is to create a web site to post information about case studies of partnership initiatives in different countries and to otherwise assist in the exchange of information.
- 4.9 The principles that govern partnerships between governments and the private sector need to be outlined clearly. It is recommended that the principles underpinning the business arrangements developed by governments and private sector companies to transfer ICT be made transparent and subject to public debate.

¹²⁷ White, S and Kenyon, P. (2001): *Enterprise-Based Youth Employment Policies, Strategies and Programmes*, International Labour Office: Geneva, p. 17.

¹²⁸ OECD (1989): *Towards an enterprising culture—A challenge for education and training*, Organisation for Economic Cooperation & Development: Paris.

¹²⁹ White, S and Kenyon, P. (2001): p. 18.

¹³⁰ *Ibid* p. 24.

¹³¹ UN ICT Task Force (2001): *Report of the Secretary-General: The role of the United Nations in promoting development, ... especially information and communication technologies, ... through partnerships with relevant stakeholders, including the private sector*, E/2001/59, 2 May, para. 70, p. 33.

¹³² UN ICT Taskforce (2001): *ibid*, para. 72, p. 35.

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- 4.10 It is recommended that the business model which is the basis of a partnership between governments and the private sector in relation to ICT should identify and attempt to quantify the public good benefits as well as the private benefits that both parties are seeking to achieve.
- 4.11 It is also recommended that the business models underpinning public-private partnerships should incorporate a strong element of corporate social responsibility and a significant development dimension. Where possible, such business models should explicitly address the needs of the poor.¹³³
- 4.12 The UN ICT Taskforce has recommended that the United Nations undertake an analysis of existing public-private partnerships in ICT to identify the lessons learned in this area to enable their incorporation into any new partnerships. The Taskforce has recommended specifically that mechanisms and tools be developed to “monitor, measure and evaluate the effectiveness of knowledge and technology transfer partnership initiatives in terms of their performance, especially in relation to achieving specific socio-economic goals and targets as defined by the partners.”¹³⁴
- 4.13 The best practice examples have also shown that it is possible through ICT for craft producers in poor and isolated regions to tap directly into regional, national and global markets. It is recommended that case studies of young people in poor and isolated regions selling their wares into larger markets via the Internet be undertaken and publicised by governments, including posting them on a web site. It is further recommended that the case studies identify the obstacles faced and the solutions found.
- 4.14 The participation of young people in the development and implementation of initiatives involving the use of ICT to generate employment is likely to be a key factor in the success of such initiatives. However, it was difficult to find best practice examples of where this has been done successfully. It is recommended that governments encourage young people, through their representative organisations, to participate actively in developing concepts, implementing projects and evaluating the outcomes of ICT-related employment generation initiatives. Information in the form of case studies about the processes for encouraging the participation of young people in public policy formation and implementation should also be made available on web sites.

¹³³ UN ICT Taskforce, 2001, *ibid*, para. 72, p. 34.

¹³⁴ *Ibid*.

Attachment 1: A profile of young people in the Asia-Pacific region

Demography

By the year 2030, it is projected that the proportion of young people in most countries in the region will have declined marginally. Kiribati and Laos will continue to have more than a fifth of their population aged 15 to 24 years. However, the proportion of young people in China and India are projected to fall to 13 and 15 per cent respectively. In Australia, Republic of Korea, Singapore and Japan, young people are likely to be only between 12 and 10 per cent of the total populations in these countries.

The high-income countries Japan, Australia, New Zealand and Singapore have lower proportions of young people aged 15 to 24 years in their total populations compared with the other ILO member countries in the region. These same countries are also forecast to have markedly lower proportions of young people by the year 2030. In Japan and Singapore, it is expected that only 10 per cent of their populations will be in the 15 to 24 age group. This suggests that young people in the high-income countries are not only benefiting from the greater opportunities available in fast growing economies. They are also in a more favourable position compared to earlier age cohorts as there are fewer young people competing for the new jobs being created.

On the other hand, by 2030 young people will continue to represent between a fifth and sixth of the population in low-and middle-income countries, which account for all of the remaining member countries in the region.¹³⁵ Young people in low-and middle-income economies face not only more limited economic opportunities. They also face increasing competition for the fewer jobs and other limited economic opportunities due to the greater absolute numbers of young people in these economies.

Educational attainment

The participation rates of young people in secondary and tertiary education in 1996 for ILO member countries in the Asia-Pacific region are presented in Table A3. Although the information is somewhat dated, the same pattern of differences between countries is still likely to hold. Australia and New Zealand record secondary school participation rates that are notably over 100 per cent. This reflects the inclusion of post school age students still in secondary school. Japan and Korea record full participation at secondary school level. Countries recording over 50 per cent participation of their relevant age population in secondary education are Iran, Philippines, Sri Lanka, Singapore, China, Malaysia, Mongolia, Thailand, and Indonesia.

Table A3 also presents data by country on enrolment in tertiary education. This is expressed as the total number enrolled, regardless of age, as a percentage of the population in the five-year age group following on from the secondary-school leaving age. The countries with more than 20 per cent of their post secondary school age group enrolled in tertiary education are Australia, Korea, New Zealand, Japan, Singapore, Philippines, and Thailand.

¹³⁵ See Table A2 for the classification of countries by gross national income.

