

*Information and Communication Technologies,
Poverty and Development:
Learning from Experience*

*A Background Paper for the
infoDev Annual Symposium
December 9-10, 2003
Geneva, Switzerland*

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infoDev

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The State Secretariat for
Economic Affairs (seco) of the Swiss
Government commissioned this study.

infoDev

Acronyms

CD-ROM	compact disk – read-only memory
DAC	Development Assistance Committee
DFID	Department for International Development
DotForce	Digital Opportunity Task Force
FDI	foreign direct investment
G8	Group of Eight major industrial democracies (Canada, France, Germany, Great Britain, Italy, Japan, Russia, USA)
HIPC	heavily indebted poor countries
HIV/AIDS	human immunodeficiency virus/acquired immune deficiency syndrome
MDGs	Millennium Development Goals
NGO	nongovernmental organisation
OECD	Organisation for Economic Co-operation and Development
PDA	personal digital assistant
SMEs	small and medium enterprises
UN	United Nations
VoIP	Voice-over-Internet-Protocol
WSIS	World Summit on the Information Society

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Preface

Since its creation in 1995, *infoDev* has been a pioneer in promoting innovative uses of information and communication technologies (ICTs) as tools of poverty reduction and sustainable development. Through a grant program that has supported over 400 innovative projects, complemented by a diverse program of seminars, workshops, research and publications, *infoDev* has contributed substantially to the development community's efforts to understand how best to increase access to ICTs, adapt them to the needs of the poor and developing countries, and use them creatively and effectively to combat poverty and create opportunities for social and economic development.

The last eight years have been a time of great experimentation and discovery, both for *infoDev* and for the development community as a whole. Yet the time has now come to assess more rigorously the results of those efforts, to learn from our experience and those of our partners, and to become more strategic and focused in our ICT-for-development efforts. The first step in this is a critical and careful examination of where we have been and what we have learned, and an open and frank dialogue among all those active in ICT-for-development efforts. Such a step is in itself a perfect illustration of *infoDev*'s new strategy (launched in 2002) to focus its effort around two priorities, namely: (1) the identification and sharing of best practices in the field of ICT-for-Development; and (2) the dissemination of the knowledge generated and acquired by *infoDev*, in its various fields of activity, both analytical and practical.

This report, commissioned by the Swiss Government and supervised by *infoDev*, is intended as a contribution to that examination of, and dialogue on, our experience with ICTs for development. Its aim is to suggest a framework for thinking about ICTs and their role in combating poverty and promoting development. We offer this report as a starting point for a broader conversation, and deeper investigation that can help us all be more effective and targeted in our ICT interventions. As the international community gathers in Geneva for the first part of the World Summit on the Information Society (WSIS), taking a sober look at the ways in which ICT has contributed (successfully or less successfully) to make societies more dynamic and less unequal may be of help when trying to define ambitious, yet realistic, objectives in this area.

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INTRODUCTION

The Scope and Purpose of this Report

This report is designed as a contribution to the discussion at the *infoDev* Annual Symposium in Geneva in December 2003, and thereby as a contribution to the broader debate in the World Summit on the Information Society, in the context of which the *infoDev* Symposium will be convened.

This report is NOT intended as an exhaustive analysis of “what works” in applying information and communication technologies (ICTs) to development and poverty reduction. There are two reasons for this. First, despite a proliferation of reports, initiatives, and pilot projects in the past several years, we still have little rigorous knowledge about “what works.” There are abundant “success stories,” but few of these have yet been subjected to detailed evaluation. There is a growing amount of data about the spread of ICTs in developing countries and the differential rates of that spread, but little hard evidence about the sustained impact of these ICTs on poverty reduction and economic growth in those countries. This is perhaps not surprising, since even in developed countries the debate on ICTs and growth is still lively and inconclusive, as is the debate on how much new ICTs such as the Internet have created a “new economy”. Nor is there solid evidence that the “digital divide” is a significant factor in understanding the roots of poverty and global inequality.

Second, it is even difficult to put together systematic and reliable information on the size and scope of ICT initiatives in developing countries. While virtually every multilateral and bilateral donor organization, and many nongovernmental and private sector organizations, have been active in the field, and developing countries have of course been engaged in their own efforts, it is difficult to get accurate and up-to-date information on who is doing what. (The Organisation for Economic Cooperation and Development's Development Assistance Committee (OECD DAC) has, however, made an impressive effort to compile a matrix of major ICT initiatives by donor countries.)¹ This problem is exacerbated by the fact that, in many donor organizations (including, for example, the World Bank, as a recent evaluation report revealed),² a vast percentage of ICT spending is imbedded within other projects in sectors as varied as health, education, trade, private sector

¹ The OECD matrix and related materials can be found at www.oecd.org/dac/ict

² Barbu, Dominquez, and Melody (2002).

development, and public sector reform. Since most of these projects are not identified as “ICT projects” and have often not been tied to the broader debate and analysis on ICT for development, and since their ICT components are often minor relative to the overall size of the project, the impact of these ICT components is rarely studied separately in ways that could increase our overall understanding of the impact of ICTs.

It is equally difficult to compile detailed data and analyses on the pre-Internet experience with ICTs and development, although we know that – from radio for rural extension to computerization of government ministries – there had been ample experimentation with ICTs in developing countries long before the creation of the Internet.

The goal of this report, then, is not to fill that substantial gap in our knowledge about what, specifically, works in particular circumstances, and why, but to *provide a framework for thinking about ICTs, poverty, and development* that could guide further analysis and future projects. The particular focus of this report is on our current understanding of the nature of poverty and the challenges of development, an analysis of how ICTs might address those challenges, and some tentative lessons drawn from our experience thus far. Therefore, this report includes information and analysis on a number of ICT-for-development initiatives, but its goal is to provide not a detailed checklist of what works but a roadmap for understanding what might work and why in specific circumstances, informed by the successes, and failures, of a variety of projects in recent years. Its focus, therefore, is on ICTs as means, not ends, as tools that enable desired changes — in the performance of institutions and markets, in the livelihoods of poor people and the vulnerabilities they face, in the capacity of individuals and governments — since it is these changes, not ICTs, that lead to poverty reduction and sustainable development. These outcomes — fewer people in poverty, more vibrant developing-country economies, more responsive government institutions, reduced disease and illiteracy, greater gender equality — are the ultimate measure of the value and impact of ICTs in development. ICT-focused measures such as the increase or decrease of the “digital divide” are at best proxies of these deeper changes, and at worst distractions from them.

The report concludes with general principles and priorities for action in harnessing ICTs as tools of development and poverty reduction. In general, the report is written not solely for ICT-for-development specialists, but for a broader audience of those working in development and interested in the role of ICTs. This reflects the overall message of the report: that the proper approach to harnessing ICTs for development and poverty reduction is to mainstream them as tools of, and subordinate them to, broader strategies and programs for building opportunity and empowering the poor.

EXECUTIVE SUMMARY

ICTs for Development: Time for a Sober Reassessment?

The growth of global information and communication networks over the past decade, the burst of creativity in technologies, applications, and business processes driven by these networks and by advances in computing, and the broader social impacts of these new technologies led to widespread enthusiasm over the potential of information and communication technologies to combat poverty and promote economic and social development in developing countries.

The mirror image of this hope was a fear that those countries and groups that did not take full advantage of these technologies would be left further behind on the wrong side of a growing “digital divide” that would trap them in deeper and intractable poverty. Urgent efforts to map and measure this growing divide grew alongside calls to address it aggressively through international action.

These hopes and fears combined to generate an incredible array of experiments, initiatives, partnerships, conferences, and other efforts to understand the potential of ICTs in combating poverty and fostering development. Vast amounts of resources and energy have been invested in efforts to increase access to ICTs in developing countries and among the poor; to adapt these tools to the specific priority needs of the poor; and to promote awareness, effective policy, and institutional and regulatory capacity in developing countries to take advantage of these technologies and their economic and social potential.

The results of these efforts are, thus far, inconclusive. This is partly because the international community has not done a good job of monitoring and evaluating its ICT-for-development efforts. Yet it is also because poverty and low growth remain seemingly intractable problems in so many countries, and because ICTs themselves have not proved to be the transformative tools that some had predicted they would be.

The mounting evidence that the Millennium Development Goals (MDGs) will most likely not be met (or even approached, in many cases) within the agreed timelines provides urgent motivation for reexamining our experience with ICT-for-development initiatives and assessing their relative priority within the broader

context of international efforts to foster sustainable development and combat poverty. The purpose of such a reassessment is not to dismiss ICTs as a tool; it is, on the contrary, to see them as a tool, to refocus our attention on the nature and causes of persistent poverty, to devise strategies that address those causes, and then to assess, based on recent experience, when and how ICTs can make a difference.

ICTs, Poverty, and Development: Reframing the Question

Some skeptics, including such notables as Bill Gates, have argued that the poor don't need ICTs; that they are a luxury that people living on less than \$1 a day can't afford. This critique, though simplistic, points to the flaw underlying much "digital divide" thinking and many donor-led ICT programs. Strictly speaking, the poor don't need ICTs (nor does anyone else, for that matter.) What the poor need is economic opportunity, improved nutrition and health care, healthy environments, education, and other components of a rewarding and sustainable livelihood. To the extent that ICTs can help achieve those other goals, they are a worthwhile tool of development efforts, but they remain tools, not goals. The presence or absence of ICTs (the "digital divide") is a symptom, not a cause. And the underlying causes of persistent poverty often have little to do, except indirectly, with the supply or absence of ICTs. By focusing on the "digital divide" (another in a long series of gaps that international development agencies have identified and sought to bridge over the past several decades) the proponents of ICT-for-development often misdirected their energies and weakened their own cause. We have, to some extent, mistaken the proxy for the problem.

The enthusiasm for ICTs has also mirrored earlier fads in development thinking in overemphasizing one factor and failing to focus adequately on the complexity and difficulty of fostering pro-poor change, and on the political and structural constraints on that change in a given country.

This is not, however, grounds for dismissing ICTs as a tool for combating poverty, fostering broad-based economic growth in developing countries, and achieving the Millennium Development Goals. On the contrary, ICTs, properly adapted to specific circumstances, have enormous potential. The key to realizing that potential is to begin the analysis not with the presence or absence of ICTs, but with the specific, interdependent causes (both local and global) and components of persistent poverty in a given country, the most effective measures for addressing those causes, and then and only then the tools (not just ICTs, but other resources, policies,

partnerships, etc.) necessary to proceed. This subordination of ICT efforts to a broader analysis of the nature of poverty and the strategies for addressing it also provides stronger grounds for setting priorities in tackling poverty. As the 2003 Human Development Report indicates, achieving the Millennium Development Goals would require levels of development assistance far above what most of the world's advanced economies currently seem willing to provide. In that context, every available resource needs to be leveraged for maximum effect in combating poverty, including, among other things, leveraging additional (e.g., private sector) resources. ICT can be an important part of this equation. But the desired result of the equation is reducing poverty and promoting pro-poor growth, not just increasing ICTs.

The Way Forward

To say that ICTs are tools sounds self-evident, but it is a point that has often been obscured in ICT-for-development discourse and projects in recent years. It means simply that ICTs are means to other ends. Specifying those ends (sustained economic growth; reduction of poverty, hunger and disease; improved economic and educational opportunities for the poor: greater gender equality) leads (or should lead) first of all to asking why those ends have not yet been achieved, and what the impediments are to their realization. This leads then to ask what changes in resources, capacities, institutions, markets, social structures, etc. are necessary in order to remove those impediments and achieve the desired ends. Development and poverty reduction, in short, are complex processes of economic, social, political and institutional change through which more people gain greater access to their desired ends, including participation in the process of deciding how those ends are prioritized and achieved.

The way forward, then, in harnessing the benefits of ICTs for development and poverty reduction (and the realization of the Millennium Development Goals) is to be more realistic about the broader changes required in a developing country in order to foster sustained growth and poverty reduction, as well as the role, which is sometimes modest, of ICTs in effecting those broader changes; to recognize that the poor, developing country governments and their international partners all face constraints in resources, time, attention and capacity; and thus to be much more selective and strategic about the attention and resources devoted to ICTs. This, of course, will lead to different strategies and priorities in different countries and regions, since the potential for ICTs to promote development and combat poverty will obviously vary considerably country by country and region by region. Several general principles, can, however be discerned as guideposts for these efforts.

1. Poverty and uneven development have complex, interdependent causes. Addressing those underlying causes is the only way to combat poverty.

The history of development assistance is full of examples of unicausal approaches to the understanding of the plight of developing countries (“the financing gap,” “the infrastructure gap,” etc.) that often led to failed efforts to “fix” the identified problem without adequate attention to the deeper and more complex causes of which the identified problem was a manifestation.

2. The “digital divide” is a symptom (among many), not a diagnosis, and bridging or closing it is a slogan, not a strategy.

Metrics of the digital divide tell us only about what ICTs people and countries have (and often only in aggregate terms). They tell us nothing about what they are able to do with those ICTs, which depends heavily on a variety of other factors. Positive changes in those metrics are, in certain cases, indicators of other desirable changes, such as improved markets for telecommunications, successful innovation, higher levels of private sector activity and foreign investment, but a change in those metrics by itself tells us almost nothing about deeper, more important changes in the resources and capacities of a community or nation, the effectiveness of its institutions and markets, or its broader economic prospects. Even in those few cases where ICT metrics might seem directly and significantly relevant to a desired change (e.g., improvements in ICT infrastructure as a lure to foreign direct investment), that desired change is fundamentally dependent on a variety of other factors that are, in most cases, more important (enabling environments, government capacity). For these reasons, indicative goals for ICT growth abstracted from a broader development strategy, such as calls for connectivity in every village by date X, are probably of limited use.

3. ICTs enable change; they do not create it. Pro-poor change in developing countries occurs through some combination of increased resources and capacities (of individuals and institutions); greater efficiency and transparency of firms, markets and government institutions; an easing of structural constraints (national or global); and concerted action on the part of key individuals and groups. ICTs can contribute to, or create the conditions for, many of these aspects of change, but they do not automatically cause change to happen. Furthermore, ICT-enabled change can be both good and bad. ICTs can open markets and increase competition, but that competition will not automatically be beneficial to developing-country producers. ICTs can further the advantages of already-powerful individuals and groups.

4. ICT strategies are only effective, sustainable, and worth the effort if they are integrally linked to broader, more comprehensive development and poverty-reduction strategies. By themselves, ICT strategies or “e-strategies” are often of little use and can even be counterproductive, both by obscuring the importance of the broader strategic priorities upon which any ICT strategy depends and by diverting scarce resources, including the time, attention and capacity of government decision makers, away from those broader priorities.

5. “Mainstreaming” ICTs in donor programs means subordinating them as tools of other, more fundamental objectives, not inserting them everywhere. The concern with “mainstreaming” arises in part from the widespread perception that ICT-for-development programs were often set apart from, and not well coordinated with, core sectoral activities of donors in education, health, private sector development, etc. At the same time, many sectoral projects had ICT components imbedded in them, but often without benefit of lessons from broader experience with ICTs and the challenges of adapting them to specific environments and conditions. The challenge, then, is both to link ICTs to core development goals and projects and to assure that everyone involved in development programs understands where and how ICTs can be useful tools, and where they are not.

6. Newer is not necessarily better. The best tool for any job is the one that does the desired work most efficiently, in a form appropriate to the user, given the available resources and other constraints on the use of the tool. The enthusiasm in the late 1990s for the Internet, and the “digital divide” logic that portrayed any technological gap as a disadvantage (and therefore undesirable), led to a technology escalation in ICT-for-development programs. Simpler and older technologies such as radio, television and even print materials were often viewed as *a priori* inferior tools because they lacked some of the functionality (particularly, the interactivity) of the Internet. The same prejudice applied to process technologies for improving the efficiency of firms and other institutions. Yet it is increasingly clear that, even in the richest countries, the full range of ICTs remains relevant to the daily needs and desires of individuals and the functioning of markets and institutions.

7. ICTs are, to some extent, social constructs. Therefore, they need to be adapted to different social contexts. Personal computers are very much a product of the economic and social forms of organization typical of rich countries, as are most of the software applications written for use on them. They are, in effect, an answer to specific needs and preferences typical of firms, institutions and individuals in developed countries. They will not necessarily be equally well suited to the needs of, or the forms of social and economic

organization common to, users in other countries, particularly poor countries. Promoting innovation in hardware and software — creating ICTs that are specific to the needs and conditions of developing countries — is a key element in ensuring that ICTs truly address the needs of developing country users.

8. Priority-setting is crucial to successful development and poverty reduction. Developing countries, and the international partners who seek to help them, including public donors, the private sector and nongovernmental organizations (NGOs), have limited resources of time, money and capacity. Any development strategy requires difficult choices, and priorities need to be chosen on the basis of an understanding of what are the most urgent needs of a given country and the actions most likely to have a positive impact on those needs. In some cases, ICTs will simply not be a priority, and an abstract sense of urgency about “falling behind in the digital divide” should never trump a clear strategy based on a detailed assessment of where the greatest levers for positive change exist in a specific country.

