Summary

Regional Human Development Report

Promoting ICT for Human Development in Asia 2004:

Realising the Millennium Development Goals

Published for the United Nations Development Programme

ELSEVIER
A Division of Reed Elsevier India Pvt. Ltd.
2004

Published By:

ELSEVIER
A division of
Reed Elsevier India Private Limited
17A/1, Lajpat Nagar IV,
New Delhi-110024

Telephone: 91-11-26447160
Fascimile: 91-11-26447156
Website: www.elsevierhealth.com

ISBN: 81-8147-329-9

Mosby, Churchill Livingstone, Saunders, Butterworth Heinemann and Hanley & Belfus are the Health Science Imprints of Elsevier.

Printed and bound in India by Rakmo Press Pvt. Ltd.

Foreword

Communications for Goodness' Sake

Sir Arthur C. Clarke

Mine was the first household in Sri Lanka to have a working television set — two years before my adopted country commenced terrestrial transmissions in 1979. The Indian Space Research Organisation (ISRO) donated a 5-metre dish antenna that enabled me to receive signals from communications satellites placed over the Indian Ocean. It was a crowd-puller for several weeks: everyone from cabinet ministers and civil servants to school children wanted to see pictures coming in from the skies.

Today, television rules how Sri Lankans work, dine and socialise. And when an important cricket match is being broadcast live, I have to look hard to find any signs of life on the streets of Colombo.

Even if the novelty of images from the skies has completely worn off, debates on their social and cultural impact continue. In the early days, I was often approached by people who were concerned about what satellite television might do to local cultures, traditions and values. Some of us who suffer from information overload find it difficult to imagine its even deadlier opposite: information starvation. I get annoyed when I hear arguments — usually from people who have been educated beyond their intelligence — about the virtues of keeping happy, backward people in perpetual ignorance. Such an attitude seems like that of a fat man preaching the virtues of fasting to a starving beggar.

Every TV programme has some education content: the cathode ray tube (and now the plasma screen!) is a window on the world; indeed, on many worlds. Often it's a very murky window, but I've come to the conclusion that, on balance, even bad TV is preferable to no TV at all.

In the mid 1970s, I was associated with the world's first systematic attempt to transmit educational television programming directly to villages. The Satellite Instructional Television Experiment (SITE) involved 2,400 villages in six Indian states, and used a leased American communications satellite to beam television programmes carrying information on family planning, crop production, healthy living and other practical matters that can raise the quality of life — and often save lives.

Working with the indefatigable Dr Yash Pal and his dynamic team gave me valuable insights on how developments in communications can produce tangible benefits for large numbers of ordinary people. Soon after SITE ended, I wrote, "One of the most magical moments in Satyajit Ray's exquisite 'Pather Panchali' is when the little boy Apu hears for the first time the aeolian music of the telegraph wires on the windy plain. Soon, those wires will have gone forever; but a new generation of Apus will be watching, wide-eyed, when the science of a later age draws down pictures from the sky — and opens up for all the children of India a window on the world."

Those experiments with the 'schoolmaster satellite' now seem to belong to a completely different age. Much has happened since, particularly in the 1990s when commercial satellite television proliferated, opening up fierce competition in the skies over India. Many millions of dishes have bloomed across the subcontinent, and tens of millions of modern-day Apus are now growing up taking satellite television, mobile phones and internet for granted.

But we have to acknowledge that the communications revolution has bypassed tens of millions of others in many parts of the world. We are reaching the point in our technological evolution when we can — and must — commit more time and resources to solving the problems of poverty, deprivation and inequality.

I discussed some of these concerns while addressing the UN General Assembly 20 years ago, during the World Telecommunications Year 1983. I suggested that the 'A telephone in every village' would be one of the most effective social stimulants in history, because of its implications for health, weather forecasting, market information, social integration and human welfare. I added, "Each new telephone installation would probably pay for itself, in hard cash, within a few months. I would like to see a cost-effectiveness study of rural telephone systems for the developing countries of Asia, Africa and Latin America. But the financial benefits, important though they are, might be insignificant compared with the social ones."

When I spoke my mind from that famous podium in New York, I did not imagine how quickly my words would be illustrated by actual developments. Just as satellite television swept across the globe during the 1980s, the internet spread rapidly in the 1990s. Virtually everything we wish to do in the field of communications is now technologically possible. The key limitations are financial, legal, social and political. In time, I am sure, most of these will also disappear, leaving us with only limitations imposed by our own morality.

And making the right choices and investments is indeed a hard task. There is a danger that technological tools can distort priorities and mesmerise decision-makers into believing that gadgets can fix all problems. A computer in every classroom is a noble goal — provided there *is* a physical classroom in the first place. A multimedia computer with internet connectivity is of little use in a school with leaking roofs — *or no roof at all*. The top priorities in such cases are to have the basic infrastructure and adequate number of teachers — that highly under-rated, and all too often underpaid, multimedia resource.

We must therefore take a few steps back from the digital hype and first try to bridge the 'Analog Divide' (to coin a phrase) that has for so long affected the less endowed communities in developing countries (and even in some developed ones). Information and Communications Technologies (ICTs) should be part of the solution, not the *only* solution.

We need to ensure that ICTs are not only accessible but are also *affordable*. I have seen how some Sri Lankan schools have all the hardware and software and yet can't use the internet — because they can't afford the phone bill. I was appalled to hear some years ago that about a third of transistor radios in the developing world are not used — because their owners can't buy new batteries. (This inspired British inventor Trevor Bailey to develop the wind-up radio).

Our big challenge, therefore, is to get ICTs to solve real life problems without creating any new ones. In the early part of the last century, Mahatma Gandhi proposed a simple test for the effectiveness of any development activity: find out how the last man would be affected by it. We should adapt this as a test for ICTs in development: how will the last man, woman and child be reached, touched and transformed by these marvellous communication tools?

This Regional Human Development Report is a pioneering attempt to examine how ICTs can be used effectively to bring about such development and social change. It is no coincidence that it covers the Asia Pacific region — home to the world's largest television audience, and where mobile phones and personal computers are among the fastest selling consumer electronic products. Using the United Nations' eight Millennium Development Goals as a benchmark, the Report presents the experience of nine Asian countries.

There is no single formula for success; each country has to define what works best within the range of options and technologies available. Such decisions and choices have to be made quickly and resolutely as the development needs are vast and urgent.

The information age has been driven and dominated by technopreneurs — a small army of 'geeks' who have reshaped our world faster than any political leader has ever done. *And that was the easy part*. As this Report shows, we now have to apply these technologies for saving lives, improving livelihoods and lifting millions of people out of squalor, misery and suffering.

In short, the time has come to move our focus from the geeks to the meek.

Sir Arthur C. Clarke
Colombo, Sri Lanka
12 November 2003

[The world's best known writer of science fiction, Sir Arthur C Clarke has long advocated the appropriate use of information and communications technologies for development. He was the first to propose the concept of the geostationary communications satellite in 1945, and one of his short stories inspired the World Wide Web. He has lived in Sri Lanka since 1956 and was until recently Chancellor of the country's MIT — the University of Moratuwa.]

Preface

The Regional Human Development Report on *Promoting ICT for Human Development: Realising the Millennium Development Goals*, is a first time attempt to systematically assess the role and impact of information and communication technologies (ICTs) on human development in Asia. Initiated jointly by UNDP's Asia-Pacific Development Information Programme (APDIP) and Asia-Pacific Regional Human Development Reports Initiative (APRI), the Report makes a significant contribution to our understanding of the potential and challenges of using ICTs to achieve human development goals. The Report covers nine countries in Asia: China, India, Indonesia, Malaysia, Mongolia, Pakistan, Sri Lanka, Thailand and Viet Nam.

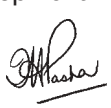
This timely effort comes in the wake of an increasing global acceptance of ICT as a tool to fight poverty, especially in the developing world. Ambitious ICTs infrastructure initiatives and development strategies and programmes on ICT are being widely launched across Asia. While the advantages of ICT for development are enormous and rightly acknowledged, it has become equally imperative to recognise that benefits of ICTs are not evenly distributed. Many sections of societies in developing countries of Asia have been barely touched by the opportunities of the information age. It is this digital divide that needs to be urgently bridged today. The gap in opportunities occurring across and within countries due to differences in starting points, inaccessibility to technology and knowledge exchange, lack of infrastructure and inhibiting social and cultural factors, needs to be overcome. There is also the gap in relevant content that addresses the concerns of the worst off.

This Regional HDR is a major step towards bringing this to the centre of the development debate. The Report's unique approach lies in its use of the Millennium Development Goals (MDGs) to measure and monitor the impact of ICTs on human development. Its comparative study across the nine countries in Asia highlights both qualitative and quantitative linkages between ICTs and human development and the channels through which the linkage effects occur.

The Report provides a clear documentation of the different levels of achievement of human development from the perspective of the MDGs and effective ICT use towards achieving them in the nine countries of Asia. Country-specific experiences, and cross-country comparisons capture the rich variety of ICT initiatives in the region, as well as their successes and failures. Conscious efforts are needed to level playing fields for harnessing the use of ICT for human development in the region.

The possibilities of using ICT towards realising MDGs are numerous. A future in the information and communications age that not only includes the poor, but also provides them with increasing opportunities and choices for a better life, however, will not occur automatically. The role of governments will continue to be central in deployment and facilitation of ICT initiatives. Civil society groups are emerging as important stakeholders, particularly to complement the efforts of governments. The trend of deregulation of ICT industries is also increasing the role of industry in ICT. The challenge is to channel this for human development initiatives. Effective partnerships among stakeholders, as the Report emphasises, is also key to any successful ICT initiative towards human development. ICT is only a tool. The success of harnessing this tool effectively is dependent on the commitment of the stakeholders to the realisation of the MDGs.

The battle for poverty and MDGs will be won or lost in parts of Asia and sub-Saharan Africa. This report, therefore, is a timely analysis on the potentials of ICT as a tool and the role it can play in achieving these goals and enhancing human development.



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UN Assistant Secretary General
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Abbreviations

ABU- Asia Pacific Broadcasting Union

ANM- Auxiliary Nurse Midwives

ARBEC- Asean Review of Biodiversity and Environmental Conservation

ATIP- Asia Technology Information Programme

BNRP- Bapedal Network Regional Project

CCTV- China's Central Television

CENWOR- Centre for Women's Research

CGIAR- Consultative Group of International Agricultural Research

CIS- Commonwealth of Independent States

DOT Force- Digital Opportunities Task Force

DOTS- Directly Observed Treatment Short-course

EDI- Electronic Data Interchange

EDIFACT- EDI For Administration, Commerce and Transport

EIMIS- Environmental Impact Management Information System

ESCAP- Economic and Social Commission for the Asia and the Pacific

FAO- Food and Agricultural Organisation

FIVIMS- Food Insecurity and Vulnerability Information and Mapping Systems

GDI- Gender-related Development Index

GDLN- Global Distance Learning Network

GDP- Gross Domestic Product

GEM- Gender Empowerment Measure

GIS- Geographic Information System

GPPN- Global Public Policy Network

HDI- Human Development Index

HDR- Human Development Report

HPC- High Performance Computing

HPI- Human Poverty Index

ICT- Information and Communication Technology

IMR- Infant Mortality Rate

ISP- Internet Service Provider

ISRO- Indian Space Research Organisation

ITU- International Telecommunication Union

IWMI- International Water Management Institute

KMVS- Kutch Mahila Vikas Sanghtan

LAN- Local Area Network

MDG- Millennium Development Goal

NARC- National Agricultural Research Centre

NEQS- National Environmental Quality Standards

NRI- Network Readiness Index

OECD- Organisation for Economic Co-operation and Development

OPP- Orangi Pilot Project

PDA- Population and Community Development Association

PEN- Pakistan Education Network

PHIMS- Perinatal HIV Implementing Monitoring System

RHDR- Regional Human Development Report

SAR- Special Administrative Region

SDNP- Sustainable Development Networking Programme

SKS- Swayam Krishi Sangam

SLPA- Sri Lanka Ports Authority

SMART- Self-Monitoring And Reporting Tool

TAI- Technology Achievement Index

TB- Tuberculosis

TM- Thematic Map

TPCPC- Telecommunications Posts Cultural Point for Communes

U5MR- Under 5 Mortality Rate

UN- United Nations

UNCSTD- United Nations Commission on Science and Technology for Development

UNDP- United Nations Development Programme

UNEP- United Nations Environment Programme

UNESCO- United Nations Educational, Scientific and Cultural Organisation

WHO- World Health Organisation

WWF- World Wide Fund for Nature

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Production and Design Elsevier, A division of Reed Elsevier India Pvt. Ltd.

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Contents

Sections

List of Tables

List of Figures

List of Boxes

Appendices

Country Fact Sheets

1 Introduction

This Summary document on the Regional Human Development Report (RHDR), *Promoting ICT for Human Development in Asia: Realising the Millennium Development Goals,* presents the essence of a pioneering attempt to assess the role of Information and Communication Technologies (ICTs) in Human Development in Asia. The objectives of the Report are to:

- explore the relationship between ICT and human development using the framework of the Millennium Development Goals (MDGs);
- assess status of ICT use and diffusion in Asia and map the region's experiences in harnessing these technologies for human development;
- identify relevant ICT indicators that can be used to quantify ICT-MDG correlates to construct composite indices that could help in ranking countries;
- recognise and identify limitations of ICT in furthering human development, including the challenges of the digital divide;
- draw lessons from multi-country experiences for identifying policy directions.

There has been much hype surrounding the potential and promise of ICT for developing countries. The study underlines the need to go beyond the mere promise of these technologies by mapping concrete Asian initiatives to harness ICT for human development. Nine detailed country studies (Table 1.1), commissioned exclusively for this project, were prepared by teams of experts. The nine countries — China, India, Indonesia, Malaysia, Mongolia, Pakistan, Sri Lanka, Thailand and Viet Nam — are spread over the three distinct sub-regions of South Asia, South East Asia and East Asia, providing a rich and diverse canvas. Each country study provides extensive qualitative documentation on the specific uses of ICT across the MDGs for promoting human development.

A separate statistical exercise, aimed at identifying key ICT indicators relevant to and available for Asia, was undertaken to complement the country studies. Indicators were selected for combining such data on ICT as could help in formulating composite aggregate indices to help capture quantitatively the overall ICT for human development situation in individual countries. The findings of the RHDR are thus informed by an interesting combination of a qualitative analysis from the nine countries and a quantitative exploration.

According to the UNDP definition, ICTs are basically information-handling tools — a varied set of goods, applications and services that are used to produce, store, process, distribute and

Table 1.1 *Countries covered by the Regional Human Development Report*

Region	Countries	Number
South Asia	India, Pakistan and Sri Lanka	3
South East Asia	Indonesia, Malaysia, Thailand and Viet Nam	4
East Asia	China and Mongolia	2
Asia		**9**

exchange information. They include the 'old' tools such as of radio, television and telephone, as well as the 'new' ICTs of computers, satellite and wireless technology and the internet.[1] The older technologies make fewer demands on user skills and are considered to be 'skill independent', while the newer technologies are far more 'skill dependent' since users need more education or training for their applications. The nine country studies have placed far more emphasis on newer technologies than on the old. This is not so much because the former are seen to have greater future potential in the information age, as it is due to their diffusion among the disadvantaged sections is more difficult, needing a coherent policy environment complemented by effective partnerships among public and private sectors and the society.

Over the past two centuries many parts of the world have witnessed unprecedented economic growth and raise in living standards. Yet, the transformation from subsistence to affluence has been far from uniform. The human development record in large parts of the developing world continues to show a persistence of poverty, hunger and malnutrition, illhealth and disease, illiteracy and unequal access to skills and knowledge. Unequal opportunities have severely restricted the choices for large sections of the population such as women, the poor and indigenous peoples. Moreover, affluence has brought new concerns regarding lifestyle-related health issues, environment and intergenerational sustainability.

The world continues to face unacceptable levels of deprivation (UNDP 2001). Of the 4.6 billion people in developing countries, more than 850 million are illiterate, nearly a billion lack access to improved water sources, and 2.4 billion lack access to basic sanitation. Nearly 325 million boys and girls are out of school while 11 million children under age five die each year from preventable causes — equivalent to more than 30,000 children a day (WHO 1997). Moreover, around 1.2 billion people live on less than a dollar a day (1993 PPP US$) and 2.8 billion on less than 2 dollars a day (Smeeding 2001b, UNAIDS 2000a, 2000b; UNESCO 2000b; World Bank 2000d, 2001b, 2001c, 2001f; WHO 1997, 2000b; OECD and Statistics Canada 2000). The philosopher-economist and Nobel laureate, Amartya Sen, summarised this situation eloquently:

> *...We also live in a world with remarkable deprivation, destitution and oppression. There are many new problems as well as old ones, including persistence of poverty and unfulfilled elementary needs, occurrence of famines and widespread hunger, violation of elementary political freedoms as well as basic liberties, extensive neglect of the interests and agency of women, and worsening threats to our environment and to the sustainability of our economic and social lives.* (Sen 1998)

In Asia, human development mapping has reflected overall progress over the past two decades. The nine countries have progressed steadily since 1975 in terms of Human Development Index (HDI). Many Asian countries have also experienced dramatic economic growth giving rise to the widespread use of the term 'Asian Miracle'. For the past decade or more, it was the Asian dragons that captured the imagination and admiration of the world with their phenomenal GDP growth bordering on 10% annually. Today it is China and India, the two most populous nations, which are leading the Asian economic drive.

Yet in many countries in Asia and among sections of the population even in the relatively better off countries, human development continues to pose a significant challenge, blemishing otherwise commendable achievements. The persistence of income poverty, hunger, low levels of adult literacy, preventable diseases and poor healthcare, as well as significant gender inequalities reiterates the need to place human development at the core of national and international development agendas.

At the turn of the century, it became increasingly evident that collective action on a global scale would be required to rid the world of the alarming levels of poverty, hunger and deprivation. The historic UN Millennium Summit held in September 2000, where Member States of the United Nations agreed to work together to eradicate poverty, promote human dignity and equality, achieve peace, democracy and environmental sustainability. The Millennium Declaration issued at this summit demonstrates the commitment of world leaders to collectively work towards a global partnership for improving the human condition. A concrete contribution of the Declaration was the global consensus on the Millennium Development Goals

(MDGs) to which 191 UN Member States have pledged themselves. For the first time in human history, the global community committed itself willingly and voluntarily to an agenda consistent with human development through eight specifically identified development goals. The MDGs are a time-bound set of goals, most of which are to be achieved by the year 2015, taking 1990 as the base year (Box 1.1). Hence the MDG framework is used in this Report to analyse the extent to which ICTs can promote human development. Each of the MDGs has specific targets, totaling 18, to be monitored through 48 specific indicators (Appendix 1).

Box 1.1 *The eight Millennium Development Goals*

Goal 1: Eradicate extreme poverty and hunger
Goal 2: Achieve universal primary education
Goal 3: Promote gender equality and empower women
Goal 4: Reduce child mortality
Goal 5: Improve maternal health
Goal 6: Combat HIV/AIDS, malaria and other diseases
Goal 7: Ensure environmental sustainability
Goal 8: Develop a global partnership for development

The 20th century witnessed remarkable advances in science and technology (Wang et al 1999). Advances in information and communication brought about by microelectronics and digital technologies have given rise to a debate on the potential of ICT to enhance human development. In Asia, governments are launching ambitious ICT infrastructure initiatives, radically changing their policy frameworks on communications and placing ICT applications at the centre of their socio-economic development strategies. The Asian region is particularly well placed to harness and strategically deploy ICT for enhancing human development as it not only constitutes one of the fastest growing ICT markets, but also one of the fastest growing regions for ICT industries in the world. However, the digital divide, both between Asian countries and within them, reveals the enormous disparities in ICT access, connectivity and skills. This divide can be a major hurdle in the effective application of ICT for overcoming the human development challenge.

This document presents a summary of the research with its key findings. The following section (Section II) contains a discussion on the state of human development in the nine countries. Section III then tracks the progress of these countries with respect to the MDGs. It is seen that although all the countries do show improvement, human development has been quite varied across the countries. Section IV contains a discussion on the potential and promise of ICT for human development and how ICT can break barriers to human knowledge, participation and economic opportunities. A significant long-term impact of ICT lies in the ability of these technologies to expand human capabilities and choices. Section V describes the status of ICT diffusion and use in Asia, highlighting the rapid growth of the sector in most Asian countries. However, as the next section (Section VI) on the digital divide demonstrates, Asia's ICT development reveals deep and widening disparities in ICT diffusion across geographic and social lines. These disparities can exacerbate existing inequalities of opportunities, constituting obstacles to harnessing ICT for widening choices for all sections of the society.

Section VII contains a quantitative exploration of the empirical linkages between ICTs and MDGs for human development. Selected indicators were used to construct a set of thematic indices covering five distinct dimensions of ICT availability and use, which were then aggregated into a composite aggregate index capturing ICT-MDG relationships. Two different statistical methods were applied. The nine countries have been ranked based on the two sets of aggregate indices. The rankings by two methods show similarities at the top and bottom ends demonstrating the robustness of the conclusions, with some interesting reversals in between. The composite aggregate indices, given the data limitations, are not perfect. Yet they constitute the first attempt that can help in tracking progress by developing countries and ranking them, thus contributing to the debate on the subject.

Section VIII provides interesting insights through a systematic exploration of the application of ICT with respect to each of the MDGs. There is a detailed discussion on specific areas of effective ICT use as well as areas where ICT has relatively limited scope as compared with more direct intervention and service provision. Examples of best practices reported from the nine countries are presented. Although ICT con-

stitutes a relatively recent phenomenon in the Asian landscape, this study reveals a wide variety of uses and initiatives that have been developed in a relatively short period. For some of the MDGs there have been very successful strategic deployment and use of ICT while for others there have been only sporadic and isolated attempts at harnessing ICT tools to address developmental concerns. Thus, while there have been numerous innovative and successful experiences in applying ICT for human development, there are also significant gaps. The research finds enormous variation across countries in terms of availability and use of higher-end and lower-end technologies, infrastructure, connectivity, cost, human skills, availability of locally relevant content, and types of ICT applications for human development. Satisfaction regarding the overall progress in Asia in respect of telecommunications, the use of personal computers and internet penetration needs to be tempered by the significant differences across countries resulting in some countries like Malaysia, China and Thailand being clearly ahead of others.

Section IX concludes that while small scale and experimental applications of ICT provide ways to explore their potential, extension of ICT use and sustainability depends on the commitment and resources that stakeholders are able to mobilise. Success in bringing human development concerns into ICT applications is likely to be conditioned by the benefits perceived by different stakeholders, including governments, civil society organisations, the private sector and individuals.

II

Human Development in Asia: Milestones and Challenges

In the 1990s, while human development witnessed unprecedented overall progress, including the Asian region, a few regions in the world faced setbacks. The Global Human Development Report 2003 (UNDP 2003) indicates that the HDI had fallen in 21 out of a sample of 113 countries with complete data. It also argued that in some countries the fall in HDI could be attributed to lower incomes and failed economic growth, as also to the spread of HIV/AIDS which lowered life expectancies in many of these countries. Of the 113 countries with data since 1980, only four saw their HDIs decline in the 1980s while 15 saw the declines in the 1990s (UNDP 2003). The Asian region is characterised by improvements in HDI, which is in keeping with the overall trend for developing countries as against the situation observed in Central and Eastern Europe and the Commonwealth of Independent States (CIS), and sub-Saharan Africa where reversals were observed (Table 2.1). The experiences from the nine countries studied in Asia reflect considerable diversity that can be of great interest as it helps in exploring a variety of circumstances. While showing an overall improvement trend in the HDI and the individual indicators relevant for human development, countries show enormous variation in values.

Starting with income poverty, relevant for human development as it contributes to a reduction of economic inequalities, data from six regions in the world show that both East Asia and the Pacific and South Asia have done much better as compared to the other regions (Table 2.2).

In keeping with the overall situation in Asia, human development measurements for the nine countries covered by this Report have generally reflected continued progress over the past two decades or more. All the countries studied, have shown steady progress since 1975 in terms of HDI (Table 2.3). With the exception of Pakistan, all of them are situated in the medium human development category.

The HDI: Linkage with TAI

There are, however, significant differences in

Table 2.1 *Region-wise HDI trend from 1975 to 2001*

Region	HDI trend
East Asia and the Pacific	Increasing from 1990 to 2001
South Asia	Increasing from 1975 to 2001
Arab States	Increasing from 1990 to 2001
Central and Eastern Europe and the CIS	Decreasing from 1990 to 1995 and increasing till 2000
Latin America and the Caribbean	Increasing from 1975 to 2001
Sub-Saharan Africa	Increasing till 1995 and decreasing from 1995 to 2001
Developing countries	Increasing from 1975 to 2001
High income OECD	Increasing from 1975 to 2001

Source: Global HDR, 2003.[7]

Table 2.2 *Strong links between economic growth and income poverty*

Region	Growth in the 1990s (annual per capita income growth) (%)	Poverty reduction in the 1990s (percentage point reduction)
East Asia and the Pacific	6.4	14.9
South Asia	3.3	8.4
Latin America & the Caribbean	1.6	−0.1
Middle East & North Africa	1.0	−0.1
Sub-Saharan Africa	−0.4	−1.6
Central and Eastern Europe and the CIS	−1.9	−13.5[a]

Source: Global HDR, 2003.

[a] Change measured using the US$ 2 a day poverty line, which is considered a more appropriate extreme poverty line for Central & Eastern Europe and the CIS.

performance with respect to individual human development indicators among these countries, which are reflected in their HDI ranks. Malaysia not only holds the highest HDI rank of 58, out of 175 countries, but it is also the only country among the Asian nations which is close to breaking into the high human development category of countries. Comparing the HDI value for the year 2001 for the nine countries with that calculated for all developing countries put together, India and Pakistan are the only two countries which have values lower than that for all developing countries. Pakistan's HDI value is lower than the overall HDI value of South Asia. Malaysia, Thailand and Sri Lanka are clearly above the world HDI value.

Interestingly, Malaysia also ranks high in the

Table 2.3 *Trends in the Human Development Index (HDI) from 1975 to 2001*

Country/ Region	HDI values						HDI rank (2001) (out of 175 countries)	Trend in HDI from 1975 to 2001	TAI rank (out of 72 countries)
	1975	**1980**	**1985**	**1990**	**1995**	**2001**			
Malaysia	0.615	0.658	0.692	0.721	0.759	0.790	58	↑	30
Thailand	0.612	0.650	0.673	0.705	0.739	0.768	74	↑	40
Sri Lanka	0.609	0.644	0.670	0.692	0.715	0.730	99	↑	62
China	0.521	0.554	0.591	0.624	0.679	0.721	104	↑	45
Viet Nam	NA	NA	0.582	0.603	0.646	0.688	109	↑	NA
Indonesia	0.464	0.526	0.578	0.619	0.659	0.682	112	↑	60
Mongolia	NA	NA	0.647	0.655	0.634	0.661	117	↑	NA
India	0.416	0.443	0.481	0.519	0.553	0.590	127	↑	63
Pakistan	0.344	0.370	0.403	0.440	0.472	0.499	144	↑	65
East Asia and the Pacific	NA	NA	NA	NA	0.678[a]	0.722	—	—	—
South Asia	NA	NA	NA	NA	0.452[a]	0.582	—	—	—
All Developing countries	NA	NA	NA	NA	0.565[a]	0.655	—	—	—
World	NA	NA	NA	NA	0.724[a]	0.722	—	—	—

Source: Global HDRs 1998, 2001 and 2003.

NA: Data not available.

[a] Indicates the median value achieved in the region or country group.

Note: The last three rows are not strictly comparable across years as the data are taken from different Human Development Reports and the methodology differs.