Table A1: Young people aged 15 to 24 years in ILO member countries in the Asia-Pacific region, proportion of total population in 1995 and estimated proportion in 2030, actual number of young people in urban and rural areas, 1995.

| | Youth Population (aged 15-24) 1995 | Projected Youth Population 2030 | Urban Population (aged 15-24) 1995 | Rural Population (aged 15-24) 1995 |
|-------------------------|--|--|---|---|
| Country | Proportion of total population (per cent) | | Actual numbers | |
| Afghanistan | 19.90 | 19.20 | 515,209 | 2,199,397 |
| Australia | 14.80 | 12.30 | 2,247,981 | 346,770 |
| Bangladesh | 20.20 | 17.00 | 3,343,173 | 15,713,615 |
| Cambodia | 16.00 | 17.90 | n/a | n/a |
| China | 18.10 | 12.50 | 62,483,161 | 183,436,161 |
| Fiji | 20.20 | 14.70 | 58,301 | 89,043 |
| India | 18.90 | 14.60 | 74,165,000 | 176,452,000 |
| Indonesia | 20.80 | 14.20 | 12,827,620 | 22,227,725 |
| Iran | 19.10 | 18.90 | 6,058,140 | 4,798,023 |
| Japan | 14.90 | 10.20 | 15,361,566 | 3,445,642 |
| Kiribati | na | 32 | na | na |
| Laos | 18.20 | 20.70 | n/a | n/a |
| Malaysia | 18.10 | 14.50 | n/a | n/a |
| Mongolia | 20.90 | 16.40 | 254,400 | 163,400 |
| Myanmar | 20.30 | 15.90 | n/a | n/a |
| Nepal | 18.80 | 19.40 | n/a | n/a |
| New Zealand | 15.50 | 12.90 | 487,980 | 68,115 |
| Pakistan | 18.90 | 19.00 | n/a | n/a |
| Papua New Guinea | 20.40 | 18.80 | n/a | n/a |
| Philippines | 19.90 | 16.20 | 6,282,807 | 6,126,169 |
| Republic of Korea | 18.70 | 11.70 | 6,670,294 | 2,175,011 |
| Singapore | 14.20 | 10.30 | n/a | n/a |
| Solomon Islands | 20.60 | 19.40 | n/a | n/a |
| Sri Lanka | 19.00 | 14.30 | n/a | n/a |
| Thailand | 20.70 | 12.70 | 2,420,100 | 9,039,700 |
| Viet Nam | 20.10 | 13.90 | 2,670,431 | 11,239,841 |
| Total population | | | 195,846,163 | 437,520,612 |

Source: *Youth profiles: Online Research Reference*, United Nations: Division for Social Policy and Development: Gateway to Social Policy and Development: <http://www.un.org/esa/socdev/unyin/wywatch/country.htm>

Table A2: Gross National Income grouping and level of external indebtedness of ILO Asia-Pacific Region countries, according to the World Bank, July 2001

| Economy | Indebtedness¹³⁶ | Heavily indebted poor country |
|--|-----------------------------------|--------------------------------------|
| <i>Low income country: US\$ 755 or less, gross national income (GNI) per capita, 2000</i> | | |
| Afghanistan | Severely indebted | |
| Bangladesh | Moderately indebted | |
| Cambodia | Moderately indebted | |
| India | Less indebted | |
| Indonesia | Severely indebted | |
| Laos | Severely indebted | HIPC |
| Mongolia | Moderately indebted | |
| Myanmar | Severely indebted | HIPC |
| Nepal | Less indebted | |
| Pakistan | Severely indebted | |
| Solomon Islands | Less indebted | |
| Viet Nam | Moderately indebted | HIPC |
| <i>Lower middle income country: US\$ 756- US\$ 2,995, gross national income (GNI) per capita, 2000</i> | | |
| China | Less indebted | |
| Fiji | Less indebted | |
| Iran | Less indebted | |
| Kiribati | Less indebted | |
| Papua New Guinea | Moderately indebted | |
| Philippines | Moderately indebted | |
| Sri Lanka | Less indebted | |
| Thailand | Moderately indebted | |
| <i>Upper middle income country: US\$ 2,996- US\$ 9,265 gross national income (GNI) per capita, 2000</i> | | |
| Korea, Republic of | Less indebted | |
| Malaysia | Moderately indebted | |
| <i>High income country: US\$ 9,266 or more, gross national income (GNI) per capita, 2000</i> | | |
| Australia | Debt not classified | |
| Japan | Debt not classified | |
| New Zealand | Debt not classified | |
| Singapore | Debt not classified | |

Source: World Bank classification of economies,
http://www.worldbank.org/data/datatopic/class.htm#Definitions_of_groups

¹³⁶ The World Bank defines “severely indebted” as either: present value of debt service to GNI exceeds 80 per cent or present value of debt service to exports exceeds 220 per cent. “Moderately indebted” is defined as either of the two key ratios exceeds 60 per cent of, but does not reach, the critical levels. For economies that do not report detailed debt statistics to the World Bank Debtor Reporting System (DRS), present-value calculation is not possible. Instead, the following methodology is used to classify the non-DRS economies. Severely indebted means three of four key ratios (averaged over 1997-99) are above critical levels: debt to GNI (50 per cent); debt to exports (275 per cent); debt service to exports (30 per cent); and interest to exports (20 per cent). Moderately indebted means three of the four key ratios exceed 60 per cent of, but do not reach, the critical levels.