9. Learning new lessons is good, but fully absorbing old lessons is just as important. There is a strong, and welcome, emphasis in ICT-for-development circles on learning from experience and finding best practices. Yet often this learning is focused on what works in the use of ICTs in specific contexts rather than on the broader enabling conditions for successful ICT use (without which the “successful” ICT use cannot possibly be replicated elsewhere). It is impossible to understand what worked in a given context without exploring more deeply why it worked. Furthermore, this learning rarely includes an effort to absorb lessons from earlier, and sometimes unsuccessful efforts to introduce technologies into developing countries (e.g., automation of government ministries, television for education, radio for rural extension). Since the success or failure of these earlier efforts most probably had similar underlying causes, such as the enabling environment, appropriateness of the technology, human and institutional capacity, the structure of local and global markets, etc., there is much to learn from these earlier efforts. There, is, furthermore, much that could be learned from studying the history of development theories and practices that focused attention on one factor (finance, infrastructure, human capital) presumed to weigh heavily on the success or failure of economic growth, since ICT-for-development thinking is prone to some of the pitfalls encountered in these earlier approaches. Finally, we need to learn from the failures of past international calls for measurable increases in ICT access by given dates, such as the Maitland Commission's call in December 1984 for universal access to telephone service by the year 2000.

Priorities for Action

If the above analysis is correct, it suggests certain priorities for ICT-for-development efforts. This is by no means an exhaustive list; it is meant simply to point to some particularly important priorities, particularly for the international donor community.

1. Deeper, more rigorous analysis of the ICT-related dimensions of poverty and low growth and of the possibilities and limits of ICTs as tools to address poverty and promote development.

As this report has suggested, there is an urgent need to imbed ICT initiatives in a more rigorous understanding of the complex causes of poverty and low growth, the dimensions and drivers of pro-poor change in developing countries, and the broader enabling factors that determine whether and how ICT can make a difference.

2. More extensive and honest assessment of experience thus far with ICT-for-development programs.

There is abundant anecdotal evidence of successes and failures in ICT-for-development projects, and some spotty data on the scope of such efforts. However, there is a serious shortage of rigorous impact evaluations of these projects, and an equally serious shortage of analysis of the underlying conditions for success and failure of these projects. Improving our collective knowledge of these matters requires not only a greater commitment to evaluate past experience frankly, but also a much greater attention to information-sharing among the large number of organizations involved in these efforts — multilateral, governmental, private sector, and NGOs.

3. A greater strategic focus, in ICT programs, on levers of change and agents of change.

If the fundamental objective of ICT-for-development programs is to foster pro-poor change and sustainable development in poor countries, then there is an urgent need to understand better the key levers of, and impediments to desired change in a given country and the key groups and institutions that can serve as agents of change. This would permit a more effective targeting and prioritization of ICT-for-development programs, since they would be then be based on a context-specific

model of how to bring about desired deeper changes, not just on observed disparities of levels of ICT access.

4. A priority focus on development and poverty reduction, and on the MDGs, not on ICTs.

The focus on the absence of ICTs as the problem leads all too easily to the presumption that the supply of ICTs is the solution. Mainstreaming ICTs into broader development and poverty-reduction strategies means seeing ICTs as one of many important tools, along with policies, money, institutions, human capacity, and political will, among others, in fostering pro-poor change in developing countries. The measure of such change is progress on the MDGs and broader, sustainable growth, not the increased presence of ICTs.

This means that ICT strategies and “e-strategies” should be strictly subordinated to, and designed to be instrumental to, national development and poverty reduction strategies.

5. More rigorous priority-setting both in ICT programs and between them and other interventions.

Any development and poverty-reduction strategy involves difficult choices, since the resources, time and capacity of relevant actors and institutions are finite. It is not enough to posit that a given ICT intervention will create benefits for the poor or will help economic growth. In fact, the ability of ICT projects to show certain tangible results (more teachers trained, more farmers informed of current prices) sometimes serves as a way to avoid the tougher questions of whether those first-order changes lead to the desired deeper changes (better education results, more sustainable agricultural livelihoods) in ways that justify giving priority to them relative to other interventions and to their cost.

6. Greater cooperation and information-sharing among donors and other involved in ICT-for-development programs.

While general information-sharing and dialogue on ICT-for-development programs has improved somewhat in recent years, there is still considerable duplication of effort and failure of coordination among donors and other key actors in this area, as evidenced by the blizzard of competing “e-strategy” initiatives in the past few years. While everyone agrees in principle on the need for better information-

sharing and joint learning, key participants need to make that cooperation a priority, and take concrete actions to advance cooperation, perhaps by focusing first on a small group of priority areas for information sharing, such as evaluation of telecenters and other common-access models.

7. Stronger support for pro-poor innovation, and innovators.

Pro-poor innovation entails designing not only ICT appliances and applications relevant to the needs of the poor, but ICT-related or enabled services for the poor, and new financing and business models for provision of ICT access and services to the poor. A wide range of organizations — public, private and nongovernmental — are involved in this innovation. Yet they are often constrained either by lack of adequate resources for scaling up their innovations or the inability to find partners, and the international private sector, particularly in the current global economic context, is wary of investing in such innovation, since the short-term risks seem to outweigh substantially the long-term hope for profits, and since “long-term” is an increasingly unattractive time horizon for many investors. Without either seeking to replace or second-guess private sector innovation and investment, the development community should look for ways to increase the resources and partnerships available to pro-poor innovators.

Taking Advantage of the World Summit on the Information Society (WSIS) Two-Stage Process

The roughly two-year period between Phase 1 and Phase 2 of WSIS provides a good opportunity for the international community to set concrete, phased targets for improved cooperation, better priority-setting, and enhanced evaluation, analysis and information-sharing in ICT-for-development programs. Rather than setting indicative ICT targets for the coming years, which are not meaningfully attainable through direct action, as long experience has shown, the donor community should make concrete commitments for progress in cooperation, information-sharing, monitoring and evaluation, and more coherent division of labor in ICT programs, which would be reviewed at the second phase of WSIS in Tunis in late 2005.

Such an approach might be viewed by some as a retreat from the more ambitious approach of adopting ICT targets in Geneva. One can argue, however, that it is ultimately not only a more realistic strategy but one more likely to produce results.

Changes in the penetration and use of ICTs in developing countries, and in their impact on the MDGs, can be meaningfully achieved only as part of a broader and more comprehensive approach to poverty reduction and sustainable development. The best contribution that the ICT-for-development community can make to these broader efforts is to make the case for ICTs as tools of poverty-reduction and economic growth, and of pro-poor change, in a more rigorous and evidence-based fashion, and to cooperate more effectively in applying ICTs to specific development challenges. The measure of success, however, will and must remain progress toward the MDGs and concrete improvements in the lives of the poor.



Chapter 1

ICTs FOR DEVELOPMENT: TIME FOR A SOBER REASSESSMENT?

A Decade of Discovery

*I*t has been barely ten years since the commercial release of the first client Web browsers transformed the Internet, and the World Wide Web that is its most famous offspring, from a relatively obscure tool for scientific and academic cooperation in a few rich countries to one of the most talked-about economic and social phenomena of our lifetimes. In language that echoed the earlier hopes attendant to the creation of the telegraph,³ predictions multiplied about how these new tools of instantaneous global communication and information-sharing would transform economy and society, bring people together, increase global understanding, and serve as tools of hope and opportunity for the poor.

These hopes were driven not just by the Internet itself, but by a remarkable confluence of technical developments of which the Internet was a powerful symbol. Continued dramatic improvements in computer memory and processing speed per unit of cost led to steady increases in the affordability and ubiquity of computers. Combined with breakthroughs in storage technology, this made it increasingly possible, and desirable, to capture and store information, entertainment and other forms of valuable information and content in *digital* form (in the binary code understood and processed by computers). This digitization, in turn, made it easier to reuse, repurpose, manipulate and combine this content, anywhere at any time, for the specific purposes of the user, through a variety of electronic means, often in combination.

³ An illuminating parallel between the hopes placed in the Internet and those expressed in the early years of the telegraph can be found in Standage (1998).

At the same time, steady and substantial increases in telecommunications bandwidth (the rate at which information can be sent through a communications network), fueled by the widespread deployment of fiber-optic cables, satellites, and wireless technologies, made it easier and cheaper to *share* information globally and to communicate instantaneously at long distances.

These new technologies, and the optimism they engendered about their economic and social potential, led to an extraordinarily dynamic period of innovation, investment and growth in the mid-to-late 1990s. Predictions abounded that these new technologies, and the new forms of economic and social activity they make possible, would transform the way we live. The combination of these new technologies and other global trends such as trade liberalization and the end of the geopolitical tensions of the Cold War led to a broader process of globalization, characterized not only by steady increases in global trade flows of goods and services but also by dramatically increased information flows. Creating, accessing and adapting information and knowledge increasingly came to be seen as a key element of global competitiveness and of individual opportunity. The notion of a global information society – where new ICTs enabled instantaneous global flows of information that increasingly served as the “oxygen” of economic, social and political life – gained popularity.

Tools of Hope?

Equally optimistic projections emerged about the potential of these new technologies and global networks to create economic opportunity in developing countries (and in poor neighborhoods in rich countries), give voice and power to the poor, make their governments more responsive and transparent, and make the world's best knowledge on any subject available anytime, anywhere to those who needed it to improve their lives. Of course, the conviction that information and communication technologies could be powerful tools to combat poverty did not originate with the Internet and World Wide Web. The history of international development over the past several decades is full of efforts to harness a wide range of technologies (computers, telephone, radio, and television, as well as sector-specific technologies in areas as diverse as health, agriculture and environmental management) to combat poverty and disease, build human capacity, and improve the functioning and efficiency of government ministries, markets, and other economic and social institutions in developing countries.

Yet many believed that the dramatic technological breakthroughs of the Internet age promised not only incremental improvements in the lives and livelihoods of the poor and the institutions that served them, but unprecedented opportunities for developing countries to break out of the cycle of poverty and join the new global economy. The “death of distance” and the growth of global markets for goods and services enabled by the Internet promised new outlets for developing countries. From software outsourcing in Bangalore to indigenous African crafts sold on the Web, examples multiplied of new economic opportunities that the globally linked economy could provide to developing countries.

At the same time, just-in-time access to global sources of information and knowledge would provide unprecedented opportunities to tackle the intractable problems that compounded and perpetuated poverty, such as disease, famine, and environmental stress. Hospitals in Africa that rarely ever received a medical or scientific journal could now, many hoped, have access to the full range of global scientific and medical research. Agricultural extension agents could now be armed with the best of what the world knew about plant, seeds, pests, fertilizers, and soil management. Policy-makers would be better able to manage natural resources and respond to environmental problems, both because they could monitor them better and because they would have at their disposal the world's knowledge about these challenges.

Discovering the Divide

The hopes engendered by the new technologies and networks had as their mirror image a fear that differential access to these tools and innovations would increase inequality, further handicap the poor and disadvantaged, and deepen (perhaps irreversibly) the economic decline, social instability, and environmental degradation of poor communities and countries. Concerns about a digital divide and about its economic and social implications first appeared primarily in the United States, an expression of the growing awareness that access to the Internet and the broader economic and social opportunities it represented mirrored — and threatened to exacerbate — existing economic, social, and ethnic divides within American society. Yet quickly the concept — and the concern — took on a broader global dimension, as analysts and policy-makers focused increasingly in the late '90s on how the spread of a global Internet-enabled economy held the risk of leaving the poor behind.

What Is a Digital Divide and How Do You Close It?

In the past several years, considerable effort has gone into defining and measuring the digital divide both within and between countries. Despite the continued popularity of attention-grabbing (and often misleading) crude measures (such as the recurrent slogan that “half the world has never made a phone call”), the definition of the digital divide has grown more nuanced over time, to include:

- Differences in access, in sustained and affordable form, to the range of ICTs from landline phones, radio and TV to the Internet, mobile phones, satellites services, etc.
- Different levels of development of the underlying *infrastructure* that enables access to, and networking of, these ICTs.
- Different levels of *capacity* to use meaningfully the applications enabled by these ICTs and the content they contain.

Our ability to measure the divide, and its change over time, has improved as well, although detailed and disaggregated data on the situation in poor countries — and especially in poor communities in those countries — are still uneven.

Yet, however well we can define and measure it, what is the relevance of the digital divide? The focus of much

international effort in recent years has been on narrowing, bridging or closing that divide. Yet these efforts have been rooted in the (often-unexamined) assumption that the digital divide is not only a reflection of deeper issues of poverty and underdevelopment, but a potentially significant causal factor in perpetuating them. Therefore the assumption has often been that closing the divide will have a direct impact on these underlying problems of poverty. Is the digital divide an *indicator* of poverty or a cause of poverty, or both?

Prior experience with poverty indicators can give us a framework for thinking more critically about the concept of the digital divide. To take a simple example, income poverty is a significant indicator of poverty more broadly, though its relative weight in poverty analysis, and its priority as a target for remedies, is still disputed. We can measure income poverty reasonably well, and it is clearly something that we want to reduce. Yet we distinguish between the desired result (increased incomes for the poor), the changes necessary to achieve that result (more economic opportunities for the poor, sustainable economic growth, reduced vulnerability, increased capacities, etc.) and the course of action necessary to effect those changes (a mix of policies and resources specific to the circumstances of a given country).

In much current discourse on the digital divide, however, we tend to blur these distinctions.

The International Response

Fueled both by the opportunities inherent in these new technologies and by the fear that a growing digital divide would deepen global poverty, an impressive range of public, private and nongovernmental organizations and networks mobilized to think about, experiment with, and invest in information and communication technologies for development. In the 7 years that separate the Information Society and Development conference in Midrand, South Africa, in May 1996 from the first phase of the World Summit on the Information Society in December 2003, a seemingly endless stream of international conferences and task forces has focused attention on the possibilities, and the perils, that ICT poses for developing countries. Most multilateral and bilateral development agencies have developed extensive programs on, and devoted considerable resources to, ICT for development. A number of wide-ranging international partnerships, encompassing international public agencies, national governments, the private sector, and NGOs, have been formed to share information, coordinate strategies, and support ICT-for-development projects. The G8 Digital Opportunity Task Force and the UN ICT Task Force have kept the ICT-for-development cause high on the international agenda and have helped to lay the groundwork for the World Summit on the Information Society.

The international private sector has also paid considerable interest to these issues and to the potential for ICT investment and innovation in developing countries. At the same time, a number of developing countries have built vibrant ICT sectors and taken strong advantage of the poverty-reducing potential of ICTs, both by harnessing local and international private investment and by innovatively adapting ICTs to their specific local challenges.

Uncertain Results

The sharp downturn in the global economy as a whole, and the Internet economy in particular, in the past three years has weakened the enthusiasm for and reduced the resources available for efforts to harness ICTs to combat poverty and promote development. Since September 11, 2001, the attention of the international community has turned sharply to other issues — international terrorism, the wars in Afghanistan and Iraq, the ongoing Middle East conflict, global economic stability. Within development circles, other issues have tended to take precedence, including the Doha trade round and the ongoing disagreements over trade and subsidies in agricultural commodities and textiles, and their impact on developing countries.

At the same time, a sober assessment of the experience thus far with ICT-for-development efforts suggests that, behind the high hopes of the late 1990s, the results are ambiguous at best. Much valuable experimentation and innovation have occurred, and much can be learned, although many of the supposed “best practices” and “lessons learned” deserve closer scrutiny. Many countries have made important progress both at the macro level of improving the environment for ICT-led growth and poverty reduction and at the micro level of using ICTs to improve the livelihoods of poor people and communities. Yet anecdotes have so far outweighed analysis and evaluation; evidence of sustained impact is scant; and information-sharing among those working in this field is still inadequate.

The mounting evidence that the Millennium Development Goals will most likely not be realized (or even approached, in many cases) within the agreed timelines provides urgent motivation for reexamining our experience with ICT-for-development initiatives, and assessing their relative priority within the broader context of international efforts to foster sustainable development and combat poverty. The purpose of such a reassessment is not to dismiss ICTs as a tool; it is, on the contrary, to see them as a tool, to refocus our attention on the nature and causes of persistent poverty, to devise strategies that address those causes, and then to assess, based on recent experience, when and how ICTs can make a difference.

Reframing the Question

In response to the widespread enthusiasm in the mid-to-late '90s about the potential of ICTs to transform the lives of the poor, an increasing chorus of skeptics (including such notables as Bill Gates) protested that the poor didn't need ICTs; that they were a luxury that people living on less than \$1 a day couldn't afford. One of the unanticipated benefits of this reaction, simplistic though it sometimes was, is that it helped to clarify the flaw underlying much digital divide analysis, and many donor-led ICT projects. Narrowly speaking, the statement that the poor don't need ICTs is correct. What the poor need is economic opportunity, improved nutrition and health care, healthy environments, education, and other components of a rewarding and sustainable livelihood. To the extent that ICTs can help achieve those other goals, they are a worthwhile tool of development efforts, but they remain tools, not goals. The presence or absence of ICTs (the digital divide) is a symptom, not a cause. And the underlying causes of persistent poverty often have little to do, except indirectly, with the supply or absence of ICTs. By focusing on the digital divide (another in a long series of gaps that international development agencies have identified and sought to bridge over

the past several decades)⁴ the proponents of ICT-for-development often misdirected their energies and weakened their own cause. We have, to some extent, mistaken the proxy for the problem.