Technology Achievement Index (TAI) used in the Global HDR, 2001, on *Making New Technologies Work for Human Development*. The index aims to capture how well a country is creating and diffusing the technology and building a human skill base — reflecting capacity to participate in technological innovations. Comparing directly the HDI and TAI rankings, a close regularity may be observed. The two countries on top of the HDI rankings are also those with the best TAI ranks — Malaysia and Thailand. At the lower end, India is followed by Pakistan in both. Sri Lanka and China change places by one level with a higher HDI rank for Sri Lanka compensated with a higher TAI rank for China. While nothing can be firmly inferred about causation, the close correlation between the HDI and TAI ranks is noteworthy.

Comparison of critical human development indicators

Human development measures across the range of critical indicators like life expectancy at birth, adult literacy rate, combined primary, secondary and tertiary gross enrollment ratio as well as GDP per capita, reveal significant disparities across the nine Asian nations. While countries such as Malaysia, Sri Lanka and China have relatively high values for life expectancy at birth (standing at over 70 years), much higher than the world figure of 66.7 years, Mongolia, India and Pakistan continue to have a ten-year gap with a far lower life expectancy (just over 60 years) (Table 2.4).

While education of users is less relevant for communication technologies like radio, TV and telephone (the less skill-dependent technologies), it is very relevant for absorption and use of newer computer and internet-related (the more skill-dependent) technologies. Within a country or region ICTs can promote human development better if their applications can counter digital divides and inequalities, rather than exacerbate them. To the extent better-off sections of the population are in a superior position to take advantage of the technologies, inequalities will only increase. Comparing the adult literacy rates, defined as the per centage of literate people aged 15 years and above, the differences in literacy are quite stark. In 2001, while Mongolia achieved close to 100 per cent adult literacy, Pakistan recorded the lowest rate at 44 per cent with India's figure second from

Table 2.4 *Human Development Index (HDI) and indicators*

S. No	Country /Region	Life expectancy at birth (years) (2001)	Adult (age 15 & above) literacy rate (2001)	Combined primary, secondary and tertiary gross enrollment ratio (%) (2000-01)[a]	GDP per capita (PPP US$) (2001)	Life expectancy index	Education index	GDP index	HDI Value (2001)	HDI Rank[b] (out of 175 countries)
1	China	70.6	85.8	64[c,d]	4,020	0.76	0.79	0.62	0.721	104
2	India	63.3	58.0	56[c,d]	2,840	0.64	0.57	0.56	0.590	127
3	Indonesia	66.2	87.3	64[c]	2,940	0.69	0.80	0.56	0.682	112
4	Malaysia	72.8	87.9	72[c]	8,750[e]	0.80	0.83	0.75	0.790	58
5	Mongolia	63.3	98.5	64	1,740	0.64	0.87	0.48	0.661	117
6	Pakistan	60.4	44.0	36	1,890	0.59	0.41	0.49	0.499	144
7	Sri Lanka	72.3	91.9	63[c,d]	3,180	0.79	0.82	0.58	0.730	99
8	Thailand	68.9	95.7	72[c]	6,400	0.73	0.88	0.69	0.768	74
9	Viet Nam	68.6	92.7	64	2,070	0.73	0.83	0.51	0.688	109
10	East Asia and the Pacific	69.5	87.1	65	4,233	0.74	0.80	0.63	0.722	
11	South Asia	62.8	56.3	54	2,730	0.64	0.56	0.55	0.582	
12	Developing countries	64.4	74.5	60	3,850	0.66	0.70	0.61	0.655	
13	World	66.7	…	64	7,376	0.70	0.75	0.72	0.722	

Source: Global HDR, 2003.

[a] Data refer to the 2000/01 school years. Data for some countries may refer to national or UNESCO Institute for Statistics estimates. Because data are from different sources, comparisons across countries should be made with caution.
[b] The HDI rank is determined using HDI values to the sixth decimal point.
[c] Preliminary UNESCO Institute for Statistics estimate, subject to further revision.
[d] Data refer to a year other than that specified.
[e] Estimate based on regression.

below at 58 per cent. India and Pakistan had adult literacy rates far lower than the other seven countries. Three countries had adult literacy rates above 90 per cent (Thailand, Viet Nam and Sri Lanka) and the rest (Malaysia, Indonesia and China) above 85 per cent. In terms of combined primary, secondary and tertiary gross enrollment ratio, the most significant finding is that Pakistan records a very poor performance with only 36 per cent, while Malaysia and Thailand clearly stand above the rest with an enrollment ratio above 70 per cent. The other countries have enrollment ratios ranging from 56 per cent (India) to over 60 per cent (China, Indonesia, Mongolia, Sri Lanka and Viet Nam).

Finally, the HDI also highlights stark differences in GDP per capita (measured in terms of PPP US$) across the nine nations (Table 2.4). Higher levels of income can contribute to funding not only basic infrastructure like roads, electricity and so on, it can also contribute to funding specialised ICT-related infrastructure. Malaysia has a high GDP per capita of US$ 8,750 which is even higher than the world GDP per capita figure of US$ 7,376, followed by Thailand's figure of US$ 6,400; there is China with a GDP per capita of US$ 4,020; this is followed by the three countries, Sri Lanka, Indonesia and India, which have a GDP per capita of around US$ 3,000; and finally we have Viet Nam, Pakistan and Mongolia constituting the lower end with GDP per capita at or below US$ 2,000.

Human poverty indicators

Recent data on human poverty also reveal stark differences among the nine countries (Table 2.5). If one were to consider the data on the probability at birth of people not surviving to age 40, the top three countries with less than 10 per cent of their population in the 2000-05 cohort who will not live till the age of 40 are Malaysia (4.2 per cent), Sri Lanka (5.1 per cent) and China (7.1 per cent).

Table 2.5 *Human Poverty Index (HPI-1)* and indicators*

S. No	Country	Probability at birth of not surviving to age 40 (% of cohort) (2000-05)[a]	Adult (age 15 & above) illiteracy rate (%) (2001)	Population without sustainable access to an improved water source (%) (2000)	Children under-weight for age (% under age 5) (1995-2001)[b]	Population below income poverty line (%)			(HPI-1)	
						US$ 1 a day (1993 PPP US $)[c] (1990-2001)[b]	US$ 2 a day (1993 PPP US $)[d] (1990-2001)[b]	National poverty line (1987-2000)[b]	Rank (out of 94 countries)	Value (%)
1	China	7.1	14.2	25	10	16.1	47.3	4.6	26	14.2
2	India	15.3	42.0	16	47	34.7	79.9	28.6	53	33.1
3	Indonesia	10.8	12.7	22	26	7.2	55.4	27.1	33	17.9
4	Malaysia	4.2	12.1	—	18	<2	9.3	—	—	—
5	Mongolia	13.0	1.5	40	13	13.9	50.0	—	36	19.1
6	Pakistan	17.8	56.0	10	38	13.4	65.6	32.6	65	40.2
7	Sri Lanka	5.1	8.1	23	29	6.6	45.4	25.0	34	18.3
8	Thailand	10.2	4.3	16	19[d]	<2	32.5	13.1	24	12.9
9	Viet Nam	10.7	7.3	23	33	17.7	63.7	—	39	19.9

Source: Global HDR, 2003.

* Refers to Human Poverty Index for developing countries.

[a] Data refer to the probability of not surviving to age 40, times 100. These are medium variant projections for the period specified.

[b] Data refer to the most recent year available during the period specified.

[c] Poverty line is equivalent to $ 1.08 (1993 PPP US$).

[d] Data refer to year or period other than that specified, differ from the standard definition or refer to only part of a country.

Pakistan, India and Mongolia perform relatively poorly on this score with as much as 13 per cent to well over 17 per cent of population who will not live till 40 years of age. Thailand, Viet Nam and Indonesia constitute the medium performance countries on this index with around 10 per cent of their population not likely to live till the age of 40. In respect of population without sustainable access to an improved water source, the scenario seems to be reversed with Pakistan coming out on top (10 per cent) followed by India (16 per cent), which perform better than the others. However, India and Pakistan perform poorly in respect of the percentage of children under 5 years of age who are underweight for their age with 47 per cent and 38 per cent, respectively of children being underweight. A comparison of the poverty percentages show that Malaysia and Thailand have the lowest prevalence of population living below the income poverty line of US$ 1 per day (less than 2 per cent). India is at the bottom (35 per cent) with China, Mongolia, Viet Nam and Pakistan following (13 to 18 per cent). Overall, the data reveal the need to improve living conditions of the people in these countries through improvements in education, healthcare and hygiene, as well as income generation among the poorer sections of the population.

Human Poverty Index (denoted as HPI-1 in case of developing countries) ranks of the nine nations reflect a rather poor record and performance. Considering that the HPI-1 rank for Malaysia is unavailable, Thailand and China come out on top, with ranks of 24 and 26 out of 94 countries. They are followed by Indonesia (33), Sri Lanka (34), Mongolia (36) and Viet Nam (39) whose rankings are almost successive in this scale. India, which is ranked 53, and Pakistan ranked a distant 65 on the HPI-1, are again the laggards in the fight against human poverty.

The gender divide factor

Equitable human development cannot be achieved without addressing gender divides in the development equation. Women are key agents of development and equal participation of women in the decision-making process is an essential precondition to development in all its dimensions. In order to bridge the digital divides, it is essential that the existing gender inequalities be addressed. Unfortunately, one of the weak aspects of human development in Asia remains the wide gender gaps. Referring to the Gender-related Development Index (GDI) of the nine countries in this study (Table 2.6), it can be seen that the life expectancy for females is the lowest in Pakistan at 60.3 years, worse than the male figure of 60.6 years. This difference becomes more significant when compared to the other countries in the study, where female life expectancy exceeds male life expectancy, as is the case for almost all countries in the world. The highest life expectancy for females among the nine countries is seen in Sri Lanka at 75.5 years, closely followed by Malaysia at 75.3 years.

A comparison of male-female literacy rates shows dismal figures for Pakistan and India, followed by China with high male-female gaps. In Pakistan the female literacy rate is only 28.8 per cent, a whopping 29.4 per cent behind the male literacy rate. Except Mongolia, in no country does female literacy exceeds that of males. The combined school enrollment ratio also brings out male-female gaps, with Pakistan at the bottom followed by India, while the gaps are much narrower in the other countries. In fact, Mongolia actually has a reverse gap with female enrollment figures significantly exceeding those of males (perhaps a reflection of the privatisation of ownership of animals, that contributed to male children taking up herding). Similarly male-female gaps are seen in earned incomes.

With regard to the proportion of seats in the national parliament that are held by women, an important indicator used in the Gender Empowerment Measure (GEM), Sri Lanka has the lowest per centage (only 4.4 per cent of parliamentary seats are held by women), followed by Indonesia, India and Thailand. At the upper end Viet Nam is a clear leader with 27.3 per cent of parliamentary seats held by women followed by China and Pakistan (Table 2.7).

Thus, while Asian nations have made considerable progress in their overall human development record, many critical challenges continue to impede progress. Lack of access to basic education and healthcare, stark socio-economic disparities, poverty prevalence, deep gender divides constitute some of the persistent obstacles to human development. While the diversity of experience in Asia provides a rich canvas for an exploration of linkages between human development and ICT, pre-existing disparities among different sections of the population can aggravate inequalities of opportunity caused by the growing use of ICT. For ICT to contribute to the widening of choices for human development, this concern needs to be addressed.

Table 2.6 *Gender-related Development Index (GDI) and indicators*

S. No.	Country	Life expectancy at birth (years) (2001)		Adult (age 15 & above) literacy rate (%) (2001)		Combined primary, secondary and tertiary enrollment ratio (%) (2000-01)[a]		Estimated earned income (PPP US$) (2001)[b]		GDI	
		Female	Male	Female	Male	Female	Male	Female	Male	Value	Rank (out of 144 countries)
1	China	72.9	68.6	78.7	92.5	62[c,d]	65[c,d]	3,169[e]	4,825[e]	0.718	83
2	India	64.0	62.8	46.4	69.0	49[c,d]	63[c,d]	1,531[e]	4,070[e]	0.574	103
3	Indonesia	68.2	64.3	82.6	92.1	63[c]	65[c]	1,987[e]	3,893[e]	0.677	91
4	Malaysia	75.3	70.4	84.0	91.7	74[c]	71[c]	5,557[e]	11,845[e]	0.784	53
5	Mongolia	65.3	61.3	98.3	98.6	69	58	1,398[e]	2,082[e]	0.659	95
6	Pakistan	60.3	60.6	28.8	58.2	27[c]	45[c]	909[e]	2,824[e]	0.469	120
7	Sri Lanka	75.5	69.6	89.3	94.5	64[c,f]	63[c,f]	2,095	4,189	0.726	80
8	Thailand	73.2	64.9	94.1	97.3	69[c]	75[c]	4,875	7,975	0.766	61
9	Viet Nam	71.0	66.3	90.9.	94.5	61	67	1,696[e]	2,447[e]	0.687	89

Source: Global HDR, 2003.

[a] Data refer to the 2000/01 school years. Data for some countries may refer to national or UNESCO Institute for Statistics estimates. Because data are from different sources, comparisons across countries should be made with caution.
[b] Because of the lack of gender-disaggregated income data, female and male earned incomes are crudely estimated on the basis of data on the ratio of the female non-agricultural wage, the female and male shares of the economically active population, the total female and male population and GDP per capita (PPP US$). Unless otherwise specified, estimates are based on data for the most recent year available during 1991-2000.
[c] Preliminary UNESCO Institute for Statistics estimate, subject to further revision.
[d] Data refer to the 1999/2000 school year.
[e] No wage data were available. For purposes of calculating the estimated female and male earned incomes, an estimate of 75% was used for the ratio of the female non-agricultural wage to the male non-agricultural wage.
[f] Data refer to the year 1998/1999 school year.

Table 2.7 *Gender Empowerment Measure (GEM) and indicators*

S. No	Country	Seats in the parliament held by women (as % of total) [a]	Female legislators, senior officials and managers (as % of total) [b]	Female professionals and technical workers (as % of total) [b]	Ratio of estimated female to male earned income [c]	GEM	
						Value	Rank (out of 70 countries)
1	China	21.8	—	—	—	—	—
2	India	9.3	—	—	—	—	—
3	Indonesia	8.0	—	—	—	—	—
4	Malaysia	14.5	20[d]	45[d]	0.47	0.503	45
5	Mongolia	10.5	—	—	—	—	—
6	Pakistan	20.6	9[d]	26[d]	0.32	0.414	58
7	Sri Lanka	4.4	4	49	0.50	0.272	67
8	Thailand	9.6	27[d]	55[d]	0.61	0.457	55
9	Viet Nam	27.3	—	—	—	—	—

Source: Global HDR, 2003.

[a] Data are as of 1 March 2003. Where there are lower and upper houses, data refer to the weighted average of women's share of seats in both houses.
[b] Data refer to the most recent year available during the period 1992-2001. Estimates for countries that have implemented the recent International Standard Classification of Occupations (ISCO-88) are not strictly comparable with those for countries using the previous classification (ISCO-68).
[c] Calculated on the basis of data for estimated earned income (PPP US$) for males and females as in table 2.6. Estimates are based on data for the most recent year available during the period 1991-2001.
[d] Data are based on the International Standard Classification of Occupations (ISCO-68) as defined in ILO (2002).

III

Asia's March Towards the Millennium Development Goals

The Millennium Development Goals (MDGs) reflect key aims of various UN Development Conferences of the 1990s, being a product of many national, regional and international consultations that involved representatives from national governments, civil society organisations, private sector actors as well as individuals. Apart from being globally accepted commitments, consistent with human development in poor countries, they also recognise the responsibility of the developed countries to support development initiatives in the poorest nations of the world.

While not perfect, the MDGs cover a majority of the most critical development challenges. These include a wide range of interrelated issues each of which cannot be addressed in isolation. Beginning with the eradication of poverty and hunger, the MDGs deal with education (achieving universal primary education), healthcare (eradicating major diseases such as HIV/AIDS and malaria as well as reducing child mortality and improving maternal health), gender equality (empowerment of women), environmental sustainability and creating global partnerships for development.

Given the global consensus about the development goals, the MDG framework is used as a benchmark around which this Report explores how ICT can promote human development. There are very strong links between the human development goals and the MDGs (Box 3.1). The three key dimensions of human development that are captured by the HDI, namely a decent standard of living, education and health (seen as longevity), are entirely consistent with Goals 1 to 7 which focus on eradication of poverty and hunger, healthcare and education. Goal 3, which focuses on gender equality and empowerment, reflects the gender-related indices, developed as supplementary indices for human development measurement. The key distinction between the human development approach and the MDGs lies in the fact that human development is a broad approach, advocating expansion of human choices while the MDGs are constructed as monitorable goals and targets.

While many nations have demonstrated progress in achieving the MDGs, developing countries are at different stages for different goals. The Global HDR, 2002 categorises progress across indicators as 'achieved', 'on track', 'lagging', 'far behind' and 'slipping back'. These assessments which have tracked the performance of countries in terms of MDG progress clearly show that there are remarkable disparities between and within regions, with human development reversals noted in some cases (sub-Saharan Africa, Central and Eastern Europe and the CIS). Interestingly, most countries in the Asian region, including South Asia which has some of the poorest countries (HDR, 2003), show advances.

These findings highlight the difficulties for many, if not most of the countries, of attaining their MDG targets. While East Asia and the Pacific on the whole has made remarkable progress in its attempt to halve income poverty and is well on track towards the goals of reducing hunger and achieving universal primary education, at its current rate of progress it will still not be able to meet the MDG targets for gender equality, reducing child mortality and providing sustainable access to improved water sources and sanitation by the year 2015.

South Asia needs to make significant progress in almost all areas if it is to achieve its MDG targets. While it has made remarkable progress in reducing income poverty and is likely to succeed in halving the number of people who live on less than US$ 1 a day by the year 2015, it lags far behind in the reduction of hunger and will be

Box 3.1 *Relationship between human development capabilities and the MDGs*	
Key capabilities for human development	*Corresponding Millennium Development Goals*
Living a long and healthy life	Goals 4,5 and 6: Reducing child mortality, improving maternal health and combating major diseases
Being educated	Goals 2 and 3: Achieving universal primary education, promoting gender equality (especially in education) and empowering women
Having a decent standard of living	Goal 1: Reducing poverty and hunger
Enjoying political and civil freedom to participate in the community life	Not a Goal but an important global objective included in the Millennium Declaration
Essential conditions for human development	*Corresponding Millennium Development Goals*
Environmental sustainability	Goal 3: Promoting gender equality and empowering women
Equity — especially gender equity	Goal 8: Strengthening partnership between rich and poor countries
Enabling global economic environment	Goal 7: Ensuring environmental sustainability

Source: Global HDR, 2003

able to reach its target in this area only after 2100. South Asia is 'on track' for only two indicators — reducing poverty and providing sustainable access to improved water sources. At its current rate of progress, South Asia will fail to reach the other goals by 2015; for example, the goals of achieving universal primary education, gender equality and reducing child mortality are expected to be reached long after 2020.

Goal 1: Eradicate extreme poverty and hunger

This goal relates to the most basic resources that people require, which are enough income for subsistence and access to sufficient food of a minimum quality in terms of nutrition. According to the Economic and Social Commission for the Asia and the Pacific (ESCAP) and UNDP regional MDG report titled, *Promoting the Millennium Development Goals in Asia and the Pacific* (ESCAP 2003), countries in the Asia-Pacific region have made very good progress with regard to the first target of halving the proportion of people whose income is less than US$ 1 a day. Between the early and late 1990s, the overall incidence of poverty declined from 34 to 24 per cent. Although this left an estimated 768 million people living on less than a dollar a day, it represented striking progress in this region (ESCAP 2003). According to the Global HDR, 2002, considering the indicator for the second target, 'percentage of undernourished people', six out of the nine countries are 'on track'. India is 'far behind' the target, while Mongolia is categorised as 'slipping back'. Data are not available for Malaysia (Table 3.1).

Goal 2: Achieve universal primary education

This target of ensuring, by 2015, that children everywhere, boys and girls alike, will be able to complete a full course of primary schooling is important for human development. Having an educated workforce is the key to future national prosperity, and a basic requirement in that direction is for all children to be enrolled in primary school. Net enrollment in the Asia-Pacific region has remained static at about 93 per cent between the early and late 1990s, as per ESCAP findings (UNESCO 2003). For this goal the limited data available suggests that China and Malaysia have already achieved the target pertaining to the indicator 'net enrollment ratio' and Mongolia has achieved the target for the indicator 'proportion of children reaching grade 5' (Tables 3.2 and 3.3).

Even in those countries where primary schooling is free, expenses are still incurred for purchasing items like books, equipment and uniforms. The most deprived families may also rely on their children not only to contribute to the

Table 3.1 *Progress towards MDG 1 by nine Asian countries*
Goal 1: Eradicate extreme poverty and hunger
Target 2: Halve the proportion of people suffering from hunger
Indicator 5: Undernourished people (as % of total population)

Country	Achieved	On track	Lagging	Far behind	Slipping back
China		●			
India				●	
Indonesia		●			
Malaysia (NA)					
Mongolia					●
Pakistan		●			
Sri Lanka		●			
Thailand		●			
Viet Nam		●			

Source: Global HDR, 2002.

family income but also to attend to domestic work and child care. Young girls are particularly vulnerable to pressure to drop out of school for this reason. In addition, families have even less incentive to send their children to school when the schools may be poorly equipped or staffed.

Goal 3: Promote gender equality and empower women

The crucial target for this goal is the elimination of gender disparity in primary and secondary education, preferably by 2005, and at all levels of education no later than 2015. In terms of primary education, there is still some way to go in the Asia-Pacific region. In almost all the countries here, there are moderate or significant gender disparities. However, the case of China leads one to be optimistic: although in the late 1990s there was a moderate disparity, with an enrollment ratio of girls to boys placed at 0.92, by 2000 the situation was reversed, with more girls than boys enrolled (ESCAP 2003). Based on available data it is observed that countries have performed modestly in terms of female gross primary enrollment ratios for both primary and secondary education.

The performance of China and India reveals a wider gender gap in secondary than in primary education (Tables 3.4 and 3.5). While China is 'on track', India is rated as 'far behind' in maintaining gender equality. In the case of Pakistan and Thailand data are not available. The most striking case is Mongolia, where there are far more girls enrolled than boys, with the enrollment ratio of girls to boys being 1.11. This could be related to the privatisation of ownership of animals, when more boys took to herding. China has room for improvement in this category although the ratio rose from 0.71 in the early 1990s to 0.82 in the late 1990s (ESCAP 2003).

Table 3.2 *Progress towards MDG 2 by nine Asian countries*
Goal 2: Achieve universal primary education
Target 3: Ensure that all children can complete primary education
Indicator 6: Net primary enrollment ratio (%)

Country	Achieved	On track	Lagging	Far behind	Slipping back
China	●				
India (NA)					
Indonesia		●			
Malaysia	●				
Mongolia (NA)					
Pakistan (NA)					
Sri Lanka (NA)					
Thailand (NA)					
Viet Nam (NA)					

Source: Global HDR, 2002.
NA: Data not available.

Table 3.3 *Progress towards MDG 2 by nine Asian countries*
Goal 2: Achieve universal primary education
Target 3: Ensure that all children can complete primary education
Indicator 7: Children reaching grade 5 (%)

Country	Achieved	On track	Lagging	Far behind	Slipping back
China		●			
India (NA)					
Indonesia		●			
Malaysia (NA)					
Mongolia	●				
Pakistan (NA)					
Sri Lanka (NA)					
Thailand (NA)					
Viet Nam (NA)					

Source: Global HDR, 2002.
NA: Data not available.

Table 3.4 *Progress towards MDG 3 by nine Asian countries*
Goal 3: Promote gender equality and empower women
Target 4: Eliminate gender disparity in all levels of education
Indicator 9: Female gross primary enrollment ratio as % of male ratio

Country	Achieved	On track	Lagging	Far behind	Slipping back
China	●				
India		●			
Indonesia		●			
Malaysia	●				
Mongolia	●				
Pakistan (NA)					
Sri Lanka		●			
Thailand (NA)					
Viet Nam		●			

Source: Global HDR, 2002.
NA: Data not available

Table 3.5 *Progress towards MDG 3 by nine Asian countries*
Goal 3: Promote gender equality and empower women
Target 4: Eliminate gender disparity in all levels of education
Indicator 9: Female gross secondary enrollment ratio as % of male ratio

Country	Achieved	On track	Lagging	Far behind	Slipping back
China		●			
India				●	
Indonesia		●			
Malaysia	●				
Mongolia	●				
Pakistan (NA)					
Sri Lanka	●				
Thailand (NA)					
Viet Nam		●			

Source: Global HDR, 2002.
NA: Data not available

Malaysia and Sri Lanka are categorised as 'achieved' while Viet Nam is 'on track'.

Data on the proportion of women who are actively involved in wage employment in the non-agricultural sector are scarce. The available data suggest that the proportion of women is

on the rise. By the late 1990s, the share of women had reached 16 per cent in India, 39 per cent in China and 46 per cent in Sri Lanka.[2] Less satisfactory though is the participation of women in decision-making at the national parliamentary level: this is typically below 10 per cent in most developing Asian countries. A notable exception is Viet Nam, where the proportion of women in the national parliament has increased significantly from 18 per cent in the early 1990s to 26 per cent in the late 1990s.[3]

Goal 4: Reduce child mortality

The target for this goal is to reduce the mortality rate of children under the age of five years by two-thirds between 1990 and 2015. ESCAP (ESCAP 2003) has rated progress for this goal as slow, with most countries in the Asia-Pacific region missing the target and lacking renewed efforts. The majority of children who die before they reach their fifth birthday, die from disease or from a combination of malnutrition and preventable diseases such as diarrhoea and measles. Of the nine countries, Indonesia, Malaysia, Sri Lanka and Thailand are categorised as 'on track', while India and Viet Nam are 'lagging'. Pakistan, with its under-five mortality rate at 109 per 1000 live births in 2001, is 'far behind' its 2015 target of 42 per 1,000 live births.[4] China is also similarly placed (Table 3.6).

Goal 5: Improve maternal health

The target for this goal is to reduce the maternal mortality rate by three-quarters between 1990 and 2015. Across the Asia-Pacific region, it is still common for women to die of childbirth-related circumstances. In addition, pregnancy and childbirth can aggravate micronutrient deficiencies such as anaemia. Teen pregnancies due to early marriage, inadequate child spacing and high parity births combined with deliveries at the hands of untrained birth attendants, poor hygiene, all contribute to avoidable maternal mortality. In many Asian countries where women have a low stating, the ability of women to negotiate for control over their own bodies even within marriage cannot be taken for granted.

Data for this MDG is difficult to obtain, because estimating maternal mortality rates requires current information on the number of deaths of women of reproductive age and the cause of death. Registration systems needed for such information gathering are inadequate in most countries in the Asia-Pacific region. With the lack of reliable data, the tracking of trends in maternal mortality rates becomes a formidable challenge.

Goal 6: Combat HIV/AIDS, malaria and other diseases

The first target associated with this goal is to have halt and begin a reversal of the spread of HIV/AIDS by 2015. The extent of the problem is enormous in the more populous countries. For example, in China, the prevalence rate among adults may be relatively low at 0.1 per cent, but this translates to around 850,000 people and infections have been on the rise. Similarly in India, a prevalence rate of 0.6 per cent means that 4 million people are infected (ESCAP 2003). In Indonesia, infections have been rising among drug users, sex workers and men who have sex with men. However, the case of Thailand is an encouraging example: high prevalence rates have been brought under control through state action. Comprehensive measures have been taken

Table 3.6 *Progress towards MDG 4 by nine Asian countries*
Goal 4: Reduce child mortality
Target 5: Reduce under-five and infant mortality rates by two-thirds
Indicator: Under-five mortality rate (per 1,000 live births)

Country	Achieved	On track	Lagging	Far behind	Slipping back
China				●	
India			●		
Indonesia		●			
Malaysia		●			
Mongolia		●		●	
Pakistan					
Sri Lanka		●			
Thailand		●			
Viet Nam			●		

Source: Global HDR, 2002.

in Thailand, including the distribution of antiretroviral drugs to HIV-positive pregnant women.