Table A3: Asia-Pacific ILO countries: secondary and tertiary education: population and enrolment ratios, 1996

| ILO country | Secondary school Population (000) | Secondary gross enrolment + (%) | | | Students per 100,000 | Tertiary gross Enrolment * (%) | | |
|----------------------------|-----------------------------------|---------------------------------|------|--------|----------------------|--------------------------------|------|--------|
| | | Total | Male | Female | | Total | Male | Female |
| Afghanistan | 2,389 | 22 | 32 | 12 | ... | ... | ... | ... |
| Australia | 1,538 | 148 | 149 | 148 | 5,682 | 79.8 | 76.9 | 82.9 |
| Bangladesh | ... | ... | ... | ... | ... | ... | ... | ... |
| Cambodia | 1,290 | 24 | 31 | 17 | 85 | 1.2 | 1.9 | 0.5 |
| People's Republic of China | 102,561 | 70 | 74 | 66 | 473 | 5.6 | 7.3 | 3.9 |
| Fiji | ... | ... | ... | ... | ... | ... | ... | ... |
| India | 139,319 | 49 | 59 | 39 | 638 | 6.9 | 8.4 | 5.3 |
| Indonesia | 25,438 | 51 | 55 | 48 | 1,157 | 11.3 | 14.6 | 8.0 |
| Iran, Islamic Republic of | 11,446 | 77 | 81 | 73 | 1,763 | 17.6 | 21.9 | 13.1 |
| Japan | 9,563 | 103 | 103 | 104 | 3,131 | 40.5 | 44.4 | 36.5 |
| Kiribati | ... | ... | ... | ... | ... | ... | ... | ... |
| Lao People's Dem. Rep. | 659 | 28 | 34 | 23 | 260 | 2.8 | 3.9 | 1.7 |
| Malaysia | 3,031 | 64 | 59 | 69 | 1,048 | 11.7 | ... | ... |
| Mongolia | 348 | 56 | 48 | 65 | 1,767 | 17.0 | 10.4 | 23.8 |
| Myanmar | 5,939 | 30 | 29 | 30 | 590 | 5.4 | 4.2 | 6.7 |
| Nepal | 2,652 | 42 | 51 | 33 | 485 | 4.8 | ... | ... |
| New Zealand | 377 | 114 | 111 | 117 | 4,511 | 62.6 | 52.8 | 72.6 |
| Pakistan | ... | ... | ... | ... | ... | ... | ... | ... |
| Papua New Guinea | 561 | 14 | 17 | 11 | 318 | 3.2 | 4.2 | 2.1 |
| Philippines | 6,323 | 77 | 77 | 78 | 2,958 | 29.0 | 25.2 | 32.7 |
| Republic of Korea | 4,573 | 102 | 102 | 102 | 6,106 | 67.7 | 82.0 | 52.4 |
| Singapore | 298 | 74 | ... | ... | 2,730 | 38.5 | ... | ... |
| Solomon Islands | 45 | 17 | 21 | 14 | ... | ... | ... | ... |
| Sri Lanka | 3,092 | 75 | 72 | 78 | 474 | 5.1 | 5.9 | ... |
| Thailand | 6,963 | 56 | ... | ... | 2,252 | 22.1 | ... | ... |
| Viet Nam | 11,712 | 47 | 48 | 46 | 678 | 6.9 | ... | ... |

+ The gross enrolment ratio is the total enrolment in secondary education, regardless of age, divided by the population of the age group which officially corresponds to secondary schooling.

* Total enrolment in tertiary education regardless of age, expressed as a percentage of the population in the five-year age group following on from the secondary-school leaving age.

UNESCO's World Education Indicators, *World Education Report 2000*, Appendix III
<http://www.unesco.org/education/information/wer/htmlENG/tablesmenu.htm>

Table A4: Literacy rate for 15 to 19 year olds, selected ILO Asia-Pacific Region member countries

| | Youth literacy rate | |
|----------------------------|---------------------|------|
| | % ages 15-24 | |
| | 1990 | 1999 |
| Cambodia | 46 | 58 |
| People's Republic of China | 95 | 98 |
| Fiji | 98 | 99 |
| India | 64 | 72 |
| Indonesia | 95 | 98 |
| Korea. | 100 | 100 |
| LAO PDR | 55 | 69 |
| Malaysia | 95 | 97 |
| Mongolia | 70 | 79 |
| Myanmar | 88 | 91 |
| Papua New Guinea | 69 | 75 |
| Philippines | 97 | 99 |
| Thailand | 98 | 99 |
| VIET NAM | 95 | 97 |

Source: World Bank Country tables, <http://www.developmentgoals.org/findout-data.html>.

Table A5: Estimated number of Internet and PC users in ILO Asia-Pacific member countries, specified dates

| Country | Date | Number of internet users | Per 100 inhabitants | Estimated total PCs (000), 1999 | PCs per 100 inhabitants 1999 |
|----------------------------------|--------|--------------------------|---------------------|---------------------------------|------------------------------|
| Australia | Nov-00 | 8.42 million | 43.9 | 7'900 | 41.72 |
| Bangladesh | Jul-00 | 30,000 | 0.0 | 130 | 0.1 |
| Cambodia | 1999 | 4,000 | 0.0 | 13 | 0.11 |
| PEOPLE'S REPUBLIC OF CHINA | Jul-00 | 16.9 million | 1.3 | 15'500 | 1.22 |
| Fiji | Jul-00 | 7,500 | 0.9 | 40 | 4.96 |
| India | Mar-00 | 4.5 million | 0.5 | 3'300 | 0.33 |
| Indonesia | Jul-00 | 400,000 | 0.2 | 1'900 | 0.91 |
| Iran | Jul-00 | 100,000 | 0.2 | 3'500 | 5.58 |
| Japan | Nov-00 | 38.64 million | 30.5 | 36'300 | 28.66 |
| Kiribati | Jul-00 | 1000 | 1.1 | 1 | 1.22 |
| Lao PDR | Jul-00 | 2000 | 0.0 | 12 | 0.23 |
| Malaysia | Jul-00 | 1.5 million | 6.9 | 1'500 | 6.87 |
| Mongolia | Jul-00 | 3000 | 0.1 | 24 | 0.92 |
| Myanmar | Jul-00 | 500 | 0.0 | 50 | 0.11 |
| Nepal | Jul-00 | 35,000 | 0.1 | 60 | 0.27 |
| New Zealand | Nov-00 | 1.49 million | 39.0 | 1'250 | 32.8 |
| Pakistan | May-00 | 1.2 million | 0.9 | 580 | 0.43 |
| PAPUA NEW GUINEA | Jul-00 | 2000 | 0.0 | ... | ... |
| Philippines | Jul-00 | 500,000 | 0.6 | 1'260 | 1.69 |
| Singapore, | Nov-00 | 1.85 million | 44.6 | 1'700 | 43.66 |
| Solomon Islands | Jul-00 | 3000 | 0.6 | 18 | 4.18 |
| Republic of Korea | Oct-00 | 16.4 million | 34.6 | 8'519 | 18.18 |
| Sri Lanka | Jul-00 | 65,000 | 0.3 | 105 | 0.56 |
| Thailand | Mar-00 | 1 million | 1.7 | 1'382 | 2.3 |
| Viet Nam. | Jul-00 | 100,000 | 0.1 | 700 | 0.89 |