The enthusiasm for ICTs has also mirrored earlier fads in development thinking in overemphasizing one factor and failing to focus adequately on the complexity and difficulty of fostering pro-poor change, and on the political and structural constraints on that change in a given country.⁵

This is not, however, grounds for dismissing ICTs as a tool for combating poverty, fostering broad-based economic growth in developing countries, and achieving the Millennium Development Goals. On the contrary, ICTs, properly adapted to specific circumstances, have enormous potential. The key to realizing that potential is to begin the analysis not with the presence or absence of ICTs, but with the specific, interdependent causes (both local and global) and components of persistent poverty in a given country, the most effective measures for addressing those causes, and then and only then the *tools* (not just ICTs, but other resources, policies, partnerships, etc.) necessary to proceed. This subordination of ICT efforts to a broader analysis of the nature of poverty and strategies for addressing it also provides stronger grounds for setting priorities in tackling poverty. As the 2003 Human Development Report⁶ indicates, achieving the Millennium Development Goals would require levels of development assistance far above what most of the world's advanced economies currently seem willing to provide. In that context, every available resource needs to be leveraged for maximum effect in combating poverty, including, among other things, leveraging additional (e.g., private sector) resources. ICT can be an important part of this equation. But the desired result of the equation is reducing poverty and promoting pro-poor growth, not just increasing ICTs.

Clarifying Our Concepts

The first step in analyzing the potential of ICTs to promote development and poverty reduction is to clarify what we mean by ICTs, what we include in our understanding of ICTs, and what it is about ICTs that seems to make them valuable tools of development. Some of this may seem self-evident, but it is important because there has been a tendency in the development community to

⁴Easterly (2001) provides a sobering analysis of development theories and the reasons for their repeated failure.

⁵Unsworth (2003) makes a compelling case for the complexity of pro-poor change and the dangers of simplistic models of how to achieve it.

⁶UNDP (2003).

use the term “ICTs” loosely, to fail to specify what is distinctive about the technologies we invoke, and to focus excessively on the newest aspect of technologies, whose greatest benefits might in fact reside in aspects that predate recent advances such as the Internet.

Two examples will help to illustrate the importance of this clarity. The first concerns the uncertain status of radio as an ICT in much development discourse of recent years. Those who have used radio as a tool of development communications and capacity building for a long time have argued that the tendency to focus on high-end ICTs such as Internet-enabled computers and mobile phones obscures the value of radio as a development tool which, in many cases, is more appropriate, affordable, and adaptable to local needs than the newer ICTs. Proponents of newer ICTs have often tended to respond that radio lacks the “many to many” interactivity of the Internet and is more of a passive broadcast technology.

Aside from the fact that new developments in digital, satellite-based, and community radio and its stronger linkages with Internet-enabled content-sharing change to some degree the nature of radio as a medium, the debate reveals the common pitfall of focusing first on technologies and their capabilities rather than on the needs of specific groups and the most appropriate technologies to address those needs. In fact, the development community's experience with radio, television and even print publications (and the whole field of “communications for social change,” which predates the Internet) has much to teach us about both the potential and the limits of fostering economic and social change with information and communication.

A second example concerns the much-discussed dairy farmers cooperatives in India⁷ that acquired new technology to automate and speed up the weighing and milk-fat measurement of the farmers' milk deliveries, thus eliminating considerable scope for error and long delays in farmer payments. While this was indeed a highly valuable technological improvement, its essential component, which was most valuable to the dairy farmers and had the most direct impact on their livelihoods, was the automation, accuracy, and immediacy of the measurement, not the ancillary feature of being connected to the Internet for sharing information about milk yields.

There are two points to make about this example. First, there are entire generations of technological and process innovations that have created efficiency gains and enhanced productivity, market transparency, and government capacity in practically every advanced economy, dating back long before the creation of the

⁷As discussed in Bhatnagar and Schware (2000).



Internet. There is still much benefit that developing countries can derive from these earlier innovations. Second, the newest technical innovations (including the Internet) are not automatically an improvement over earlier innovations unless they provide some additional benefit that is directly relevant to (and cost-effective relative to) the need they are addressing.

This is not to imply that developing countries should settle for older technologies, nor that they must pass through stages of economic and technological development that precisely mirror those of developed countries. Rather, the point is simply that the measure of any tool or process is whether it answers a need in the most efficient fashion, relative to other options, given existing constraints.

With these caveats in mind, this paper focuses not only on newer ICTs such as the Internet, mobile and satellite telephony, wireless networks and information devices such as personal digital assistants (PDAs), but also on older tools such as radio, television and print materials as part of a broad toolkit of information and communication tools that can be harnessed in different combinations relevant to the needs and circumstances of specific communities and nations.



Chapter 2

ICTs, POVERTY AND DEVELOPMENT: DEFINING THE ISSUES

Widespread experimentation in recent years with ICTs as tools to combat poverty and promote sustainable development has taught us much about their potential and about their pitfalls. All too often, ICTs have been deployed to address specific development challenges without adequate attention to the broader context, or sufficient understanding of the underlying conditions for success. This has led in many cases to ICT-for-development projects that have not met their expectations or proved sustainable in the long run. Given the severity of the development challenges facing the globe in the next decades, as symbolized by the disappointing progress on the Millennium Development Goals, it is increasingly important to imbed our approach to ICTs in a more complex and contextual understanding of the nature of persistent poverty and the impediments to sustained economic growth in specific countries and regions. A proper approach to understanding the role of ICTs in development and poverty reduction begins, therefore, not with attention to digital divides but with a closer look at the nature of poverty at the beginning of the 21st century.

*The Complex Nature of Poverty*⁸

There is much we still do not understand (or on which there is still considerable disagreement) about the nature and causes of persistent poverty. Yet recent

⁸ The discussion in this section has been influenced heavily by Sue Unsworth's analysis of the dynamics of pro-poor change (Unsworth 2003), and Cynthia Hewitt de Alcantara's work on the "development divide in a digital age" (Hewitt de Alcantara 2001). The discussion of poverty is influenced by Shaffer (2001) and the World Development Report 2000/2001, and mirrors in some ways the analysis in Marker, McNamara, and Wallace (2001).

progress in our understanding of the complexity and interdependence of the causes of persistent and widespread poverty offer an entry point for understanding where, and how, ICTs might help address those causes.

We know, to begin with, that the poor are not simply lacking in material and financial resources, nor do they perceive their poverty solely in these terms. While this resource-based understanding of poverty might help us define what poverty is, in static terms, it is less helpful in diagnosing poverty and developing strategies for combating it. This is particularly the case if we want to understand not only what analysts call poverty stocks (the number and specific characteristics of the poor at a given point in time) but also poverty flows (the transition of individuals and groups *into* and *out of* poverty.) It is increasingly clear that some individuals, families, and groups tend to remain in poverty, and the reasons for this need to be understood and addressed. In addition, there are, at any given time, significant flows into and out of poverty. In overly simple terms, flows into poverty are the joint product of economic decline and the shocks and vulnerabilities particular to the poor. Conversely, flows out of poverty are the result of some combination, particular to a country and time, of economic growth, opportunities for the poor, and mitigation of the risks and vulnerabilities that the poor particularly face.

The poor, then, lack not only material and financial resources. They lack opportunities to convert the resources they do possess (their labor, skills and experience, and the physical resources at their disposal) into value-creating activity (producing either cash income or other resources valuable to their particular livelihoods.) They lack information of many sorts. First, they lack information (about resources, tools, processes) that could help them be more productive, or about new opportunities to increase their income and improve their livelihoods. They lack information about markets and prices and about the availability and reliability of persons and institutions on which they depend in their economic exchanges.

The poor lack communication opportunities vital to their lives and livelihoods. The rural poor in particular, who comprise a substantial majority of the world's poorest, spend disproportionate amounts of resources that are valuable to them (time and money, in particular) for essential communications with family, trading partners and suppliers of economic necessities, health providers, government officials, and others.

The poor lack access to education and knowledge that could improve their lives and expand their opportunities. They have extremely limited access to the increasing stock of global knowledge on agriculture, disease-prevention,

environmental and resource management. They lack access to innovations in products and processes that could increase their efficiency, help them economize on their scarce resources, including labor, and make them more competitive in local, regional, and global markets. They lack access to the educational opportunities that are widely recognized to be one of the most important factors in ensuring the transition out of poverty for both individuals and families.

The poor lack access to capital and to financial resources and services that would permit them to enter into new value-creating activities. These impediments are compounded by weak access by the poor to the legal status and documentation for themselves and the resources they own (including clear title to their land) that would both enhance their economic opportunities and ensure full access to government services to which they are entitled.

More generally, the poor lack voice and power in the institutions that affect their lives, even those designed to help them. This not only deprives them of the opportunity to articulate their specific needs. It also makes these institutions less responsive and efficient, and more prone to corruption. Even when local government officials are well-meaning and hard-working, they often lack the resources (financial and otherwise) and skills to do their job effectively. In this and many other ways, as Amartya Sen has articulated, the poor lack the opportunity to make the choices that constitute freedom.⁹

The complex deprivations facing the poor are compounded by vulnerabilities to which they are especially prone. The rural poor, for example, who depend in large part on subsistence agriculture, are especially prone to environmental shocks (famine, drought or floods, pests, and even global climate change) because they have few or no reserves (food stocks, money, and other valuables) on which to draw when such shocks occur. For these reasons also, and because of their poor access to health care, the poor are especially vulnerable to disease. These shocks and vulnerabilities can significantly affect poverty levels in a country, both by pushing more people into poverty and by blocking the upward progress of those who, for other reasons, might have been on the verge of rising out of poverty.

The specific challenges facing a poor individual or family in a given community are then compounded at the societal level. With some exceptions, developing countries with large numbers of poor people are low-growth or no-growth economies plagued by persistent and systemic impediments to sustained

⁹ Sen (1999)

economic growth. Even where economic growth is fairly robust in some developing countries, the ability of the poor to participate in that growth is often highly uneven, and the subject of ongoing debate in development circles. The enabling environment for sustained economic growth is often seriously deficient in several dimensions in developing countries. Markets perform poorly because of poor policy frameworks, weak information flows, and poor incentives for risk and innovation. Governmental institutions that shape and regulate the market are often weak, inefficient, and prone to corruption or capture by special interests. The government more broadly may be ineffective in both its mobilization and use of societal resources.

The private sector in many developing countries provides a poor engine for growth for several reasons. Poor access to information and knowledge, and to capital, weakens the ability of firms in developing countries to innovate and compete in regional and global markets. Inefficient, overly burdensome, and sometimes corrupt government regulation of the private sector, including regulatory impediments to firm creation, slow the creation and weaken the chances for success of small and medium enterprises (SMEs). And the ability of these SMEs to grow into larger firms serving broader markets is hampered by poor access to capital, information, and communications access to new markets. Weak physical infrastructure (roads, telecommunications, ports, etc.) serves as a further impediment, particularly to firms outside major urban areas or far removed from major transportation nodes.

Finally, at the regional and global level, developing countries often have limited ability to shape trends, processes and practices that affect their economy and society. The combination of ICT-enabled global communications and the increase in global financial and trade flows, part of the broader process commonly called globalization, could provide new economic opportunities for developing countries. Yet weak governmental capacity relative to the overwhelming array of domestic and international challenges posed by globalization lessens the ability of developing countries to negotiate international rules of the game (in areas ranging from trade, intellectual property and financial markets to health and medicine, the environment and transborder natural resource management) in ways that are favorable to their sustained growth.

Furthermore, in a global trading system where primary commodities, the principal exports of many developing countries, have been consistently declining in price, while an increasingly larger share of global trade is made up of high-value-added and high knowledge-added goods and services, the ability of developing

countries to create sustained growth depends increasingly on their ability to tap into, and contribute to, innovation and high-value knowledge creation at a global level, an ability severely hampered by their resource constraints, institutional weaknesses, and poorly functioning markets.

Seeing Poverty through an ICT Lens

One of the reasons for the high degree of excitement in the last decade about the potential of ICT to combat poverty and promote sustainable development is that it is possible to discern an information, communication or knowledge component of virtually every development challenge articulated above.

It is widely understood that information plays a vital role in the proper functioning of markets. Yet information flows are crucial to society more broadly. When information flows poorly, and the poor lack adequate access to information about rights, services, and opportunities, public institutions are often unresponsive to the needs of the poor, inefficient, and subject to corruption. When the poor lack information and knowledge about basic hygiene and health issues and resources, disease deepens and perpetuates their poverty. When poor farmers lack information about crop prices, new farming techniques, and new markets, they remain excessively dependent on middlemen, unable to adapt to environmental and market changes, and unable to get the best yield from their own labor and that of their family.

When information flows poorly both within government institutions and between those institutions and their stakeholders, those institutions remain inefficient and more likely to make poor policies. Their lack of transparency makes them more susceptible to corruption and improper influence. When government institutions lack access to best practice, to information about their clients and their needs, and to knowledge about broader social and economic developments, government officials often make short-sighted or self-defeating decisions.

Economic growth is severely constrained in environments where markets and institutions perform poorly because of weak information, communication and knowledge flows. Where information flows poorly, and where communication is difficult, investment and innovation are also scarce. Without adequate information and communications infrastructure as well as good physical infrastructure, foreign private investment will be limited.

There is another important aspect to the relation between ICTs, economic growth, and poverty reduction. ICTs boost the productivity of individuals and firms, both by permitting greater outputs for a given input of scarce resources and by making available new information and knowledge about processes, products, techniques and markets. The poor typically spend a disproportionate percentage of their scarce resources (labor, time, money, land, water, and other resources) to secure the things necessary for themselves and their families because they have less access to the time-saving and productivity-boosting effects of technology. This is no less true with ICTs than with earlier technologies, from motors to tractors. Poor access to these efficiency-enhancing technologies and processes (and the innovations imbedded in them) cause developing countries to fall further behind the richer countries, in an increasingly global economy where this increased gap in productivity and innovation can be ruinous.

Where information flows poorly and communications are difficult, knowledge flows poorly as well. As the World Bank's 1998/99 World Development Report clearly demonstrated, effectively creating, harnessing, adapting and using knowledge is vital not only to growth and competitiveness in an increasingly global economy but also to addressing the needs of the poor and the root causes of persistent poverty. In information-poor environments, the poor are not only deprived of the benefit of rapidly expanding global knowledge on health, agriculture, environmental management, and other issues vital to their daily lives. They are also deprived of opportunities to develop new skills that can give them new opportunities, and of the empowerment that comes with understanding the functioning of their societal and governmental institutions and their roles and rights within them. Last but not least, they are deprived of the opportunity to share their own, often extremely valuable, centuries-old local knowledge, and to reap benefit from that knowledge, while also benefiting from the traditional knowledge of other poor communities.

The capacity of ICTs to enable global, rapid and efficient exchange of information and knowledge, and to facilitate instantaneous communication across distance, seems to hold out vast opportunities to address the crucial information, knowledge and communications dimensions of persistent poverty and low growth in developing countries. At the same time, the greater efficiencies and "imbedded innovation" contained in new process technologies in a variety of economic and social fields (agriculture, manufacturing, health care, delivery of government services) would seem to hold out hope for developing countries to benefit from, and catch up with, the progress in all these areas enjoyed by richer countries in recent years.

Poverty Traps and Digital Divides

Our understanding of the complexity of poverty's causes and characteristics, at both the individual and societal level, has led to increased attention to the problem of poverty traps. Poverty traps occur when a multiplicity of factors, each of which independently would lead to poverty, are compounded and feed upon each other, making poverty virtually inescapable. For example, a resource-poor, geographically isolated, small country with low per-capita income and low levels of education will often suffer as well from weak governmental institutions, poor infrastructure and very little access to foreign investment. Unable to generate new sources of economic growth, it is trapped in commodity-exporting sectors of the global economy, where prices are plummeting, global competition is increasing (particularly from those countries able to harness new technologies), and rich-country trade barriers and subsidies remain high. Not only are the root causes of the country's poverty virtually intractable, they are compounded by global factors over which the country has little control.

At the individual level, poverty traps are often just as intractable. A family with few physical or financial assets is dependent on markets and institutions that function poorly and on inadequate (or non-existent) public infrastructure. Their chances for advancement are limited by poor educational opportunities; persistent malnutrition, poor hygiene and sanitation, and the chronic and acute disease they engender; little or no access to capital; and, in many cases, discrimination.

It is obvious that the growth of an ICT-enabled global economy can exacerbate existing poverty traps by giving greater advantages — economic, social and political — to those who already have resources, opportunities and power. It is therefore often assumed that ICTs can provide the remedy to poverty traps by addressing the many deprivations that cause them.

The 2003 Human Development Report identifies six “policy clusters” for escaping poverty traps:

- Investing in human development
- Helping small farmers increase productivity
- Investing in infrastructure
- Developing industrial development policies
- Emphasizing human rights and social equity
- Promoting environmental sustainability and improving urban management.

Obviously there are ways that ICTs can help achieve each of these goals. Yet ICTs are instrumental. They *enable* change; they do not of themselves produce it. The magnitude of the challenges facing the poorest countries and families requires decisive and coherent action by developing country governments and societies and by their international partners, which need both to provide resources and to address structural issues in the global economy that have a particularly strong negative effect on poor countries. ICTs cannot replace these more fundamental tasks, and increasing access to ICTs will not of itself remove these deeper causes of the poverty traps in which many developing countries find themselves.

Yet, the impact that new ICTs and the growth of global information and communications infrastructure have on even the richest countries is still not fully understood and may be, for the time being, less profound than assumed. Furthermore, this impact is itself dependent on a complex set of resource endowments, human and institutional capacities, historical legacies and enabling environments. Simply providing ICTs where they are not available will not substitute for addressing the deeper economic, social, resource, and historical challenges faced by individual developing countries. Nor will simply measuring the relative presence or absence of ICTs in a given country or region tell us much, in itself, about what role ICTs can play in helping that country or region address its poverty challenges. The digital divide is a proxy, a measure (and sometimes a misleading one) of deeper challenges facing a developing country. The first step, therefore, in designing strategies for helping a country harness ICTs to combat poverty and foster sustainable development is to focus not on the proxy but on the underlying (and context-specific) challenges which that (inadequate) proxy reflects.