The second target is to halt the spread of malaria by 2015, and achieving the reversal of the incidence of malaria and other major diseases. The need to curb the spread of malaria has gained urgency recently, due to the malarial parasite developing drug resistance and insecticides becoming less effective in controlling mosquitoes. Another serious concern is the spread of tuberculosis. For example, the prevalence rate of 335 per 100,000 people in Indonesia, in the year 2000, provides cause for concern. In South-East Asia alone, there are around 3 million cases a year (WHO 2003). The HDR, 2002 assessment does not have data on categorising countries under this goal.

Goal 7: Ensure environmental sustainability

The first target for this goal is the integration of the principles of sustainable development into country policies and programmes, and reversal of the loss of environmental resources. Deforestation, industrial pollution, domestic wood burning and human waste are among the numerous ways by which environmental degradation occurs in Asia. Reforestation in some instances has been helpful; for example, forest cover in China and Viet Nam appears to have increased slightly, between 1990 and 2000.[5] However, losses in forestry continue to occur in countries like Indonesia, Malaysia and Sri Lanka. While legislation is usually adequate, enforcement in remote areas poses a great challenge to the authorities, and is complicated by corruption. ESCAP has rated the progress for this target in the Asia-Pacific region as poor so far, with few countries giving this target sufficient attention (ESCAP 2003).

The next target is to halve, by 2015, the proportion of people without sustainable access to safe drinking water. Urban water coverage is 93 per cent and rural coverage is 75 per cent for Asia (Kataoka 2002). Thus, the most serious problems regarding clean water access can be found in the rural areas, where millions of people lack water from protected sources. There has been some progress in certain countries; for example, in India, rural coverage went up from 61 per cent in 1990 to 79 per cent in 2000. However, based on current trends, it is likely that the region as a whole will miss the target.[6] Sri Lanka is the only country that has 'achieved' the target while China is rated as 'far behind' and Viet Nam is 'lagging' in terms of population using improved water sources (Table 3.7).

Assessments in Asia's march towards achieving the various MDGs indicate a mixed and varied performance. Countries like Malaysia, Thailand and even China show significant progress and are 'on track' to achieve most of the goals and targets. Sri Lanka's performance with reference to most of the goals and targets is also commendable. Pakistan, India and Mongolia lag behind the other six countries in almost all the MDGs, while Indonesia stands between the successful countries and the laggards with a very mixed overall record.

Table 3.7 *Progress towards MDG 7 by nine Asian countries*
Goal 7: Ensure environmental sustainability
Target 10: Halve the proportion of people without access to improved water sources
Indicator 30: Population using improved water sources (%)

Country	Achieved	On track	Lagging	Far behind	Slipping back
China				●	
India		●			
Indonesia		●			
Malaysia (NA)					
Mongolia (NA)					
Pakistan		●			
Sri Lanka	●				
Thailand		●			
Viet Nam			●		

Source: Global HDR, 2002.
NA: Data not available.

IV

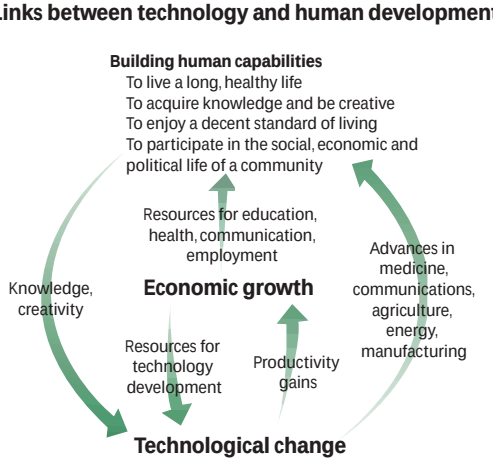
ICT for Enhancing Human Development: Potential and Promise

Recent developments in the fields of communications and information technology are indeed revolutionary in nature. Information and knowledge are expanding in quantity and accessibility. In many fields future decision-makers will be presented with unprecedented new tools for development. In such fields as agriculture, health, education, human resources and environmental management, or transport and business development, the consequences could be really quite revolutionary. Communications and information technology have enormous potential, especially for developing countries, and in furthering sustainable development.
— Kofi Annan (1997), United Nations Commission on Science and Technology for Development 'Inter-Agency Project on Universal Access to Basic Communication and Information Services', 3rd Session, Geneva.

The technological revolution in the information and communications sector brought about by microelectronics and digital technologies has given rise to widespread speculation and debate on the potential of ICT to enhance human development. Many developing countries, businesses and citizens' groups are identifying ICT as a means to transcend structural and historical weaknesses of developing nations in the economic, political and social spheres. They argue that ICT offers the developing world the opportunity to 'leapfrog' several stages of their development and join the industrialised nations in the information age. ICT is said to facilitate the process of leapfrogging by dramatically increasing the capacity to produce, store, process, distribute and exchange information. It is also more practical, environmentally sound and less expensive than all earlier forms of technology.

Harnessing technological change for human development can happen in several ways. Advances in medicine, agriculture, energy, communications, etc. can directly build human capabilities through improvement in health, longevity, knowledge and greater participation in social, economic and political life. It can also expand human choices through productivity gains and increase in income. Human capabilities in turn, through creative application of education, can trigger further technological change which can be harnessed for building human capabilities and expanding choices (Figure 4.1).

Figure 4.1 *Harnessing technology for human development*



Source: Global HDR, 2001.

The literature on the role of ICT in promoting economic development is rich in terms of empirical rigour and diversity of opinions, despite having a short history (Brynjolfsson & Hitt 1996, Lehr & Lichtenberg 2003). The final report of the Digital Opportunities Task Force (DOT Force 2001) has highlighted the transformational impact of ICT by examining over three hundred ICTs for development initiatives from around the world. The DOT Force collected

empirical evidence to illustrate the role of ICTs in generating new economic opportunities, delivering improved healthcare and education, promoting sustainable environmental management, fostering democratic governance by empowering people and organisations, and making government processes more efficient and transparent.

Although such studies have suggested a positive impact of ICT on income and employment growth, most of them pertain to developed countries {Oliner & Sichel, 2000; Javala & Pahjola, 2002; Dewan & Kraemer (forthcoming)}. In the case of developing countries where non-ICT investments tend to have a higher pay-off than ICT investments, a positive relationship is either weak or absent. In view of this, scholars have argued that growth of ICT should not become a 'techno-quick-fix' for solving development problems as there may be unacceptable trade-offs with MDGs in less-developed countries (Wilde 2003). They believe, "We are only beginning to understand how the application of ICTs relates to the achievement of social goals and economic growth and there are serious doubts whether the benefits truly outweigh the costs."

Proponents of the view that ICTs have powerful positive impact on human development have argued that harnessing the power of ICTs and ushering in of a 'digital revolution' can transform production processes, commerce, government and education and create new forms of economic growth that will benefit all sections of the population. Furthermore, these can contribute to the realisation of social goals through greater dissemination of health and reproductive information, training of medical personnel and teachers, equitable access to education and training facilities, opening up of opportunities for women and expanding the scope for citizen participation. Taking a sample of 37 developing countries, one study (Baliamoune 2002) establishes that ICTs have a strong positive effect on the process of socio-economic development, provided that governments create and maintain a conducive, enabling environment.

Technological innovations in the information and communication sectors are seen to affect human development in several tangible ways. In this study, the development effects of ICT are explored through three channels: i) ICT as a sector of economic activity; ii) ICT as an enabler or input for enhancing human productivity; and iii) ICT directly influencing human development through access to information, knowledge and enlarging choices.

First, and this is perhaps where the impact of ICT is immediately visible, is the contribution of the ICT sector to the overall economic growth of a nation or even to the global economy. Global spending on information and communications technology is projected to grow from US$2.2 trillion in 1999 to US$ 3 trillion in by 2003.[7] The ICT sector and industry have witnessed unprecedented growth in the past decade. In the mid 1990s, the ICT sector became the world's first industry to surpass leading industrial sectors such as automobile and steel. In the latter part of the 1990s, the average annual growth rate of the world economy was around 3%, while the growth of the ICT sector was two to three times that of the growth rate of the world economy. In 1998, the contribution of the ICT industry to world economic growth was 14.7 per cent, and actually exceeded 25 per cent in view of a decreased value of products and services. In 1999, the merger and acquisition transaction in the global information industry amounted to up to $1 trillion, with an average annual growth of 200 per cent.

Second, ICT enhances the process of human development through productivity gains that it generates in every sector. The pervasive potential impact of ICT emerges from its being used as control technology, leading to innovations in products and processes in the manufacturing sectors and resource extraction industries. It plays a critical role in computational activities supporting scientific and technological research and in the network of communication research and development and business activity around the world (Mansell & Wehn 1998).

At this level, however, quantitative assessment of the impact of ICT becomes difficult as it is so embedded and integrated in all industrial and services sectors. The problem lies in isolating and then quantifying actual contributions made by ICTs themselves. ICTs have in fact become indispensable ingredients in all forms and processes of economic activity ranging from stock inventories, product and service information, marketing, manufacturing and design. They have become a vital component of national and international business transactions, stock market information, international trade and global currency markets.

Third, and perhaps most significant, the long-term impact of ICT lies in its ability to directly expand human choices through increased access to information and knowledge. ICT derives its significance in the development equation from being one of the most important purveyors of knowledge. Knowledge plays a critical role in people's ability to process, interpret, evaluate and deploy information in their own context and in the pursuit of their own interests. Knowledge empowers individuals, organisations and communities by providing them with choices far beyond those that may be available to them otherwise. These choices generate opportunities for increased participation — economically, socially, politically and culturally. ICT enables this flow of knowledge across geographical, political, economic and social borders thereby breaking earlier forms of knowledge monopoly which led to the exclusion of large sections of the world's population.

ICT breaks barriers to human development in at least three ways not possible before or with other forms of technology:

Breaking barriers to human knowledge

Access to information and education are indispensable in building human capabilities. The internet and other ICTs are increasingly becoming their key delivery mechanisms to sections of the population which did not have access to educational infrastructure and content. Moreover, these new delivery mechanisms provide access to global and diversified sources of information and educational content, thereby enhancing dramatically the quality of educational inputs that are available to even the most remote and deprived populations. ICTs are also being actively used in promoting life-long learning and continued education as well as reintegrating unemployed people into the workforce through re-education and retooling of skills. Women and other excluded groups stand to benefit particularly from this.

Breaking barriers to participation

The world has witnessed innovative uses of the internet and other ICTs in enhancing political participation as well as in bringing about greater transparency and accountability. In many parts of Asia, where the mass media have been and continue to be strictly controlled by governments, the internet has offered a new medium of political mobilisation and participation. In Malaysia, the emergence of alternative news and online websites such as *Malaysiakini* have provided a channel for opposition groups and parties as well as critics of the government to express dissent, thereby creating a new space for political debate and expression. In India, *Tehelka.com*, an investigative journalism website, broke news of a high level defense scandal involving senior defense officials of the government who were caught accepting bribes in exchange for giving out defense contracts. These internet and ICT based news and information groups have contributed to the creation of a more vibrant public sphere. They increase social, political, economic and cultural participation which enhances networking and social mobilisation and can drive governments to become accountable and transparent (Banerjee 2003).

Breaking barriers to economic opportunity

Since the ICT sector requires less initial investment than the more traditional sectors of industrial activity, it lowers the barriers to entry into the economy for people who could never break into the industrial sector. ICT provides new and unprecedented opportunities to people who have proficiency in handling ICT tools and have an idea or service to sell. This was undoubtedly one of the underlying forces of the dotcom boom. This is what helped people with ICT skills in countries like India, China and Malaysia to overcome the traditional barriers to employment and wealth creation by joining the computer software industry or related ICT industries. ICT has also created new outsourcing opportunities whereby services are provided in one country and delivered to another country. The global outsourcing market is worth more than US$ 100 million and provides an array of opportunities to Asian countries with their high-skill ICT proficiencies and relatively cheap labour. In addition, ICT, through the creation of call and transcription centres, has led to new economic opportunities for large sections of the Asian population. These new avenues of employment have particularly benefited the underprivileged sections; for example, in India, women constitute a large section of the workforce in call and transcription centres.

V

Status of ICT Diffusion and Use in Asia

Asian nations are well placed to leverage the use of ICT for socio-economic and human development. In just over a decade, several Asian nations have emerged as global leaders in terms of ICT use and penetration. Telephone, personal computer (PC) ownership and internet access are spreading rapidly, pushed by growing government support through pro-ICT policies and regulations as well as much lower start-up costs compared to what developed countries experienced initially. Asian populations are also increasingly spending more and more on ICT. Expenditures for ICT, which include external[8] and internal[9] spending on information technology, are on the increase for some Asian countries (Table 5.1). In all countries where data were available (except Indonesia), ICT expenditure is seen to have increased both in absolute terms and as a share of GDP between 1995 and 2001. The extent of increase has varied, with a high absolute increase of around 227 per cent in China and a low increase of a little over six per cent in Thailand. India also shows a remarkable increase, more than doubling its ICT expenditure over this period. Indonesia is the only country that actually experienced a decline of a little over 18 per cent. In terms of GDP shares the variations recorded are less, with all countries showing increases including, interestingly, Indonesia.

Table 5.1 *Increase in ICT expenditures of nine Asian countries in years 1995 and 2001*

	Total ICT expenditure (million US$)		ICT expenditure as % of GDP	
	1995	2001	1995	2001
China	20,401.0	66,612.0 (226.51%)	2.9	5.7
India	7,250.0	19,662.0 (171.20%)	2.1	3.9
Indonesia	4,337.0	3,540.0 (-18.37%)	2.1	2.2
Malaysia	4,438.0	6,325.0 (42.51%)	5.0	6.6
Mongolia	NA	NA	NA	NA
Pakistan	NA	NA	NA	NA
Sri Lanka	NA	NA	NA	NA
Thailand	4,464.0	4,751.0 (6.42%)	2.7	3.7
Viet Nam	740.0	2,124.0 (187.02%)	3.6	6.7

Source: Development Data Group, World Bank http://www.worldbank.org/data/countrydata/countrydata.html
Note: Figures in parenthesis denote percentage changes as compared to 1995.

Table 5.2 *Technology and infrastructure data profile in years 1997 and 2001*

Indicators	World		East Asia and Pacific		South Asia		Europe and Central Asia	
	1997	2001	1997	2001	1997	2001	1997	2001
Total population	5.8 billion	6.1 billion	1.7 billion	1.8 billion	1.3 billion	1.4 billion	473.5 million	474.6 million
Fixed lines & mobile telephones (per 1,000 people)	175	328.7 (87.82%)	61.7	207.4 (236.14%)	17.6	38.1 (116.47%)	202.0	375.0 (85.64%)
Personal computers (per 1,000 people)	53.8	86.2 (60.22%)	7.5	19.1 (154.66%)	2.1	5.3 (152.38%)	28.1	52.1 (85.4%)
Internet users (million)	95.8	501.5 (423.48%)	1.9	50.9 (2578.94%)	0.774	8) (933.59%	3.1	18.8 (506.45%)

Source: *World Development Indicators Database*, April 2003.
Note: Figures in parenthesis indicate percentage changes as compared to 1997.

ICT related infrastructure development has also been diverse across Asia (Table 5.2). Between 1997 and 2001, the Asian region (East Asia and the Pacific and South Asia) recorded the highest percentage increases in tele-density (fixed and wireless), PC penetration and internet users as compared with the world as well as Europe and Central Asia. The percentage increases were exceptional, with East Asia and the Pacific recording around 236 per cent for tele-density, 154 per cent for PC penetration and a whopping 2579 per cent in internet users. Within the Asian region, the percentage increases in East Asia and the Pacific exceeded those of South Asia. In terms of technology diffusion and take-up rates, internet users clearly recorded exponential growth in all regions of the world. However, here also, the growth in the Asian region was the highest.

Further, examining the status of tele-density rates for the nine Asian countries (Table 5.3) based on 2001 data, Malaysia and China are the top performers, both in telephone mainlines and mobile phones per 1,000 inhabitants. The lowest penetration rates are observed for Pakistan for both telephone mainlines and mobile phones, followed by Viet Nam, with India and Indonesia coming next for telephone mainline penetration. As for the mobile phone penetration rate, India follows Pakistan from the bottom. Of the nine countries, it is only in Malaysia and Mongolia that mobile phone penetration exceeds that of mainline telephones. However, the reasons for this similarity are likely to be quite different, given that these two countries stand at very different levels of economic development. It is likely that in Malaysia, mobile telephones have caught on as a trend backed by higher purchasing power, whereas in Mongolia a

Table 5.3 *Penetration rates for telephone mainlines and mobile phones for nine Asian countries in the year 2001*

Country	Telephone mainlines (per 1,000 inhabitants)	Mobile phones (per 1,000 inhabitants)
China	111.8	65.8
India	32.0	3.5
Indonesia	32.3	17.8
Malaysia	199.2	213.2
Mongolia	49.5	65.1
Pakistan	21.6	2.5
Sri Lanka	41.4	23.2
Thailand	92.3	50.4
Viet Nam	31.9	9.9

Source: World Development Indicators Database, April 2003.

more likely explanation is the absence of fixed line infrastructure as reflected in its low mainline tele-density of less than 50 per 1,000 inhabitants.

With regard to wireless communication, although the possibilities are endless, it is the relative advantage (the degree to which it is perceived to be better than what it supersedes) and the compatibility (consistency with existing values, past experiences and needs) which are critical factors for its adoption. For example, in geographically difficult regions, while the relative advantage of wireless communication is significant, actual adoption could face obstacles of limited past experience, exposure, cost, etc. Currently the biggest barrier to wireless internet access is bandwidth and speed. Sending data to and from a mobile device is still tedious; users are not inclined to send mile-long emails via their mobile phones.

In most developing countries, where even basic communication infrastructure is a problem, mobile telephony is proving to be a boon. Operators no longer have to invest heavily in hardware and in countries where laying landlines is a difficult process, user rates of mobile telephony are on the increase. In 2001, China's SMS revenues totaled US$ 234 million and as diffusion spreads exponentially, revenue is set to triple every year. In Mongolia, all *aimags,* or provinces, (except for Huvsgul) are connected with microwave digital lines, with some *aimags* having satellite connections.

In terms of internet penetration in Asia, the International Telecommunications Union estimated that in 2001, Asia-Pacific had over 160 million internet users with a penetration rate of 460 users per 10,000 inhabitants (Table 5.4). Amongst the nine Asian countries, China leads with a little over 59 million users, followed by India with a little under 17 million users. However, in respect of number of users per 10,000 inhabitants, it is Malaysia that emerges on top, with a penetration rate of 3197, well above the Asia-Pacific average. The other eight countries are all well below this rate, with Thailand coming in second at around 776. The lowest penetration rates are observed in Pakistan and Sri Lanka, with a little over 100 users per 10,000 inhabitants.

With respect to personal computer (PC) penetration, Malaysia leads the nine countries with 14.7 PCs per 100 inhabitants. All the others have single digit PC penetration rates. In fact, Pakistan, India and Viet Nam are at the bottom, with the PC penetration rate below one per 100 inhabitants. Data on internet hosts per 10,000 inhabitants reveals a similar picture. Interestingly, as per available data, broadband subscriptions (which enormously increase the speed and volume of information transactions) as a share of total internet users range between a low 0.1 per cent for Thailand to 2.5 per cent for Indonesia, well below the Asia-Pacific average of 19 per cent (the Republic of Korea leads the world with a massive broadband subscriber share of 93 per cent).

Table 5.4 *Internet diffusion in selected Asian countries in years 2001 and 2002*

Country	Estimated PCs		Internet hosts		Number of ISPs	Number of internet users		Number of internet subscribers (in thousands)[a]		International internet bandwidth
	Estimated PCs Total (in thousands)	Estimated PCs per 100 inhabitants	Hosts Total	Hosts per 10,000 inhabitants		Total (in thousands)	Per 10,000 inhabitants	Total	Broad band	(M/bit/s)*
Asia- Pacific*	NA	NA	NA	NA	6,654	160,217	460.00	74,290	13,979	64,955
China	35,500	2.76	156,531	1.22	936	59,100	460.09	17,364	203	7,598
India	7,500	0.72	78,595	0.75	90	16,580	159.14	3,200	50	1,475
Indonesia	2,519	1.19	61,279	2.89	60	8,000	377.16	600	15	343
Malaysia	3,600	14.68	86,285	35.18	6	7,841	3196.89	2,115	4	733
Mongolia	69	2.84	127	0.52	NA	50	205.85	NA	NA	NA
Pakistan	600*	0.42	12,707	0.87	70	1,500	102.77	200	NA	225
Sri Lanka	250	1.32	2,335	1.23	29	200	105.56	62	NA	18
Thailand	2,461	3.98	100,132	16.18	18	4,800	775.61	1500	2	624
Viet Nam	800	0.98	529	0.07	4			252		34

Source: ITU Telecommunications Update, 2001; ITU 2003 (Internet Host Data: Network Wizards, RIPE). Retrieved from www.itu.int/ITU-D/ict/statistics.index.html.

* Figures relate to 2001

NA: Data not available.

VI

Digital Divides: Challenges for Human Development in Asia

In examining the use of ICT for development between 1995-1997, the Working Group on IT and Development of the United Nations Commission on Science and Technology for Development (UNCSTD) noted that despite the positive impacts experienced in the industrialised countries and certain sectors of many developing nations, evidence showed that there were many people, especially in the least developed countries, whose lives had been barely touched by ICT (UNCSTD Report 1995). There were also many whose lives were being negatively affected by their exclusion from the global information society or by the social or economic dislocations that can accompany the impact of ICT.

The term 'digital divide' denotes the disparity in the adoption of ICT by different sections of the society. In spite of the commendable efforts by many Asian governments, ICT diffusion and use has followed existing socio-economic, gender and urban-rural divides. Digital divide is a reflection of existing broader socio-economic inequalities. It is urgent to reinstate human development at the core of ICT initiatives in Asia to avert widening of the digital divide and prevent the exclusion and marginalisation of certain sections of the population in the developing world (Mansell & Wehn 1998).

Factors in digital divide

Digital divide can be assessed by examining indicators like penetration, cost, technology acheivement, network readiness, socio-economic factors, locally relevant content and appropriate policy regime. These factors influence the ability to derive economic and social benefits from information-intensive activities (DOT Force 2001).

Penetration

Although countries in Asia have taken giant leaps in terms of internet penetration in the past decade, digital divide across countries is evident

Table 6.1 *Digital divide in internet use across regions of the world in years 1998 and 2000*

Region	Internet users as a percentage of population	
	1998	2000
East Asia and the Pacific	0.5	2.3
South Asia	0.04	0.4
United States	26.3	54.3
Arab States	0.2	0.6
Eastern Europe and the CIS	0.8	3.9
Latin America and the Caribbean	0.8	3.2
Sub-Saharan Africa	0.1	0.4
High income OECD (excluding US)	6.9	28.2
World	2.4	6.7

Source: HDR, 2001: Making New Technologies Work for Human Development.
http://hdr.undp.org/reports/global/2001/en/pdf/chaptertwo.pdf

Table 6.2 *Differences in regional diffusion of ICTs in the year 2002*

	PC (per 100 inhabitants)	Internet users (per 10,000 inhabitants)
Global	9.22	972.16
Africa	1.23	99.62
Americas (North and South)	27.49	2421.02
Asia	3.95	557.56
Europe	20.01	2079.00
Oceania	38.94	3330.47

Source: International Telecommunication Union, 2002.

(Tables 5.4, 6.1 & 6.2). Data in Table 6.1 show that share of internet users to total population has more than doubled in the short three-year period (1998-2000) in all regions of the world. However, the US and high income OECD countries continue to be way ahead of the other regions. Both East Asia and the Pacific, and South Asia are far behind. As compared to the world averages of 2.4 per cent and 6.7 per cent in 1998 and 2000 respectively, the share of internet users in East Asia and the Pacific was only 0.5 per cent and 2.3 per cent. South Asian percentages were even lower, at 0.04 and 0.4. Thus the digital divide in terms of internet penetration clearly persists across regions. This is significant because the United States and high-income OECD countries constitute just 19 per cent of the world population.

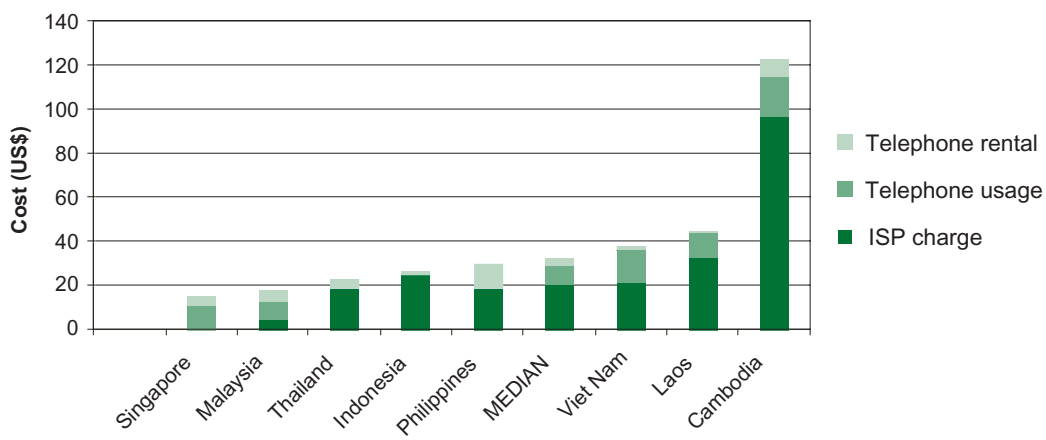
With regard to PC penetration, the digital divide is clear (Table 5.4) across the nine Asian countries. Putting this in a global context, enormous digital divides across regions of the world also exist in respect of both PC and internet penetration (Table 6.2).

Cost

Cost considerations are a critical factor in the digital divide. The poor are already hampered by social factors such as low education and unfamiliarity with technology. Adding the burden of high cost of access to ICT services only serves to deepen the digital divide. Unfortunately, users in countries which are in the early stages of ICT development encounter higher cost of access as companies have to factor in capital costs as well as a lower user base. Data on internet retail pricing reveals enormous usage cost differences across countries (Figure 6.1 & Table 6.3).

While the average usage costs of internet retail pricing are comparable between OECD and Asian countries at approximately US$ 30.00 and US$ 32.50 respectively, poorer Asian countries like Cambodia, Laos and Viet Nam have signifi-

Figure 6.1 *Internet pricing in selected Asian countries in the year 2001*



Source: International Telecommunications Union, 2001

Table 6.3 *Internet retail pricing and number of ISPs in selected Asian countries in the year 2001*

Country	Total cost	Number of ISPs (licensed)	Number of ISPs (operational)
Singapore	15.38	44	NA
Malaysia	17.63	18	NA
Thailand	22.93	18	18
Indonesia	26.90	150	60
Philippines	30.43	150	50
Viet Nam	37.88	5	4
Laos	44.96	2	2
Cambodia	123.60	3	3

Source: International Telecommunication Union, 2001

cantly higher than average costs. Particularly striking is the case of Cambodia, where the total cost of internet usage per 30 hours stands at an exceptional high of US$ 123.60. At the other end of the spectrum, better off countries like Singapore, Malaysia and Thailand face costs for comparable services ranging between US$15 and US$ 23, well below the average.

There is also a relationship between the number of Internet Service Providers (ISPs) in these countries and the retail prices faced by users (Table 6.3). The countries with higher retail prices have far fewer ISPs as compared with the countries with relatively lower retail prices.