Source: *Internet user statistics*, http://www.nua.ie/surveys/how_many_online/asia.html; *PC statistics*, *OECD World Internet Indicators*, <http://www.OECD.org>.

Attachment 2: Definition of information technology and communication

In terms of hardware, ICT refers to a range of manufacturing and service activities. These include the manufacture of computers and equipment, the wholesale trade of computers and equipment, and the retail trade of computers and equipment. It also includes the production of magnetic and optical recording media, electron tubes, printed circuit boards, semiconductors, passive electronic components, industrial instruments for measurement, instruments for measuring electricity and laboratory analytical instruments.¹³⁷

ICT also encompasses the software and related services industries: computer programming services, pre-packaged software, wholesale trade of software, retail trade of software, computer-integrated system design, computer processing, data preparation and information retrieval services, computer services management, computer rental and leasing, as well as computer maintenance and repair.¹³⁸

The third prong to ICT is the communication component or the means of transferring the data from one digital device such as a computer or mobile phone to another digital device. The range of industry sectors involved here includes those involved in equipment manufacture such as those related to routing of network traffic on the Internet. Also included are the service industries such as Internet service providers (ISPs).

¹³⁷ US Department of Commerce (2000): *Digital Economy 2000*, Economics and Statistics Administration, 137 US Department of Commerce (<http://www.ecommerce.gov>), p. 23.

¹³⁸ *Ibid.*

Attachment 3: Recommendations of the High-level Panel of the Youth Employment Network

Recommendation 5: The potential of information and communication technologies

Adopt national strategies to harness the employment generation and welfare-enhancement potential of information and communication technologies (ICT) for the benefit of young women and men by:

1. Giving young people with opportunities to develop ICT literacy through the education system and/or ICT training facilities, and to provide them with affordable access to computers and the Internet;
2. Building the technical ICT skills of young people in collaboration with the ICT industry, educational institutions and other actors to design and accredit culturally relevant and youth-friendly courses;
3. Making the most of opportunities for paid employment and self-employment, and entrepreneurial activities offered by the development of internationally and domestic-oriented ICT industries and the deployment of ICT across different industry groups, paying special attention to the needs of particular groups, including young people with disabilities;
4. Make greater use of both new and traditional information and communication technologies as tools for development and for greater voice and empowerment for all groups of young people in collaboration with employers' organizations, trade unions, ICT service vendors, non-governmental organizations, youth organizations and other national and international partners;
5. Take action to bridge the ICT gender divide within as well as among countries by eradicating factors that restrict equal access to ICT; providing and supporting education and ICT training for both young women and young men; and encouraging young women to participate in the design of the content and modes of use of ICT. In countries where cultural norms and traditions isolate women, maximize the potential of the Internet to provide young women with new means of access to learning and information;
6. Create an enabling environment for ICT diffusion through infrastructure development and appropriate trade and fiscal policies and legislative frameworks, mobilizing domestic and foreign investment;
7. Facilitate and foster community initiatives and partnerships between public, private and multilateral institutions to ensure that actions at the local, national and international levels to bridge the digital divide are mutually reinforcing.¹³⁹

¹³⁹ UN General Assembly (2001, September 28): Recommendations of the High-level Panel of the Youth Employment Network, A/56/422, p. 12.

Attachment 4: Five principles used to identify best practice initiatives using ICT to generate youth employment

Fostering Youth ICT employment through youth entrepreneurship

Youth entrepreneurship will be defined as both for profit and not for profit employment generating activity. This means including information on youth involvement in social entrepreneurship related to the use of ICT. Social entrepreneurship refers to the process of organising, managing and assuming the risks of a business enterprise but in a non profit setting to benefit a particular group or society in general.¹⁴⁰

Youth employment and public-private partnerships

Public-private partnerships refer to collaborative medium-to long-term arrangements involving governments, private enterprises or NGOs. Particular focus is given to the partnerships between high-growth enterprises and government-supported agencies and local NGOs related to ICT employment opportunities.

ICT employment opportunities for vulnerable groups among youth

Vulnerable youth refer to those young people who are having difficulty finding paid work sufficient to support them. This may be due to a lack of education or to other social factors such as their geographical location in rural areas.