From Diagnosis to Action: ICTs as an Agent of Change

The point of departure for any strategy to combat poverty and promote sustainable development is to foster positive change, and particularly pro-poor change. This may seem a simplistic observation, but it provides an important frame of reference for any ICT-for-development strategy. The Millennium Development Goals offer a useful illustration of this perspective, since the MDGs are, in their own way, proxies for deeper changes. The MDGs point to a set of desired first-order changes in the situation of developing countries: fewer people in absolute poverty, fewer women dying in childbirth, more girls in school, etc. Yet they presume, and fundamentally depend upon, a deeper set of changes, such as higher and broader economic growth in developing countries, more capable and responsive government institutions, better policies, stronger voice for the poor, etc. These deeper changes depend in part on actions that are not directly associated with any one MDG but are fundamentally enabling of all the goals (improving the functioning of developing country markets, enhancing government capacity, mitigating the risks that particularly affect the poor, enhancing the efficiency, openness, and fairness of trade, etc.).

The same can be said about ICTs. It is clear that ICTs, properly adapted to local circumstances, can be a powerful tool to combat poverty and foster sustainable development. Yet the key to deploying ICTs as an agent of positive change in a given country is to begin *not* from measures of what ICTs that country lacks but

from a clear picture of that country's key development challenges and a rigorous analysis of where, and how, ICTs could make an impact on those challenges in a sustainable fashion, of sufficient magnitude to justify investment in ICT by donors or developing countries or both. In other words, one begins not with the question of what ICTs a given country lacks and what we can do about it (the implicit question underlying much digital divide analysis) but what specific types of change are required to make this country more sustainably prosperous, in ways that include even the poorest. ICTs are then brought into the analysis as possible instruments (among others, including both resources and policies) of these desired changes, not as a thing to be desired in themselves. For this reason, ICT-related indicative goals (e.g. a telecenter in every village over population X by date Y) are at the best misleading and at the worst bad policy.

There are a number of reasons for suggesting this more sober and instrumental approach to ICTs-for-development. First, the history of international development efforts over the past several decades should lead us to some degree of caution about our expectations that one factor or input is crucial to successful development. The history of development assistance is riddled with “gaps” (the infrastructure gap, the financing gap, etc.), the “filling” of which was seen as key to solving the conundrum of sustainable development. The digital divide risks serving as another uncausal explanation of development success and failure that diverts the attention and resources of the international community from the much more complex and context-specific challenges of development.

Second, especially in the context of constrained budgets for international development assistance (and even an increase in those budgets in coming years would leave them well below desired levels), priority-setting is vital to any successful development strategy. While even the more advanced ICTs have been steadily declining in price, and Internet bandwidth is becoming more widely available, ICT-based interventions are often very expensive in the first instance and entail ongoing costs that are difficult for the intended beneficiaries to meet in the long run. At the level of government policy and action, spending the time and human capacity of developing country governments on ICT-related policies and initiatives at the expense of other key areas of policy and action can be justified only if those ICT-related policies and activities promise substantial leverage for a core element of the country's development strategy. Yet a number of developing countries, including some of the poorest, now have several different e-strategies prepared and supported by different international donors or partners. Given scarce government resources and capacity, one can wonder whether these should have been a priority.

Third, many of the ICT-for-development experiments and pilot projects of recent years have not proved sustainable in the long run, because they have not been accompanied by (or failed to generate) the broader economic and social changes that would lead to sustainable demand for those ICT goods or services, especially relative to other demands on scarce resources. This unsustainability of ICT projects has been compounded by the frequent disconnect between ICT-for-development projects and the core sectoral work of most development agencies.

Fourth, in many cases the desired result for the sake of which ICTs are deployed is more fundamentally dependent on other changes over which ICTs have no influence. To take one example, using ICTs for teacher training may well increase the capacity of the teachers, which is a good thing in itself. Yet, if a developing country's education budget is so tight that over 95% of funds go to teachers' salaries (a common situation in developing countries), and the teacher corps is being ravaged by HIV/AIDS, it is hard to understand how ICTs can be a priority, unless they enable a significant decrease in another core cost in the education budget (e.g., the labor cost of teacher trainers).

Fifth, in most cases, ICTs do not *create* change; they only *enable* it. Change comes about because of the actions of individuals and groups faced with a given set of changing or unchanging conditions, incentives, resources and power relations. ICTs can make possible the emergence of new coalitions for change, and can adjust the incentives and opportunities facing certain individuals and groups, but any ICT strategy, sectoral or society-wide, needs to be more explicit about these broader dynamics of social and economic change in the context of a specific country.

Finally, in development as in so much else in life, one size does not fit all. The potential of ICTs as a tool of economic growth and poverty reduction will vary widely in scope and specifics across developing countries. In some middle-income countries, ICTs might well serve as a powerful engine for economic growth and global competitiveness, which combined with ICT interventions in specific sectors might lead to widespread poverty reduction as well. It is important to point out, however, that ICT-led growth does not of itself necessarily have any impact on poverty within a country. In some of the poorest countries, ICT might well serve as crucial tools in specifically targeted interventions designed to address key impediments to realizing the MDGs and breaking the cycle of persistent poverty. In every case, the key to success will be a clear and coherent national strategy for growth and poverty-reduction in which ICT is viewed as a tool for specific, explicit purposes, justified relative to other possible tools or strategies by their ability to leverage substantial change relative to their cost.

In devising such national strategies and the donor programs to support them, the first step is to learn, rigorously and critically, from past experience with ICT for development programs, both to identify the greatest opportunities for effecting change through ICTs and to avoid the costly mistakes of the past.





Chapter 3

LEARNING FROM EXPERIENCE

Our ability to draw conclusive lessons from the experience of recent years in using ICTs for development and poverty reduction is limited somewhat by the fact that there has so far been little systematic evaluation of these efforts. However, it is already possible to discern some basic lessons that can serve as a guidepost for future efforts.

*ICTs and Economic Growth*¹⁰

One of the persistent debates in development circles is over the relative emphasis to give to growth and poverty reduction in national development strategies. While disagreement persists over the extent to which growth is good for the poor, it is hard to argue that sustained poverty reduction can occur without sustained long-term economic growth. Indeed, while none of the Millennium Development Goals is focused specifically on economic growth, it is difficult to imagine how any of the MDGs can be achieved without sustained growth.

Disagreement also persists on the impact of ICTs on growth, even in the richest countries, and on whether ICTs have led to the emergence of a “new economy.” The enthusiasm of the late 1990s in this regard has been tempered by the burst of the Internet bubble, the global economic slowdown of the last few years, and nagging questions about the long-term growth prospects of several of the world's largest — and most ICT-intensive — economies.

¹⁰ A good review of the recent literature on ICTs and growth can be found in Qiang, Pitt, and Ayers (2003).

These second thoughts have led, not surprisingly, to questions about whether and how ICTs can foster economic growth in developing countries. The logical first step in answering that question is to consider some of the causes of poor growth in those countries, and then explore how ICTs might help to address those causes. It is, of course, dangerous to make generalizations about developing country economies, since they vary enormously in size, endowments, challenges, and the nature and extent of poverty they contain. Most countries eligible for the Heavily Indebted Poor Countries (HIPC) debt relief program depend heavily on the export of primary commodities, in the context of increased global competition, declining prices, and persistent rich-country barriers to trade. At least in the short term, it is difficult for these countries to rely on export diversification to help promote economic growth, given their weak institutions and markets, low human capacity, and poor access to capital.

Some developing countries are, on the other hand, (at least in medium-term trends) high-growth economies that have, and are addressing, challenges in reducing the percentage of their population in poverty. Some are societies with high-growth enclaves that have not yet created adequate spillovers to broader growth and poverty reduction. In these cases, it is easier to see how ICT-enabled diversification and increased global trade could serve as an engine of long-term growth, although the spillover effects of ICT sector growth and ICT enclaves has yet to be demonstrated. (This should serve as a caution for those looking to “create their own Bangalores.”) Yet it is safe to say that the majority of developing countries are either low-growth economies or economies where recent growth is from a starting point of low per-capita income and, therefore, widespread poverty. Examining some of the common characteristics of these economies can help us to identify ways that ICTs might foster growth.

The majority of these countries are characterized by weak, poorly functioning domestic markets characterized by poor information flows, low levels of innovation within firms and sectors, inadequate infrastructure (roads, ports, telecommunications), and weak access to investment capital or to domestic and international partners. Access to international best practice and to technical and process innovations is therefore also weak. Low levels of education and skills, particularly among the poor, exacerbate the problems facing firms in these countries and contribute to their weak competitiveness in international markets, particularly in a global economy where “knowledge-value-added” goods and services are an increasing part of international trade. Domestic and foreign constraints on trade, ranging from poor infrastructure and inefficient or corrupt

Small and Medium Enterprises (SMEs) and ICTs

SMEs can be a significant engine of growth and jobs in developing countries, as they are in most OECD countries. They are often a major source of innovation in products and services, and particularly in adapting to the specific needs and desires of the communities they serve.

Furthermore, in many developing countries, a considerable percentage of local economic exchanges happen in the “informal economy,” either in the form of barter or in the cash purchase of goods and services between individuals operating under the radar screen of government regulation and taxation. Creating conditions for a vibrant SME sector helps many informal economy businesses transition to recognized and licensed small businesses, which integrates them better into local and regional markets, positions them better for growth and for expanding their market reach and share, and has the additional benefit for the government of creating tax revenues.

ICTs can help address many of the challenges to the creation and growth of SMEs. They can make them more efficient both by the direct impact of technology on production processes and business practices and by access to global best practice. They can broaden their access to markets, to suppliers, to domestic and international business partners, and to sources of capital. They can improve their access to customers and make it easier for existing customers to interact with them. In all these ways, ICTs can help SMEs serve as an engine of jobs and growth in developing countries.

Yet many of the most serious impediments to the emergence and growth of SMEs in developing countries have little to do with ICTs, or can only be marginally affected by the insertion of ICTs. One of the greatest impediments to SME creation in many developing countries is the complex, time-consuming, and often corruption-prone process of registering a new business and obtaining required permits and licenses. ICTs can help to automate and simplify this process, but *only* if the political will exists, both at the local and national level, to implement such reforms. Given the number — and the power — of those who have a stake in the existing, complex permitting process, this will for reform is often weak.

The focus on SMEs as an engine of growth in developing countries also points to what Sir Arthur Conan Doyle's famous detective, Sherlock Holmes, referred to as the problem of “the dog that didn't bark.” The predominance of SMEs in many developing countries is often partly due to the relative scarcity of large private firms and the difficulty SMEs face in trying to grow into larger firms serving larger (domestic and international) markets. Here again, ICTs can help, but the reasons for the scarcity of larger firms serving larger markets reside in deeper structural constraints — national and global — faced by the private sector in many developing countries. Without a clear focus on this bigger picture of the constraints on private sector growth in developing countries, ICT-led growth in the SME sector is likely to be limited both in its prospects and in its impact on broader economic growth.

customs systems to tariffs and subsidies, further weaken the ability of these economies to compete internationally, deepening the “poverty traps” in which all too many of these countries find themselves.

Given such circumstances, there are obviously, in principle, a number of ways in which ICTs, properly deployed, could help foster sustained economic growth in these countries. ICTs, and the technical and process innovations imbedded in their use, can enhance the efficiency of existing firms and sectors in the use of both labor and capital. They can expose existing firms to global knowledge and best practice. They can create new opportunities for both firms and individuals, both in the ICT sector itself and in ICT-enabled goods and services, both domestic and international — including, for example, overseas outsourcing of data entry and customer service. They can increase the transparency and efficiency of markets and of institutions that shape and regulate the domestic market — including, notably, government. They can improve access to capital and to partnerships, both domestic and foreign. They can improve efficiency and reduce opportunities for corruption in customs administration and other trade-related government services.

Yet ICTs are not a “magic pill” for the problems of developing countries with low growth. Sustained economic growth also depends on a range of other factors that, while they might be facilitated by ICTs to some extent, require concerted action in their own right. Perhaps most important, sustained growth depends on the creation, and continued support of, an appropriate enabling environment for private sector growth and innovation. While the role of government policy and regulation in this enabling environment is critical, equally important is clarifying the role of government and establishing its clear limits, and then making government as efficient, fair and transparent as possible in the execution of that role. This involves a number of extremely difficult decisions that often engage political, economic, and bureaucratic interests that are resistant to change. ICTs can help both provide the tools and mobilize support for these changes. They do not, however, take the place of the more difficult process of policy change and institutional reform.

Furthermore, ICTs do not automatically make firms, or entire sectors of the economy, more efficient and competitive. There is growing evidence from OECD countries that the contribution of ICTs to economic growth, and to the competitiveness of firms, depends crucially on factors other than (though enabled by) ICTs, including skills development, process innovation and organizational change. A common pitfall with ICTs — in the private sector and in government — is the assumption that the process and organizational changes implied by the

insertion of ICTs will indeed be engendered by those ICTs. This often proves not to be the case. As we shall see below, e-government initiatives often succumb to this costly and erroneous assumption.

Experience from OECD countries also indicates that a number of other factors shape the impact of ICTs on firm performance as well, including the size and age of the firm, the extent of competition, management quality, and the broader environment for innovation. This broader environment includes not only access to capital and to domestic and foreign research and development, but the flexibility of the labor market, conditions for and constraints on new-business creation, the strength and flexibility of domestic financial institutions and markets, and human capital/skills development. As a recent OECD report¹¹ concludes, developing countries need to focus on:

- Getting the fundamentals right, so that markets work and macroeconomic conditions are sound.
- Facilitating the diffusion of new technologies.
- Fostering a pro-innovation environment so future technologies will emerge and spread.
- Investing in human capital and adapting labor market institutions and policies to the changing nature of work.
- Improving the entrepreneurial environment to help commercialize new technologies.

The importance of openness to foreign direct investment (FDI) deserves particular mention. Even before the emergence of the ICT economy, FDI had shown itself to be a crucial source of innovation and growth for developing country firms and sectors because of the large amount of knowledge often imbedded in that investment and the international partnerships and market opportunities it engenders. Openness to FDI and, more broadly, trade openness are in most cases strongly correlated with growth in developing countries. Here again, ICTs can help both improve the environment for FDI and trade (both by enhancing the performance of domestic firms, markets and governments and by improving vital infrastructure) and increase the impact of FDI (by helping to disseminate and mainstream the innovations that FDI brings), but ICTs cannot substitute for the policy frameworks and the human, firm and institutional capacity necessary to attract FDI.

¹¹ *Tambo in OECD DAC Journal (2003). See also the work of the OECD Growth Study at www.oecd.org/growth.*

Networks, Thresholds, and ICTs

One of the challenges facing developing countries in seeking to reap the economic and social benefits of ICTs is that these benefits seem to come primarily *after* ICTs have reached a certain “critical mass” in a country. When one examines earlier phases of technological innovation in developed countries, such as the introduction of the steam engine or electricity, it is clear that the impacts of these technologies on productivity, and thus on economic growth, came only after a considerable lag. There were two reasons for this. First, it took considerable time for the improvement to be adopted by the majority of firms. Second, it took additional time for them to reorganize their production to realize the efficiency gains from these new technologies.

The same seems to be true of computers and the Internet, according to recent research. While there is still significant argument about whether computers and ICTs have led to

measurable, sustainable productivity growth in OECD countries, there is broad agreement that these effects can begin to be felt only when those technologies reach a certain density in society.

On a related front, it is well understood that the benefits of ICT-enabled networks depend crucially on the size of the network. In the words of Robert Metcalfe's now-famous “law”: “The value of a network gains as the square of the number of users.” While it is true that there are many uses of ICTs in developing countries that do not depend on networks, the low telecommunications and Internet network density of many developing countries limit the opportunities for value-producing economic, social and political interactions, both domestic and international. They also reduce the attractiveness of the country as an economic partner. Thus, low network density can serve to reinforce the poverty traps afflicting many developing nations.

Improving the Livelihoods of the Poor

In addition to fostering broad economic growth, developing countries face the urgent challenge, reflected in the Millennium Development Goals, of reducing the large numbers of poor people in their midst by giving the poor sustainable opportunities to improve their livelihood and increase their income. The poor will often not be the first direct beneficiaries of ICT-led growth in developing countries, since many of the new opportunities created by this growth tend to be concentrated in urban areas and dependent on a certain level of education and skill. The challenge, then, is both to improve the current livelihoods of the poor and provide them with new opportunities appropriate to their circumstances while building their capacities and reducing their vulnerabilities so that, over time, they can broaden their economic opportunities as the economy itself grows and diversifies.

ICTs as Tools of Inequality? Power, Technology Rents, and Poverty

ICTs are not automatically tools of equal opportunity. Much depends on the social context into which they are inserted and the other capacities of individuals and groups. There is considerable evidence from the “Green Revolution” that early adopters of the new agricultural technologies gained a considerable advantage over other, often-poorer farmers, often to the point of putting them out of business. Similar examples exist from efforts to use ICTs for register rural land titles — a vital step in establishing the assets of rural farmers and thus easing their access to credit and government services. In some cases, those with first access to the new registration system have filed fraudulent claims to land owned by other farmers, claims that are then difficult and expensive to combat. Earlier systems of land registry that depended on local government agents did not in themselves prevent this type of fraud, since they were frequently the target of bribes (one of the problems that the new automated systems

were meant to alleviate). And paradoxically, the new, automated systems have not necessarily eliminated the human interface, since many poor, illiterate farmers need help in using the new registries.