Within each country also, cost differences exacerbate the digital divide. According to the Mongolia country study associated with this Report the price of internet connections has been dropping overall. An hourly rate of US$ 0.60 in internet cafes makes access more affordable for citizens who have no computer at home or in the office, in the urban area of Ulaan Baatar. Unfortunately, for users in rural *aimag*s, dial-up connections are costly since phone calls cost US$ 0.20 per minute. In comparison, phone calls cost only US$ 0.06 per minute in Ulaan Baatar. Therefore the only alternative in rural *aimags* are the internet cafés at the local post and telecommunication offices, which charge rates of US$ 0.45 to US$ 0.60 per minute.

In another example from India, it cost the state government of Maharastra US$ 600,000 to wire up 70 contiguous villages in the districts of Kolhapur and Sangli. With 550,000 villages across India, the cost of wiring every single village in the country would work out at US$ 4.7 billion, far beyond the ability of even the most capable government administration.

The Malaysian government has allocated US$ 290 million in its Eighth Malaysia Plan to bridge the digital divide among its citizens, underlining the role of the state in reducing such inequalities. However Malaysia has also given some companies a Multimedia Super Corridor status which entitles them to financial incentives such as no income tax for up to 10 years or an investment tax allowance with no duties on the import of multimedia equipment. While this provides incentives for companies to establish themselves in the Malaysian technopole, it can have the unintended effect of further privileging the larger business enterprises.

Hardware and software costs

Another area of concern is the cost of hardware. While tariff and excise duty reduction has helped bring down the cost of ICT equipment, it still is unaffordable from the point of view of providing IT to the masses. One such initiative in India aims to reduce hardware costs by simplifying the equipment as well as its usage. The Simputer was designed in 2001 as a simple, easy-to-use and inexpensive device with multilingual software, aimed at providing hardware access to a large number of poor users at low cost. Priced at less than US$ 200, it is currently being produced in small prototype batches and is being field-tested in selected ICT for development projects.

It is widely accepted that initial software costs and costs of upgrading software can be substantial if ICT for development projects depend

Box 6.1 *Measures of e-readiness capturing inter-country digital divides*

Asia's development and divide in the ICT sector has also been captured by several recent e-readiness assessments. E-readiness has been defined by the Harvard Centre for International Development as the potential of a community to participate in ICT developments. Two benchmarks of e-readiness have emerged — the Technology Achievement Index (TAI) (UNDP 2001) and the Networked Readiness Index (NRI).[10]

TAI was first used by the UNDP in the Human Development Report 2001. The index measures "how well a country is creating and diffusing technology and building a human skill base, reflecting capacity to participate in the technological innovations of the network age" (UNDP 2001). TAI focuses on four dimensions of technological capacity to make up the TAI value: creation of technology, diffusion of recent innovations, diffusion of old innovations, and human skills. TAI categorises countries into four levels:

- **Leaders** (TAI above 0.5) — countries at the cutting edge of technological innovation; high achievements in technology creation, diffusion and skills.
- **Potential Leaders** (TAI 0.35 – 0.49) — countries with investments in high levels of human skills; wide diffusion of old technologies but limited innovations; skill levels comparable to leaders.
- **Dynamic Adopters** (TAI 0.20 – 0.34) — countries with dynamic uses of new technology; higher skills than fourth group; with important high-technology industries and technology hubs; slow and incomplete diffusion of old inventions.
- **Marginalised** (TAI below 0.20) — technology diffusion and skill building have a long way to go; large sections of the population not benefited from old technologies.

solely on proprietary software. There is a gathering momentum in the open source software movement, promoting a more equitable and fair pricing. This has generated some interesting debates regarding 'open source' and 'free' software, often leading to confusion. Most valuable for lowering costs and maximising diffusion is software where the source code has been made easily acceptable for programmers and users to modify the software as required. The attraction of open source software lies in the fact that its use by government and a large public could encourage local software professionals to provide software support in the form of add-on applications that are written at a cost much smaller than that required to buy multi-featured packaged software. This would decentralise software production, challenging the large transnational producers of packaged and bundled software, who have been able to convert the software industry from a service industry to one of large-scale manufacturing, thus worsening digital divides.

Recently the government of the state of Madhya Pradesh in India publicly announced its decision to use the well-known open source *Linux* software in its official IT programme, which includes its e-governance (*Gyandoot*) and computer-enabled school education (Headstart) initiatives. This is in keeping with trends in other developing countries including China and many in Latin America like Mexico, Brazil, Argentina and Peru.

In Asia, as per TAI, Japan, Korea and Singapore are the only countries in the leader category (Table 6.4). The digital divide across countries is again evident, with only one country among the nine, Malaysia, being categorised as potential leader with a TAI value of 0.396 and ranked 30 out of the 72 countries ranked. China, India, Indonesia, Sri Lanka and Thailand come under the dynamic adopter category, while Pakistan is marginalised. Categorisation was not possible in the cases of Mongolia and Viet Nam as satisfactory data was not available; this itself probably reflects even lower levels of technology adoption.

The NRI framework for 2002–2003 takes into account more than ICT use in the economy: it also incorporates factors that contribute towards the use of ICT for a nation's development. Originally, the NRI captured the degree to which a community is prepared to participate in the networked world.[11] which was expanded in 2002 to include a community's potential to participate in the networked world in the future. Top-ranked countries are those with the most developed ICT networks and the greatest potential to exploit the capacity of their networks. The NRI scores are a combination of indi-

cators on a) network use and b) enabling factors reflecting important dimensions relevant for assessing the digital divide. Out of a total of 82 countries covered, most Asian countries with the exception of Singapore, Taiwan, Republic of Korea, Hong Kong (SAR) and Japan, are at the lower half of the NRI (Table 6.5). Many are ranked 30 or worse, with Bangladesh being the least network ready at rank 77. Of the nine countries covered by this Report, Malaysia at 32 is the highest ranked. At the other end of the scale, Viet Nam (71) and Indonesia (64) are the least network-ready countries. Pakistan and Mongolia do not feature in this ranking due to data limitations.

Socio-economic factors and the digital divide

The digital divide is not limited to issues of penetration, costs of access, hardware and software and e-readiness. Increasingly recognised as more fundamental factors are the social, economic, cultural and locational disparities, which lead to further cumulative inequalities. The interdependence among these factors deepen and widen the digital divide, impeding the effective use of ICT for human development. In Asia, male-female gaps, urban-rural disparities, special disabilities faced by remote and indigenous populations, inter-generational gaps, all create sizeable obstacles to ICT absorption and use.

ICTs have a requirement of specific skill and that comes in the way of its adoption by the underprivileged groups and regions. For example, in less-developed countries, legal and administrative structures that have been considered important for providing equitable access to all sections of the population are yet to be institutionalised. Even when these structures are in place, difficulties in implementation can negate their effectiveness for human development, strengthening the position of economic and political elites *vis-a-vis* others. These elites have larger resources at their command to own or access the technology, can acquire the necessary skills easily due to their higher levels of secondary and tertiary education and can establish links through ICT with other productive and social sectors for appropriating new facilities and opportunities.

Content

The information and communication revoluation can bypass the disadvantaged population groups if there is inadequate attention to developing locally relevant content. Issues of poverty, inequality and exclusion cannot be addressed if content does not address real life problems for these groups. For example, information on health that focuses on tackling lifestyle diseases like obesity, is of little use in a situation of poverty and starvation. Similarly

Table 6.4 *Technology Achievement Index (TAI) for selected Asian countries in the year 2001*

Country	TAI value	TAI rank (out of 72 countries covered)	Category
Japan	0.698	4	Leader
Republic of Korea	0.666	5	Leader
Singapore	0.585	10	Leader
Malaysia	0.396	30	Potential leader
India	0.201	63	Dynamic adopter
China	0.299	45	Dynamic adopter
Thailand	0.337	40	Dynamic adopter
Indonesia	0.211	60	Dynamic adopter
Sri Lanka	0.203	62	Dynamic adopter
Pakistan	0.167	65	Marginalised
Mongolia	NA	Satisfactory data not available	Others
Viet Nam	NA	Satisfactory data not available	Others

Source: HDR, 2001: *Making New Technologies Work for Human Development*. Available at http://hdr.undp.org/reports/global/2001/en/pdf/chaptertwo.pdf
NA: Data not available.

Table 6.5 *Network Readiness Index (NRI) of selected Asian countries*

Country	Score	NRI rank (out of 82 countries covered)
Singapore	5.74	3
Taiwan	5.31	9
Hong Kong SAR	4.99	18
Japan	4.95	20
Malaysia	4.28	32
India	3.89	37
Thailand	3.80	41
China	3.70	43
Sri Lanka	3.45	54
Philippines	3.25	62
Indonesia	3.16	64
Vietnam	2.96	71
Bangladesh	2.53	77

Source: Global Information Technology Report, 2002–2003.

the empowerment of women can hardly be promoted through websites where female subjects focus on beauty treatments or pornography. Rural develpment issues are harder to address if the content is not in local language and idiom.

Policy

Appropriate policy regimes can also influence digital divide. Policies can influence content, access, competition, availability and spread of infrastructure, etc.

Choices guiding ICT initiatives in Asia are often driven by economic and commercial interests and the gloss around the technology obscures social choices about how to computerise or communicate and the ways in which different forms of computerisation or communication advance different values (Mody 1999). The guiding of ICT initiatives in Asia is also driven by governmental agendas such as political interest, social policy and military security, not always consistent with promoting human development.

The United Nations Commission on Science and Technology for Development (UNCSTD) Working Group raised some crucial questions which need to be urgently addressed by political leaders and citizens of the developing world. Do the benefits of the increasingly widespread, albeit uneven, diffusion and application of ICT outweigh the risks for developing countries? Are stakeholders in developing countries taking appropriate measures to minimise the risks of social and economic exclusion that could be associated with these revolutionary technologies?[12] The UNCSTD report and other recent studies not only provide some interesting and useful insights into the problems of access and use of information technology by developing countries but also call for caution and careful planning and implementation of ICT if it is to be harnessed for genuine development objectives and goals.

VII

ICTs and the MDGs: A Quest for Empirical Regularities and Indexing

Role of ICT in promoting MDGs has been a point of debate among planners, policy makers, researchers and others. Many consider ICT to be the only possible means of achieving MDGs through technological leapfrogging. An equally vociferous view, on the other hand, is that ICT is of no great value and could even be detrimental to the less-developed world, particularly for populations that are economically and socially underprivileged. Indeed, the impact of ICT in a country or a region depends on its nature, the purpose of its deployment and spatial spread, besides the economic, administrative and social environment backing up the strategy of its diffusion. In this context, assembling empirical evidence on the impact of ICT on human development is of key importance.

Objectives

To assess empirically the linkages between ICT linked services and their contribution towards achievement of MDGs for human development in Asia, an empirical study was undertaken to:

- Identify ICT indicators that articulate the key concerns for human development and MDGs;
- Construct composite indices for capturing the extent of ICT use for human development, towards achievement of MDGs.

Data for the nine countries of Asia were used for the study. Constructing the indices serves as a benchmarking exercise. This could initiate the process of determining and monitoring the progress of different countries towards the stated goals.

Recent initiatives and limitations of existing data sources

A number of regional and international organisations have undertaken studies and proposed frameworks to assess progress in ICT development for achieving various socio-economic goals. Orbicom's *Monitoring the Digital Divide* assesses the magnitude of the digital divide and, more specifically, progress of different countries toward the 'infostate', by building thematic clusters of indicators related to info-density and info-use. *Global Information Technology Report*, brought out by the Global Economic Forum, gives a monitoring framework with an index of three elements: environment for ICT; readiness of stakeholders; and usage of ICT among stakeholders. *Global Survey and Guide to ICT Planning in Education* is an important instrument in assessing ICT progress in education. A study by the European Commission has built Statistical Indicators Benchmarking the Information Society (SIBIS) for a large number of OECD countries. It provides information related to access of ICT to households for various purposes like business, education and healthcare. Unfortunately, a similar exercise has not been carried out for Asian countries. The World Health Organisation is working on a set of ICT-related indicators for the health sector. Data on Asian countries from this source are not yet available to researchers and policy makers. International Development Research Centre (IDRC) gives, besides the supply indicators, information on users and usages.

An important initiative is that of the United Nations ICT Task Force, established in March 2001. It has attempted to place relevant initiatives and research studies within a coherent

policy framework. The Task Force has overviewed, largely in qualitative terms, the current applications of ICT in different countries and come out with a set of indicators to chart progress, which could help in setting up targets for ICTs. It has also come up with a matrix that maps ICTs across the eight MDGs. This suggests a path — translating each MDG into a set of indicators, working out corresponding ICT goals, and then constructing a set of compatible ICT indicators. Following these guidelines, a list of indicators under each MDG has been worked out (Appendix II). However, it is not possible to obtain information on many of these indicators for Asian countries from international websites. Meeting data deficiencies through cross-country surveys are prohibitively expensive.

A framework for identification of indicators for construction of composite index

A critical problem in anchoring ICTs within the MDGs is choosing appropriate indicators and assigning weights for composition. Earlier studies on the subject were restricted to industrialised countries. Since problems in diffusion of technology across sectors, regions and groups of population are less serious for developed countries, concerns about the digital divide were negligible. The indicators selected were mostly on the supply side, pertaining to availability of personal computers, internet facility, density of telephones, use of electronic goods, ratios of enrollment or passing out from technical institutions, etc. These data are available in international publications and worldwide websites. Similar indicators can easily be compiled for Asian countries, although there are problems[13] of comparability of data in some cases.

For developing countries, there is a strong case to go beyond supply-linked indicators to assess whether technologies are promoting the development process. This would require information on user-specific indicators like ICT applications, purpose of use, agencies involved and legal framework for adoption of ICTs.

Existing data sources for Asian countries do not permit building up of such specific indicators suitable for cross-country comparison. Generation of fresh data would make difficult financial and administrative demands on national and international statistical systems. Also, these countries are so very diverse in levels of economic development, human development, degree of openness to world markets and socio-cultural specificities that it is difficult to generalise and arrive at a consensus on user-specific indicators.[14] Further, a review of literature and analysis of interdependencies of ICT in developing countries may not be adequate to estimate its role in future years, particularly because ICT is still in its infancy.[15]

Identification of different dimensions of development and their constituent indicators

The difficulties[16] encountered in cross-country comparison necessitate the use of straight forward indicators reflecting primarily the degree of availability of ICT[17] (see the list of supply-side indicators under eight MDGs in Appendix II). They are combined with a few sector- or user-specific indicators that are obtainable from international documents or websites of UN agencies and the World Bank. These indicators are classified into four categories, focusing on four broad aspects: (Appendix III) availability or supply-linked; efficiency and speed; targeting social sectors; and targeting vulnerable groups.

Availability-linked indicators

Availability-linked indicators have been placed in two sub-categories: skill-independent and skill-dependent.

The first includes popular ICT tools for which users do not require much skill or training, such as telephone mainline connections, cellular subscriptions, television sets and radio sets, all being presented per 1,000 of population. Under the skill-dependent ICT category[18] where training and skills are required, the indicators identified are internet users per 100 people, personal computers per 100 people and per capita ICT expenditure. Higher expenditures would imply greater use of the technology by larger sections of population as they cover purchase of ICT products, including telecommunication facilities and other equipment for offices, businesses, households, governments and educational institutions. Two separate categories have been kept on the supply side so as to increase the importance of availability-linked indicators in the overall aggregation scheme.

Indicators of efficiency and speed

Indicators that capture aspects of efficiency, internet service provider charges, telephone usage charge for internet, cost of peak rate local

call per three minutes from the fixed line, cost of peak rate call to the United States per three minutes, internet speed and access, and IT training and education. Information on these indicators are compiled from the World Bank website on data and statistics[19] and the Global Competitiveness Report (GCR) 2001-02. Internet service provider charge is the monthly dial-up access charge for 20 hours of use and telephone usage charge is the telephone call charge for 20 hours of access. Higher costs would imply lower efficiency and lesser access. The last two are positive indicators of efficiency as these assign higher values to countries where the ICT facilities are relatively more efficient as manifest in greater speed of access and higher expenditures incurred in training of personnel.

Indicators of targeting social sectors

These include internet access in schools, computers in educational institutions per 1,000 students, government prioritisation of ICT, and government online services availability. The importance of universal literacy held by MDGs justifies inclusion of two educational indicators. Two government-linked indicators have been included, as the state continues to have a major role in promoting social development in Asian countries. Data on computers in educational institutions are obtained from the World Bank website and all other indicators are compiled from the GCR, 2001-02. These indicators simply show the 'rating' of each country, as assigned by GCR. These ratings, reflecting the performance of countries, are based on an opinion survey of 4,600 senior business leaders from 75 countries.[20]

Indicators of targeting vulnerable groups

Five indicators have been identified to assess ICT's contribution to socially deprived sections of the population: percentage of women among professional and technical workers;[21] public access to internet; government success in ICT promotion; competition in provision of internet services; and efficacy of laws relating to ICT use. Data on women professionals and technical workers have been taken from the HDR 2003 and information on other indicators from GCR 2001-02. Public access to internet facilities and high competition among the service providers is expected to lead to greater diffusion of the technology, lowering of the price and improvement in accessibility, all these hopefully increasing the access of the economically worse off. Also, greater competition is likely to generate greater employment in the informal sector, benefiting poor and vulnerable groups like women. Government's success in ICT promotion as also greater efficacy in the legal system for e-commerce, consumer protection etc., would reflect the outreach of the technology. This, too, will benefit vulnerable sections that tend to be marginalised under free functioning of the market, without adequate protection of the state or legal institutions.

Rationale for selection of indicators

What is the extent to which the selected indicators can map the attainment of MDGs? For goals like eradication of poverty, the important question is whether the income and employment effect of ICT has a bias in favour of the poor that could help them move above the poverty line. Despite equivocal opinions, there is adequate empirical evidence to suggest that the overall impact of the availability of ICT has been positive for the poor. In any case, availability is a precondition for any kind of application, pro-poor or otherwise. This would justify inclusion of availability-linked and efficiency indicators of ICT development. Besides, the state playing a role in providing public access to internet and in ensuring competition among service providers, the legal system promoting ICT development would help in better penetration of technology among the masses[22] and make a dent in poverty and inequality. It would be useful to construct other indicators for accessibility to the underprivileged or coverage of remote and backward areas, but this is not possible with existing official as well as non-official databases.

The role of ICT in improving education has been noted as positive and justifies inclusion of the availability-linked and efficiency indicators, in the context of meeting the education-related MDG. In addition, internet access in schools and computer use in educational institutions have been considered extremely useful sectoral indicators in articulating progress of countries towards universal primary education.

Statistics on access and usage of ICT by women relative to that of men would be useful in understanding the gender divide. While data are available in *The World's Women 2000*, with citations from Cyber Atlas and NUA, there are serious information gaps and problems of reliability due to

sources of different quality in the Asian countries.[23] There are also anomalies and inconsistencies in data collection procedures adopted by different countries, particularly for temporal comparison (Hafkin, 2003). One alternative is to take the percentage of women having tertiary level of education (university, teachers' college or higher professional school), or enrollment of women in the field of science and engineering,[24] but this would be a bit remote in capturing gender sensitivity in ICTs. It is, therefore, proposed to capture this dimension through the share of females among professionals and technical workers.

In the context of maternal and child health, access to basic amenities including sanitation facilities, and other social sectors, indicators pertaining to the role of the government such as public access to internet, success of the state in internet promotion, efficacy of laws in ICT use, are useful as the state plays a key role in social development in Asian countries. These may be included to indirectly reflect the coverage of social sectors, as disaggregated data on use of ICT in these sectors are not available.[25] Besides, there would be dependence on availability-linked indicators since the growth of ICT per se can help achieve these goals through market functioning. This is possible if countries follow certain kinds of ICT policy which, the overview suggests, is still in the formative stage in most Asian countries.

The Task Force concedes that selection of indicators at any point of time will be guided by availability of data. It argues in favour of a certain flexibility in the methodology so that the experiences gained over the years can be brought in to improve and refine the indicators over time. Further, it recognises the limitation of not getting hard empirical evidence to justify the selection of indicators or determine their relative importance. Therefore the Task Force argues that assembling anecdotal evidence and success stories would be a useful complementary exercise. Hence the attempt to work out a few composite indices reflecting various dimensions of ICT development as also its overall progress.

Component indices on different aspects of ICT development and aggregate index

The methodology

In view of the growing popularity of composite indices and possible usage of the ranking of the countries in national and international policy debates, it is proposed not to use complex multivariate tools in the composition exercise. The methodology attempts aggregation of the indicators in several stages, as has been done in working out the HDI. The method of assigning weightages on the basis of a correlation matrix, such as Principal Component Analysis, is not considered appropriate here since the pattern of interdependencies is likely to change as the technologies take firmer roots in the region. As there is no other empirical basis to work out the relative importance of indicators, they are assigned equal weights.[26]

The other important problem is the elimination of the bias of scale that characterises each indicator. In computing the HDI for the Global HDRs, UNDP adopts a 'Range Equalisation (RE) method' where each indicator is divided by the range (after subtraction of the lowest value) so that scale-free values vary between 0 and 1. In recent years HDI methodology has changed, as it uses fixed range computed on the basis of predetermined 'goalposts', reflecting the feasible upper and lower limits to the values. This enables temporal comparisons not only of the rank scores of the countries but also of their human development indices. The disadvantage is that the three constituent indices pertaining to life expectancy, education and GDP have lost the feature of a fixed range of unity. The highest value in each constituent index falls short of unity as the value for the top ranking country is below the goalpost. Similar is the explanation for the minimum value being higher than zero. In view of the popularity of this method among practitioners and policy makers, as well as for comparability, the same has been used in the present analysis.

However, fixing the range of the constituent indices through division by range discriminates against indicators that have greater disparity. Also, as inequalities in different indicators show different trends, it would be inappropriate to force these to have uniform and constant range over time. Indeed, with the introduction of the concept of goalposts to compute the range, the (scale-free) values of the indices no longer have the constant range of unity (thereby have lost their unique property). But the maximum and minimum values have been specified based on possible values over recent years and division by range is expected to ensure that the differ-

ence in disparity in the constituent indicators does not get reflected in HDI. There can also be disagreements in fixing goalposts for indicators like GDP per capita and life expectancy as the issues involved here are empirical. The two bounds for literacy and gross enrollment, on the other hand, are mathematical. While inequality in these two over time will decline as the maximum value is fixed, the same may not be the case with per capita income (Kundu 2003). Unfortunately, the RE method treats the two types of indices in identical manner. The popularity and acceptability of HDI among policy makers seem to have come in the way of these issues being investigated adequately in the literature.

It is proposed to use an alternate method that permits the coefficients of variation of different indicators to remain different even after making them scale free and lets these differences be reflected in the composite index and ranking. All the indicators have been made scale free through division by their own means.[27] The coefficients of variation of the original indicators, thus, become the standard deviations of the scale-free indicators, which are then carried into the component indices.

Another important point is temporal comparability of the indices. As the present exercise is undertaken to make the comparison across countries only, elimination of scale effect has been done by dividing each indicator by either range or mean, computed for the chosen year. In case such comparisons are to be made over time, it would be necessary to fix the values of the divisors, as is now being done in computing HDI in HDRs. Indeed, for computing ICT composite indices for any future year, it would make sense to use the same means as in the base year in the denominator for each indicator. However, in case the base year is not considered representative of the early years of the 21st century, it should be possible to work out the mean of the first three years, say 2001, 2002 and 2003 and fix these as the denominators for eliminating the scale bias for all subsequent exercises.

Five component indices have been constructed, in the first stage by (RE) method as well as by (DM) method of indexing, to cover the following aspects: skill-independent ICT; skill-dependent ICT; efficiency and speed; Social sector targeting; and vulnerable groups targeting.

Before composition, all the indicators need to be made uni-directional within each category. Indeed, the indicators reflecting the costs of interaction, such as internet service provider charges, telephone usage charge for internet, cost of local call and cost of call to U.S., cannot be combined with those articulating internet speed or IT training. It is necessary to reciprocate these cost figures so that efficiency indicators get defined as: (a) internet time available per US dollar; (b) telephone time for internet per US dollar; (c) local telephone time (at peak period) available per US dollar; and (d) US telephone time per US dollar. This is based on the understanding that the higher the accessibility of ICT time per unit of money, the greater is the efficiency of the system. This problem does not exist for any other category of indicators. Finally, the composite aggregate index of development of ICT in the context of MDG has been obtained by combining the five component indices.

Component indices obtained through RE method and the corresponding aggregate index

Following the RE method, the component index for a category is obtained by first making each indicator scale free, by subtracting its minimum value from each observation and then dividing it by its range. The average of these values across the indicators (within the category) for each country then becomes the value of its component index. Understandably, if a country has maximum values for all the indicators in a category, it will score an index value 1. Similarly, a country will obtain a composite score of zero only when it has the minimum value in all the indicators. The larger the value of group-specific or aggregate index, the higher is the role played by ICT towards the attainment of MDGs. An aggregate index for ICT development has been computed by using the same methodology as that of category-specific indices.

The indices of skill-independent and dependent ICT availability measure the relative positions of countries for availability of different types of facilities. Malaysia obtains the top position in both skill-independent and skill-dependent ICT categories (Table 7.1). The value of skill-dependent ICT index in this case is unity as it secures the highest value in all the indicators belonging to this category. Thailand and China that follow Malaysia are way behind, reflecting the differences across countries within the Asian region. The value of skill-independent ICT index for

Table 7.1 *Component indices showing different aspects of ICT development and the aggregate index as obtained by RE method for nine Asian countries*

Country	Indices pertaining to different aspects of ICT development					**Aggregate index**	**Rank**
	Skill-independent ICT index	Skill-dependent ICT index	Efficiency and speed index	Social sector targeting index	Vulnerable group targeting index		
China	0.57	0.12	0.46	0.87	0.39	**0.48**	**2**
India	0.04	0.01	0.62	0.65	0.76	**0.42**	**4**
Indonesia	0.17	0.04	0.38	0.14	0.40	**0.22**	**7**
Malaysia	0.87	1.00	0.67	0.59	0.68	**0.76**	**1**
Mongolia	0.14	0.06	0.31	0.09	0.37	**0.19**	**8**
Pakistan	0.03	0.00	0.57	0.36	0.48	**0.29**	**5**
Sri Lanka	0.18	0.04	0.62	0.10	0.33	**0.25**	**6**
Thailand	0.49	0.21	0.50	0.57	0.59	**0.47**	**3**
Viet Nam	0.18	0.04	0.29	0.06	0.24	**0.16**	**9**

Malaysia is also very high but its gap with the second and third position countries is less than in the previous case. The availability of ICT across the countries, therefore, exhibits wide inter-country variation.

The efficiency and speed index depicts the ranking of the countries in providing access to high-speed ICT at low cost to their people. Here, too, Malaysia obtains the highest position. However, its relative position, *vis-a-vis* other countries is not as high as in the case of ICT availability indices due to high cost of providing internet facilities and a call to the US being more expensive here compared to other countries (the two indicators belonging to this category). Sri Lanka, India and Pakistan report high values (fairly close to Malaysia), although these have very low levels of ICT availability.

The social sector targeting index reflects the performance of the countries in promoting ICT in certain specific directions for the well-being of the people. The idea is to assess whether benefits of the technology have remained restricted to a few or have percolated down to larger sections of the population. China obtains the highest position here, followed by India and Malaysia. The high value obtained by China is largely due to the indicators pertaining to deployment of computers in the field of education and government giving ICT a high priority.

Vulnerable group targeting index measures the efficacy of the system to help the benefits of ICT reach women and ordinary citizens through legal and governmental support. India is placed in the top position, followed by Malaysia; and this is due to high values reported on public access to internet, government's success in ICT promotion, competition among internet service providers and developed legal system concerning ICT use.