Youth employment generation that bridges the gap between the digital economy and the informal sector

What constitutes the informal sector varies greatly from country to country. Many production units in the informal sector consist of subsistence-level activities, motivated by the need for gain a livelihood. In many cases, enterprises in the informal sector are characterised by low levels of income, productivity, skills, technology and capital, and weak linkages with the rest of the economy. However, there are also modern and dynamic segments of the informal sector which do generate growth and jobs, or which are linked to organized and emerging markets in the country or abroad.¹⁴¹

The informal sector can be taken to refer to one of three broad groups: (a) owner-employers of micro enterprises, which employ a few paid workers, with or without apprentices; (b) own-account workers, who own and operate one-person business, who work alone or with the help of unpaid workers, generally family members and apprentices; and (c) dependent workers, paid or unpaid, including wage workers in micro enterprises, unpaid family workers, apprentices, contract labour, home workers and paid domestic workers.¹⁴²

The ILO notes that in the 1990s, own-account and family workers represented one-half of the total non-agricultural labour force in South Asia and one-fourth in East Asia.¹⁴³

¹⁴⁰ The National Center for Social Entrepreneurs, *The definition of a social entrepreneur*, (<http://www.socialentrepreneurs.org/entredf.html>).

¹⁴¹ See The ILO discussion of the informal sector on its web site (<http://www.ilo.org/public/english/employment/skills/informal/who.htm>).

¹⁴² Definition proposed by the ILO/ICFTU international symposium on the informal sector in 1999, see (<http://www.ilo.org/public/english/employment/skills/informal/who.htm>).

¹⁴³ *Ibid.*

Putting young people in charge

Encouraging youth participation in program design and delivery has several benefits. One is the development of programs that tap into the particular ways that young people forge their livelihood. Another benefit from fostering youth participation is to improve the chances of achieving more effective outcomes by giving young people ownership and responsibility for achieving program outcomes.

Young people can be viewed by governments and other agencies as either passive clients of government services passing through a series of developmental stages, as autonomous agents able to shape their own destinies or as constrained decision makers.¹⁴⁴ Obviously, the different starting points offer a fundamentally different approach to the type of policy. The assumption that young people are passive clients is often the most common operating principle. However, this is contrary to evidence that consensual, participatory and transparent processes achieve more effective outcomes.¹⁴⁵

¹⁴⁴ Curtain, R. (2001): "Youth Employment Strategy: a Public Policy Perspective," *Development Studies Bulletin*, No. 55, The Australian National University: Canberra.

¹⁴⁵ World Bank (2000): *World Development Report 2000/2001: Attacking Poverty*, World Bank and Oxford University Press.

Attachment 5: Micro credit and young people

According to a recent ILO's paper, young people's lack of access to finance is a serious cause of vulnerability in the informal economy.¹⁴⁶ The paper also notes that micro finance institutions can help set up sustainable credit guarantee schemes to enable small and medium size enterprises to graduate from informal to formal financing sources.

*Especially for young people, the issue of control over resources is as important as access to finance. It is, therefore, important to consider ways to grant legally enforceable property and contractual rights to the young.*¹⁴⁷

Ways for micro credit programs to reduce its risk exposure in relation to young people need to be developed. One way is offering smaller and more short-term loans. Another suggestion is for micro credit lenders to assess the risk profile of young people in terms of their demonstrated commercial and financial competencies rather than merely age. This could be done through micro credit programs offering training in commercial and financial principles aimed at business start-ups before credit was offered. Guarantees for the loan could be eased based on a young person's demonstrated competence.

This is the approach used by the Youth Enterprise Fund, a Commonwealth Youth Credit Initiative, in a number of Commonwealth countries through its regional centres in Africa, Asia, the Caribbean and the Pacific. The Fund's partner NGO, the International Centre for Career and Entrepreneurship Development provided training programs before offering loans to young people in urban, rural and tribal areas. By March 2000, the Youth Enterprise Fund in Asia had made over 1,000 loans, with a recovery rate of over 85 per cent. Over 800 enterprises had been set up, and about half the people granted loans were women. The estimated success rate of businesses in the scheme is 80 per cent, compared with a 10 per cent for normal businesses in poorer Commonwealth countries. The success of this model has proved that young people with appropriate training and access to credit can set up their own businesses.

Ways to help ensure the success of micro credit programs

- ❑ Provision of a range of financial services tailored to the needs of the client base being targeted.
- ❑ A strong outreach approach is needed to attract young micro-entrepreneurs. The most successful micro credit programs in developing countries are said to go literally from door-to-door to gain recruits.
- ❑ Loan applicants also need "small business management" skills such as preparing a simple business plan and put in place simple system to manage finance matters. Education services may be needed to provide these skills. Other support services needed such as assistance with identifying and gaining access to new markets. These support services may need to be funded separately.
- ❑ Efficiency needs to be a central focus. Overhead costs of the loan administrators need to be kept low as a key element in achieving self-sufficiency. Systems are needed which are based on stringent operating standards regarding overhead costs per loan, the number of loans disbursed per staff member and the time it takes for a borrower to receive funds. Rigorous standards also need to be used for benchmarks to evaluate

¹⁴⁶ ILO (2001): *Meeting the Youth Employment Challenge: a Guide for Employers*, International Labour Office: Geneva, p. 38.

¹⁴⁷ ILO. (2001): *Generating decent work for young people: An Issues Paper prepared for the Secretary-General's Youth Employment Network*, p. 7.

organisational performance and make funding decisions.