This points to the broader problem that many ICTs require a certain level of skill, including literacy, which means that they risk reinforcing existing inequalities in capacity and therefore in access to services, rights and even assets. More generally, when ICTs are introduced into a poor community, those who already have more power, higher income, greater skills, and higher social status are more likely to gain access to those tools and use them to their benefit. This is particularly the case if use of the tools incurs some cost (even modest) for the user. For these reasons, it is particularly important to design ICT interventions in poor communities in ways that actively address these issues of status and differential access.

*a. ICTs and Rural Development*¹²

The majority of the world's poor (roughly 75% overall, 90% in Africa) live in rural and remote areas. Most depend primarily on agriculture for their livelihood. In addition, their agricultural production provides a vital resource for their country as a whole – not just food, but a major source of internationally tradable commodities and thus of national income. Therefore, the productivity of the agricultural sector in a developing country is of great importance not only to the rural poor but to the country as a whole.

The poverty of the rural poor is compounded in many ways by their physical isolation. That isolation translates, in most developing countries, into poor access to markets, weak physical infrastructure, poor health and education, weak access

¹² Good reviews of the role that ICTs can play in rural development can be found in Bhatnagar and Schwere (2000); Chapman and Slaymaker (2002); and Winrock International (2003).

to capital, and poor access to government services. Information and knowledge — about crop varieties, pests, strategies to increase yield, more efficient harvesting and processing technologies, weather and climate, prices and markets — are vital to farmers, but often difficult or costly to access. There are many ways in which ICTs, properly designed and deployed, can help increase access to vital information and knowledge. Yet it is important, first of all, to understand the livelihood strategies of the rural poor, the information and knowledge they do have, and the ways in which they absorb and use information and knowledge. The rural poor in fact possess a rich store of highly contextual (and therefore highly valuable) local knowledge: about which crops work best in which fields, about long-term trends in local agriculture, about local microclimates. They also have well-developed strategies for seeking and sharing information and knowledge — mostly oral, and heavily dependent on social networks and trusted information intermediaries.

This leads to two important points about using ICTs to help rural farmers. The first is that it is crucial to begin from an understanding of the information and knowledge assets of the rural poor in a given region or country, and then determine, in consultation with them, what their priority needs are for new or enhanced information or knowledge. The second point is that the new information or knowledge provided to them needs to be made available in a form that is appropriate and is affordable in terms of its demands on either their cash or noncash resources (including their time).

In addition to enhanced information and knowledge, rural farmers need better access to other resources, to markets for their products, and to a range of government services, including land titling, which is crucial to their ability to seek credit. ICTs can help markets and government institutions work more effectively for the poor by lowering transaction costs, providing better choice, and decreasing opportunities for various forms of rent-seeking, including local government corruption. At the same time, it is important to bear in mind that often, the most critical needs of rural farmers are for inputs other than information and knowledge, such as water, fertilizer, and power.

These improvements in the functioning of rural markets and government institutions can also help create the environment for non-agricultural economic development in rural areas. This is important for two reasons. First, diversifying the rural economy can have positive spillover effects for agriculture by enhancing rural access to infrastructure, credit, government services, and other products and

Information is Power, Sometimes. ICTs, Prices and Markets

A frequently touted benefit of ICTs for poor farmers is their increased access to current information on market prices, which permits them either to choose where to bring their goods, at what time, or to extract a fair price from the middlemen to whom they sell their goods. Similar benefits have been identified in fishing, in that owners of fishing boats can check prices in different ports before deciding where to bring their catch ashore.

It is true, in general, that more complete and current information about prices-at-market can help farmers and fishers secure better prices for their goods, and that ICTs can increase their access to this information in a timely fashion. However, their success in translating this information into better prices depends as well on a number of other factors that have little to do with ICTs. If a farmer has no means to transport his goods to market himself, and there is only one middleman to whom he can sell his goods, his ability to extract better prices from the middleman is limited. If he cannot afford to hold his goods off the market to wait for a better price because they are perishable, or he has limited

storage capacity, or he needs the money right away for other purposes, his negotiating leverage is limited.¹³

Furthermore, even when this price information is valuable and usable, it is not necessary for it to be delivered by the most advanced ICTs. Indeed, many rural farmers already have reasonably good access to price information at market by radio. There are only limited instances where more advanced ICTs (the Internet or mobile phones, for example) provide an appropriate and cost-effective improvement over radio — in particular, those cases where interactivity is required, such as price negotiation at a distance. It is almost always true that we can do with newer technologies many of the things we could already do with older technologies. The crucial question, however, remains whether the improvements offered by the new technology justify its increased cost. In the case of ICTs for price information in developing-country agriculture and fisheries, we need to get beyond the inspiring stories to some more rigorous analysis of costs and benefits.

¹³ *There is a particularly good discussion of this in Hewitt de Alcantara (2001), pp. 25-26.*

services valuable to farmers, while at the same time strengthening local demand for the farmers' products. Second, and just as important, broader rural development, by creating job opportunities and improving quality of life for the rural poor, can help to reduce what has become an endemic problem for many developing countries — the exodus of the rural poor to the cities.

Indigenous Crafts and e-Commerce

Many of the poor engage in traditional handicrafts of various sorts as a way to supplement their income. In many cultures, these handicrafts also provide a welcome (and rare) economic opportunity for women. Yet traditionally the markets for these handicrafts have been local or regional at best, since these craftspersons have rarely had the information or resources to tap into broader markets. In the past several years, there has been great optimism about the potential of the Internet to provide global markets for these crafts. Often with the help of local and global NGOs working in concert, craftspersons have been offered broader outlets for their goods through “indigenous crafts” websites, along with technical support and training to help them respond to new sets of customers. The supporting organizations aggregate supply and

demand, facilitate the commercial transactions, arrange shipping, and ensure quality control. While there have been some modest successes, they have been limited in size and seem difficult to scale up, for several reasons. First, although the commerce might be electronic, the goods are not, and the process of shipping them and receiving payment is still arduous for many craftspersons. Second, it is fairly clear that the global market for indigenous crafts is rather small and particularly sensitive to overall economic trends in richer countries. Third, even those international NGOs and for-profit firms that have sought to tap into this market and help indigenous craftspersons are having trouble finding sustainable business models, as reflected in the recent restructuring of one of the pioneers in this field, Peoplink.

b. ICTs and the Urban Poor

In recent decades, the number of the urban poor in many developing countries has increased markedly, both because of persistent poverty and population growth in cities and because of increased levels of migration from rural areas to urban and periurban areas. The migration mirrors a pattern witnessed in many OECD countries in the second half of the 20th century, as advances in agricultural productivity, the lack of non-agricultural job opportunities in the countryside, and perceptions of the city as a place of opportunity drew millions of rural dwellers to cities. The challenges posed for developing countries by this migration, however, are more acute for several reasons. First, much of the migration comes not because of the success of rural agricultural productivity (increasing the yield per unit of human labor, and thus reducing the need for agricultural workers) but because of the desperate state of life in the countryside. Second, in low-growth

environments, the opportunities for urban employment for these migrants from rural areas are scarce, particularly given their low level of education and skills. Third, the infrastructure and services of many cities in developing countries are already overtaxed and under-resourced, and the large influx of new, needy people adds additional strain. For lack of better options, many of the migrants end up in slums or “informal settlements”, where public infrastructure (even such basic infrastructure as water and sewer services) is often non-existent, disease and crime are rampant, and the poor have few rights or opportunities.¹⁴ Often, the influx is intensified by military conflict or ethnic strife. While the cash income of these poor people might improve as they move to the cities, thus signaling an “improvement” in their lives by the narrow measure of income poverty, their livelihoods usually do not improve and frequently worsen.

There are two overlapping sets of responses that developing country governments must make to these challenges. First, they must create the conditions for job creation and economic growth in urban areas and take measures to increase the opportunities for the poor to participate in that growth. Second, they must help the urban poor improve their current livelihoods and address their vulnerabilities. In simpler words, the challenge is to reduce over time the number of urban poor, and to make life more tolerable for those who remain in poverty. ICTs can help to address these challenges, but their role, once again, must be seen in a broader context.

ICT-enabled job creation and economic growth in developing countries are likely to be concentrated heavily in urban and periurban areas, at least in the early stages, because that is where the necessary ingredients of infrastructure, finance, government services and skilled workers are more heavily concentrated. The need for skills (even basic education and literacy) makes it more difficult for the urban poor to respond to these opportunities. Of course, there are opportunities for job creation and economic growth in developing countries that are facilitated by global ICT networks but are not themselves technology-intensive or dependent on a highly skilled workforce. The exodus of unskilled and semiskilled manufacturing jobs from OECD countries to developing countries is evidence of this. Yet the longer-term trend of imbedding simple skills in process technologies themselves (replacing semi-skilled workers with “smart machines”) means that, over time, the skill demands of even basic manufacturing jobs are likely to increase.

Thus education and training are an important, and obvious, component of providing opportunities for the urban poor to escape poverty and participate in economic growth, and ICTs, appropriately adapted, can certainly help to increase

¹⁴ A detailed examination of the severity of the problem can be found in the new report from the UN HABITAT Programme (United Nations Human Settlement Programme 2003).

access to, and the impact of, education and training opportunities. Yet even for those urban poor who seek to respond to these opportunities (where they exist), and especially for the bulk of the urban poor who do not yet have access to economic opportunities, the daily livelihood challenges facing them are daunting and can often serve as an impediment even to those who seek to respond to existing or new job opportunities.

A recent study for the United Kingdom Department for International Development (DFID) by the Intermediate Technologies Development Group (ITDG)¹⁵ identified eight critical livelihood issues facing the urban poor:

- Housing
- Money
- Water
- Waste
- Illness
- School
- Getting places
- Security

While many of these issues have an information component, in many cases it is not information that is lacking. The problem is, rather, the lack of personal and government resources, adequate infrastructure, coherent and well-implemented policies, and intermediary organizations that help, mobilize, and advocate for the urban poor. Even in urban areas that enjoy vibrant growth and considerable wealth, the urban poor can be caught in a poverty trap from which it is difficult to escape. The persistence of urban poverty in even the richest countries is testimony to this. ICTs can help, directly or indirectly, to address many of the dimensions of this urban poverty trap, by making government institutions more efficient and responsive, increasing the knowledge and skills of the urban poor, including knowledge about how to manage the livelihood issues listed above, and giving a stronger voice to the urban poor and their representatives. More generally, modern technology can help improve the living conditions of the urban poor, by increasing the supply of fresh water and access to sanitation services and increasing the reach of other vital infrastructure. Yet many of the difficult choices required to improve the lot of the urban poor are policy and resource decisions that ICTs can help enlighten and facilitate, but certainly not replace.

¹⁵ Schilderman (2002).



Information Intermediaries and the Poor

Both in urban and rural settings, the poor often rely on trusted intermediaries for information that is crucial to their livelihood. These intermediaries are individuals, informal networks, or formal organizations (particularly NGOs) that have, because of their resources, networks or experience, access to information and knowledge on a particular set of issues that is particularly important to the poor and difficult or costly for individual poor persons to access themselves. More generally, the poor tend to rely for information more on social networks and trusted interlocutors, and thus more on oral information, than on print and electronic sources of information. The reasons for this are complex and vary from country to country, but generally they have to do with a combination of trust, tradition and the lower transaction costs of seeking information from acquaintances.

For these reasons, many discussions about increasing the information and knowledge assets of the poor with ICTs have focused on information intermediaries. The logic behind this is straightforward. If these intermediaries are valuable and trusted sources of

information for the poor, and if it is too difficult for several reasons (cost, capacity, literacy, etc.) to provide ICT-enabled information services directly to the poor, then priority should be given to helping these intermediaries use ICTs to access information more easily, adapt it for the needs of their beneficiaries, and disseminate it more effectively to them.

It is important, however, to be attentive to the local context in pursuing such a strategy. The fact that the poor tend to give more credence to information from a known intermediary makes it all the more important that such information be accurate. While ICTs can help in this regard, social and cultural factors, including power relations within a community, can often shade the motives of these intermediaries, and thus the content of the information they provide, no matter how abundant their supply of more accurate information. Thus it is important to have some understanding of the social role and presumed interests of the intermediaries whose capacity is being strengthened with ICTs. For this reason, it is preferable wherever possible to focus on increasing the choice and variety of information sources available to the poor.

Remittances, Labor Mobility and ICTs

Cash remittances by workers employed in other countries are a substantial and important source of income for many families in developing countries, and a major source of foreign exchange earnings for those countries. Recent World Bank research¹⁶ indicates that remittance flows are the second-largest source, after foreign direct investment, of external funding for developing countries. In 2001, remittances to developing countries from overseas were estimated at \$72.3 billion. Their importance is especially acute for low-income countries, where in 2001 remittances accounted for 1.9 percent of GDP and 6.2 percent of imports. It is estimated that, during most of the 1990s, remittances exceeded official development assistance. For developing countries with significant rural poverty, *internal* remittances from family members who have moved to urban areas to work are also an important source of income for rural poor families, though it is much more difficult to compile aggregate data on these internal remittances.

The scale of overseas remittances points to the vital importance of labor mobility as a source of earnings for many developing countries (and for poor regions within those countries.) Yet these

mobile workers and their families face considerable challenges. Given the weakness of financial and banking systems in many developing countries and the constraints foreign workers face in using the formal banking system in their host countries (particularly acute for undocumented workers), sending remittances to one's family members can be an expensive and difficult process. For workers from Central and South American countries, for example (such as the huge number employed in the United States, one of the largest sources of workers' remittances), transaction costs for remittances average 13 percent and can exceed 20 percent.

Communication between foreign workers and their families back home are often difficult, but vital for several reasons. Family members need to be alerted to an impending remittance. Overseas relatives are often a key source of information on job opportunities. And the well-being of the workers and of their families back home depends in part on their ability to remain in regular contact. (Indeed, arranging remittances and "keeping in touch" with distant family members are the two main reasons that many rural poor people give for their willingness to spend scarce resources for access to telephone services.)

¹⁶ Ratha (2003)

ICTs can help to address these challenges in several ways. Improvements in the performance of banking systems in developing countries, and in access to banking services by the poor, can reduce the transaction costs of remittances, and protect poor workers from exploitation by unscrupulous or unreliable remittance services. Easing communications between workers and their families also reduces the time and money spent at both ends to arrange and verify these remittances. Easier access to information about overseas employment opportunities, and about rights and services available to migrant workers, can improve both the opportunities and choices available to workers and the conditions they encounter once they migrate.

Yet there are broader issues that shape the

remittance economy and the condition of migrant workers that only marginally relate to ICTs. The policies of both sending and receiving countries on labor mobility significantly shape the supply of opportunities for migrant workers. Increasing the access of the poor to banking services, and the costs they face in using those services, depends on broader banking and financial sector reform in developing countries, and on securing the rights of migrant workers in the countries to which they migrate for work. Indeed, increasing the reach and effectiveness of banking services for the poor (and particularly the rural poor) would have a double benefit; it would both reduce the cost and difficulty of remittances and more effectively inject the funds remitted into the recipient economy. This is especially true because, other than those cases where remittances support the basic costs of current subsistence

consumption for poor families, there is strong evidence that remittance funds are usually invested in the local economy, including in the creation and sustaining of new small businesses.



Increasing Capacities and Opportunities

One of the many deprivations that compound the misery of the poor and prevent their rise out of poverty is their lack of access to adequate education, training, skills development, and broader information and knowledge resources that could help them improve their lives and livelihoods. There has been increased emphasis in recent years on the importance of education, training, and access to global knowledge in the context of the emergence of globalized markets and the growth of knowledge-value-added goods and services within that global marketplace. Yet the importance of knowledge to sustainable development and poverty reduction long predates the “knowledge economy.”

Simply put, access to education and knowledge helps the poor to improve their current livelihoods, address impediments and vulnerabilities that prevent them from seeking opportunities to improve their lives, and participate in new sectors of the economy that require greater skills and therefore offer higher incomes. Increasing the education and skills of the population more broadly is also central to any developing country's hopes to grow its economy and compete globally.

Yet education systems in most developing countries are severely challenged. Government budgets, plagued by low growth and high external debt, cannot provide adequate resources to provide quality education for all, even at the primary level. Teacher salaries alone account for most of the education budget in many developing countries, leaving few resources for infrastructure, teacher training, or books and curricular materials. Many poor communities do not even possess a barely adequate school building, or if they do it is largely devoid of even the most basic school supplies. In many countries, particularly in Africa, the teacher corps has been devastated by HIV/AIDS. This profoundly affects both the *quantity* of education available (since the teachers are not easily or quickly replaced) and its *quality* (since the replacement teachers are almost always less skilled than those lost to disease).

Poor parents often cannot afford the school fees, uniforms, and other expenses they are expected to bear in sending their children to school. Many poor parents keep their children, particularly the girls, out of school to help with the challenges of daily life, such as collecting water and firewood and working in the fields.