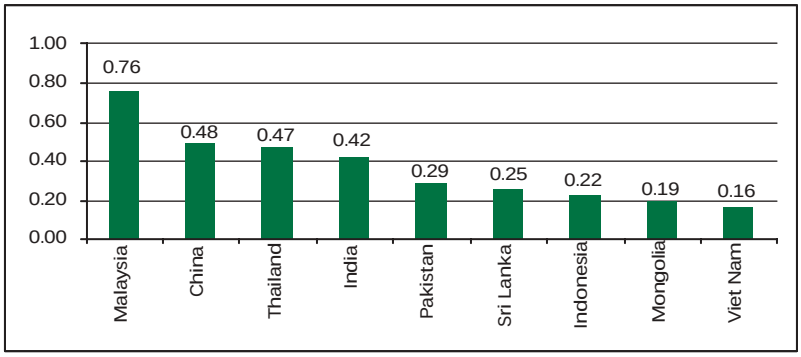
The aggregate index is a summary measure of the five component indices. It may be taken to reflect the overall progress a country has made in promoting ICT in the context of goals for human development. Malaysia obtains the highest value, followed by China and Thailand (Figure 7.1). India comes fourth and this is due to its scoring high values in categories other than availability of ICT. Pakistan, Sri Lanka and Indonesia have values in the middle level, indicating a modest role of ICT in promoting socio-economic development. Mongolia and Viet Nam have a long way to go, particularly in terms of targeting social groups or vulnerable groups of the population.

Component indices obtained through DM method and the corresponding aggregate index

In applying the DM method, the indicators in each category are divided by their respective means. The values obtained are added up for each country to obtain the component index for the category. An identical procedure is adopted for computing the aggregate index of ICT development, based on the category-specific component indices.

The unique position of Malaysia in ICT development emerges in all the categories of indicators, except the social sector targeting index where China takes the initiative (Table 7.2). The position

Figure 7.1 *Aggregate index by RE method for nine Asian countries*



of Malaysia is particularly impressive in availability of skill-dependent ICT for which the value works out to about 25 times that of the Indo-Pak average, the two countries occupying the lowest positions. In skill-independent ICT again, Malaysia has a very high value (followed by China), exhibiting a huge gap from India and Pakistan.

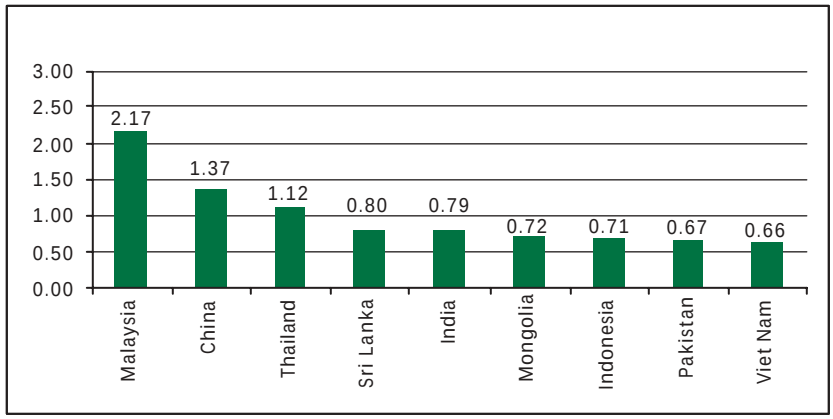
In the case of ICT efficiency, India and Pakistan are impressive, almost similar to Malaysia and China. Sri Lanka, which secures modest values in availability-linked indicators, goes to the top for efficiency. This index does not show much variation across countries, as costs are becoming similar around the world, under the impact of globalisation of technology. In targeting social sectors, China secures the highest value, basically because ICT is used in a big way in educational institutions and government assigns it a high priority. It is only in this category that we see Malaysia sinking very low, going below the average of the series, while India and Thailand notch significantly higher positions. In targeting vulnerable sections of population, India and Malaysia seem to be doing well. In both countries, the state plays an important role in prioritising ICT as also in creating a competitive environment among service providers. Again, inter-country disparity does not show alarming proportions because of the nature of the indicators.

Understandably, Malaysia has the highest value in the aggregate index, followed by China and Thailand, the countries that have been part of a globally-linked rapid development process during the past two decades. India and Sri Lanka come next (Figure 7.2). They are at about the same level but the latter gets past the former by reporting significantly higher values in availability- and efficiency-linked indicators. Immediately following them are Mongolia and Indonesia. These report medium level values in all the five categories of ICT development. Pakistan and Viet Nam are at a

Table 7.2 *Component indices showing different aspects of ICT development and the aggregate index as obtained by DM method for nine Asian countries*

Country	Indices pertaining to different aspects of ICT development					**Aggregate index**	**Rank**
	Skill-independent ICT index	Skill-dependent ICT index	Efficiency and speed index	Social sector targeting index	Vulnerable group targeting index		
China	6.18	2.20	6.40	10.14	4.81	**1.37**	**2**
India	1.64	0.71	6.58	4.36	5.59	**0.79**	**5**
Indonesia	2.65	1.12	5.06	2.75	4.79	**0.71**	**7**
Malaysia	10.12	15.24	6.86	3.84	5.61	**2.17**	**1**
Mongolia	2.91	1.42	4.90	2.50	4.82	**0.72**	**6**
Pakistan	1.50	0.51	6.24	3.14	4.88	**0.67**	**8**
Sri Lanka	2.83	1.12	8.12	2.47	4.67	**0.80**	**4**
Thailand	5.63	3.62	5.11	4.31	5.36	**1.12**	**3**
Viet Nam	2.53	1.06	4.71	2.49	4.48	**0.66**	**9**

Figure 7.2 *Aggregate index by DM method for nine Asian countries*



still lower level in the final aggregate index. The two reflect opposite development patterns, the former showing high values in efficiency and targeting while the latter has a significant edge in availability.

Comparison of the alternate sets of indices

A quick comparison of the rankings obtained from the two composite aggregate indices (by RE and DM methods) suggests that the results are not very different. The top three positions are occupied by Malaysia, China, and Thailand and the bottom by Viet Nam in both the methods. There are a few changes in the ranking of the middle order countries that are marginal. It could be argued that since the proposed DM method gives results similar to the RE method, the credentials of this alternative needs to be noted in the literature of aggregative indices. The objective of using the two different methods in this exercise, however, is quite different. It is to identify and focus on the differences that have emerged from the two methods, identify and analyse the reasons in the context of the dynamics of ICT development.

The first major difference is that despite the ranks of the countries being similar, the gaps in the values of the indices are quite different. For example, the difference between China, Thailand and India, obtained by the RE method, may be seen as insignificant. This, however, is not the case by the DM method. Of particular importance here is the gap between India and the other two countries, which is due to the low values of the former for two composite indices of ICT availability. It is important that the alternate DM approach succeeds in retaining the significant variation in these two indices (Table 7.2) and gets these reflected in the aggregate index which brings down the figure for India. The RE method implicitly reduces their importance by treating them at par with other (component) indices that do not exhibit significant inter-country variation. Similarly, Mongolia and Viet Nam score very low values in the aggregate index by the RE method, which is not the case with the alternate DM method. This again is because the availability indicators, for which these two countries record reasonably high values, receive low weightage in the logic of aggregation applied in HDI.

One major difference is in the ranking of Pakistan *vis-a-vis* Sri Lanka in the aggregate index by the two methods. The higher scores of the latter on availability get reflected in the aggregate index by the DM method, with a relatively higher weight giving it a higher rank. In the RE method, the importance of the availability indices (with high disparities) are implicitly reduced, which is responsible for reversal in ranking. Division by mean eliminates the scale bias but not disparity. Sri Lanka has higher scores than Pakistan in a large number of indicators and by a huge margin in absolute as well as relative terms.

The difference in ranking occurs even in category-specific component indices. Sri Lanka and China get top positions in terms of efficiency and targeting social sectors, respectively by the DM method, leaving Malaysia behind (which is placed at number one in both, by the RE method). Most of the indicators in the two categories have low variation. All the countries have similar values except for telephone charge for

internet services and computers installed in educational institutions. Both the indicators are important within their respective categories and are responsible for much of the differentiation among countries. Importantly, Sri Lanka's advantage lies in charging low price for internet services while China's is in promoting computer education in schools. The DM method, by implicitly giving higher weightage to these indicators, has placed the two countries above all the others in these categories. Similarly, Malaysia is able to get past India in terms of vulnerable group targeting index (the latter having the top position by RE method) as it has a larger percentage of female professionals among workers and the method implicitly gives a higher weightage to the indicator because of its higher disparity.

It is not the purpose of this statistical exercise to establish the superiority of one method over the other as their suitability would depend on the objectives of the exercise and empirical regularities observed in the region under investigation. This discussion makes it clear that change in the methodology of composition can and does bring about significant changes in the values of component indices and can alter even the ranking of countries. Issues of value judgment, implicit in the methodology, cannot be dismissed.

It has been demonstrated that the RE method implicitly gives lower weightages to indicators pertaining to availability and a few other aspects of ICT development that are observed to have high disparity. The disparity, in the countries under consideration, has been caused through the process of development, mediated largely through the market, with limited control being exercised by the government. In the earlier sections it has been argued that ICT is still in the initial stages of development and consequently, increase in its availability itself could prompt socio-economic development. Several economic, social and cultural factors are currently inhibiting the process of growth and an increase in the availability ICT will help in giving exposure to policy makers, administrators and the common people to the global information system. Further, this would lead to the establishment of better communication networks even within the countries and facilitate decision making by public and private agencies. Supply of ICT is strongly linked with economic affordability, bringing in high disparity. Also, economic factors affecting affordability will be important in future years as well for the development of ICT. In view of all this, giving importance to availability indicators does not seem misplaced.

National governments in the Asian region have tried to give a direction to the development of ICT by intervening in the market, controlling prices, introducing it in social sectors, fixing priorities, strengthening the legal structure for ensuring access to all, etc. Importantly, the cross-country differences in the concerned indicators are not very high as may be inferred from the low coefficients of variation of the indicators (Appendix III) belonging to third, fourth and fifth categories. Irrespective of socio-political structures, each country has taken measures to give a push to the dissemination of technology. There are specific measures adopted by individual governments to direct ICT towards the MDG objectives but it is impossible to generate cross-sectionally comparable data on this. Also, the success of such measures has been limited and uneven across countries, due to the overwhelming nature of markets. This is reflected in sectorally and spatially unbalanced growth of ICT, evident from the high disparity of the indicators of availability, belonging to the first and second category.

Therefore, maintaining the variation of the indicators (by making the standard deviation of the original indicator the coefficient of the scale-free indicator) and then giving equal weightage to their variations in the aggregation scheme, appears appropriate. Studies have shown that indicators that play a significant role in the development dynamics of less-developed countries exhibit high disparity in space (Kundu 1984). Undoubtedly, this kind of regularity observed in certain contexts cannot claim universality. However, given the pattern of development noted through correlation analysis and review of literature in the Asian region, the retention of the variation in availability indicators in the process of composition can be justified. This implies giving higher weightage to availability indicators, the rationale for which has been discussed while analysing the development dynamics in the region.

In brief

To assess the levels of ICT applications for human development towards achievement of

MDGs, 22 indicators were identified to capture five dimensions or broad categories of ICT development. Component indices were worked out for each of the categories by aggregating the constituent indicators after eliminating the scale bias. This was done with both the RE method used by UNDP in computing HDI and the DM method. An aggregate index was then computed based on the category-specific component indices by each method. These indices present the relative position of the nine countries in terms of development of ICT for attainment of MDGs.

Malaysia has the highest value in most of the category-specific component indices as well as the composite aggregate index, because of its high values on availability indicators for both skill-independent and skill-dependent ICT. China and Thailand follow in most of the individual indicators as well as component indices. However, in social sector targeting, China goes past Malaysia to the top position by both methods, due to its emphasis on the use of ICT in education. Thailand is at par with these two but gets a lower aggregate value due to deficiencies in availability indices. At the lower end are Mongolia and Viet Nam, though they are fairly high in terms of availability indicators — way ahead of India or Pakistan. The latter two countries, however, have an advantage in efficiency and targeting social sectors and vulnerable groups. The third South Asian country, Sri Lanka, has fairly high values for availability and occupies the top position in terms of ICT efficiency by one method. Indonesia has middle level values in almost all the indicators and figures in category-specific as well as composite aggregate indices.

An important point emerging from the analysis is that, in assessing the progress of ICTs for achieving any set of socio-economic goals, there would have to be an emphasis on availability indicators. In addition, several efficiency-linked and user-specific indicators would have been included in the analysis. For that, information must be gathered covering aspects of affordability, access and utilisation of ICT. These should bring in the demand side more strongly and reflect the spread of technology not only across economic and social classes but also regions, sectors and gender categories. Indicators, for example, may be built to articulate what percentage of households in certain social, economic, rural-urban, vulnerable groups like tribals and other disadvantaged sections are able to make use of ICT for applications relevant to them. Alternatively, one can try to build up 'surrogate end points' such as better information flows and better management of education, health and public delivery systems through ICT, for assessing progress towards achieving MDGs.

VIII

Systemic Exploration of Harnessing ICT for Realising the MDGs: Asian Experiences

While the quest for empirical evidence on interdependencies between ICT and human development indicators is critical in establishing the impact of ICT on human development, this must be complemented by qualitative research and assessment of effective use of ICT in key areas such as poverty eradication, healthcare, education and the environment.

ICT can act as an enabler with a potential to enhance the achievement of MDGs. ICT, if wisely deployed, can have an impact on almost every sector nudging development budgets, private sector investment and commitments from development stakeholders to go that much further in cost effectiveness and reach. It is critical that the focus on ICT as an enabler for development be reflected in national strategies for poverty reduction and human development, as opposed to assuming an ICT sector focus (software, hardware, IT services) where the development gains are likely to be less extensive with fewer spread effects.

ICT is able to strengthen the conditions such as transparency, accountability and democratisation, required for the achievement of MDGs. ICT can facilitate information sharing and knowledge creation with implications for each of the MDGs. ICT is able to strengthen participatory inputs, demand-driven responses and bottom-up implementation. It also supports collaboration and coordination through enhanced networking. The nine country studies provide a wealth of Asian experiences on how ICT has been harnessed for realising the MDGs (UNDP 2003a, b, c, d, e, f, g, h, i).

The role of ICT in the eradication of extreme poverty and hunger

ICT can address and improve existing human deprivations worldwide through direct and indirect means. The direct contribution of ICT to poverty reduction, for example, can come either through employment generated by the diffusion of technologies into poor rural and urban areas, or through ICT-enhanced returns from economic activities of poorer households. Indirect contribution can come through facilitating delivery of ICT services and reducing their costs. Increased service delivery either promotes wage and self-employment, or helps overcome structural constraints on poverty alleviation projects.

In a situation where the world is becoming a global village, ICT can help the poor acquire literacy, marketable skills and other knowledge to alleviate poverty (Chowdhury 2000). Developing countries, in particular the poorer sections, are beginning to recognise ICT as increasingly important in their effort to escape poverty. Given the option, they are willing to invest in telecommunications out of their limited resources (UNDP 2003f). ICT has the potential to combat rural and urban poverty and foster sustainable development (Samiullah and Rao 2000). This can only be achieved if there is an enabling environment, as reflected by the presence of a strong political will, the participation of the private sector and the NGOs, the free flow of information, access by women, and capacity building.

Due to its communications dimension, ICT can provide timely information to trigger rapid responses by the state to combat hunger. This is

especially important in case of food crisis when starvation can result in widespread malnutrition and even deaths. ICT can serve as a critical tool for monitoring and managing the procurement, storage and distribution of essential food grains. Malnutrition is aggravated through inappropriate dietary practices arising out of ignorance and misinformation. Here, the dissemination of correct information through ICT can contribute to improvement.

Increasing employment and other economic opportunities for the poor

Using electronic job marketplaces, employers and employees can match labour skills and availability to satisfy their demands. TARAhaat, an Indian portal designed to serve villages in rural India, provides job opportunity information on local websites in local dialects. Another country to have harnessed ICT for improved labour market facilitation and direct payment is Mongolia where it is widely utilised for job search, employment and education.

The telecentre movement is gaining momentum in the developing world, as ICT becomes more affordable. Individual telecentres foster profound developmental outcomes within the communities they serve. As telecentres provide shared access to the communications infrastructure, it becomes possible for many to share the cost of a single connection. An often cited example of successful ICT use in poverty reduction is the Grameen Bank's Village Pay Phone initiative in Bangladesh (Nyaki Adeya 2002). Pakistan's Green Revolution and Orangi Pilot Project (OPP) are examples of productivity-enhancing technological packages which have had long-term and continuing positive impact on rural incomes. A village in Thailand, Baan Samka, is using a telecentre operated by children and youth to serve as a knowledge intermediary by broadcasting useful information from the internet to adults via the village audio tower. Currently Baan Samka is ranked as the strongest village in the district in terms of leadership, community funds, income, village committee, civic and occupational groups and drug abuse prevention.

ICT can make a difference by helping to raise the magnitude and reduce the vulnerability of returns earned by small producers from their economic activities. In a village in South India, where 130 out of 210 families struggle below the poverty line, two solar-powered computers are being used to give villagers a wealth of data. This project has helped the farmers to have a better grip on their local markets as prices are more transparent and the fishermen to get information from satellite images on where the fish shoals are positioned off the Pondicherry coast. In Viet Nam, villages such as Bat Trang and Hoi An have created websites by themselves to sell village goods.

Access to credit

Access to credit, say, through self-help groups is crucial for micro-enterprises. Microfinance is a substitute for formal sector credit which tends to bypass the poor and women. In countries like India, Sri Lanka, Bangladesh, Pakistan and Indonesia, microfinance institutions have been particularly successful in providing the credit to rural women. But microfinance, even when successful in reaching credit to the poor and ensuring high recovery rates, is characterised by high transaction costs which influence interest rates. India's Swayam Krishi Sangam (SKS) smart cards project is an example of using ICT to reduce transaction costs and minimise the cost of credit provided by self-help groups.

Agricultural development

Agriculture is also being transformed by ICT. ICT can empower farmers, rationalise supply chains, improve productivity, facilitate research and development, and promote information sharing on agricultural farm extension technologies, market prices, weather information, etc, all of which can enhance food security. India's network of internet-connected kiosks, known as e-Choupals, serves the soybean, cotton, tobacco, and shrimp farmers in its procurement network enabling farmers to get up-to-date weather reports, local and international produce prices and also to buy agricultural inputs and consumer goods for daily use.[28] China's Beijing FarmKnow reaches over 100,000 farmers through its website where they can access information on crop planting, disease control, pest identification and control, seed prices, and market prices, as well as consult agricultural specialists by e-mail.[29] TaniNet in Malaysia is also a similar information service toolset.

Community decision making

ICT is able to overcome the barriers of social, economic and geographic isolation, increase access to information and education, and

enable the poor to participate extensively in the decisions that affect their lives. Governments are going online with the governance process. In Viet Nam, provincial authorities have organised radio programmes in local languages for ethnic people who cannot read and speak Vietnamese, bringing them necessary information to raise their awareness about policies and current situations (UNDP 2003i).

Poverty mapping

ICT helps facilitate consultative inputs, poverty monitoring and mapping and assessments to evaluate impact and enhance support to the poor. ICT such as geographic information system (GIS) enable poverty mapping that combines geographically-referenced survey and census data, generating poverty and inequality profiles at low levels of aggregation. Poverty maps also serve benchmarking, monitoring and evaluation purposes (Flor 2001). Malaysia's database on the poor called SINAR system has been used to centralise the coordination of information on urban poor and has proven useful to governments and donor agencies.

Hunger and food security

Asia has the largest number of undernourished persons worldwide. Accurate and timely information regarding areas of food surplus and shortages can be facilitated through ICT. This contributes to improved food grain management to combat hunger and promote food security. The Food Insecurity and Vulnerability Information and Mapping System (FIVIMS), is a national and global initiative that aims to raise awareness of food security issues, improve data quality, promote better use of the information to drive action and, on an international level, work with the Food and Agricultural Organization (FAO) to define common standards, methods and tools for information management and presentation. A number of FIVIMS activities are operational in Bangladesh, Cambodia, India, Papua New Guinea, Philippines and Thailand. Nutrition surveillance and monitoring can be effectively put in place through the power of technologies since large data can be easily processed and disseminated on a regular basis.

Improvement of government services for the poor

ICT has been used by governments to help extend and improve their services to the poor. ICT helps governments strengthen internal information flows, accountability and transparency, and procurement of goods and services. The Indonesian government has initiated a number of projects, for reducing government bureaucracy and inefficiency, such as the Electronic Data Interchange (EDI) which has reduced processing time significantly. In largely rural Viet Nam, there is a trend in the ministries to focus on the creation of databases to support development activities such as economic, agricultural and water resource management. Under the Telecommunications Posts Cultural Point for Communes (TPCPC) plan launched in 1998, government aims to provide all communes with access to basic telecommunications and postal services. This has special relevance for remote and mountainous parts, within the rural areas.

The role of ICT in achieving universal primary education

ICT by itself cannot universalise primary education. It is a tool which can complement investments in education infrastructure and enhance teaching and learning capabilities. It can create new possibilities for reaching the unreached and making life-long education feasible for all. This can be done through appropriate use of ICT as an innovative new delivery mechanism for system-wide provision of education, especially in distance and non-formal education (UNESCO 2000). ICT in education has both short- and long-term potential, facilitating educational reforms and providing connectivity for all educational institutions. Connectivity can contribute to better school education management through tracking school infrastructure availability and resource status, teacher-student ratios, teacher training needs and management.

In Asia, governments have realised the importance of integrating ICT in education policies. Across countries like India, Sri Lanka and Mongolia, governments are initiating programmes that promote the use of ICT at all levels of education and for all parties involved in the educational process. In countries with vast land areas that make access to education a problem, ICT is proving that it can bring education to all sectors of society, not just for the literate and the elite.

Access to ICT enables traditional or formal education systems, to adapt to different learning

and training needs. Computer simulation, telematics, video-audio, computer conferencing and virtual learning, along with educational television and radio, have greater potential to reach larger audience than in a traditional classroom (UNESCO 2000). However, here the role of teachers in leveraging this potential is critical. Therefore initiatives to enhance teacher capacities are likely to produce dramatic results.

Reduction of physical and social barriers to education

ICT complements the traditional mode of education via the classroom. Smart schools, online education and virtual universities are becoming more a norm in developed countries and developing countries are fast catching on. ICT has the capability to deliver instruction, manage administrative services and provide support for learners. In June 2003, the Government of India announced an ambitious programme titled 'Vidya Vahini', to create computer laboratories with facilities like internet access, an online library, academic services and web-casting across 60,000 schools in the country. Viet Nam has also invested in a computer-based information network system called Educational Network (EduNet). Similar steps were taken by Thailand in 1995 by launching SchoolNet which has connected 4758 schools throughout the country. Pakistan invested US$ 5.18 million in the Pakistan Education Network (PEN) initiative in 2003, to provide connectivity across primary and secondary schools as well as universities. China's Modern Distance Learning Satellite Broadband Multimedia Transmission Platform went into operation in November 2000, to serve its western and other remote regions. This project allows simultaneous transmission of video and multimedia channels at different rates.

In Sri Lanka, various ICT media have been used to address the problem of low IT literacy among students and to bring the benefits of ICT to a large section of the community. These are the 'Wijeya Pariganaka' Magazine, Kotmale community radio project, the TV programme 'Antharjalaya Obe Nivasata' (Internet to Your Home), and the radio programme 'Antharjalayai Obai' (Internet and You).

An advantage of ICT is that, as a tool, it does not discriminate against socio-economic factors such as gender, race or age and can help improve the overall standard of education in a country by reducing the gap in quality of education between schools in urban and rural areas. Realising that India's explosion of student population could not be adequately reached through mere classroom education, the Countrywide Classroom was launched in 1984 where satellite television (Doordarshan, India's national public service television) was used as a means to supplement classroom teaching. Indonesia's Southeast Asian Ministers of Education Organisation established the regional open and distance learning centre to supplement conventional classroom instructions with online courses for senior secondary school students. It also facilitated the training institution personnel, field extension workers and university lecturers, production of web and CD-based multimedia learning to programmes, integration of IT into teaching of mathematics and science and in the education and prevention of HIV/AIDS.

Promoting efficiency in education

ICT offers alternative classroom conditions as it no longer requires people to congregate at a venue where learning takes place. There is no need for a hierarchic structure where the instructor is the provider of knowledge and there is a predetermined path of academic grades. The curriculum becomes student centred with a self-learning environment, enabling the student to customise his/her own learning experience. The Sri Lankan government runs several key initiatives connecting 92 education centres across provinces, regions and sectors within the ministry, developing computer training centres at 800 selected schools to be completed by 2004, and issuing CD-ROMs to meet the educational requirements of secondary schools. Malaysia's Smart School concept is a learning institution that aims to foster self-assessed, self-paced, and self-directed learning. The government along with the private sector has set out to develop Smart School Applications comprising of teaching and learning materials and school management systems.

Improving the quality of teaching and learning

ICT can be used as a tool for training and support of teachers, regardless of their geographical dispersion. Teachers can also use the internet to expand the quantity and quality of teaching resources (Haddad & Jurich 2002a). India's Goa Computers for Schools Project has been successful in raising the levels of computer access and literacy among teachers and students.

Further, the project also allows adults in the community to use computers after school hours to access e-mail and information on income-generating schemes. In Malaysia, the electronic book pilot project studies how the electronic book appliance that stores textbook contents and links users to the internet, can be used to improve teaching and learning.

ICT for promoting gender equality and the empowerment of women

ICT represents both a challenge and an opportunity for the empowerment of women. The increased prominence of ICT, in the absence of significant and sustained interventions to ensure equal opportunities for women in accessing new technologies, could serve to marginalise women further. However, its tremendous potential for empowerment of women cannot be discounted. ICT can help women overcome significant barriers that restrict their access to education, knowledge and information. Socio-cultural factors prevalent in many Asian countries place restrictions on the mobility of women. ICT can play an important role in eliminating the distance between women and information, and in overcoming cultural barriers to the acquisition of knowledge by women.

ICT can be used by the disadvantaged women themselves or by organisations that specifically target these women. It allows the information to be transferred across distance without face-to-face contact. As such it offers possibilities for women to engage in e-commerce, distance education, and e-government.

With its power and reach, ICT can be an instrument for either promoting or negating gender equality. The way the women are represented in the media, particularly in relation to men, is the key since some representations reinforce their unequal status. Recognising this, sensitivity to gender issues and imbalances should influence ICT content not only in education, but in all sectors.

Women's education

Educating women and giving them equal rights is important not only because it increases their productivity, raises their output and reduces poverty but also constitutes an end in itself. It promotes gender equality within households and reduces constraints on women's decision making. It gives women better control over fertility, increased child spacing and maternal health. Educated women can be more informed about the health and nutrition of their children. Equal access to education is an important step towards greater gender equality, but it is not the only one. Even as gender disparities in education diminish, other differences persist in legal rights, labour market opportunities, and the ability to participate in public life and decision-making.[30]

ICT can improve women's opportunities in receiving education and training. Distance education based on ICT, especially through radio and television broadcasting which contain various forms of educational and training content, can promote sharing of education resources and offer women wider access to professional training, secondary education, on-the-job education, and continuing education. Programmes targeted at women help them not only educate and develop skills, but also provide insights into women's issues and create awareness among women regarding their rights, problems and solutions and choices. This will help equip women to identify and break down barriers that discriminate against them. The Gobi Women's Project in Mongolia uses the radio to provide non-formal distance education to some 15,000 nomadic women, giving useful instruction on health, commercial skills, family planning, traditional crafts and environmental issues.