- ❑ Micro credit loan administrators also need effective information systems for monitoring borrowers and sanctioning defaulters. Some micro credit programs have a policy of “zero tolerance” for defaulters. They do this by tracking defaulters closely, sometimes on daily basis, and cutting access to supporting services for borrowers who fail to repay on time. This is an essential element in sending the right signals to borrowers to help maintain their motivation.
- ❑ Innovation needs to be fostered through experimentation and exchange of experiences. This can lead to new financial products for which the “core” poor are willing and able to pay relatively high charges. Alternatively, it should also be possible to find cheaper ways to deliver financial services to poor clients.
- ❑ If governments are involved, for example as loan guarantors of subsidisers of interest rates, an arms-length relationship is needed between the micro credit lending agency and government. This arms-length relationship needs to be based on explicit criteria and forms of accountability and conducted in a clearly transparent manner. The same standards should also apply to relations between an international donor NGO and the local micro credit lender.
- ❑ Facilitating and mobilising household savings should also be part of micro credit arrangements to help achieve financial viability. This may require formal links to chartered banks to provide government regulated security.

Sources: Bhatt, N. Painter, G. and Shui-Yan Tang. (1999): “Can microcredit work in the United States?,” *Harvard Business Review*, November-December, pp. 26-27, Morduch, J. (2000): “The microfinance schism,” *World Development*, Vol. 28, No. 4, pp. 617-629.

Attachment 6: ICT in the Asia-Pacific region

Hardware

In terms of ICT hardware, a number of Asian countries are world leaders. Asian countries in 1999 accounted for the top five positions in the world's production. These are Japan, Taiwan Province of China, Singapore, China, and Republic of Korea. Together they produced \$110 billion worth of computer hardware compared with the \$95 billion produced by the USA. Also Asia growth in output of computer hardware is growing at a faster rate than that of the USA: 8 per cent versus 5 per cent between 1998 and 1999.¹⁴⁸

The Philippines is also a significant producer of computer hardware. In 1999, electronics exports accounted for more than 60 per cent of total exports from the Philippines. This was a marked increase from 20 per cent of total exports in 1988.¹⁴⁹ South Korea's Samsung Electronics, for example, is at the forefront of developments in relation to computer memory chips, digital appliances such as mini computers and the latest generation of mobile phones.¹⁵⁰

Software

The outstanding success story in the Asia-Pacific region in relation to computer software is India. In the five years to 2000, Indian software exports grew from US\$ 50 million to US\$ 4 billion.¹⁵¹ Market capitalisation of listed software companies in India was estimated to stand at US\$55 billion on June 2000. More than 90 per cent of India's top 300 software firms have achieved internationally recognised quality standards.¹⁵² More than 185 of the Fortune 500 companies outsource their software requirements from Indian software producers.¹⁵³ The industry contributed some 20 per cent to the growth of the Indian economy in 2000, although it only accounted for 2 per cent of GDP.¹⁵⁴

The Indian software industry began with a focus on "data entry" or "data processing". The industry then moved into high-end data entry and processing jobs like digitisation of maps, objects, records, etc. However, as lower cost options from countries in the Caribbean, Philippines, Thailand and others emerged, Indian companies withdraw from this work. From the mid 1990s, Indian software companies became "specialities" oriented with a strong focus on specific segments of software development. Nearly two-thirds of Indian software companies are now engaged in developing end-user application products and services ranging from straightforward accounting systems to specialised niche market products or customised services. The remaining companies obtain their revenues from consultancy, systems integration and the supply of specialised software systems such as software tools, communications software and software for dedicated hardware devices.¹⁵⁵

Access to ICT services

Access to ICT in the form of computers, the Internet and telephones is much easier in high-income countries. However, for middle-and even low-income countries in the Asia-Pacific region, ICT access is improving rapidly. In relation to the Internet, one "educated guess" as to

¹⁴⁸ Rohwer, J. (2001): *Remade in America: How Asia Will Change Because America Boomed*, John Wiley and Sons (Asia): Singapore, p. 211.

¹⁴⁹ *Ibid*,

¹⁵⁰ *Ibid*,

¹⁵¹ *The Economic Times* (India). (2001): "Software amongst fastest growing sectors in economy," February 24 (<http://www.economictimes.com/Budgetcountdown/survey23.htm>).

¹⁵² Rohwer, J. (2001): p. 251.

¹⁵³ *The Economic Times*, (2001).

¹⁵⁴ Rohwer, J. (2001): p. 254.

¹⁵⁵ Sundaram, Vasanti (1998): "India: The Emerging Software Superpower," *The International Indian*, Vol. 6, 6 Nov-Dec (<http://www.intindian.com/Vol6-6/software.htm>).

how many are online worldwide as of November 2000 is 407.1 million. This consists of the following region distribution.

Table A3.1: Internet users, estimated, November, 2000

| Region | Internet users Million | Per cent |
|----------------|---------------------------|----------|
| Africa | 3.11 | 0.8 |
| Asia/Pacific | 104.88 | 25.8 |
| Europe | 113.14 | 27.8 |
| Middle East | 2.4 | 0.6 |
| Canada and USA | 167.12 | 41.1 |
| Latin America | 16.45 | 4.0 |
| World Total | 407.1 | 100.0 |

Source: Nua Internet Surveys (http://www.nua.ie/surveys/how_many_online/index.html).

It has been predicted that by 2003 Asia-Pacific will have more Internet users than either the United States or Western Europe. Dataquest forecasts that the Asia-Pacific region, including Japan, will have 183.3 million subscribers in 2004, while the US will have 162.8 million and Western Europe 162.2 million.¹⁵⁶ In mid 2000, one estimate puts the number of Internet users at about 95 million in the region. Japan (38.6 million), South Korea (16.4 million), China (16.9 million), Australia (8.4m) and India (4.5 million) have the largest concentration of Internet users (see Table A5). In terms of computers per 100 inhabitants, the countries with the most access to computers, based on 1999 data, are Singapore and Australia (44 and 42 per 100 respectively), New Zealand (33 per 100), Japan (29 per 100) and South Korea (18 per 100).