An increasingly globalized, knowledge-intensive economy puts further pressures on the educational system. Workers in developing countries urgently need new skills in order to attract globally mobile jobs in skilled production and service

sectors. Domestic innovation, which is important both as a source of new businesses and as a way to adapt global innovations to local needs, can be fueled only by a trained cadre of researchers, product developers, scientists and other specialists. They, in turn, urgently need greater access to global knowledge resources and to opportunities to collaborate with foreign colleagues. This also requires a substantial upgrading of both the infrastructure and the capacities of higher education institutions. Thus, the long-standing tension between the goal of universal primary education and the pressure to “skill up” the economy of a developing country in order to compete globally, and thus foster broad-based economic growth, becomes even more acute in the context of a global knowledge-based economy.

ICTs alone cannot solve the dilemmas and difficult choices that developing countries face in this domain. These issues go to the heart of a country's development and poverty reduction strategy and the urgent challenge of priority-setting. There are, however, a number of ways in which ICTs can help address these challenges, if applied judiciously within the context of an overall strategy.

ICTs can help make education bureaucracies more efficient and responsive, both by improving communication flows within them and between them and their various constituencies and by increasing their access to global knowledge and best practice in education. Education bureaucracies in developing countries (as in many developed countries) are often overcentralized, highly bureaucratic and hierarchical, and inefficient. Of course, as in other sectors, the insertion of ICTs into an otherwise-unreformed institution will not magically change it; ICTs can only enable and complement reform, not create it. However, the efficiencies they can help create could free resources (even within an unchanged education budget envelope) for other needs.

One of the most promising areas where ICT can help improve education quality and outcomes, and where we have considerable experience in the past several years, is in teacher training. Developing country educational systems are, in general, plagued by inadequate resources for teacher training and curriculum development, which means that, despite the best intentions of teachers, educational quality is often low. Teacher training has long been a priority of the development community, and the newest ICTs are not strictly necessary, nor are they sufficient, to provide quality teacher training. Books, radio and television programs, and even early computer-based teacher training programs have shown positive results long before the Internet. Yet creative combinations of the Internet (for content access and interactivity) and digitally stored training materials

(including CD-ROMs) can dramatically increase both the *reach* and the *yield* per unit of cost of teacher training efforts.

Here, however, a note of caution is necessary. As in any other application of ICTs, care must be exercised to design ICT-based teacher training programs to meet the specific, priority needs of teachers in a given country, and the measure of their success should be the improvement of the teachers' ability to provide their students with quality education. Networking teachers, both regionally and globally, to share teaching strategies, lesson plans and other experience can be highly valuable, but the measure of its success is the quality of education and the amount of improvement realized for the resources spent, relative to other options, not the number of teachers networked.

Of course, ICTs in the classroom benefit only those who attend school (and their teachers.) The much larger problem facing many developing countries is the substantial number of children, and especially girls, who do not attend school. Achieving universal primary education has been a goal of the international community for a number of years, but the impediments are enormous. ICTs can help in some small ways (e.g., increased efficiency of teacher training, modest savings from bureaucratic efficiencies), but the real impediments are inadequate education budgets, the inability or unwillingness of poor families to pay educational expenses, and the low priority given to girls' education in many cultures.

Given that primary and secondary education efforts are, naturally, locally based, since most children go to school in their own neighborhood or town, ICTs will in most cases serve as a supplemental resource to the "bricks and mortar" of actual classrooms and the students and teachers who interact there. In tertiary, post-graduate and professional education, on the other hand, the context and challenges are different, and the opportunities for using ICTs are considerable. Higher and professional education tends to be concentrated in larger towns and cities in most developing countries, given both the efficiencies of concentrating resources there and the proximity both to complementary resources (infrastructure, government services, private sector partnerships) and to opportunities for graduates. This concentration corresponds, fortunately, with higher levels of access to information and communications infrastructure.

Higher education and professional education, particularly in a knowledge-based global economy, crucially depend for their quality on access to global information and knowledge resources, interaction with peers both locally and globally, and the

ability to acquire, process and adapt large amounts of information and knowledge on demand for specific purposes. This is especially the case in scientific and technical education and training. Yet higher and professional education face the same resource and infrastructure challenges as primary and secondary education in most developing countries. Stories abound of developing country medical and technical universities with almost bare libraries, unable to afford the purchase of new books or subscriptions to scientific journals. The ability, therefore, to digitize and share these materials at near-zero marginal cost is potentially an enormous boon to developing countries. Similarly, the opportunity for students, researchers and faculty to interact with professional colleagues worldwide can add significantly to the quality of their work and permit them to absorb, and adapt to local circumstances, the best of the world's knowledge on their subject. Here again, however, the emphasis must be on the appropriateness of the tools to the priority needs of students, teachers and researchers.

As the recent experience of OECD countries has shown, in a knowledge-based economy learning does not end with formal schooling. Indeed, one of the distinctive characteristics of a successful knowledge-based economy is the ability of its working citizens to learn and adapt throughout the course of their productive lives. There are many elements to this adaptability, including policies and practices relating to labor mobility and firm creation and cultural norms relating to risk taking. Yet a crucial element is the demand for, and supply of, opportunities for lifelong learning and skills upgrading at all stages of an individual's productive life. For developing countries, skill upgrading of the workforce is a critical element in attracting foreign investment and jobs, fostering domestic innovation and new firm creation, and thus promoting broad-based economic growth. It is clear that ICTs can have, and have had, a substantial role in increasing the quality and supply of skills training in developing (and OECD) countries in recent years. The crucial, and difficult, issues in this area involve priority setting and the relative role of public and private resources. Many donor-financed or corporate-philanthropy financed ICT-based skills training programs focus on ICT-related skills and on learning foreign languages, notably English. Some of these programs charge fees, while others do not. In order to bring these programs to scale and make them sustainable, developing countries and donors need to make tough decisions about priorities for public investment in this area and then create the conditions for greater private sector involvement.

One of the challenges in making these decisions about public funding of skills development for the ICT economy is that there seems to be a threshold problem with skills as with ICTs. Once there is sufficient supply of ICT-related skills to attract

foreign investment and ICT-related jobs, paying demand for such skills increases, as does the supply of such skills training both by training institutions and by firms themselves. In developed countries, a good deal of skills upgrading happens *within* firms. Yet skills training alone does not attract new jobs absent other enabling conditions, as evidenced by the uneven success of “reskilling” programs even in the OECD countries, and developing country governments thus have to balance investment in skills enhancement designed to attract higher-paying jobs with other policy and resource priorities. The emphasis on advanced skills should not, of course, obscure the fundamental importance of basic education at all levels. A well-educated population can quickly acquire new skills.

Reducing Vulnerabilities

Poverty and illness go hand in hand and feed upon each other. Poor people are particularly prone to disease and illness for several related reasons. Their living conditions are often unsafe and unsanitary. Their access to safe water and waste disposal facilities is limited. Their diet is poor, low in both calories and nutrients. They are particularly prone to a variety of environmental hazards, such as household smoke from primitive cooking fuels and stoves. Their ability to preserve good health and to treat illness is further compromised by a shortage of medical personnel, medicines and health infrastructure. The medical personnel who do treat the poor are hampered not only by scarce supplies but by scarce information about new threats and new treatments and few opportunities to improve their own skills. These conditions, in turn, keep people trapped in poverty and often return to poverty those who had managed to escape it, because the medical and social safety nets in most developing countries are so weak.

The ravages of HIV/AIDS in developing countries (the full extent of which is only now becoming clear) have intensified this vicious circle of disease and poverty, depriving households of their wage-earner, turning countless children into orphans, and depriving communities of their teachers and other trained professionals, who are at least as prone to infection as the poor, and in some cases perhaps more so. Yet even before HIV/AIDS, developing countries were beset with other persistent and widespread diseases, including malaria and tuberculosis, that have decimated their population, weakened their economies, and deepened the “poverty trap” for individuals, communities and countries.

There are several ways that ICTs can help to address the health challenges facing developing countries. First, the capacity to monitor, respond to, and thus

hopefully control disease outbreaks and address their causes can be significantly enhanced by improving communication flows among, the knowledge available to, and the information-management capabilities of health care professionals at local, regional and national levels. In many cases, time is of the essence in responding to disease outbreaks, and faster communication and information-gathering can often make a dramatic difference in how well an outbreak is contained. More generally, the ability of health care providers to assemble and share timely information about health trends and needs enables a country's health care system to adapt more quickly and target resources more effectively.

Second, ICTs can help improve hygiene and other health-related behaviors by disseminating more broadly what is known about the relationship between hygiene and health and specific information about disease-prevention strategies and behaviors. Here, as in so many other areas of development practice, these efforts long predate the emergence of advanced ICTs such as the Internet. What new ICTs bring to the effort is a dramatically enhanced ability to deliver information wherever and whenever it is needed, to combine and adapt it to specific needs and audiences, to connect health practitioners to share information, experiences and concerns, and to upgrade the quality and relevance of health and hygiene information regularly on the basis of global best practice. However, this is an area where there is much to learn from prior experience about the complicated relationship between information and action. HIV/AIDS campaigns are now encountering a lesson that earlier practitioners of “communications for social change” have struggled with for some time; new information does not necessarily lead to changed behavior. Here again, ICTs can play a valuable role, but they only enable change. They do not create it.

Third, ICTs can enhance the capacity and effectiveness of health care providers. Particularly in rural areas (where the majority of the world's poorest live), the shortage of health care professionals is exacerbated by their poor access to ongoing training and new knowledge and procedures. They also have limited opportunities to collaborate and consult with other trained professionals, particularly specialists who have more knowledge and experience in a given health discipline or with a specific disease or medical condition. By easing their access to knowledge and to colleagues, ICTs can help health care providers in poor communities to know more, act more decisively, and achieve better results for their patients.

Fourth, ICTs can help broaden access to health care, particularly by permitting forms of remote diagnosis and treatment in areas where local health care providers are few in number or have limited skills.

Yet is important to bear in mind that some of the most pressing health challenges facing developing countries have little to do with information, communication and knowledge flows, and hence with ICTs. Most notably, the lack of affordable access to vaccines and other medicines is a major impediment to improving health outcomes in developing countries. The recent controversy over price and patent issues related to HIV/AIDS treatments is only one example of this. And more fundamentally, the underlying causes of poor health in developing countries are so inextricably tied to deeper issues of persistent poverty that even the widespread use of ICTs in health care and disease prevention will go only so far in tackling the endemic health crises of poor populations. This in no way means that such efforts should be abandoned. It simply points to the importance of realism and priority-setting in the use of (scarce) developing country government and donor community resources in improving health and combating disease.

Environment and Natural Resource Management

Balancing growth with environmental stewardship and managing natural resources sustainably constitute a challenge that is not unique to developing countries. Yet it is particularly important to them because of the dependency of the poor (particularly the majority of the poor who depend on agriculture) on natural resource stocks, the vulnerability of the poor to environmental shocks, and long-term environmental and natural resource constraints on growth in many developing countries.

ICTs can help in several important ways with environmental and natural resource challenges. The combination of remote sensing technologies and communications networks can significantly improve monitoring of environmental conditions and natural resource stocks, They can also permit early warning of, and prompt response to, environmental emergencies. Increased awareness of and access to sustainable approaches in agriculture, forestry, and extractive industries can reduce environmental strains. “Cleaner” technologies in industry and agriculture can reduce pollution and lower consumption of energy, water and other resources. ICTs can also improve the monitoring of environmental abuses and the enforcement of environmental regulations, and empower citizens' groups to participate in this monitoring and enforcement. More generally, ICTs can help disseminate knowledge, and raise awareness, about environmental issues and sustainable livelihoods.

This public education, and the integration of environmental and sustainable development issues into public debate, is particularly important as developing

countries work to create the economic growth necessary to meet the Millennium Development Goals and combat poverty. It is important to bear in mind that some of the most significant environmental pressures facing developing countries have their roots in the poverty of those countries. Deforestation, to take just one example, is intensified both by the desperate need of the poor for fuel and their need for agricultural land. While improvements in agriculture, and in the overall economy, might ease those pressures, it will replace them with others common to growing economies, from motor vehicle and industrial pollution to mounting demands on water and an increased need for sanitation systems. In addition, some of the worst environmental conditions in developing countries (and those with the most immediate adverse effects on the population) can be found in the overcrowded poor districts of large cities. One of the greatest challenges for developing countries is to make their rapidly growing cities livable. ICTs for environmental management and sustainable development can help, but they are of course only one small part of the challenge, which has more to do with building national consensus around policies for sustainable growth.

The global context must be considered as well. Recent international negotiations on environmental issues reflect a growing consensus that environmental strains do not respect national borders, and that many of the most serious problems facing the environment, such as ozone depletion, global warming, depleted supplies of fresh water, require regional and global responses. ICTs can help raise awareness about these issues and give greater voice to the concerns of developing countries. However, as experience with the Kyoto Protocol shows, the real challenge in managing international environmental issues is getting all countries, particularly those whose impact on the environment is greatest, to agree on joint action. Once again, ICTs can help enable change and build coalitions in support of change, but they do not create it.

Enhancing Government Capacity, Efficiency and Accountability

The challenges facing developing country governments, at all levels, are enormous. They have to design and implement a vast array of complex and interdependent policies to promote economic growth and combat poverty and to provide a broad range of services to their citizens, and they need to do so with limited and increasingly strained resources, weak institutional and human capacity, and complex and contradictory domestic and international pressures. Even the most well-intentioned government officials in developing countries, therefore, are less effective

than they would like – and need – to be. To compound matters, weak institutions and mechanisms for public voice and participation in government, and for accountability of government institutions and officials, create opportunities for corruption, inefficiency, and the excessive influence of certain individuals or groups, even to the point of what social scientists call “state capture” by private interests. These problems manifest themselves not only at the national level but at all levels of government and public service. Indeed, the opportunities for corruption and private interests dominating public policy and government practice are often greater at the local level, since most services are delivered at that level and citizens have most of their interactions with government at that level.

Both in developed and developing countries, there has been great interest in recent years in the ways in which ICTs might make governments at all levels more effective, efficient and accountable. In fact, it is easy to perceive many of the challenges facing governments — and thus citizens — in developing countries as having an information and communication dimension, and thus to understand how ICTs could play a creative role.

Government officials, and the institutions in which they work, are hampered in many ways by poor information and knowledge flows. They often have weak access to even basic current data about the issues with which they deal and about trends elsewhere in the country. Information flows poorly within most government bureaucracies because of a combination of weak communications infrastructure, hierarchical structures, and rigid bureaucratic cultures. In addition, government officials have limited information on global best practice, and few opportunities for consultation and collaborative problem-solving with colleagues elsewhere. ICT can help in a variety of ways to address these problems, by helping to reorganize and speed up administrative procedures, increasing the volume and speed of information both within government institutions and between them and the larger society, training government officials in global best practice, and permitting greater collaboration and sharing of experience among government officials both within a country and across borders.

At the same time, citizens, and particularly the poor, often have limited information about their rights and the services available to them, about the structure and functioning of government agencies, and about procedures for requesting services. Because they also have limited information about the performance of government in delivering these services, they have little ability, individually or

collectively, to hold government accountable, and few outlets for expressing their concerns. Even where citizens are aware of their putative rights, exercising those rights (and even establishing their own legal status to assert those rights) can be burdensome because of complex and obscure procedures administered by sometimes self-interested public authorities. This applies not only to the poor person seeking to apply for government documents or services but also to the entrepreneur seeking to create a new business, since in many developing countries creating a new business requires a complex, costly and time-consuming set of permissions and documents, each of which provides an opportunity if not for graft, then at least for improper discretion on the part of government officials.

In such an environment, where incentives to perform for public benefit are weak, incentives to turn government resources to private advantage can be strong. Since the desired government service or document is highly valuable to applicants (either because their livelihood crucially depends on it or because it is an unavoidable step in creating a business or seeking out a new opportunity), and they have few opportunities either to call the official to task or to circumvent them, they often have little recourse but to pay the official the requested bribe. Strictly speaking, the problem is not that information is scarce. On the contrary, everyone knows what bribes are necessary, and everyone knows which officials are taking bribes. The problem lies with the structure of incentives and the power of the actors.

Nevertheless, ICTs can play an important role in combating corruption and making government institutions more transparent, by reducing the opportunities and incentives for and increasing the costs of corruption. The most obvious role for ICTs is to “disintermediate” between the citizen and the services, procedures and documents she requires by automating, and making widely accessible, many of the simpler procedures which have traditionally depended on the involvement of a local government bureaucrat. If a citizen can directly access a needed form, acquire required documents, permits and certifications, or register a new small business, using automated procedures, the opportunities for corruption are reduced.

ICTs can also empower individual citizens and groups to hold government officials publicly accountable, by widely disseminating information not only about the resources available to local governments and agreed performance measures for spending those resources, but also about the government's actual performance relative to those measures. Furthermore, ICTs can increase the

e-Government: Some Caveats

The experience of recent years in a number of countries leads to a number of caveats in designing an approach to e-government. First, ICTs do not, of themselves, change organizational cultures and practices. This is a lesson that should already have been learned from widespread efforts in the past few decades to automate government ministries, but the lessons from these past efforts are not widely known. The social organization of work, particularly in tradition-bound and highly hierarchical institutions such as government ministries, can significantly impede the takeup and effective use of ICTs. In many bureaucratic cultures, including those in some OECD countries, using a computer is viewed as a clerical function, “typing,” to be done by secretaries and clerks. In rich-country private sector firms, the widespread penetration of desktop computers in white-collar jobs coincided with, and was related to, the flattening of management hierarchies, the thinning of secretarial and clerical ranks, and the shifting of those lower end functions to a combination of “smarter” software and the expectation that workers further up the ladder would do their own typing. ICTs create the conditions for this shift in the culture and structure of organizations, but in government bureaucracies (and particularly in hierarchical cultures) resistance to this change can be substantial and long-standing. Nor, more generally, do ICTs of themselves create broader institutional reform and the redesign of government processes and procedures. An added source of resistance to

this restructuring, and the shrinkage of government payrolls which it often entails, is that the civil service is often a considerable source of employment, and patronage, in many developing countries.