Since 1985, Indonesia has been developing a programme called 'Kelompencapir', for introducing new methods of growing crops, new varieties of crops or new technology in the villages. This programme, delivered through village radio, is in the form of discussions between groups of village people and the extension worker who introduces a method or a system. In this programme, one village group will compete with those of other villages in transforming the knowledge into actual practice. The participants in this programme have an almost equal gender distribution. These simple models could be further improved to become more innovative by using the full spectrum of ICT.

A community development project on ICT for women's empowerment is being conducted by the Annisa Foundation, in collaboration with the UNESCO office in Jakarta. The aim of the project

is to alleviate poverty in West Nusa Tenggara. It is being implemented in two villages; Batu Kumbung and Gegerung in West Lombok. The Annisa Foundation assists eight groups in literacy programmes including three groups of female farm labourers for the functional literacy programme, one group of children who are out of school, one group of male teenagers, as well as one group of fathers and two groups of mothers. The literacy programmes consist of teaching of writing, reading and simple calculation. Other activities for women's empowerment conducted by the foundation include imparting of knowledge related to their health and the environment, and establishing income-generating activities.

Sri Lankan women's groups are increasingly using ICT tools for education and training purposes. The Centre for Women's Research (CENWOR) has launched a Women's Electronic Information Network, which consists of electronic mailing lists and a website, and it also provides online training for women. The Siyath foundation provides information to women at the grassroots level by downloading it from the internet, translating it into their mother tongue and distributing it by fax or post. Regular discussions about the downloaded information are held among women at village level at 'Gami Hamuwa' meetings (Wanasundera 2002).

In Pakistan, Sustainable Development Networking Programme (SDNP) centres, as part of the Internet Skills Training Programme for Women, conduct workshops that teach basic internet access. These centres use workshops of short duration for large groups. SDNP in Quetta focused one workshop, in May 2001, on housewives and working women, attracting about fifty participants with home access to computers. The province as a whole is highly gender segregated and the presence of a female SDNP staff member enabled contact to be established. The aim was to assist women in overcoming their fear of technology, to provide basic training on e-mail and web use, and to enable them to oversee family use of the internet. Since mid-2000, 322 participants have attended 13 workshops in Quetta city, and some 760 participants attended a further ten sessions in remote areas, all run from the Quetta office.

Older forms of communication technologies such as the radio have a crucial role to play in a society with limited literacy. This is illustrated by the activities of the Kutch Mahila Vikas Sanghtan, (KMVS), an NGO working with rural women in 150 villages of Kutch district in Gujarat, India. After its involvement in community development work for over a decade, KMVS launched in 2000, a weekly 30-minute sponsored programme in the Kutchi language on All India Radio's Radio Bhuj. Titled 'Kunjal Paanje Kutch Ji' (Sarus Crane of Our Kutch), the programme deals with a range of gender-related issues such as the participation of women in political processes, a girl's right to education, female foeticide, and harassment of brides for dowry and female suicides.

Women's advocacy

A significant positive impact of ICT on women's empowerment is the enhanced capacity of women's advocacy and support groups to exchange information, coordinate action, and increase the reach of advocacy campaigns. Civil society and activist organisations routinely receive dozens of e-mails containing information on emerging areas of concern. The power of ICT has enabled advocacy groups to interact and network even across national boundaries, creating power synergies to highlight gender issues, combat prejudices and stereotypes as well as mobilise action. The Human Rights Commission of Pakistan has been able to extend its outreach precisely because of e-mail and the internet. An initiative that was critical in making such interaction possible is the construction of e-mail lists and list archives on specific issues by the Sustainable Development Networking Programme (SDNP). Indeed, this is among the true success stories of Pakistan's ICT experience.

Employment opportunities for women

ICT can provide a number of new job or business opportunities for women. ICT can allow them to juggle family responsibilities and work commitments by teleworking, which opens up a plethora of productive employment opportunities for women previously constrained by the need to stay at home. 'E-homemakers' is a community project managed by homemakers in Malaysia. The project currently involves the management of a community portal, www.myhome4work.net, in three languages and the testing of a virtual office with teleworking staff who all work from home. Two hundred disadvantaged women

have been trained in information technology (IT) with the aim of preparing them to work from home as teleworkers.

Women's social and political participation

ICT can also facilitate women's participation in government and political affairs. Rural women can gain a new communication platform to exchange their opinions on political issues, using ICT to raise women's issues to their leaders. Female political candidates can also win support from voters in this way, employing ICT in the communication of their political messages to voters. In many countries in Asia, access to information and education is empowering women and has the potential to increase women's participation in politics. By providing information and knowledge to women, ICT plays a significant role in helping them gain more awareness of their rights, which in turn empowers them to actively defend and promote their interests through political mobilisation, activity and participation. In Malaysia, the use of ICT among political groups is seen to be higher and more comprehensive as compared to non-profit groups. A major factor for this could be access to better funding. 'Puteri UMNO' (the young women's wing of UMNO, the dominant Malay-based party within the ruling coalition) and 'Wanita MCA' (the women's wing of the major Chinese-based political component within the same coalition) have secretariates with several permanent staff linked through Local Area Networks (LANs).

ICT for reduction in child mortality

ICT can have an impact on infant and child mortality rates by improving the formal healthcare system and the effectiveness of health promotion and disease-prevention programmes as well as health-service delivery. ICT is increasingly being used to facilitate two-way information exchange in healthcare between rural and urban areas, providing isolated communities with access to the latest health information and treatment and informing officials of rural public health issues.[31] The relevance of ICT here lies in its application to issues of low-birth weight, infectious loads that children have to bear including upper respiratory infections and diarrhoeal diseases, childhood malnutrition (including its severe forms like kwashiorkor and marasmus) and immunisation. ICT can also combat social factors that contribute to child mortality such as female infanticide.

While ICT seems to offer critical inputs to reduce infant and child deaths, traditional interventions such as oral rehydration therapy, better drug supplies, trained healthcare professionals and extension of health services to uncovered areas are still primary. Given that resources for infant and child health are finite, governments need to balance investment in ICT with other basic healthcare programmes.

The potential impact of ICT in reducing Infant Mortality Rate (IMR) and Under 5 Mortality Rate (U5MR) needs to be realistically assessed. Governments, NGOs, health establishments and people can have greater access to content on child care and health information through various forms of ICT, for example, radio or television programmes and the internet. The local population can access locally-appropriate content on child care and child health in local languages. ICT helps to improve access to locally available resources related to preventive healthcare and child care data or information. ICT can also customise content to suit local cultural contexts to help overcome beliefs and prejudices detrimental to child health.

ICT provides opportunities for infant and child healthcare providers, researchers and policy-makers to discuss via local or global discussion groups and/or bulletin boards, and to share and consult on child health issues. It can help increase the information exchange on immunisation rates and needs of infants and children in rural areas. ICT can also facilitate intra-government coordination on healthcare and improve government planning, health awareness and disease prevention and control across all sectors and departments, particularly in crisis-affected countries.

ICT increases access of rural caregivers to specialist support and remote diagnosis, and reduces the need to transfer patients to a site of medical expertise. It can enhance access by local child healthcare workers to suitable and relevant international information on causes of child mortality and ways to reduce it, adapting the information to local circumstances as necessary. ICT increases mapping, tracking and information sharing on childhood and infant diseases to enhance support in the most crisis-vulnerable and affected countries. ICTs can document local child mor-

tality problems in local languages, propagating locally-suitable approaches through local channels and in local languages.

Telemedicine

Telemedicine is an active and expanding field of ICT in healthcare, and can play an important role in reducing infant and child mortality through increased options and informed healthcare. Medical consultations include tele-radiology, tele-pathology and tele-cardiology among others. In Asia, governments, public institutions and the private sector have been promoting ICT for national health systems. In Western China, the Angel Programme uses ICT to establish a telemedicine network, connecting hospitals at national level. In Malaysia, the Ministry of Health joined forces with the private sector to form Telehealth, with the aim of delivering high quality health content to the public, using ICT. In India, Apollo Telemedicine specialises in providing consultations and second opinions to remote areas where access to quality healthcare for children is difficult. Its rural telemedicine centre caters to about 50,000 rural population. The Indian Space Research Organisation (ISRO) has demonstrated how satellite communications have been harnessed to extend super speciality medical consultations in remote and inaccessible locations like the Andaman and Nicobar Islands, Tripura, Leh and Assam.

Infant and child healthcare education and training

The availability of information to healthcare workers in developing countries is important to help reduce infant and child mortality rates. Health InterNetwork led by the World Health Organisation (WHO) covering 111 developing countries was created to bridge the digital divide in health, ensuring that relevant information — and the technologies to deliver it — is widely available and effectively used by health professionals, researchers, scientists and policy makers. TelMedPak in Pakistan serves as a repository of medical information, articles and news alerts on emerging infant and child healthcare issues, guidelines on preventive medicine and a directory of practitioners.

Hospital and healthcare administration

In Thailand, ICT is used to increase the efficiency of hospital administration through improved database management in the healthcare systems and services. The Lady Ridgeway Children's Hospital in Colombo is a rare instance in Sri Lanka where a government hospital uses ICT to maintain patient records. In Viet Nam, the Institute of Information Technology and other universities have carried out research on ICT for health applications. The Ministry of Health also set up a medical intranet connecting 30 hospitals and institutes. In Pakistan, hospitals like Shifa International Hospital and Shaukat Khanum Memorial Hospital, are using computers for maintaining data (Mirza, 2001). Computers are available in most Indonesian hospitals, primarily for recording and reporting data of individual divisions: patient admissions, medical records, billing systems, personnel and logistics data.

Management of patient health information

ICT can play a role in the child healthcare through database storage and retrieval of information pertaining to the child's health condition. In Thailand, ICT is used to promote maternal and child health through the Perinatal HIV Implementing Monitoring System (PHIMS). Developed by the Office of Health Promotion, Department of Health, the system aims to improve the management of maternal and child health information, starting from data collection at the public hospitals and health facilities, and transmission of such data to the central office.

In Mongolia, the Soros Foundation Medical Internet Programme supported a grant to develop a national health and medical information network that would enable health institutions to have e-mail and internet access. A multi-user public-access computer website was established and connected to hospitals through a computer network. Medical professionals underwent basic and advanced e-mail and internet training programmes.

Public health education and awareness

Many of the Thai government's major health promotion schemes have a health-education component where ICT is used to deliver health information to pregnant women and mothers of the newborn, as well as healthcare workers. The Office of Health Promotion also has its own radio programme, which broadcasts health information on AM and FM channels for 30 minutes each week. About 20% to 30% of the airtime is allocated to maternal and child-related health information. Video cassettes have also

been used extensively to provide health-related knowledge and distributed to public and community hospitals as well as health facilities. China's Central Television (CCTV) network has launched a special programme on maternal and child health. In Mongolia, the Health Promotion Department is in charge of health education and promotion; media campaigns; health and behavioural surveys; developing, planning and distributing the information, education and communication materials; and social mobilisation to create a healthy environment. The ESS studio in Mongolia produces and broadcasts TV spots, health advice, health-education programmes and radio promotions, which are received by more than 100,000 people throughout the country. Reproductive health, safe motherhood and child health programmes are aired on radio twice a week.

In Indonesia, there is no single unit dedicated to the overall child health programmes, and information on different aspects of a child's health is managed separately. Information and communication management consequently follows the management structure of child health programmes. Of the total 856 internet search strings reviewed on March 31st 2003, the top 20 search strings had 13.5% access on maternal and child health issues (which is a little over 3% of the total of 856 search strings) that include infant health, nutrition status of children under five, health of pregnant women and anaemia. Other child health-related websites include the Indonesian Society of Paediatricians (www.idai.com) for parents of young children.

ICT for improving maternal health

Most experiments using ICT in health services delivery and health management have taken place in developed countries. Health initiatives using ICT do reduce the developed country's healthcare cost substantially but this is of no immediate relevance to countries where the problem is not high cost but inadequate service provision. However, the results of some experiments suggest that ICT can be useful even in developing countries (Chandrasekhar & Ghosh 2001). Issues of concern to maternal health in developing countries revolve around early marriage, early pregnany, anaemia, child spacing and parity, etc. The use of ICT in enhancing delivery of better information to health service professionals, women and their families can contribute to improving maternal health.

ICT can affect maternal health in poor countries through improvements in healthcare management and communication of knowledge on maternal health issues. ICT has been used to access and link networks of expertise, manage medical information and patient data, automate basic processes of care, enable remote medical assistance, improve public knowledge and awareness on maternal health issues, facilitate maternal health research and training, generate locally relevant content and mobilise volunteerism. Mothers in poor communities benefit through enhanced access to critical health resources and communication across large distances, governmental and quasi-governmental resources and services, superior medical advice, and diagnosis or knowledge in their own locality (Sood 2002).

Managing health information and patient data

The interconnectivity feature of ICT can greatly improve maternal healthcare delivery systems by connecting healthcare professionals around the world, including online networks of expertise (doctor-to-doctor, doctor-to-hospitals), and by providing access to information about maternal health issues confronting the countries.[32] The e-mail discussion list 'HIF-net at WHO' has allowed international debate on the subject of 'local health content' as well as increased awareness of the issue, among a committed group of over 900 individuals worldwide, from publishers to librarians, from community health workers to senior executives in international health agencies, from NGOs to ministries of health, all working together to improve access to reliable, relevant information for healthcare workers in developing and emerging countries (Packenham-Walsh 2003).

For rural healthcare practitioners, ICT can support the capturing and dissemination of information, for example, in the monitoring of diseases and treatments and the dissemination of disease prevention information (Bridges.org 2001). Handheld computers such as personal digital assistants (PDAs) and emerging wireless technologies provide healthcare practitioners with unprecedented opportunities to move information out to where it is needed most. They are also powerful tools for data collection and analysis, providing rapid access to information which policy makers and health planners

need to respond to and prevent common maternal health problems, practice sound resource management, and track progress.[33] India's Teledoc Project, formerly known as 'Handy Vaid', is a good example of how local and international health and medical information can be stored in PDAs and used by healthcare workers to raise the efficacy of social service delivery in areas where electricity, telephone lines, books and internet facilities are not readily available. Also in Rajasthan, India, the Indian Health Care Project equipped auxiliary nurse midwives (ANMs) with PDAs and relevant support tools to improve management of patient health information at the village level. The ANMs reported that PDAs had reduced time spent on paper work; increased data accuracy; and ensured data availability at the village level in electronic form, which translated into far more effective healthcare delivery.

Automating basic processes of healthcare

ICT has made health administration processes more efficient, cost effective and reliable by automating the administrative, financial and clinical aspects of care, for example scheduling systems, ordering of medical supplies and access to lab test results. ICT has enabled proper data storage and retrieval, thus reducing the time and effort spent on healthcare administration and management. The use of ICT has also benefited patients, especially pregnant mothers, who find it much easier to make appointments to see their doctors. In Sri Lanka, e-channelling helps patients in remote areas to make appointments with medical specialists in Colombo without the hassle of travelling.

Enabling remote healthcare through telemedicine

Telemedicine has the potential to bridge the rural-urban divide, providing patients and health professionals in remote areas real-time access to medical knowledge.[34] In the long run, telemedicine will improve maternal health and lower medical costs. ICT can be potentially used to increase the transparency and efficiency of governance, thus improving the availability and delivery of public health services. It empowers the poor and improve the delivery of basic health services (Chandrasekhar and Ghosh 2001). ICT can be a formidable and cost-effective development tool for maternal health (ITU 2002). Telemedicine can impact maternal health by decreasing the relocation costs of health specialists, thus lowering the cost of healthcare (UNDP 2003b). For developing countries with an acute shortage of health practitioners, telemedicine may be the most practical means to provide good maternal healthcare services to the people.

It can also be an effective tool to provide valuable information on how to address common maternal ailments and concerns like anaemia, care during pregnancy and lactation, diet, age at marriage, etc. In many Asian countries, where women face social barriers in seeking out the information openly on sensitive issues that directly affect their health, telemedicine has the potential to provide scientific information and facilitate the sharing of the experiences on contraception, child spacing and parity, menstrual and other sexual health issues.

Telemedicine and telehealth applications are not limited exclusively to expensive, high bandwidth services. As long as the local medical community is motivated and committed to telemedicine and telehealth programmes, a wide range of health benefits can be achieved through remote patient monitoring and diagnosis, multimedia communication links between urban and remote facilities, and broadcasting of health information over radio and television.[35] In Yunnan, China, village doctors in mountainous areas use mobile telephones to consult directly with experts at provincial capital hospitals, several hundred miles away. Mobile phones help village doctors to improve the quality of their diagnoses and provide prompt treatment.

ICT for the fight against HIV/AIDS, malaria, and other diseases

In addressing diseases like HIV/AIDS, malaria and tuberculosis (TB), ICT can provide opportunities for innovative solutions. This is especially crucial for infectious and communicable diseases, particularly HIV/AIDS.

Given the current and projected impact of the pandemic, reversing HIV/AIDS has become a critical MDG (Björkman 2002). ICT is seen as a potential tool in the global response to the pandemic because it offers, at relatively low cost, access to information and knowledge for those working on the problem, for those suffering from the disease or its effects, for those who need to take preventive action, as well as for care givers and other family members. It allows networks that have potential to link partners in

different spheres and location in their efforts to apply the rapidly increasing knowledge to action (Driscoll 2001).

With HIV/AIDS emerging as a broader development concern, not just a health issue, ICT can also facilitate inter-departmental coordination within the governments, mainstream HIV/AIDS, create health awareness and help prevention through appropriate information dissemination across departments.

ICT can be used as a tool for advocacy, awareness building, and education not only aimed at preventing transmission of diseases, but also for facilitating support groups, counseling, etc. Public broadcast media like radio and TV have a long history of effectively facilitating the dissemination of public health messages and disease prevention techniques in developing countries (UNDP 2001). The number of new HIV/AIDS cases in Thailand dropped from 143,000 in 1991 to 29,000 in 2000 due in part to a 48 million dollar education and public health campaign. Led by Meechai Viravaidhya, former deputy prime minister of Thailand and president of the Population and Community Development Association (PDA), 488 radio stations and 15 TV stations aired HIV/AIDS preventive messages for 30 seconds every hour.

ICT can be a surveillance tool to examine emerging trends of a disease and identify potential problem areas. It can collect and analyse health information, measure outcomes and disseminate information to relevant audience. The Malaria Research Unit of the Department of Parasitology at the University of Colombo's medical faculty uses the Geographic Information System (GIS) to monitor the spread of malaria at several selected Grama Niladhari divisions at Badulla and Moneragala districts, Sri Lanka. This GIS database was developed using data collected between 1997 and 2002. Based on this, the Unit prepared a risk map to indicate malaria-prone areas.

ICT can support HIV/AIDS research in many ways such as facilitating better response to a disease pandemic through sharing the lessons learnt, treatment practices and guidelines with other healthcare professionals, NGOs, researchers and policy makers during the outbreak. ICT can also be used for continuing education or life-long learning for healthcare workers so that they can keep up with the latest developments and knowledge. PakMediNet is an online portal in Pakistan that facilitates research and provides access to Pakistani medical journals. So far, it has managed to archive and store 39 medical journals, a phenomenal achievement in the absence of financial support.

ICT allows healthcare providers, researchers and policy makers to communicate via local or global discussion groups and/or bulletin boards, which serve as a venue for sharing and consultations on health issues. India's Saathii (Solidarity and Action Against the HIV Infection in India) is an organisation that seeks to disseminate research, training and funding-related information on a real-time basis to those with limited access to libraries and the Internet. It publishes a weekly or daily e-newsletter, providing information on current research advances in behavioural, basic science and clinical aspects of HIV/AIDS that are relevant to resource-limited settings.

ICT for environmental sustainability

ICT is gaining in relevance amidst increasing concern for the environment worldwide. ICT, by its very nature, has various applications that go beyond mere information gathering and distribution, to analysis of data which is one of its key potentials. Thus ICT makes a valuable contribution to promoting the creation of a sustainable environment by improving public awareness, supporting monitoring and response systems, facilitating environmental activism and enabling more efficient resource use.

ICT can also influence the functional adjustments and changes required to help sustain the environment. A free-access website that tracks industrial emissions, for example, can serve as a self-monitoring tool for private sector businesses with warning e-mails to the relevant offices when emissions approach a critical limit as specified in the case of Pakistan by the National Environmental Quality Standards (NEQS).

Additionally, ICT serves as an unparalleled enabler of communicating awareness and information about the importance of the environment. The greatest advantage that ICT offers in any society and local community is the effectiveness of this tremendous tool in exchanging ideas and knowledge with different stakeholders to garner support from not only within a nation but also from global resources.

ICT enables a better understanding of issues such as climate change and biodiversity. The power of ICT as an information and networking medium enables citizens to act as environmental enforcement agents, alerting decision makers to compliance infringements while leveraging on their power to reach and influence public opinion. Any programme that provides connectivity has the potential to increase sustainability, given appropriate content and training. Two application areas key to natural resource management are GIS mapping and land registration. Both are relatively new developments founded on what most call geospatial technologies.

ICT can contribute to environmental sustainability by providing public access to information; means of participation by the public for decision making (open forum); information dissemination; accountability of governments; public awareness; promotion of green techniques and technologies; source of alternative livelihoods; and environmental monitoring, mapping and management.

Training of skilled people and connectivity remain the two major challenges facing Asia. In many countries, although computer infrastructure does exist, key environment institutions have difficulty connecting to the internet. Additionally, limited awareness of the role of ICT amongst decision makers must be addressed. Progress is yet to be seen as national policies have not translated environmental vision into specific goals. Asian countries have not been very successful in articulating a coherent vision which can be facilitated through the potential of ICTs (United Nations 2003b).

Geographic information system (GIS) and remote sensing

GIS and satellite remote sensing have played an important role in collecting information, pinpointing sensitive and vulnerable forest, watershed and fragile marine ecosystems which are of critical relevance to the livelihoods of the most excluded sections of the population. They provide essential information on both the quantity and quality of forest land, wildlife and marine resources. GIS has also been instrumental in monitoring changes in forest land. In Thailand, 'Forest Loves the Water and the Land' project used satellite images to identify denuded forest areas in five northern provinces.[36] GIS was applied for India's rehabilitation of the water distribution system in Mirzapur in the state of Uttar Pradesh. In Sri Lanka, remote sensing and GIS techniques were applied for the detection of change in forest cover (UNDP 2003g). In this project, two Landsat Thematic Map (TM) images from 1992 to 1998 were used to determine the deforestation in a selected area in Habarana, Polonnaruwa district, North-Central Province. China used GIS and Remote Sensing Systems to track urban development and arable land decrease in Shanghai between 1996 and 2000; NOVA and Radar images to track forest fires in North Eastern China in 1997; and floods along Dongting Lake in the Yangtze River Basin in 1998. In Mongolia, where herding is a way of life for rural population, satellite data and GIS are used for pasture management.

Environmental databases

The development of effective environmental databases that can be used for tracking the status of various environmental indicators and impacts is a key effort in utilising ICT application for environmental protection. China has created many national databases, for land evaluation and management, population, environment and sustainable development; land cover (by county), soil erosion, cultivated land by slope steepness and wetlands. The National Agricultural Research Centre (NARC) in Pakistan, provides the retrospective search facilities of 23 international databases available on CD-ROMs, including those on major agriculture and life sciences. In Sri Lanka, the International Water Management Institute (IWMI), part of the global network known as Consultative Group of International Agricultural Research (CGIAR), is committed to maintaining freshwater resources and irrigation research information in databases and disseminating them through its extensive website. In Malaysia, ASEAN Review of Biodiversity and Environmental Conservation (ARBEC) provides an on-line platform, www.arbec.com.my, for the effective dissemination of critical research among the members of the Biodiversity Community in Asia and the World.

Increased networking

ICT can also be used for emergency communication at the grassroots level. For example, Mongolia's Disaster Management System Improvement through Upgraded Emergency Warning Systems is used to address the establishment of a nationwide reliable emergency warning system to secure the society from any natural disaster. Indonesia's government, with the help of the Asian Development Bank (ADB), has started a project called Bapedal Network Regional Project

(BNRP) which is an Environmental Impact Management Information System (EIMIS) connecting seven provinces and 14 districts to three regional offices and a central office in Jakarta. The Forest Department in Sri Lanka has used ICT in developing a communication system that effectively delivers information on forest offences to intercept offenders immediately.

Municipal solid waste and pollution management

One of the interesting applications of the information revolution is improved solid waste management, including its reduced generation. Inventory management systems, traditionally used for efficient business processes, have been customised to address this important concern. Better calculation of mass demand and customisation is possible through the use of ICT. In India, dramatic and immediate service improvement was achieved with a new solid waste collection system for the city of Mirzapur, Uttar Pradesh (Gibbons 2003). Solid waste collection depots have been constructed throughout the city in order to eliminate the secondary collection of solid waste.

For pollution control, the Self-Monitoring And Reporting Tool (SMART) in Pakistan maintains a database of industrial activity, where the data on the emissions and pollution levels generated by specific industries are available.

Environmental sustainability through a knowledge society

ICT can help in the diffusion of knowledge, breaking the monopolies of experts and elites and, thus, creating an increased awareness about core environmental concerns and issues. Promoting such a knowledge-based society can enhance self-governance where citizens are infused with appropriate value systems that emphasise a sustainable quality of life with best practices that may be replicated for universal benefit. Self-compliance for environmental sustainability reduces the need for external regulation and intervention. Garbage segregation, rainwater harvesting, minimising noise pollution are some examples of this. E-NVIRONMENT Malaysia is a virtual community set up by the Malaysian Nature Society to promote the study, appreciation, conservation and protection of Malaysian natural heritage. It has also set up online information kiosks at various nature locations such as the ones at the Kuala Selangor Nature Park and Boh Tea Estate. The Malaysian Cyber Plant Conservation Project has resulted in an electronic community committed to the conservation of the environment and plant genetic resources as well as the conservation and propagation of indigenous rare species and enhancing environmental awareness about their importance. It is also a virtual learning platform for 20 schools (on a pilot basis) on the importance of conserving the environment. Indonesia's Ministry of Environment is also working to develop other applications for environmental management that will be accessible to the public.

ICT towards a global partnership for development

Creating inclusive global partnerships is one of humanity's central challenges in the 21st Century. Although great opportunities exist in today's fast changing global economy, many developing nations have been left on the margins, lacking the skills, technologies and financial resources to participate in global developments. The last MDG addresses the ways in which industrialised countries can assist developing countries to achieve the other seven goals. This partnership can be supported through the development and dissemination of information and communication technologies. Knowledge exchange and sharing of technical expertise can help developing nations in the new information age. Examples from the nine Asian countries reveal how they have used various initiatives that involve global partnerships through ICT.

Governance

The potential of ICT in addressing development goals and efficiency in government to streamline and improve public service delivery and interactions of the private sector and civil society with the government (e-procurement, forms and registrations, etc.)[37] can have far-reaching effects. In 1993, China initiated a Golden Customs project intended to create an integrated data communication system connecting foreign trade companies, banks, and the customs and tax authorities. This system has allowed China's customs authority to solve criminal and smuggling cases valued at approximately US$ 96 million. The Bapedal Regional Network Program, Indonesia, is a US$ 77 million joint venture with the Asia Development Bank, providing an environmental network for seven provinces and 14 districts with three regional offices and one central office in Jakarta to disseminate information to the public.