¹⁵⁶ Dataquest, 2001, "Asia to become largest Net market," August 7, <http://technology.scmp.com/internet/ZZZWAX4ZXPC.html>

Attachment 7: Basic preconditions for an ICT strategy

A report published in July 2001 for The Digital Opportunity Initiative by United Nations Development Programme (UNDP) has emphasised five key strategic elements that need to be addressed for countries to develop successful ICT strategies.¹⁵⁷ These relate to infrastructure, human capacity, public policy, enterprises, content, and applications.

Importance of appropriate infrastructure

Infrastructure refers to the means through which ICT networks operate. A reliable, and affordable telecommunications and electrical power infrastructure is an important precondition for the use of ICT to generate employment opportunities. Another important aspect of the infrastructure is the capacity to provide reasonable coverage of the population or at least to offer good prospects for expanding this coverage.

The rapidly declining costs for telecommunication technologies may make it possible to allow developing countries to leapfrog ahead by using cutting-edge technologies. In Botswana, for example, the information network is based on an all-digital microwave and fibre-optic system with digital exchanges at the main centres. The involvement of the private sector has hastened the adoption of these technologies, particularly in the case of wireless and mobile.¹⁵⁸

Importance of human capacity

The human capacity element involves building up a critical mass of knowledge workers, increasing technical skills among computer users and strengthening local entrepreneurial and managerial capabilities. It has been noted that that high school age students aged 14-18 can do excellent software work in some cases, so an intense educational program started now could yield results in a few years--perhaps faster than many equivalent investments in agriculture or manufacturing.¹⁵⁹

At a more sophisticated level, a core of professionals with the technical capabilities to maintain ICT infrastructure and related ICT services and to adapt new technologies for local requirements is also needed. Development of this core of professional expertise requires that tertiary institutions have relevant educational curricula. It may also require creating new educational facilities with specific emphasis on ICT skill development.¹⁶⁰ The “brain drain” may also be a problem that has to be addressed for those with ICT skills in demand. Also needed to generate employment from ICT is a critical mass of motivated entrepreneurs who can leverage new opportunities.

The importance of supportive public policy

The use of ICT to generate employment opportunities also requires supporting policies from government. At one level, this involves a regulatory environment which promotes fair and open competition. At another level, it involves strengthening government’s capacity to implement and enforce policies.¹⁶¹ The Indian Ministry of Information sees its main function as being more of an enabler rather than an merely an enforcer of regulations or receiver of fees through licences.¹⁶²

¹⁵⁷ Accenture, Markle Foundation and the UNDP (2001): *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*, July (init.org/framework/pages/contents.html).

¹⁵⁸ Accenture, Markle Foundation and the UNDP (2001): para. 3.1.1.

¹⁵⁹ Posting, Openeconomies mailing list, James F. Moore, Senior Fellow, Berkman Center for Internet and Society, Harvard Law School.

¹⁶⁰ Accenture, Markle Foundation and the UNDP (2001): para. 3.

¹⁶¹ *Ibid.*

¹⁶² UN (2000): *World Economic and Social Survey 2000*, p. 204.

In relation to enterprises, policies are needed which improve access to financial capital, make it easier to sell products or services to global and local markets, backed by enforcing appropriate tax and property rights regulations. In the case of India, the government encouraged the formation of private Internet service providers by not requiring ISPs to pay any licence fees. The government also lowered the price of access to core transmission service (bandwidth) and invited private companies to set up their own international gateways in competition with the state owned long distance telephone company.¹⁶³ The Indian government also made it easy to set up foreign venture capital funds and only required them to pay a single 20 per cent tax on income distributed as dividends.¹⁶⁴ Other forms of government include use of ICT in its own processes. In South Africa, the government used electronic tenders to carry out their public procurement function and this in turn helped to generate a range of other employment related ICT developments.¹⁶⁵

The importance of a supportive framework for enterprises

Access to credit and financing is a basic requirement for enterprises seeking to create employment opportunities from ICT. Availability of sources of capital through banking (including micro finance and venture capital) need to be part of an operating environment that supports the enterprises at start-up and expansion stages. Business incubators may also be needed to provide a supportive role for fledging enterprises.

The importance of local content and applications

The final element that in a comprehensive strategy is the availability of information that is relevant to the needs of local people in a language that is commonly understood. The information also needs to be in a form that can be easily used by most people. For example, in many developing countries, access problems can arise because standard fonts for local languages are unavailable.

¹⁶³ *Ibid.*

¹⁶⁴ *Ibid.*

¹⁶⁵ Accenture, Markle Foundation and the UNDP (2001): para. 3.

References

Accenture, Markle Foundation and the UNDP, 2001, *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*. <http://www.opt-init.org/framework/>

Ashley, C; Roe, D & Goodwin, H, 2001, *Pro-Poor Tourism Strategies: Making Tourism Work For The Poor a review of experience*. Pro-Poor Tourism Report No. 1. April 2001, <http://www.propoortourism.org.uk/>

Bhatt, N; Painter, G; and Shui-Yan Tang, 1999, 'Can microcredit work in the United States?', *Harvard Business Review*, November-December, p26-27.

Canadian International Development Agency (CIDA), 2000, Grameen Telecom's Village Phone Programme in Rural Bangladesh: a Multi-Media Case Study Final Report, www.telecommons.com/villagephone/finalreport.pdf.

Curtain, R, 2000, "Identifying the Basis for a Youth Employment Strategy Aimed at Transitional and Developing Countries", commissioned by the United Nations Social Development Division <http://www.un.org/esa/socdev/youthemployment/research.html>

----- 2001, 'Youth Employment Strategy: a Public Policy Perspective', *Development Studies Bulletin, No 55*, The Australian National University, Canberra.