Even when there is widespread commitment to bureaucratic reform, the task can be monumental and expensive. Converting handwritten records, reskilling staff, installing computers and networks, and retooling procedures can require enormous commitments of money and manpower. And since the costs are more immediate and visible than the benefits, resistance can easily mount given other pressures and priorities.

The ability of ICTs to make governments “smarter” both in the formation and implementation of policy is limited, of course, by the fact that policy making and implementation are complex and often highly political processes where, even if there is a “best” solution, it is not always the one that prevails. This is not to deny the importance of increasing the information and knowledge available to policy makers and civil servants, and the benefits of ICTs in this regard. It is simply to insert a note of caution that few government decisions, in any country, are made by purely disinterested parties on the basis of the best information available to them. Furthermore, there is often a significant disparity between a general policy and the various instances of its implementation.

This, however, is where the third type of “e-Government” can be useful: increasing the transparency and accountability of government officials by increasing public information and voice. The ability of government officials at all levels to exercise undue discretion or profit personally in the making and implementation of policies and the provision of government services can be diminished if more citizens know what services they are entitled to, what procedures are normal, and what resources government has committed to spend on public services in their community. It can also enable citizens to band together to seek redress of grievances, push for the removal of corrupt or incompetent officials, and work for equal rights for minorities and disadvantaged groups.

Here again, of course, ICTs by themselves do not create change. If broader structures of power and privilege are resistant, if community social capital is weak and trust among citizens is weak, the empowering potential of ICTs is not likely to be realized. It is also important to recognize that those who most urgently need government services and who are most likely to be discriminated against in the provision of those services — the poor, minority groups — are also those least likely to be able to use ICTs effectively unless the ICTs are specifically designed for their needs or unless there are strong intermediary organizations helping to press their interests.





participation of citizens in decision-making, implementation and monitoring at the local level both by disseminating information about pending issues and by helping to aggregate and share the views and concerns of local citizens. While more traditional communications media such as radio and newspapers have an important role in this regard (including the vital investigative role of journalists), newer ICTs permit more forms of horizontal, many-to-many communications on issues of public importance and give citizens more opportunities to organize around their interests and priorities.

However, it is important to bear in mind that ICTs cannot substitute for, and cannot in themselves bring about, more fundamental and crucial reforms in the functioning and accountability of government, the relations among levels of government, and the norms and expectations held by both leaders and citizens about the role of government in society and the standards of conduct of government officials. Successful applications of ICTs that tangibly improve the performance and accountability of government institutions can, in certain cases, create a virtuous cycle of expectations and improvements, as citizens come to understand that they can demand better of their government institutions and have the tools and strategies (and the self-organization) to do so. Here as elsewhere, however, ICTs are mere instruments (although, under certain conditions, powerful instruments) of more fundamental and difficult changes.

Participation, Empowerment and the Strengthening of Civil Society

ICTs can play an important role in informing and empowering citizens and strengthening the capacities of a wide range of civil society organizations and institutions. This is important not only in increasing the demand for good

governance and strengthening the voice of citizens in government policy, but for a more fundamental reason. There is increasing evidence that a dense and complex layer of social institutions, formal and informal groups, and networks of interaction and common interest between the individual citizen and the state is good both for the stability and responsiveness of the political system and for the economy and society as a whole. This social capital enables richer and more diverse views to surface on important societal issues, empowers groups to address common concerns and interests without necessarily relying on government intervention, and can even help the emergence of social consensus by permitting multidirectional debate and sharing of information among those with different perspectives through mechanisms that are not directly tied to the formal political and governmental structure. By facilitating new forms of many-to-many communication, collaboration, and information-sharing, both within a given country and among groups with similar interests and concerns across borders, ICTs can add to the vibrancy of civil society institutions and networks as a check on government, a source of ideas and innovations, and an outlet for the interests, concerns and desires for solidarity on the part of individuals and groups.

This is particularly important to the poor. One of the clearest messages of recent research on the experience of poverty is that the poor feel isolated, powerless and neglected. By facilitating contact and joint action among the poor and their advocates in civil society, ICTs can help to reduce the isolation of the poor, bring their issues and needs onto the national agenda, and increase pressure on government for pro-poor policies and services. Just as important, ICTs can help the poor preserve and share their knowledge and cultures, and learn from each other about concrete ways to address their own challenges.

By definition, however, the poor have scarce resources, and the burdens of their daily lives often leave them little discretionary time to engage in activities designed to protect their interests and articulate their needs. Their limited education, and in many cases illiteracy, puts them at a disadvantage when faced with sophisticated ICTs that are not adapted to their most pressing needs, their modes of communication (including a frequent preference for oral communication), their cultural norms, and the social contexts in which they typically interact and pursue joint action. Thus it is particularly important that ICTs intended for direct use by the poor be both appropriate in their design and deployment and affordable by their intended users, either individually or in groups. Giving voice to the poor is meaningful only if the poor are able to use a voice — a means of public expression — that is comfortable and meaningful to them.

ICTs and Information-rich Societies: The Role of the Media

Broadcast and print media have long played an important role in creating information-rich societies; improving the performance and transparency of markets, firms and government institutions; informing public debate (and broadening participation in that debate); and enabling a variety of groups and interests to organize and express their preferences. While the role of the media in promoting participation and accountability in politics and government is well recognized, it is equally important as a tool of healthy markets, which depend as much on the free flow of information as on the flow of capital, labor and other assets.

New ICTs certainly add both to the ways in which existing media organizations can reach, and interact with, their audiences, and to the options for creating new types of news and information services. The Internet, mobile phones, and digital cameras can make “everyone a reporter”, and diversify both the sources of information and the range of views on issues of public importance. Community radio networks can give voice to those who were previously limited to being passive listeners, and can increase access to locally-relevant and contextual information and viewpoints. The extremely low barriers to entry in creating Web-based news and information sites or communicating to a wide audience through email make it less likely that minority or unpopular views will be filtered out, and more difficult for the powerful or special interests to prevent the dissemination of information.

Yet the new, and much more diverse, ICT-enabled media environment is a mixed blessing, both for developed and developing countries.¹⁷ The reduction of government restrictions on broadcasting, and the reduced prominence of (and funding for) public broadcasting in many countries has led to greater diversity of news sources, but also in many cases to private media monopolies and to the growth of global media conglomerates. This often leads to a dramatic reduction in public-service broadcasting, an increased emphasis on entertainment over information and public debate, and commercial and political influence on content and analysis. It has also led, in many developing countries, to a greater concentration of media resources in more populated areas and a reduced emphasis on coverage of issues relevant to the poor and rural populations. At the same time, the often-overwhelming diversity of information sources can paradoxically lead to a reduction of trust in all sources, or to a form of self-imposed “information myopia” where individuals only rely on sources that match their narrow ideological or political predispositions. This is not a situation unique to ICTs; newspapers in most countries have long had an identifiable political leaning. What is new is the ability of individuals to filter more completely what types of news and views they are exposed to.

This is not to imply that diversification of media sources, and the elimination of government monopolies or restrictions on broadcasting, are bad things. It is simply to point out that,

¹⁷ The Panos Institute has covered these issues extensively and thoughtfully. See www.panos.org.uk

once again, ICTs are just tools, and the consequences of the use of those tools will depend on broader economic, social, political and cultural factors. This serves as a useful reminder that, in this as in so many areas of ICT policy, it is vital to be clear about objectives. The goal of media policy in the ICT age is to foster the growth of an information-rich environment where many voices are heard, public debate is robust, citizens and consumers are empowered, and markets and institutions are efficient and responsive. The most effective path to this goal will vary from country to country, but in every case the diversity and private initiative made possible by ICTs and by liberalization and privatization of the media sector do not eliminate the need for thoughtful government policy, smart regulation and carefully-targeted public investment.



Three Broader Challenges

There are three broader challenges facing developing countries as they seek to harness the power of ICTs as tools of economic growth, social welfare and poverty alleviation. Successfully addressing these broader challenges is in many ways a necessary condition for success in the more specific areas of ICT application enumerated above.

Building a Policy and Enabling Environment for ICT-enabled Growth and Poverty Reduction

Perhaps the most important role of developing country governments, in cooperation with civil society and the private sector, in creating the conditions for ICT-enabled growth is the creation of policy and regulatory frameworks — and capacity to carry through on them — that promote the spread of ICT infrastructure, foster ICT-led innovation, increase incentives for risk-taking and new business development, enable new and growing businesses to access capital and other resources, and more broadly encourage the free flow of information and knowledge within society.

The advent of a global, interconnected economy, where ICT-enabled innovation is a key element of international competitiveness, adds new urgency to these measures. Yet the recent hype about the newest ICTs should not obscure the fact that many of the key steps that developing countries need to take have not changed fundamentally in the past decade. The ICT economy might add new dimensions or complications, but it does not change some of the fundamentals.

First and foremost, many developing countries still need to make considerable progress in liberalizing their telecommunications sector, dismantling state monopolies, promoting private investment in infrastructure and services, and increasing competition in all sectors of the telecommunications market. The importance of this cannot be overstated, and even more so in the age of the Internet. Even before the advent of the Internet, there was abundant evidence that developing countries with liberalized telecommunications markets enjoyed not only better telecommunications infrastructure and services but positive spillovers into other areas of the economy. Competition brings innovation, greater efficiency, and wider, more rapid rollout of services. Even if recent innovations such as wireless networks and more creative use of satellites might enable developing countries to leapfrog over some of the fixed infrastructure requirements of earlier stages of

telecommunications development (“stringing copper”) or gain significantly greater performance per unit of cost (fiber optic cable, digital switches, etc.), the fact remains that buildout of telecommunications and related ICT infrastructure requires vast amounts of capital, far beyond what most developing country governments, with their already-strained budgets, can possibly afford. Of course, until recently one of the strong incentives for governments to preserve their national telecoms monopolies or dominant positions was the significant amount of revenue that they generated for the government budget, mostly from settlement payments on international calls. Yet the reform of the settlement rate system is reducing those revenues, and the opportunity costs of maintaining the monopolies are increasing as ICT-led growth increasingly risks passing these countries by.

Reducing the government's ownership role in the telecommunications sector does not mean its departure from the scene. Indeed, telecom reform is truly effective only if the government at the same time develops an independent regulatory capacity which ensures an even playing field for all competitors, adherence to agreed rules and commitments, and protection of the rights of customers.

The advent of the Internet and other new ICTs does not change the fundamental importance of these reforms. It adds some new complexities – about spectrum management for wireless communications, Internet infrastructure and content issues, intellectual property and related ownership issues of digital information, among others – but it does not fundamentally change the urgency of sector reform. Nor does it diminish the importance of policies relating to earlier ICTs such as radio, which can be a powerful tool of communication, knowledge-sharing and public dialogue and education. At the same time, given the considerable advantages that ICTs can offer to individuals, groups and institutions in society, the importance of ensuring broad access to ICTs, especially to the poor and isolated, takes on increased urgency.

Telecom sector reform – and, more broadly, coherent policy for promoting the spread of ICTs – is only one element of the policy framework necessary to foster ICT-led growth and poverty reduction. Other aspects of the enabling environment for private-sector-led growth are equally crucial. Capacity for domestic innovation and new-business creation and the ability to attract foreign direct investment are key elements of a vibrant ICT economy in developing countries. Yet many developing countries still remain fairly inhospitable environments for private sector growth and new-business development. Access to capital, both for existing and new businesses, is often difficult because of weak banking systems and financial

markets. Rigid labor markets and strict rules about business closures impede the mobility of labor and capital necessary to fuel innovation. Securing the necessary permits to open a new business can often be an extremely time-consuming and expensive process, with many often-obscure requirements and ample opportunity for improper discretion, favoritism, and corruption on the part of local officials. Just as important, the ability of small businesses that innovate successfully to become *larger* businesses and reach out to broader domestic and international markets is equally hampered by weak infrastructure, poor access to capital, and weak opportunities for international partnership.

ICTs can help to address some of these impediments to the creation of an enabling environment for private-sector growth. However, in the absence of these broader efforts, ICTs alone will not create growth or reduce poverty. In other words, the relative supply of ICTs in a country and their successful penetration into all sectors of society as tools of growth and opportunity are symptoms of deeper changes. To the extent that ICTs can help build the desire and capacity for those deeper changes (by awareness-raising, training, and consensus-building), facilitate their implementation (e.g., through greater efficiency, transparency and accountability of institutions and markets), and spread the benefits of these deeper policy and structural changes more broadly throughout society, they are a vital tool even at the early stages of building ICT-enabled growth and poverty reduction. Yet ICTs by themselves do not create these deeper and more difficult changes in policy environments and in the roles and capacities of governments, markets and other societal institutions. The opportunities posed by ICTs, and the risks of being left behind, make the hard work of policy and institutional reform in developing countries more urgent; they do not, however, substitute for it.

Ensuring Access for All

Even the poorest have information and communication needs that are central to their lives and livelihoods. The institutions and markets on which they depend, and the various people who provide services to them (health workers, teachers, local government officials, etc.) also depend heavily for their effectiveness on the efficient flow of information and communications. The poor, in fact, often spend significant amounts of the modest resources they have in money, time, and labor to meet their information and communication needs, such as requesting government services, learning about prices for their goods, accessing new

information that will make them more efficient as farmers, seeking health information and health services, and communicating with relatives. As discussed above, ICTs have significant potential to improve the lives and livelihoods of the poor and reduce the vulnerabilities that keep them in, or return them to, poverty.

Yet ensuring access for all to ICTs is an ongoing challenge for virtually every developing country (as it has proved to be for many rich countries as well). The majority of the world's poorest live in rural and remote areas, and the costs of building out ICT infrastructure to rural areas is often prohibitively expensive, or at least not commercially viable. Even those poor who live in urban and peri-urban areas often live in slums or neighborhoods that are poorly serviced by all public infrastructures — not only telecommunications, but power, water, sanitation, roads, etc. Second, the poor in most cases cannot afford their own telecommunications services even if they were available, and public access points for shared services have until recently been underprovided in poor areas.

These problems of universal access long predate the Internet. Even in the richest countries, buildout of telephone services to rural and poor areas required proactive government policy and a variety of cross-subsidies, access funds, and other measures for supporting universal access. Fortunately, much has been learned from the successes and failures of these earlier efforts, and these lessons can be useful, if appropriately adapted, to the needs of developing countries. Furthermore, a number of developing countries have pioneered approaches to increasing access to telecommunications that combine the creativity and resources of the private sector with carefully targeted government policies, benchmarks and resources that extend the reach of the market and make provision for those currently beyond its reach.

The emergence of new ICTs, the opportunities they create, and the risk they pose of leaving the poor further behind, however, have led to a number of creative approaches to broadening the access of the poor, particularly the rural poor, to ICTs. One of the most widespread approaches is based on the same principle as a public telephone booth: aggregating the demand of a group of users who cannot individually afford service, and centrally locating access in a place that is reachable by a sufficiently large group of potential users. While many of these ICT public access point experiments have been lumped under the general heading of “telecenters,” they vary considerably along at least three dimensions:

Rural Access to ICTs – Combining Policy Pull and Technology Push

Extending access to ICTs to rural areas, where the majority of the world's poorest live, is a crucial and difficult challenge for developing countries. Even in developed countries, the buildout of telecommunications infrastructure to rural areas, and the achievement of universal service or at least universal access, required in most cases substantial public investment and strong public policy measures. In recent years, experience with telecom sector liberalization has demonstrated that, given proper conditions, the market can prove effective in extending the communications network to rural areas and providing services to the poor. Recent technical innovations – including wireless technologies – add to the menu of options for extending service in an affordable and sustainable manner, particularly by reducing the fixed costs of communications infrastructure. Yet in most developing countries, universal – or even widespread – access to information and communication networks and services will require some combination of creative government policy to optimize conditions for private investment, technical innovation to get the most impact from that investment, and public investment to reach the poorest and most isolated. Given both the importance of extending access and the high costs of doing so, it is extremely important to find the proper balance among these elements, which will be different for each country. The first step is to distinguish between

those rural areas, and customers, that could be served by the market in a liberalized telecommunications regime with proper regulation and proper incentives for private investment, and those that would still be “beyond the market” even under optimal conditions.¹⁸ Creating policy frameworks that encourage private investment in rural areas (including, most fundamentally, eliminating government telecom monopolies and liberalizing the telecom sector) can create conditions where private investment and technological innovation extend the scope of those who can be served by the market. To reach those who would still be excluded, universal access policies and public investment are often necessary. Yet they are most effective when they serve as leverage to attract private investment, by helping to make the poorer and more isolated market segments commercially viable in the medium term.

The Chilean experience with “smart subsidies”, for example, shows how a modest amount of public subsidy can mobilize substantial private investment for rural access.¹⁹

¹⁸Two especially good discussions of these issues are Navas-Sabater, Dymond and Juntunen (2002) and Caspary and O'Connor (2003).