Partnerships between stakeholders

Governments alone cannot ensure that ICT plays

its designated role in development. Very often, the effort of developing the appropriate technology, and innovation aimed at reducing the costs of that technology, is often best undertaken by individuals, autonomous institutions, private firms and civil society organisations, that have the requisite knowledge and the flexibility to ensure success (Chandrasekhar 2003). In December 2001, Intel launched its worldwide effort to help teachers integrate technology into instruction known as 'Teach to the Future' in Karachi, Pakistan, piloting two batches of master trainers, equipped with 60 hours of extensive training, an exhaustive set of modular training material, and licensed software for their personal use. In India's Warana project, several government bodies have worked together to increase computer penetration to a cluster of 70 contiguous villages. Civil society is also collaborating in this project. In 1984, the UN Environment Programme (UNEP) and World Wide Fund for Nature (WWF) established the International Television Trust for the Environment (TVE International) as a global non-profit organisation to raise awareness of environment, development, health and human rights issues through the media. Another global partnership was established between the Asia-Pacific Broadcasting Union (ABU) and Sri Lanka to provide skills training, scholarships, and programme exchanges which has raised the broadcasting standards in Sri Lanka (Chanuka, Nalaka & Hasitha 2003). In Mongolia, the Millennium Development Gateway, which is part of the Global Development Gateway, uses ICT for development by sharing knowledge and experiences among 45 countries.

Partnerships in education and research

ICT tools have linked worldwide research institutions enhancing scientific research and supported the development of innovative projects. The networked communication between universities and research organisations has increased collaborative efforts between institutions and countries. In China, educational institutions have been aggressive in establishing partnerships with foreign institutions, which is facilitated by ICT. Indonesia has also been aggressive in using ICT to build partnerships with foreign research institutes to enhance its education sector, through projects such as the Global Distance Learning Network (GDLN) at the University of Indonesia. The Asia Technology Information Program (ATIP) of Tokyo's effort in global partnership is seen in its High Performance Computing (HPC) Asia conference that promotes accessible HPC activities in Asian countries and Australia, partnership between Asian and Australian universities and research institutions and their partners in the United States and European countries.

Global public policy networks

Global Public Policy Networks (GPPNs) are international networks and coalitions that can work consensually in developing sustainable policy positions. They have been effective in drawing interest from a wide group of individuals and institutions with similar objectives although operating in different local environments. A good example is RosettaNet which is an international standard that is managed by RosettaNet Global, a non-profit organisation with a membership of more than 400, made up of the world's leading electronic companies, enabling companies in the supply chain to communicate and conduct business electronically through common codes for sourcing of parts and components. ICT facilitates the standardisation of formats, systems, standards, codes and protocols which are essential for international collaboration and exchange.

ICT as business tool to facilitate international trade

The availability of commercial and unrestricted internet and e-mail facilities has radically transformed the way business is conducted with foreign parties. Internet and e-mail have provided an easy and cost-effective means for business firms to communicate with foreign suppliers, partners and buyers. China has established wide public and private networks for global and regional networking through the internet, such as the international website for the New Euro-Asian Continental Bridge cooperation, the International Network for Bamboo and Rattan and The Asian City Network. In Sri Lanka, the implementation of Electronic Data Interchange (EDI) has also resulted in the setting up of MARINET by Sri Lanka Ports Authority (SLPA) linking it with the shipping agents and the approval of some of the UN/EDIFACT (EDI For Administration, Commerce and Transport) standards (Chanuka, Nalaka & Hasitha 2003).

ICT can provide critical support for small and medium sized enterprises to access global markets with limited expenditures, for example, for advertising and overhead expenses. E-mail communication cuts costs and provides an instantaneous mode of communication linking suppliers and purchasers across the globe. Even rural and excluded groups have succeeded in leveraging ICT for improving their economic status through these channels.

IX
Conclusion

The aim of this research is to explore the role and significance of ICT for human development in Asia, in the framework of the eight Millennium Development Goals (MDGs).

The report finds enormous variations across countries in ICT availability and use of higher and lower end technologies, infrastructure, connectivity, cost, human skills, availability of locally relevant content, and types of ICT applications for human development. A significant long-term impact of ICT lies in its ability to expand human capabilities and choices. The assessment of ICT use and diffusion in Asia reveals clear progress in telecommunications, use of personal computers and internet penetration. It also, however, highlights significant differences resulting in some countries, for example, Malaysia, China and Thailand, being clearly ahead of others.

The analyses of human development and the achievement of MDGs in the nine countries show considerable diversity across countries, and yet demonstrate how ICT can break barriers to human knowledge, participation and economic opportunities. Although ICT constitutes a relatively recent phenomenon in the Asian landscape, this study reveals a wide variety of uses and initiatives that have been developed in Asian countries. Towards some of the MDGs, there has been very successful strategic deployment of ICT tools to address development concerns with only sporadic and isolated attempts in others. Thus, while there have been numerous innovative and successful experiences in applying ICT for human development there are also significant gaps. The degree to which ICT can influence the achievement of MDGs is conditioned by:

a) the inherent nature of a particular goal combined with the materiality of information and communication in achieving it;
b) three critical enabling factors — technological, access-related and human.

For example, in respect of the three MDGs on health, ICT contributes in several specific ways like improved healthcare management, patient health information, public health education and awareness and outreach through telemedicine. On the other hand, to combat hunger or make primary education universal, ICT has a more indirect and limited impact. Even where ICT can have a critical influence, its role is largely a facilitating and complementing one to the more direct forms of intervention and service delivery. However, where ICT plays a strong and critical complementary role, it is essential for stakeholders to target ICT applications for achieving human development goals.

This report reveals that while small scale and experimental applications of ICT provide ways to explore their potential, their extension and sustainability depends on the commitment and resources that stakeholders are able to mobilise. The success of ICT applications for human development depends on the perceived interests and benefits of stakeholders, including governments, civil society organisations, the private sector and the individuals. In the context of developing countries, governments continue to be major players in ICT initiatives both in their capacity as policy makers as well as in their role as providers of ICT infrastructure and services. In addition, NGOs are fast emerging as innovative and effective users and purveyors of ICT. As high-cost infrastructure is a prerequisite for ICT

development and diffusion, harnessing private sector resources and expertise are also important. The trend towards deregulation and liberalisation of ICT industries is also increasing the role and importance of the private sector in the provision of infrastructure and services. As many of the experiences highlighted by this report clearly indicate, the successful harnessing of ICT for human development depends to a great extent on the creation of effective partnerships among all the stakeholders.

Use of ICT in accelerating human progress rests, above all, on the will and unwavering commitment of nations, businesses and civil society institutions to dedicate themselves wholeheartedly to the cause of human development and to achieve the clear targets set by MDGs.

Appendices

Appendix I: Millennium Development Goals and indicators

Goals and Targets	Indicators
Goal 1: Eradicate Extreme Hunger and Poverty	
Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than one US dollar a day	1. Proportion of population below 1 US$ a day (PPP values)
	2. Poverty gap ratio (incidence X depth of poverty)
	3. Share of poorest quintile in national consumption
Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	4. Prevalence of underweight children (under five years of age)
	5. Proportion of population below minimum level of dietary energy consumption
Goal 2: Achieve Universal Primary Education	
Target 3: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	6. Net enrollment ratio in primary education
	7. Proportion of pupils starting grade 1 of those who reach grade 5
	8. Literacy rate of 15-24 year olds
Goal 3: Promote Gender Equality and Empower Women	
Target 4: Eliminate gender disparity in primary and secondary education preferably by 2005 and to all levels of education no later than 2015	9. Ratio of girls to boys in primary, secondary and tertiary education
	10. Ratio of literate females to males (in the age group, 15-24)
	11. Share of women in wage employment in the non-agricultural sector
	12. Proportion of seats held by women in national parliament
Goal 4: Reduce Child Mortality	
Target 5: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate	13. Under-five mortality rate
	14. Infant mortality rate
	15. Proportion of 1-year-old children immunised against measles

Goal 5: Improve Maternal Health	
Target 6: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio	16. Maternal mortality ratio
	17. Proportion of births attended by skilled health personnel
Goal 6: Combat HIV/AIDS, Malaria and other Diseases	
Target 7: Have halted by 2015, and begin to reverse, the spread of HIV/AIDS	18. HIV prevalence among 15–24 year old pregnant women
	19. Contraceptive prevalence rate
	20. Number of children orphaned by HIV/AIDS
Target 8: Have halted by 2015, and begin to reverse, the incidence of malaria and other major diseases	21. Prevalence and death rates associated with malaria
	22. Proportion of population in malaria risk areas using effective malaria prevention and treatment measures
	23. Prevalence and death rates associated with tuberculosis
	24. Proportion of tuberculosis cases detected and cured under DOTS (Directly Observed Treatment Short Course)
Goal 7: Ensure Environmental Sustainability*	
Target 9: Integrate the principles of sustainable development into country policies and programmes to reverse the loss of environmental resources	25. Proportion of land area covered by forest
	26. Land area protected to maintain biological diversity
	27. GDP per unit of energy use (as proxy for energy efficiency)
	28. Carbon dioxide emissions (per capita) (plus two figures of global atmospheric pollution: ozone depletion and the accumulation of global warming gases)
Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water	29. Proportion of people with sustainable access to an improved water source
Target 11: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	30. Proportion of people with access to improved sanitation
	31. Proportion of people with access to secure tenure [urban/rural disaggregation of several of the above indicators may be relevant for monitoring improvement in the lives of slum dwellers]

Goal 8: Develop a Global Partnership for Development*

Target 12: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system

Includes a commitment to good governance, development, and poverty reduction — both nationally and internationally

Target 13: Addresse the special needs of the LDCs

Includes: tariff and quota free access for LDC exports; enhanced programme of debt relief for HIPC and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction

Target 14: Address the special needs of landlocked countries and small island developing states

(through Barbados Programme and 22nd General Assembly Provisions)

Target 15: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

Some of the indicators listed below will be monitored separately for the Least Developed Countries (LDCs), Africa, landlocked countries and small island developing states.

Official Development Assistance (ODA)

32. Net ODA as percentage of DAC donors' GNI (targets of 0.7% in total and 0.15% for LDCs)

33. Proportion of ODA to basic social services (basic education, primary health care, nutrition, safe water and sanitation)

34. Proportion of ODA that is untied

35. Proportion of ODA for environment in small island developing states

36. Proportion of ODA for transport sector in landlocked countries

Market Access

37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas

38. Average tariffs and quotas on agricultural products and textiles and clothing

39. Domestic and export agricultural subsidies in OECD countries

40. Proportion of ODA provided to help build trade capacity

Debt Sustainability

41. Proportion of official bilateral HIPC debt cancelled

42. Debt service as a percentage of exports of goods and services

43. Proportion of ODA provided as debt relief

44. Number of countries reaching HIPC decision and completion points

Target 16: In co-operation with developing countries, develop and implement strategies for decent and productive work for youth	45. Unemployment rate of 15–24 year olds
Target 17: In co-operation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries	46. Proportion of population with access to affordable essential drugs on a sustainable basis
Target 18: In co-operation with the private sector, make available the benefits of new technologies, especially information and communications	47. Telephone lines per 1,000 people 48. Personal computers per 1,000 people

** The selection of indicators for Goals 7 and 8 is subject to further refinement*

Source: UNDP, MDG website: www.undp.org/mdg

Appendix II: Indicators for ICT development under different Millennium Development Goals (MDGs), proposed as per the guidelines of UN ICT Task Force

MDG 1 — Eradication of extreme poverty and hunger

(i) Average income from ICT as per centage of GDP
(ii) Number of ICT initiatives related to the eradication of extreme poverty and hunger
(iii) Preps (poverty reduction strategy papers) that include development of ICT (IMF)

MDG 2 — Achievement of universal primary education

(i) ICT access and usage in primary school
(ii) Number of teachers trained on the usage of ICT
(iii) Initiatives related to ICT use in primary education
(iv) Presence of ICT-related content in primary education, particularly in terms of availability of learning materials in digital form in local languages, educational websites; e-learning products/ services etc.

MDG 3 — Promotion of gender equality and empowerment of women

(i) Women's ICT access and usage
(ii) ICT literacy among girls
(iii) Sensitivity of ICT policy environment to gender issues assessing importance of women in ICT plan, policy or strategy (Hafkin 2003)
(iv) Role of women in ICT policymaking
(v) Percentage of female IT workers or female technical workers
(vi) Initiatives to bring about women's advancement through the use of ICT

MDGs 4, 5 & 6 — Reduction of child mortality, improving maternal health and combating HIV/AIDS, malaria and other major diseases

(i) Initiatives promoted through ICT for sensitisation of population on health related issues like child mortality, maternal health, HIV/AIDS, malaria and other major diseases
(ii) Investment, penetration, usage of ICT in health institutions and by medical professionals and other health workers
(iii) Importance given to health and healthcare needs in terms of allocation of resources and setting perspectives, in country's ICT plan
(iv) Number and coverage of specific programs and campaigns related to ICT in health sector

MDG 7 — ICT impact on environmental sustainability

(i) Presence of content related to environmental protection and sustainability including climate change, biodiversity, etc., in education and information, disseminated through ICT
(ii) Indicators pertaining to prevention/monitoring of environmental disasters
(iii) ICT initiatives related to reduction in consumption of energy, water and other essential resources through introduction of ICT

MDG 8 — Developing a global partnership for development[38]

(i) Number of telephone connections
(ii) Number of personal computers
(iii) Number of people trained in ICT (local capacity building)
(iv) Number of local companies registered with ICT as main/major business
(v) Number of domain names registered locally or domain addresses registered to an address in a country
(vi) Number of personal computers, phones, mobiles, radios, radio stations, etc.
(vii) Degree of competitiveness and regulatory controls in the market
(viii) Number of ISPs
(ix) Patents registered related to local ICT

(x) Number of registered software licenses
(xi) Number of health and educational institutions connected electronically
(xii) Number of web pages in major 'local' languages
(xiii) Number of IP addresses, domain names and e-mail accounts
(xiv) Number of people employed in ICT sector

Appendix III: Indicators used for construction of indices pertaining to ICT development

1. *Availability or supply-linked — skill-independent*
   i. Telephone mainlines (per 1,000 people)
   ii. Cellular subscribers (per 1,000 people)
   iii. Television sets (per 1,000 people)
   iv. Radios (per 1,000 people)

2. *Availability or supply-linked — skill-dependent*
   i. Internet users (per 100 people)
   ii. Personal computers in use (per 100 people)
   iii. ICT expenditure per capita (in US dollars)

3. *Efficiency and speed*
   i. Internet service provider charges (in US dollars)
   ii. Telephone usage charge for internet service (in US dollars)
   iii. Cost of local call per 3 min (in US dollars)
   iv. Cost of call to US per 3 min (in US dollars)
   v. Internet speed and access
   vi. Training and education in IT

4. *Targeting social sectors*
   i. Internet access in schools
   ii. Computers installed in education (in thousands)
   iii. Government prioritisation in ICT
   iv. Government online services availability

5. *Targeting vulnerable groups*
   i. Female professional and technical workers (% of total female workers)
   ii. Public access to internet
   iii. Government's success in ICT promotion
   iv. Competition among internet service providers (ISPs)
   v. Laws related to ICT use

ICT FACT SHEET- CHINA

S. No.	INDICATOR	China		East Asia & the Pacific	Lower middle income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	33	137	110	146
2	Telephone mainlines-waiting list (thousands)	1400	812	1901	27675
3	Telephone mainlines-cost of local call ($ per 3 minutes)	NA	NA	0.02	0.04
4	Mobile phones (per thousand people)	3	110	97	110
5	International telecommunications-outgoing traffic (minutes per subscriber)	33	7	49	58
6	International telecommunications-cost of call to US ($ per 3 minutes)	NA	6.70	4.62	4.50
7	Daily newspapers (per thousand people)	42	NA	NA	NA
8	Radios (per thousand people)	339	339	287	346
9	Television sets (per thousand people)	243	312	266	292
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers per thousand people	2.3	19.0	19.1	28.1
11	Personal computers installed in education (thousands)	315.4	2092.1	NA	NA
12	Internet- users (thousands)	60.0	33700.0	50901.8	68936.9
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	20401.0	66612.0	NA	NA
14	ICT as % of GDP	2.9	5.7	NA	NA
15	ICT per capita ($)	16.6	52.7	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	4.3	4.0	4.3
17	Competition in ISPs	NA	3.7	4.3	4.2
18	Government online services availability	NA	3.5	2.7	3.1
19	Laws relating to ICT use	NA	3.5	3.5	3.3
20	Government prioritization of ICT	NA	5.3	4.9	4.0

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Lower middle income refers to countries with 2002 GNI per capita of $736 - $2,935
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - CHINA

INDICES

S. No.	INDICES	China	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.721	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	104	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.726	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	96	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.566	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	101	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	14.2	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	26	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	14.9	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	24	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.718	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	83	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.724	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	77	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	NA	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	NA	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	China	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	1,285.2	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	36.7	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	24.3	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	4.9	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	1.8	2.7	2.9	3.3	2.0

S. No.	INCOME	China	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	4,020	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	3,169	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	4,825	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	3[b]	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	16.1	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	4.6	NA	NA	NA	NA

S. No.	EDUCATION	China	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	85.8	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	78.7	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	92.5	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	62[a]	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	65[a]	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	2.1	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	37.4	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	32.2	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	15.6	NA	NA	NA	NA

S. No.	HEALTH	China	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth, 2001 (yrs)	70.6	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	72.9	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs)	68.6	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	31	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	39	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	55	NA	NA	NA	NA
45	Per centage of Children Underweight for Age (% under age 5), 1995-2001	10	NA	NA	NA	NA
46	Population with Access to Improved Sanitation (%), 2000	40	61	51	37	48
47	Population with Access to Improved Sanitation (%), Urban, 2000	69	85	77	68	73
48	Population with Access to Improved Water Source (%), 2000	75	82	78	85	76
49	Population with Access to Improved Water Source (%), Urban, 2000	94	95	92	95	93
50	Population with Access to Improved Water Source (%), Rural, 2000	66	71	69	81	67

S. No.	ENVIRONMENT	China	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of Land Area Covered by Forests, 2000	17.5	NA	NA	NA	NA
52	Ratio of Protected Area to Surface Area, 2003	0.07	NA	NA	NA	NA
53	Per Capita Carbon Dioxide Emissions (Metric Tons), 1999	2.3	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), Human Development Report 2003, Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.

Notes:

[a] Data refers to the 1999-2000 school year

[b] Data refers to 2000

ICT FACT SHEET- INDIA

S. No.	INDICATOR	India		South Asia	Low income
	ICT Infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	13	38	32	26
2	Telephone mainlines waiting list (thousands)	2277	1649	2624	3663
3	Telephone mainlines cost of local call ($ per 3 minutes)	0.02	0.02	0.02	0.05
4	Mobile phones (per thousand people)	0	6	6	10
5	International telecommunications-outgoing traffic (minutes per subscriber)	29	14	58	114
6	International telecommunications-cost of call to US ($ per 3 minutes)	NA	3.20	2.66	5.27
7	Daily newspapers (per thousand people)	NA	60	60	40
8	Radios (per thousand people)	119	120	112	139
9	Television sets (per thousand people)	61	83	81	91
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	1.3	5.8	5.3	5.9
11	Personal computers installed in education (thousands)	23.6	238.7	NA	NA
12	Internet- users (thousands)	250.0	7000.0	7973.0	15332.3
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	7250.0	19662.0	NA	NA
14	ICT as % of GDP	2.1	3.9	NA	NA
15	ICT per capita ($)	7.8	19.0	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	5.8	4.2	NA
17	Competition in ISPs	NA	4.5	4.2	NA
18	Government online services availability	NA	3.9	1.9	NA
19	Laws relating to ICT use	NA	4.3	3.3	NA
20	Government prioritization of ICT	NA	5.6	4.9	NA

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Low income refers to countries with 2002 GNI per capita of $ 735 or less
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - INDIA

INDICES

S. No.	INDICES	India	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.59	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	127	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.577	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	124	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.309	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	134	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	33.1	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	53	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	33.1	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	55	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.574	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	103	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.56	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	105	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	NA	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	NA	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA
19	Technology Achievement Index Value, 2000	0.201	NA	NA	NA	NA
20	Technology Achievement Index Rank, 2000 (Out of 72 countries)	0.201	NA	NA	NA	NA
21	Networked Readiness Index Score, 2002-3	3.89	NA	NA	NA	NA
22	Networked Readiness Index Rank, 2002-3 (Out of 82 countries)	37	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	India	World	Developing Countries	South Asia	East Asia & the Pacific
23	Total Population (millions), 2001	1,033.4	6,148.1	4,863.8	1455.1	1,899.7
25	Urban Population (as % of the total), 2001	27.9	47.7	40.8	29.5	38.8
27	Population under age 15 (as % of the total), 2001	33.7	29.8	32.6	35.2	26.4
29	Total Fertility Rate, 1970-75	5.4	4.5	5.4	5.6	5.0
30	Total Fertility Rate, 2000-5	3.0	2.7	2.9	3.3	2.0

S. No.	INCOME	India	World	Developing Countries	South Asia	East Asia & the Pacific
31	GDP Per Capita (PPP US$), 2001	2,840	7,376	3,850	2,730	4,233
32	Female Estimated Earned Income (PPP US$), 2001	1,531	NA	NA	NA	NA
33	Male Estimated Earned Income (PPP US$), 2001	4,070	NA	NA	NA	NA
34	Youth unemployment (% of labour force aged 15-24), 2000	NA	NA	NA	NA	NA
35	Per centage of Population Below Poverty Line (US$ 1 a day), 1990-2001	34.7	NA	NA	NA	NA
36	Per centage of Population Below Poverty Line (National Poverty Line), 1987-2000	28.6	NA	NA	NA	NA

S. No.	EDUCATION	India	World	Developing Countries	South Asia	East Asia & the Pacific
37	Adult Literacy Rate (% age 15 and above), 2001 (%)	58.0	NA	74.5	56.3	87.1
38	Female Literacy Rate, 2001 (%)	46.4	NA	67.1	44.8	81.3
39	Male Literacy Rate, 2001 (%)	69.0	NA	NA	NA	NA
40	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 1999-2000	49	NA	NA	NA	NA
41	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 1999-2000	63	NA	NA	NA	NA
42	Public Expenditure on Education (as % of GDP), 1998-2000	4.1	NA	NA	NA	NA
43	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	39.4	NA	NA	NA	NA
44	Public Exp. on Secondary Education (as % of all levels), 1998-2000	40.5	NA	NA	NA	NA
45	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	20.1	NA	NA	NA	NA

S. No.	HEALTH	India	World	Developing Countries	South Asia	East Asia & the Pacific
46	Life Expectancy at Birth (yrs.), 2001	63.3	66.7	64.4	62.8	69.5
47	Life Expectancy at Birth (Female), 2001 (yrs)	64.0	NA	NA	NA	NA
48	Life Expectancy at Birth (Male), 2001 (yrs.)	62.8	NA	NA	NA	NA
49	Infant Mortality Rate (per 1,000 live births), 2001	67	56	61	69	32
50	Under 5 Mortality Rate (per 1,000 live births), 2001	93	81	89	95	42
51	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	540	NA	NA	NA	NA
52	Per centage of children underweight for age (% under age 5), 1995-2001	47	NA	NA	NA	NA
53	Population with access to improved sanitation (%), 2000	28	61	51	37	48
54	Population with access to improved sanitation (%), Urban, 2000	61	85	77	68	73
55	Population with access to improved water source (%), 2000	84	82	78	85	76
56	Population with access to improved water source (%), Urban, 2000	95	95	92	95	93
57	Population with access to improved water source (%), Rural, 2000	79	71	69	81	67

S. No.	ENVIRONMENT	India	World	Developing Countries	South Asia	East Asia & the Pacific
58	Per centage of land area covered by forests, 2000	21.6	NA	NA	NA	NA
59	Ratio of protected area to surface area, 2003	0.05	NA	NA	NA	NA
60	Per capita carbon dioxide emissions (metric tons), 1999	1.1	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), Human Development Report 2003, Oxford University Press, New York.
2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.
3 For rows 19, 20: UNDP (2001) Human Development Report 2001, Oxford University Press, New York.
4 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.
5 For row 66: www.worldbank.org/data/countrydata/countrydata.html
6 For rows 21, 22: World Economic Forum (2003) The Global Information Technology Report 2002-3, Oxford University Press, New York

Notes

(a) Data refers to 2000
(b) Data refers to 1999

ICT FACT SHEET- INDONESIA

S. No.	INDICATOR	Indonesia		East Asia & Pacific	Low income
	ICT Infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	17	35	110	26
2	Telephone mainlines waiting list (thousands)	117	NA	1901	3663
3	Telephone mainlines cost of local call ($ per 3 minutes)	0.04	0.02	0.02	0.05
4	Mobile phones (per thousand people)	1	31	97	10
5	International telecommunications-outgoing traffic (minutes per subscriber)	63	44	49	114
6	International telecommunications-cost of call to US ($ per 3 minutes)	NA	4.20	4.62	5.27
7	Daily newspapers (per thousand people)	24	23	NA	40
8	Radios (per thousand people)	153	159	287	139
9	Television sets (per thousand people)	113	153	266	91
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	5.0	11.0	19.1	5.9
11	Personal computers installed in education (thousands)	22.1	58.5	NA	NA
12	Internet- users (thousands)	50.0	4000.0	50901.8	15332.3
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	4337.0	3540.0	NA	NA
14	ICT as % of GDP	2.1	2.2	NA	NA
15	ICT per capita ($)	22.3	16.6	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	4.0	4.0	NA
17	Competition in ISPs	NA	4.2	4.3	NA
18	Government online services availability	NA	2.0	2.7	NA
19	Laws relating to ICT use	NA	2.8	3.5	NA
20	Government prioritization of ICT	NA	3.7	4.9	NA

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Low income refers to countries with 2002 GNI per capita of $ 735 or less
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - INDONESIA

INDICES

S. No.	INDICES	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.682	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	112	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.684	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	110	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.515	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	108	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	17.9	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	33	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	18.8	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	33	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.677	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	91	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.678	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	91	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	NA	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	NA	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	214.4	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	42.0	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	30.4	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	5.2	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	2.4	2.7	2.9	3.3	2.0

S. No.	INCOME	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	2,940	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	1,987	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	3,893	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	NA	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	7.2	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	27.1	NA	NA	NA	NA

S. No.	EDUCATION	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	87.3	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	82.6	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	92.1	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	63	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	65	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	NA	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA

S. No.	HEALTH	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth (yrs.), 2001	66.2	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	68.2	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs.)	64.3	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	33	56	61	69	32
43	Under 5 Mortality Rate (per 1,000 live births), 2001	45	81	89	95	42

44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	380	NA	NA	NA	NA
45	Per centage of children underweight for age (% under age 5), 1995-2001	26	NA	NA	NA	NA
46	Population with access to improved sanitation (%), 2000	55	61	51	37	48
47	Population with access to improved sanitation (%), Urban, 2000	69	85	77	68	73
48	Population with access to improved water source (%), 2000	78	82	78	85	76
49	Population with access to improved water source (%), Urban, 2000	90	95	92	95	93
50	Population with access to improved water source (%), Rural, 2000	69	71	69	81	67

S. No.	ENVIRONMENT	Indonesia	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of land area covered by forests, 2000	58.0	NA	NA	NA	NA
52	Ratio of protected area to surface area, 2003	0.16	NA	NA	NA	NA
53	Per capita carbon dioxide emissions (metric tons), 1999	1.2	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), Human Development Report 2003, Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.