Hafkin, N & Taggart, N 2001, *Gender, Information Technology, and Developing Countries: An Analytic Study*. For the Office of Women in Development, Bureau for Global Programs, Field Support and Research, United States Agency for International Development, June, <http://www.usaid.gov/wid/pubs/it01.htm>

ILO, 2001, Generating decent work for young people: An Issues Paper, prepared for the Secretary-General's Youth Employment Network,. www.un.org/esa/socdev/youthemployment/

ILO, 2001, Meeting the Youth Employment Challenge: a Guide for Employers. International Labour Office, Geneva.

ILO, 2001, *World Employment Report 2001: Life at Work in the Information Economy*. Geneva.

Isham, J., D. Kaufmann, and L. Pritchett. 1997. 'Civil Liberties, Democracy, and the Performance of Government Projects', *World Bank Economic Review* 11(2), 219- 42.

Jensen, M & Esterhuysen, A; 2001, *The community telecentre Cookbook for Africa Recipes for self-sustainability: How to Establish a Multi-purpose Community Telecentre in Africa*. UNESCO, Paris. <http://unesdoc.unesco.org/images/0012/001230/123004e.pdf>

Kenyon, P and White, S; 2001, *Enterprise-based youth employment policies, strategies and programmes*. International Labour Office, Geneva,. www.ilo.org/public/english/employment/skills/youth/publ/

Khurshid, A & Ghani, J; 2001, 'Lahore: A public-private partnership to enter the global IT market', Background paper, World Employment Report 2001. Geneva

Larance, L; 1998, 'Building Social Capital from the Center: A Village-Level Investigation of Bangladesh's Grameen Bank', Washington University, St Louis, Missouri

Lovering, D; 2001, 'Taming the killing fields of Laos', *Scientific American*, August, pp 56-60.

-
- McConnell International, 2001, *Ready? Net. Go! Partnerships Leading the Global Economy*. May, <http://www.mcconnellinternational.com/ereadiness/ereadinessreport2.htm>
- Mitter, S and J. Millar, 2001, 'The impact of ICT on the spatial division of labour in the service sector', Background Paper for the World Employment Report 2001, ILO, Geneva.
- Morduch, J; 2000, 'The microfinance schism', *World Development* Vol 28, No 4, pp 617-629.
- Narayan, D, Chambers, R; Kaul Shah, M and Petesch,P; 2000, *Voices of the Poor: Crying Out for Change*. World Bank and Oxford University Press, New York.
- OECD, 2001, *Putting the Young in Business: Policy Challenges for Entrepreneurship*. Organisation for Economic Development & Cooperation, Paris.
- OECD, 2001, *Understanding The Digital Divide*. Organisation for Economic Development & Cooperation, Paris.
- Prahalad, C K; 2000, 'Let 's focus on the digital dividend: Conventional mental models may be an impediment to the diffusion of internet benefits to poorer countries', *European Business Forum* http://www.ebfonline.com/at_forum/at_forum.asp?linked=32&id=26
- Rohwer, J; 2001, *Remade in America: how Asia will Change Because America Boomed*. John Wiley and Sons (Asia), Singapore.
- Stiglitz, J; 1999, 'Participation and development: perspectives from the comprehensive development paradigm', The World Bank, February 27, Seoul, Korea.
www.worldbank.org/cdf/speeches.htm
- The Digital Opportunity Task Force (DOT Force), 2001, *Digital Opportunities for All: Meeting the Challenge: including a Proposal for a Genoa Plan of Action*. May 11, Genoa.
<http://www.dotforce.org/reports/>
- The National Center for Social Entrepreneurs, 'The definition of a social entrepreneur',
<http://www.socialentrepreneurs.org/entredef.html>
- UK Treasury, 2000, *Public Private Partnerships: The Government's Approach*.
<http://www.hm-treasury.gov.uk/mediastore/otherfiles/80.pdf>
- UN General Assembly, 2000, United Nations Millennium Declaration 55/2.
<http://www.un.org/millennium/declaration/ares552e.htm>
- UN ICT Task Force, 2001, Report of the Secretary-General: *The role of the United Nations in promoting development, ...especially information and communication technologies, ...through partnerships with relevant stakeholders, including the private sector*. E/2001/59,
<http://www.dotforce.org/reports/>
- UN, 2001, 'Recommendations of the High-level Panel of the Youth Employment Network' General Assembly of the United Nations, 28 September, A/56/422,
<http://www.un.org/esa/socdev/youthemployment/>
- UN, n.d. Youth Participation Manual. & Youth Policy Formulation Manual. Human Resources Development Section, Social Development Division, United Nations, Economic and Social Commission for Asia & the Pacific.
- UNDP, 2001, *Human Development Report 2001: Making new technologies work for human development*. Oxford University Press, for the United Nations Development Programme, New York.

UNESCO, 2000, *World Education Report 2000*. Appendix III,
<http://www.unesco.org/education/information/wer/htmlENG/tablesmenu.htm>

US Department of Commerce, 2000, *Digital Economy 2000*. Economics and Statistics
Administration, US Department of Commerce, Washington. <http://www.ecommerce.gov>

van Bastelaer, T, 2000, 'Imperfect information, social capital and the poor's access to credit'
Center for Institutional Reform and the Informal Sector, University of Maryland, College Park,
Working Paper No. 234, <http://www.iris.umd.edu/publications/detail.asp?ID=wp&number=234>

World Bank, 2000, *World Development Report 2000/2001: Attacking Poverty*. World Bank and
Oxford University Press, New York.