ICT FACT SHEET- MALAYSIA

S. No.	INDICATOR	Malaysia		East Asia & Pacific	Upper Middle income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	166	196	110	201
2	Telephone mainlines waiting list (thousands)	140	91	1901	3626
3	Telephone mainlines cost of local call ($ per 3 minutes)	0.05	0.02	0.02	0.09
4	Mobile phones (per thousand people)	50	314	97	253
5	International telecommunications-outgoing traffic (minutes per subscriber)	111	146	49	111
6	International telecommunications-cost of call to US ($ per 3 minutes)	NA	2.37	4.62	2.16
7	Daily newspapers (per thousand people)	136	158	NA	123
8	Radios (per thousand people)	422	420	287	466
9	Television sets (per thousand people)	169	201	266	308
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	37.3	126.1	19.1	84.7
11	Personal computers installed in education (thousands)	31.4	121.9	NA	NA
12	Internet- users (thousands)	40.0	6500.0	50901.8	27607.4
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	4438.0	6325.0	NA	NA
14	ICT as % of GDP	5.0	6.6	NA	NA
15	ICT per capita ($)	220.7	262.1	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	3.9	4.0	4.9
17	Competition in ISPs	NA	4.4	4.3	3.7
18	Government online services availability	NA	3.3	2.7	3.5
19	Laws relating to ICT use	NA	4.8	3.5	3.6
20	Government prioritization of ICT	NA	5.9	4.9	4.6

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Upper middle income refers to countries with 2002 GNI per capita of $2,936 - $9,075
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - MALAYSIA

INDICES

S. No.	INDICES	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.790	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	58	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.782	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	59	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.790	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	57	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	NA	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	NA	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	NA	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	NA	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.784	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	53	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.776	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	54	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	0.503	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	45	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	0.505	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	43	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	23.5	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	58.1	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	33.4	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	5.2	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	2.9	2.7	2.9	3.3	2.0

S. No.	INCOME	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	8,750	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	5,557	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	11,845	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	NA	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	<2	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	NA	NA	NA	NA	NA

S. No.	EDUCATION	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	87.9	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001	84.0	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001	91.7	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	74	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	71	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	6.2	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	31.8	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	32.9	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	31.9	NA	NA	NA	NA

S. No.	HEALTH	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth (yrs.), 2001	72.8	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	75.3	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs.)	70.4	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	8	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	8	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	41	NA	NA	NA	NA
45	Per centage of children underweight for age (% under age 5), 1995-2001	18	NA	NA	NA	NA
46	Population with access to improved sanitation (%), 2000	NA	61	51	37	48
47	Population with access to improved sanitation (%), Urban, 2000	NA	85	77	68	73
48	Population with access to improved water source (%), 2000	NA	82	78	85	76
49	Population with access to improved water source (%), Urban, 2000	NA	95	92	95	93
50	Population with access to improved water source (%), Rural, 2000	94	71	69	81	67

S. No.	ENVIRONMENT	Malaysia	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of land area covered by forests, 2000	58.7	NA	NA	NA	NA
52	Ratio of protected area to surface area, 2003	0.05	NA	NA	NA	NA
53	Per capita carbon dioxide emissions (metric tons), 1999	5.4	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), Human Development Report 2003, Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.

ICT FACT SHEET- MONGOLIA

S. No.	INDICATOR	Mongolia		East Asia & the Pacific	Low income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	35	52	110	26
2	Telephone mainlines-waiting list (thousands)	39	38	1901	3663
3	Telephone mainlines-cost of local call($ per 3 minutes)	NA	0.02	0.02	0.05
4	Mobile phones (per thousand people)	NA	81	97	10
5	International telecommunications-outgoing traffic (minutes per subscriber)	25	38	49	114
6	International telecommunications-cost of call to US ($ per 3 minutes)	NA	4.92	4.62	5.27
7	Daily newspapers (per thousand people)	31	30	NA	40
8	Radios (per thousand people)	145	50	287	139
9	Television sets (per thousand people)	66	72	266	91
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	3.4	14.6	19.1	5.9
11	Personal computers installed in education (thousands)	NA	NA	NA	NA
12	Internet- users (thousands)	0.2	40.0	50901.8	15332.3
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	NA	NA	NA	NA
14	ICT as % of GDP	NA	NA	NA	NA
15	ICT per capita ($)	NA	NA	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	NA	4.0	NA
17	Competition in ISPs	NA	NA	4.3	NA
18	Government online services availability	NA	NA	2.7	NA
19	Laws relating to ICT use	NA	NA	3.5	NA
20	Government prioritization of ICT	NA	NA	4.9	NA

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Low income refers to countries with 2002 GNI per capita of $ 735 or less
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - MONGOLIA

INDICES

S. No.	INDICES	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.661	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	117	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.655	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	113	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.578	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	100	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	19.1	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	36	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	19.4	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	35	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.659	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	95	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.653	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	95	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	NA	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	NA	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	2.5	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	56.7	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	34.2	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	7.3	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	2.4	2.7	2.9	3.3	2.0

S. No.	INCOME	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	1,740	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	1,398	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	2,082	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	NA	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	13.9	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	NA	NA	NA	NA	NA

S. No.	EDUCATION	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above) - 2001 (%)	98.5	NA	74.5	56.3	87.1
31	Female Literacy Rate - 2001 (%)	98.3	NA	67.1	44.8	81.3
32	Male Literacy Rate - 2001 (%)	98.6	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	69	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	58	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	2.3	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	22.0	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	60.1	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	18.0	NA	NA	NA	NA

S. No.	HEALTH	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth, 2001 (yrs)	63.3	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	65.3	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs)	61.3	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	61	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	76	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	150	NA	NA	NA	NA
45	Per centage of Children Underweight for Age (% under age 5), 1995-2001	13	NA	NA	NA	NA
46	Population with Access to Improved Sanitation (%), 2000	30	61	51	37	48
47	Population with Access to Improved Sanitation (%), Urban, 2000	46	85	77	68	73
48	Population with Access to Improved Water Source (%), 2000	60	82	78	85	76
49	Population with Access to Improved Water Source (%), Urban, 2000	77	95	92	95	93
50	Population with Access to Improved Water Source (%), Rural, 2000	30	71	69	81	67

S. No.	ENVIRONMENT	Mongolia	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of Land Area Covered by Forests, 2000	6.8	NA	NA	NA	NA
52	Ratio of Protected Area to Surface Area, 2003	0.12	NA	NA	NA	NA
53	Per Capita Carbon Dioxide Emissions (Metric Tons), 1999	3.2	3.8	1.9	1.1	2.3

Data Sources:

1 UNDP (2003) Human Development Report 2003, Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.

ICT FACT SHEET- PAKISTAN

S. No.	INDICATOR	Pakistan		South Asia	Low income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	17	23	32	26
2	Telephone mainlines-waiting list (thousands)	209	230	2624	3663
3	Telephone mainlines-cost of local call($ per 3 minutes)	0.05	0.02	0.02	0.05
4	Mobile phones (per thousand people)	0	6	6	10
5	International telecommunications-outgoing traffic (minutes per subscriber)	31	53	58	114
6	International telecommunications-cost of call to US($ per 3 minutes)	NA	3.54	2.66	5.27
7	Daily newspapers (per thousand people)	23	40	60	40
8	Radios (per thousand people)	102	105	112	139
9	Television sets (per thousand people)	51	148	81	91
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	3.5	4.1	5.3	5.9
11	Personal computers installed in education (thousands)	NA	NA	NA	NA
12	Internet- users (thousands)	0.2	500.0	7973.0	15332.3
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	NA	NA	NA	NA
14	ICT as % of GDP	NA	NA	NA	NA
15	ICT per capita ($)	NA	NA	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	NA	4.2	NA
17	Competition in ISPs	NA	NA	4.2	NA
18	Government online services availability	NA	NA	1.9	NA
19	Laws relating to ICT use	NA	NA	3.3	NA
20	Government prioritization of ICT	NA	NA	4.9	NA

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Low income refers to countries with 2002 GNI per capita of $ 735 or less
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - PAKISTAN

INDICES

S. No.	INDICES	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.499	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	144	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.499	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	138	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.311	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	132	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	40.2	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	65	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	41.0	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	68	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.469	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	120	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.468	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	120	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	0.414	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	58	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	146.3	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	33.4	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	41.8	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	6.3	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	5.1	2.7	2.9	3.3	2.0

S. No.	INCOME	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	1,890	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	909	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	2,824	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	13[a]	NA	NA	NA	NA
28	Per centage of Population below Poverty Line (US$ 1 a day) - 1990-2001	13.4	NA	NA	NA	NA
29	Per centage of Population below Poverty Line (National Poverty Line) - 1987-2000	32.6	NA	NA	NA	NA

S. No.	EDUCATION	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	44.0	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	28.8	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	58.2	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	27	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	45	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	1.8	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA

S. No.	HEALTH	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth, 2001 (yrs.)	60.4	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	60.3	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs.)	60.6	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	84	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	109	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	NA	NA	NA	NA	NA
45	Per centage of Children Underweight for Age (% under age 5), 1995-2001	38	NA	NA	NA	NA
46	Population with Access to Improved Sanitation (%), 2000	62	61	51	37	48
47	Population with Access to Improved Sanitation (%), Urban, 2000	95	85	77	68	73
48	Population with Access to Improved Water Source (%), 2000	90	82	78	85	76
49	Population with Access to Improved Water Source (%), Urban, 2000	95	95	92	95	93
50	Population with Access to Improved Water Source (%), Rural, 2000	87	71	69	81	67

S. No.	ENVIRONMENT	Pakistan	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of Land Area Covered by Forests, 2000	3.1	NA	NA	NA	NA
52	Ratio of Protected Area to Surface Area, 2003	0.05	NA	NA	NA	NA
53	Per Capita Carbon Dioxide Emissions (metric tons), 1999	0.7	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), Human Development Report 2003, Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) Human Development Report 2002, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) Human Development Report 1993, Oxford University Press, New York.

Notes:

[a] Data refers to 2000

ICT FACT SHEET- SRI LANKA

S. No.	INDICATOR	Sri Lanka		South Asia	Lower middle income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines(per thousand people)	11	44	32	146
2	Telephone mainlines waiting list (thousands)	227	258	2624	27675
3	Telephone mainlines cost of local call($ per 3 minutes)	0.03	0.04	0.02	0.04
4	Mobile phones (per thousand people)	3	36	6	110
5	International telecommunications-outgoing traffic (minutes per subscriber)	138	58	58	58
6	International telecommunications-cost of call to US($ per 3 minutes)	NA	2.66	2.66	4.50
7	Daily newspapers (per thousand people)	28	29	60	NA
8	Radios (per thousand people)	214	215	112	346
9	Television sets (per thousand people)	78	117	81	292
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers per thousand people	1.1	9.3	5.3	28.1
11	Personal computers installed in education (thousands)	NA	NA	NA	NA
12	Internet- users (thousands)	1.0	150.0	7973.0	68936.9
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	NA	NA	NA	NA
14	ICT as % of GDP	NA	NA	NA	NA
15	ICT per capita ($)	NA	NA	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	4.2	4.2	4.3
17	Competition in ISPs	NA	4.2	4.2	4.2
18	Government online services availability	NA	1.9	1.9	3.1
19	Laws relating to ICT use	NA	3.3	3.3	3.3
20	Government prioritization of ICT	NA	4.9	4.9	4.0

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Lower middle income refers to countries with 2002 GNI per capita of $736 - $2,935

Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - SRI LANKA

INDICES

S. No.	INDICES	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.730	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	99	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.741	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	89	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.663	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	86	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	18.3	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	34	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	17.6	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	31	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.726	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	80	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.737	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	70	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	0.272	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	67	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	0.274	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	64	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	18.8	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	23.1	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	25.5	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	4.1	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	2.0	2.7	2.9	3.3	2.0

S. No.	INCOME	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	3,180	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	2,095	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	4,189	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	24[a]	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	6.6	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	25.0	NA	NA	NA	NA

S. No.	EDUCATION	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	91.9	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	89.3	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	94.5	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	64[b]	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	63[b]	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	3.1	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA

S. No.	HEALTH	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth (yrs), 2001	72.3	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	75.5	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs)	69.6	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	17	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	19	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	90	NA	NA	NA	NA
45	Per centage of children underweight for age (% under age 5), 1995-2001	29	NA	NA	NA	NA
46	Population with access to improved sanitation (%), 2000	94	61	51	37	48
47	Population with access to improved sanitation (%), Urban, 2000	97	85	77	68	73
48	Population with access to improved water source (%), 2000	77	82	78	85	76
49	Population with access to improved water source (%), Urban, 2000	98	95	92	95	93
50	Population with access to improved water source (%), Rural, 2000	70	71	69	81	67

S. No.	ENVIRONMENT	Sri Lanka	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of land area covered by forests, 2000	30.0	NA	NA	NA	NA
52	Ratio of protected area to surface area, 2003	0.13	NA	NA	NA	NA
53	Per capita carbon dioxide emissions (metric tons), 1999	0.5	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), *Human Development Report 2003,* Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) *Human Development Report 2002*, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) *Human Development Report 1993*, Oxford University Press, New York.

Notes:

[a] Data refers to 2000

[b] Data refers to 1998-9 school year

ICT FACT SHEET- THAILAND

S. No.	INDICATOR	Thailand		East Asia & Pacific	Lower middle income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	61	99	110	146
2	Telephone mainlines waiting list (thousands)	1083	544	1901	27675
3	Telephone mainlines cost of local call($ per 3 minutes)	0.12	0.07	0.02	0.04
4	Mobile phones (per thousand people)	23	123	97	110
5	International telecommunications-outgoing traffic (minutes per subscriber)	67	52	49	58
6	International telecommunications-cost of call to US($ per 3 minutes)	NA	1.49	4.62	4.50
7	Daily newspapers (per thousand people)	46	64	NA	NA
8	Radios (per thousand people)	188	235	287	346
9	Television sets (per thousand people)	198	300	266	292
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers (per thousand people)	14.1	27.8	19.1	28.1
11	Personal computers installed in education (thousands)	88.9	271.5	NA	NA
12	Internet- users (thousands)	55.0	3536.0	50901.8	68936.9
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	4464.0	4751.0	NA	NA
14	ICT as % of GDP	2.7	3.7	NA	NA
15	ICT per capita ($)	75.2	75.6	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	3.9	4.0	4.3
17	Competition in ISPs	NA	4.9	4.3	4.2
18	Government online services availability	NA	3.2	2.7	3.1
19	Laws relating to ICT use	NA	3.5	3.5	3.3
20	Government prioritization of ICT	NA	5.1	4.9	4.0

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Lower middle income refers to countries with 2002 GNI per capita of $736 - $2,935
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - THAILAND

INDICES

S. No.	INDICES	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.768	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	74	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.762	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	70	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.715	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	74	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	12.9	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	24	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	14.0	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	21	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.766	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	61	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.760	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	60	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	0.457	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	55	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	0.458	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	50	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	61.6	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	20.0	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	25.9	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	5.0	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	1.9	2.7	2.9	3.3	2.0

S. No.	INCOME	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	6,400	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	4,875	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	7,975	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	7[a]	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day), 1990-2001	<2	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line), 1987-2000	13.1	NA	NA	NA	NA

S. No.	EDUCATION	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (% age 15 and above), 2001	95.7	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	94.1	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	97.3	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	69	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	75	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	5.4	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	36.0	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	27.1	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	24.1	NA	NA	NA	NA

S. No.	HEALTH	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth (yrs), 2001	68.9	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	73.2	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs)	64.9	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	24	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	28	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	44	NA	NA	NA	NA
45	Per centage of children underweight for age (% under age 5), 1995-2001	19[b]	NA	NA	NA	NA
46	Population with access to improved sanitation (%), 2000	96	61	51	37	48
47	Population with access to improved sanitation (%), Urban, 2000	96	85	77	68	73
48	Population with access to improved water source (%), 2000	84	82	78	85	76
49	Population with access to improved water source (%), Urban, 2000	95	95	92	95	93
50	Population with access to improved water source (%), Rural, 2000	81	71	69	81	67

S. No.	ENVIRONMENT	Thailand	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of land area covered by forests, 2000	28.9	NA	NA	NA	NA
52	Ratio of protected area to surface area, 2003	0.14	NA	NA	NA	NA
53	Per capita carbon dioxide emissions (metric tons), 1999	3.3	3.8	1.9	1.1	2.3

Data Sources -

1 UNDP (2003), *Human Development Report 2003,* Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) *Human Development Report 2002*, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) *Human Development Report 1993*, Oxford University Press, New York.

Notes:

[a] Data refers to 2000

[b] Data refers to a year or period other than that specified, differs from the standard definition or refers to only part of the country

ICT FACT SHEET- VIET NAM

S. No.	INDICATOR	Viet Nam		East Asia & the Pacific	Low income
	ICT infrastructure and access	**1995**	**2001**	**2001**	**2001**
1	Telephone mainlines (per thousand people)	11	38	110	26
2	Telephone mainlines waiting list (thousands)	150	NA	1901	3663
3	Telephone mainlines cost of local call($ per 3 minutes)	0.10	0.02	0.02	0.05
4	Mobile phones (per thousand people)	0	15	97	10
5	International telecommunications-outgoing traffic (minutes per subscriber)	50	18	49	114
6	International telecommunications-cost of call to US($ per 3 minutes)	NA	NA	4.62	5.27
7	Daily newspapers (per thousand people)	4	4	NA	40
8	Radios (per thousand people)	107	109	287	139
9	Television sets (per thousand people)	163	186	266	91
	Computers and the internet	**1995**	**2001**	**2001**	**2001**
10	Personal computers per thousand people	1.4	11.7	19.1	5.9
11	Personal computers installed in education (thousands)	7.7	27.0	NA	NA
12	Internet- users (thousands)	NA	1009.5	50901.8	15332.3
	ICT expenditures	**1995**	**2001**	**2001**	**2001**
13	Total ICT ($, millions)	740.0	2124.0	NA	NA
14	ICT as % of GDP	3.6	6.7	NA	NA
15	ICT per capita ($)	10.0	26.2	NA	NA
	ICT business and government environment*	**1995**	**2002**	**2002**	**2002**
16	Local specialised IT services availability	NA	3.4	4.0	NA
17	Competition in ISPs	NA	2.7	4.3	NA
18	Government online services availability	NA	2.2	2.7	NA
19	Laws relating to ICT use	NA	2.8	3.5	NA
20	Government prioritization of ICT	NA	4.7	4.9	NA

* Ratings from 1 to 7; 7 is highest/best

Notes: Figures in italics refer to an earlier year.
Low income refers to countries with 2002 GNI per capita of $ 735 or less
Source: World Bank website http://www.worldbank.org/data/countrydata/countrydata.html

HUMAN DEVELOPMENT FACT SHEET - VIET NAM

INDICES

S. No.	INDICES	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
1	Human Development Index Value, 2001	0.688	0.722	0.655	0.582	0.722
2	Human Development Index Rank, 2001 (Out of 175 countries)	109	NA	NA	NA	NA
3	Human Development Index Value, 2000	0.688	0.722	0.654	0.570	0.726
4	Human Development Index Rank, 2000 (Out of 173 countries)	109	NA	NA	NA	NA
5	Human Development Index Value, 1990	0.472	NA	NA	NA	NA
6	Human Development Index Rank, 1990 (Out of 173 countries)	115	NA	NA	NA	NA
7	Human Poverty Index Value (%), 2001	19.9	NA	NA	NA	NA
8	Human Poverty Index Rank, 2001 (Out of 94 countries)	39	NA	NA	NA	NA
9	Human Poverty Index Value (%), 2000	27.1	NA	NA	NA	NA
10	Human Poverty Index Rank, 2000 (Out of 88 countries)	43	NA	NA	NA	NA
11	Gender-Related Development Index Value, 2001	0.687	NA	NA	NA	NA
12	Gender-Related Development Index Rank, 2001 (Out of 144 countries)	89	NA	NA	NA	NA
13	Gender-Related Development Index Value, 2000	0.687	NA	NA	NA	NA
14	Gender-Related Development Index Rank, 2000 (Out of 146 countries)	89	NA	NA	NA	NA
15	Gender Empowerment Measure Value, 2001	NA	NA	NA	NA	NA
16	Gender Empowerment Measure Rank, 2001 (Out of 70 countries)	NA	NA	NA	NA	NA
17	Gender Empowerment Measure Value, 2000	NA	NA	NA	NA	NA
18	Gender Empowerment Measure Rank, 2000 (Out of 66 countries)	NA	NA	NA	NA	NA

INDICATORS

S. No.	DEMOGRAPHY	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
19	Total Population (millions), 2001	79.2	6,148.1	4,863.8	1455.1	1,899.7
20	Urban Population (as % of the total), 2001	24.5	47.7	40.8	29.5	38.8
21	Population under age 15 (as % of the total), 2001	32.6	29.8	32.6	35.2	26.4
22	Total Fertility Rate, 1970-75	6.7	4.5	5.4	5.6	5.0
23	Total Fertility Rate, 2000-5	2.3	2.7	2.9	3.3	2.0

S. No.	INCOME	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
24	GDP Per Capita (PPP US$), 2001	2,070	7,376	3,850	2,730	4,233
25	Female Estimated Earned Income (PPP US$), 2001	1,696	NA	NA	NA	NA
26	Male Estimated Earned Income (PPP US$), 2001	2,447	NA	NA	NA	NA
27	Youth unemployment (% of labour force aged 15-24), 2001	NA	NA	NA	NA	NA
28	Per centage of Population Below Poverty Line (US$ 1 a day) - 1990-2001	17.7	NA	NA	NA	NA
29	Per centage of Population Below Poverty Line (National Poverty Line) - 1987-2000	NA	NA	NA	NA	NA

S. No.	EDUCATION	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
30	Adult Literacy Rate (%, age 15 and above), 2001	92.7	NA	74.5	56.3	87.1
31	Female Literacy Rate, 2001 (%)	90.9	NA	67.1	44.8	81.3
32	Male Literacy Rate, 2001 (%)	94.5	NA	NA	NA	NA
33	Female Gross Enrollment Ratio Combined Primary, Seconday, Tertiary, 2000-1	61	NA	NA	NA	NA
34	Male Gross Enrollment Ratio Combined Primary, Secondary, Tertiary, 2000-1	67	NA	NA	NA	NA
35	Public Expenditure on Education (as % of GDP), 1998-2000	NA	NA	NA	NA	NA
36	Public Exp. on Pre-Primary & Primary Ed. (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
37	Public Exp. on Secondary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA
38	Public Exp. on Tertiary Education (as % of all levels), 1998-2000	NA	NA	NA	NA	NA

S. No.	HEALTH	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
39	Life Expectancy at Birth (yrs.), 2001	68.6	66.7	64.4	62.8	69.5
40	Life Expectancy at Birth (Female), 2001 (yrs)	71.0	NA	NA	NA	NA
41	Life Expectancy at Birth (Male), 2001 (yrs)	66.3	NA	NA	NA	NA
42	Infant Mortality Rate (per 1,000 live births), 2001	30	56	61	69	32

43	Under 5 Mortality Rate (per 1,000 live births), 2001	38	81	89	95	42
44	Maternal Mortality Ratio Reported (per 100,000 live births), 1985-2001	95	NA	NA	NA	NA
45	Per centage of children underweight for age (% under age 5), 1995-2001	33	NA	NA	NA	NA
46	Population with access to improved sanitation (%), 2000	47	61	51	37	48
47	Population with access to improved sanitation (%), Urban, 2000	82	85	77	68	73
48	Population with access to improved water source (%), 2000	77	82	78	85	76
49	Population with access to improved water source (%), Urban, 2000	95	95	92	95	93
50	Population with access to improved water source (%), Rural, 2000	72	71	69	81	67

S. No.	EDUCATION	Viet Nam	World	Developing Countries	South Asia	East Asia & the Pacific
51	Per centage of land area covered by forests, 2000	30.2	NA	NA	NA	NA
52	Ratio of protected area to surface area, 2003	0.03	NA	NA	NA	NA
53	Per capita carbon dioxide emissions (metric tons), 1999	0.6	3.8	1.9	1.1	2.3

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1 UNDP (2003), *Human Development Report 2003,* Oxford University Press, New York.

2 For rows 3, 4, 9, 10, 13, 14, 17, 18: UNDP (2002) *Human Development Report 2002*, Oxford University Press, New York.

3 For rows 5, 6: UNDP (1993) *Human Development Report 1993,* Oxford University Press, New York.

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[2] United Nations, Common Database; Millennium Indicators Database (UNESCO, ILO, IPU)
[3] United Nations, Common Database; Millennium Indicators Database (UNESCO, ILO, IPU)
[4] ESCAP staff estimates based on UNICEF, The State of the World's Children 2003; and End-decade Database; and United Nations, Millennium Indicators Database (UNICEF-WHO estimates).
[5] United Nations, millennium Indicators Database (FAO, UNEO-IUCN, IEA, UNSD, World Bank).
[6] United Nations, Millennium Indicators Database (UNICEF, WHO).
[7] International Data Corporation 2000. http://www.idc.com/
[8] External expenditures include information technology products purchased by businesses, households, governments, and education institutions from vendors or organizations outside the purchasing entity
[9] Internal spending on information technology includes spending on internally customized software, capital depreciation, and the like.
[10] World Economic Forum 2003.
[11] World Economic Forum 2003.
[12] UNCSTD Report 1997a.
[13] One would have to, however, ignore these in the present analysis, in view of the enormous costs involved in checking and ensuring comparability of the data, generated through the national statistical system.
[14] Furthermore, the role of ICT in these countries would depend on the institutional and policy safeguards that they are able to evolve and it is hard to predict their capability, a priori. In this sense, achievement of socio-political objectives would depend not merely on sector, region or gender specific use of the technology but on the overall system of governance. It is, therefore, not possible to determine the appropriate indicators of ICT without bringing in the larger issues of governance into consideration.
[15] Countries like India and Pakistan are newcomers in the field and the impact of ICT can be expected to materialise on ground only with a certain time lag.
[16] Given this perspective, the growth of ICT per se can be taken as desirable for achieving MDG, as it has been done in the existing literature for developed countries, unless of course there is evidence to the contrary. This implies that the importance of supply-side indicators of ICT may not be underplayed in the developing countries.
[17] Given the absence of a clear policy perspective in many Asian countries, it may be proposed that each country designs a system of incentives and controls that would lead to the desired social outcome.
[18] The institution of hosts has not developed due to different organisational structure and does not affect growth of these technologies. So this indicator is not included in the construction of ICT index.
[19] These data are compiled from International Telecommunication Union (ITU), UNESCO and WITSA. See http://www.worldbank.org/data/countrydata/ictglance.htm
[20] Ratings range from 1 to 7; the higher the value, the better is the country in terms of ICT diffusion to other spheres of activity.
[21] The information on per centage of female workers in IT sector is not available. Hence, this indicator is taken as a proxy.
[22] The Bank has also given a ranking of the countries based on the existence of a highly skilled IT job market. However, this may not be very useful in this analysis as its impact in terms of poverty alleviation or meeting other MDGs would be marginal.
[23] United Nations Development Fund for Women (UNIFEM), "The World's Women 2000," New York: United Nations, pg. 96.
[24] These data are available from Women's Indicators and Statistical Database, Wistat, Version 4, United Nations.
[25] The role of the government is likely to be significant in the context of achieving other MDG goals as well.
[26] It is hoped that the Theory of Large Numbers will tend to minimise the bias implicit in the methodology, over a large number of such applications.
[27] The mean for each indicator has been obtained by adding up the values of all the countries and dividing the total by 9. The new or scale-free value of each country, obtained through the division by mean, shows its relative position vis-à-vis the average of the nine countries, on that indicator.
[28] e-Choupal at http://www.digitaldividend.org/knwldge_bank/knwldge_bank_01_echoupal.htm.
[29] Beijing FarmKnow at http://www.farmknow.com.
[30] Millennium Development Goals: Gender Equality
[31.] Digital Divident Digest 2003.
[32.] World Information Technology and Services Alliance (WITSA) 2002.
[33] http://www.healthnet.org/ictinhealth.php
[34] Bridges.org. 2001. However, the issues of access, changing administrative culture, capacity building and addressing community needs with appropriate technology need to be addressed. Clarity in the policy environment in required as to where the liability and compensation lies in the event of a misdiagnosis after an "off-site" consultation.
[35] ITU 2000.
[36] Information provided by the Royal Forestry Department.
[37] United Nations Information and Communication Tecnologies Task Force 2003
[38] Development of ICT, besides playing a role in achieving the other MDG, has been considered as a goal in itself. This would enable inclusion of a large number of supply side indicators pertaining to ICT, as listed.