¹⁹Wellenius (1997) provides a good overview of the Chilean experience.

- Financing and ownership model: some are heavily donor- and/or government-financed and offer their services for free to members of a community (at least for an initial period); some are completely private and solely dependent on income from users; some earn part of their income from related products and services;
- Range of services: some are simple phone kiosks; others offer computer use and Internet access as well; still others add on various sorts of training, both in ICT-related fields and in other subjects;
- Links with other institutions and services: some are free-standing; other are tied to other public services such as post offices, government offices, hospitals, and schools. In fact, some are an outgrowth of projects originally designed to provide ICTs for other purposes (such as school computer centers that have become community telecenters after school hours.)

This variety might give the impression that each of these projects has emerged from an analysis of the specific needs and priorities, ability to pay, and market conditions of a given community. Unfortunately, this has often not been the case, and developing countries now abound in examples of telecenters that are not sustainable, in the long term, or that were never widely used because they were ill-adapted to the needs of the community, its social dynamics, or physical and environmental constraints. The opportunity now exists to learn from these experiments, and to design models of community access that address the urgent needs of poor communities without crowding out private sector innovation and without unsustainable inputs of public monies in the long term.

Innovations in hardware, software, products and services in recent years have helped to extend access and to generate new models of how to serve the needs of the poor. Innovations has proceeded along several promising, and complementary, dimensions:

- “Thinking outside the box” — new information appliances. While many early ICT projects focused on getting computers to individuals, groups and institutions in developing countries, the combination of disappointing results with many of these efforts and technical innovation has led many to focus more on developing more flexible and affordable (and locally appropriate) information appliances for developing country users, and on ways of adapting new information appliances originally developed in OECD countries (such as PDAs and multifunction mobile phones) to the needs of developing countries. Efforts



Telecenters: Learning from Failure

One of the most popular approaches to increasing ICT access in rural and poor urban and periurban areas has been the creation of multipurpose "telecenters" offering some combination of telephone, computer and Internet access, along with, in many cases, training in ICT and related business skills. These telecenters, most of them donor funded in their early years, represent the high end of a spectrum of models for aggregating demand to address the inability of individuals and families to afford service independently.

Although detailed evidence on these telecenters is still spotty, it is increasingly clear that most of the larger and more elaborate, and therefore costly, telecenters have proved unsustainable both because of their recurring costs and because of low demand. Many were created in the initial wave of donor enthusiasm for increasing ICT access, often with inadequate user involvement, unclear business models, and core funding that was not sustainable over time. Furthermore, their creation did little to create momentum for needed change in the broader enabling conditions for increased ICT access (telecoms sector reform, innovation in technology and financial models for rural access, broader infrastructure challenges facing rural areas). At the same time, other models that focused first on providing a core set of services and

emphasizing private ownership and innovation, such as the privately-owned phone shops in Senegal, have had more success. The contrast points to a common mistake in ICT-for-development approaches. The donor-driven telecenter represented an attempt to address directly a problem of differential access by providing access. More sustainable approaches are based on a deeper assessment of the underlying reasons for the problem (regulatory restrictions on sale of telecom services, inadequate incentives for innovation in providing access to rural and poor populations) and a focus on addressing those underlying reasons, so as to create the conditions for a sustainable, private-sector-driven, response to the problem.

This is not to say that public funds should never be expended to expand rural access. Indeed, given the urgent need of developing country governments to provide better services to their rural poor, and to improve conditions for economic growth and sustainable livelihoods in rural areas, extending access to ICTs is a legitimate concern. The challenge is to focus on strategies that maximize the opportunities for private sector initiative and target public funds strategically where private initiative is insufficient and the needs of the poor are most acute.

have focused both on technical innovation (including new appliances such as the “Simputer”, which is really closer to a PDA than to a computer) and on creating applications relevant to developing country needs, such as PDA-based educational, diagnostic and reporting tools for rural health workers.

- Simplifying, and customizing, hardware and software. Most globally available computer hardware and software has been optimized for rich-country uses. The hardware depends on environmental conditions (steady power supply, temperature and dust control) that are hard to replicate in many developing countries, particularly in rural areas. The software is so complex and loaded with features that it requires relatively high levels of computer processing power and user ability. There are several promising experiments in designing more environmentally robust, power-flexible, modular computers, and simpler software more adapted to the needs and capacities of developing country users. The “open source” software movement has, not surprisingly, attracted considerable interest and spawned much innovation in developing countries, both because of the greater flexibility that open source software provides for adapting applications to local needs and because of the daunting cost of purchase or licensing of proprietary software.
- Innovative uses of existing technology. Voice mail is a relatively mature technology that, until recently, was largely restricted to those who already have individual telephone service. Yet there are several ways that it can be useful to the poor when combined with existing public telephone services, such as phone booths and phones in post offices. Providing individuals and families with voice mail accounts accessible from any telephone gives them an ability to receive messages from distant family members, service providers, government agencies, business partners and others. Voice mail, combined with customized software, can also serve as a valuable tool for information access and remote reporting by health care workers, environmental monitors, and others providing valuable services to the poor in remote areas.²⁰

Technical innovations such as Internet connectivity by satellite, the expansion and increased flexibility of wireless networks (including wireless local loop for telephony and wireless Internet access), and the improvements in Voice-over-Internet-Protocol (VoIP), provide opportunities for rapidly expanding access by the poor (including the rural poor) to information and communication services. Yet, in many

²⁰ A particularly interesting example is the work of Voxiva (www.voxiva.net).



Getting Unwired: Are Wireless Networks the Answer for Developing Countries?

Thanks in part to increased competition and private investment in the mobile market, enabled by government liberalization of the sector, mobile penetration has surpassed fixed-line penetration in many developing countries, and average annual growth rates in mobile phones have dramatically outstripped growth in landlines.

This heightened interest in mobile technologies has focused not only on cellular mobile telephones, but on wireless local loop technologies for the "last mile" connection from exchanges to individual homes and businesses as well -- given that this connection is a significant component in the upfront investment in creating a new subscriber. More recently, interest has also turned to the potential of wireless Internet networks (often called "wi-fi" networks) to increase access to broadband services, both Internet and multi-function phones, in developing countries. One of the attractive features of wi-fi broadband Internet is that, within the wireless footprint of the transmitter, the marginal cost of adding another user is practically zero, except for the user's access device.

Wireless telephony is clearly an area of major growth potential and creativity for developing countries. And wireless broadband offers interesting possibilities for new models of Internet

service provision. Yet the buildout of wireless infrastructure and services in developing countries faces a set of familiar challenges that do not disappear simply because of innovations such as wi-fi broadband. The capacity of developing country governments to manage the radio spectrum and license new services effectively and transparently in ways that promote broad-based development and include the poor, and particularly the rural poor, is still highly uneven. Weak telecommunications and Internet backbone in many developing countries, including the persistent problem of international routing of most Internet traffic and insufficient or nonexistent national Internet exchange points, creates price distortions and inefficiencies that limit the spread of Internet services. And access for the poor is still hampered by issues of cost and limited buildout in rural areas. Even the creation of wireless hotspots for free Internet access does not erase either the cost of access devices or the other economic, social, and cultural impediments that the poor face in accessing and using ICTs.

Wireless technologies, then, hold out considerable hope as a tool for expanding access. They are not a magic pill, however, and the development community should be careful to avoid making them the latest fad for pilot projects.

developing countries, government regulations (and the interests of government-dominated telecommunications companies) restrict or prohibit the rollout of these innovations. Extending access to all, therefore, requires a careful combination of policy and regulatory reform, technical innovation, and the proper balance of public and private investment. This is, fortunately, an area where much has been learned in recent years, from both successes and failures, and sharing those lessons more effectively will help create support for the policy changes necessary to reap the benefits of ICTs for all.

Social Inclusion

Technology is not automatically a force for opportunity and social inclusion, and this caution applies to ICTs. In fact, depending on how they are designed, deployed, and accessed, ICTs can deepen and solidify existing economic, political, and social inequalities. They can also serve as tools to mobilize prejudice and inflame social tensions. Thus, in addition to ensuring widespread access to ICTs and their benefits for the poor and disadvantaged, developing country governments need to take proactive measures to ensure that ICTs serve as tools of social inclusion.

Gender is an important element of this challenge, though not the only one. It is noteworthy that several of the Millennium Development Goals focus primarily on increasing opportunities for, and reducing the vulnerabilities faced by, women and girls. Women play complex and vital roles in developing countries, and there are several compelling ways in which improving the lot of women and girls dramatically increases the welfare of society as a whole. Women with higher levels of education have fewer children; those children tend to be healthier; and they have a greater chance of rising out of poverty. Households with higher levels of female education tend to have higher incomes.

Yet for many reasons women often are prevented from securing equal access to, and the benefits from, ICTs. First and foremost, educational opportunities continue to be poorer for women than for men in most developing countries, despite some progress in increasing school enrollment for girls. This is reflected in the fact that nearly two-thirds of the world's illiterate population is female, and roughly half of all women in developing countries are illiterate. Deprived of basic educational skills, these women are then further deprived of the new opportunities for education and skills enhancement that come with ICTs. In addition, even those girls and women who do have access to primary and secondary education are constrained by the

multiple and time-consuming economic and social roles played by women in developing countries. Even if they can find time, cultural constraints on women (on where they can appear in public, under what circumstances, with whom) in many countries limit their ability to access ICTs in public access points such as libraries, cyber-cafes or telecenters. And their ability to pay for these services is limited by the fact that, in many countries, women have little control over family income and little discretionary income of their own.

If ICTs are to serve as a tool of social inclusion and empowerment and economic opportunity for women, particular efforts need to be made to provide access opportunities, tools and content particularly suited to the priority needs of women. Yet at the same time, it is important to pay attention to the ways in which ICTs can reinforce existing gender inequalities. For example, the still-sharp gender division of labor in many developing countries is not automatically reduced by ICTs. The tendency of women to be concentrated in low-wage, low-skill manufacturing and service occupations can in fact be reinforced by the siting of such jobs in locations where larger numbers of women are available, a mobility that is facilitated by ICTs.

More broadly, developing country governments, and their partners in civil society and in the international community, need to ensure that traditionally excluded and disadvantaged groups within society (the handicapped, ethnic and religious minorities, etc.) have access to ICTs in ways that are relevant to their specific needs and circumstances and that create new economic and social opportunities for them. Absent such efforts, these groups are likely to be further marginalized as they miss out on the economic, educational, health, and livelihood benefits of ICTs.



Chapter 4

*When the only tool you have
is a hammer, you tend to see
every problem as a nail.*

Abraham Maslow

THE WAY FORWARD

Guiding Principles

Adopting a more measured approach to ICTs for development, and subordinating our ICT strategies to broader strategies and priorities for development and poverty reduction, in no way signifies a diminished appreciation of the value of ICTs as tools for development and poverty reduction. In fact, one could argue that the only hope for success in using ICTs for development is to “put them in their place,” to understand them as tools, and to analyze more clearly how they relate to, and often depend on, other tools, resources and policies in order to be effective.

To say that ICTs are tools sounds self-evident, but it is a point that has often been obscured in ICT-for-development discourse and projects in recent years. It means simply that ICTs are means to other ends. Specifying those ends (sustained economic growth; reduction of poverty, hunger and disease; improved economic and educational opportunities for the poor, greater gender equality) leads, or should lead, first of all to asking why those ends have not yet been achieved, and what the impediments to their realization are in a specific country. This leads then to ask what changes in resources, capacities, institutions, markets, social structures are necessary in order to remove those impediments and achieve the desired ends. Development and poverty reduction, in short, are complex

processes of economic, social, political and institutional change through which more people gain greater access to their desired ends.

The way forward, then, in harnessing the benefits of ICTs for development and poverty reduction and the realization of the Millennium Development Goals is to be more realistic about the broader changes required in developing countries in order to foster sustained growth and poverty reduction, as well as the sometimes modest role of ICTs in effecting those broader changes; to recognize that the poor, developing country governments and their international partners all face constraints in resources, time, attention and capacity; and thus to be much more selective and strategic about the attention and resources devoted to ICT. This, of course, will lead to different strategies and priorities in different countries and regions, since the potential for ICTs to promote development and combat poverty will obviously vary considerably by country and region.

Several general principles can, however, be discerned as guideposts for these efforts.

1. Poverty and uneven development have complex, interdependent causes. Addressing those underlying causes is the only way to combat poverty. This, too, may seem obvious, but the history of development assistance is full of examples of uncausal approaches to the understanding of the plight of developing countries (“the financing gap,” “the infrastructure gap,” etc.) that often have led to failed efforts to “fix” the identified problem without adequate attention to the deeper and more complex causes of which the identified problem was a manifestation.

2. The digital divide is a symptom (among many), not a diagnosis, and “bridging” or “closing” it is a slogan, not a strategy. Metrics of the digital divide tell us only about what ICTs people and countries *have* (and often only in aggregate terms). They tell us nothing about what they are able *to do* with those ICTs, which depends heavily on a variety of other factors. Positive changes in those metrics are, in certain cases, indicators of other desirable changes, such as improved markets for telecommunications, successful innovation, higher levels of private sector activity and foreign investment, but a change in those metrics by itself tells us almost nothing about deeper, more important changes in the resources and capacities of a community or nation, the effectiveness of its institutions and markets, or its broader economic prospects. Even in those few cases where ICT metrics might seem directly and significantly relevant to a desired

change (e.g., improvements in ICT infrastructure as a lure to foreign direct investment), that desired change is fundamentally dependent on a variety of other factors that are, in most cases, more important, such as enabling environments and government capacity. For these reasons, indicative goals for ICT growth abstracted from a broader development strategy, such as calls for connectivity in every village by date X, are probably of limited use.

3. ICTs enable change; they do not create it. Pro-poor change in developing countries occurs through some combination of increased resources and capacities of individuals and institutions; greater efficiency and transparency of firms, markets and government institutions; an easing of national or global structural constraints; and concerted action on the part of key individuals and groups. ICTs can contribute to, or create the conditions for, many of these aspects of change, but they do not automatically cause change to happen. Furthermore, ICT-enabled change can be both good and bad. ICTs can open markets and increase competition, but that competition will not automatically be beneficial to developing-country producers. ICTs can further the advantages of already-powerful individuals and groups.

4. ICT strategies are effective, sustainable, and worth the effort only if they are integrally linked to broader and more comprehensive development and poverty-reduction strategies. By themselves, ICT strategies or “e-strategies” are often of little use and can even be counterproductive, both by obscuring the importance of the broader strategic priorities upon which any ICT strategy depends and by diverting scarce resources, including the time, attention and capacity of government decision makers, away from those broader priorities. As a tool for mobilizing enthusiasm and support for those more fundamental and often more difficult choices by highlighting the opportunities for economic growth and poverty reduction afforded by ICTs if those more fundamental choices are properly addressed, an emphasis on ICTs can be of value. Yet the considerable recent attention given to “e-strategies,” and the disturbing fact that some developing countries have several different “e-strategy” documents emerging from different donor projects, raises concern about the value of these exercises and their potential to divert resources, energies, and political will away from other more pressing issues.

5. “Mainstreaming” ICTs in donor programs means subordinating them as tools of other, more fundamental objectives, not inserting them everywhere. The concern with “mainstreaming” arises in part from the widespread perception that ICT-for-development programs were often set apart from, and not

well-coordinated with, core sectoral activities of donors in education, health, private sector development, etc. At the same time, many sectoral projects had ICT components embedded in them, but often without benefit of lessons from broader experience with ICTs and the challenges of adapting them to specific environments and conditions. The challenge, then, is both to link ICTs to core development goals and projects and to ensure that the full range of those involved in development programs understand where and how ICTs can be useful tools, and where they are not.

6. Newer is not necessarily better. The best tool for any job is the one that does the desired work most efficiently, in a form appropriate to the user, given available resources and other constraints on the use of the tool. The enthusiasm in the late 1990s for the Internet, and the digital divide logic that portrayed any technological gap as a disadvantage and therefore undesirable, led to a technology escalation in ICT-for-development programs. Simpler and older technologies such as radio, television and even print materials were often viewed as *a priori* inferior tools because they lacked some of the functionality (particularly the interactivity) of the Internet. The same prejudice applied to process technologies for improving the efficiency of firms and other institutions. Yet it is increasingly clear that even in the richest countries, the full range of ICTs remains relevant to the daily needs and desires of individuals and the functioning of markets and institutions.

7. ICTs are, to some extent, social constructs. Therefore, they need to be adapted to different social contexts. Personal computers are very much a product of the economic and social forms of organization typical of rich countries, as are most of the software applications written for use on them. They are, in effect, an answer to specific needs and preferences typical of firms, institutions and individuals in developed countries. They will not necessarily be equally well-suited to the needs of, or the forms of social and economic organization common to, users in other countries, particularly poor countries. Promoting innovation in hardware and software, creating ICTs that are specific to the needs and conditions of developing countries, is a key element in ensuring that ICTs truly address the needs of developing country users.

8. Priority-setting is crucial to successful development and poverty reduction. Developing countries, and the international partners who seek to help them, including public donors, the private sector and the NGO community have limited resources of time, money and capacity. Any development strategy requires

difficult choices, and priorities need to be chosen on the basis of an understanding of the most urgent needs of a given country and the actions most likely to have a positive impact on those needs. In some cases, ICTs will simply not be a priority, and an abstract sense of urgency about falling behind in the digital divide should never trump a clear strategy based on a detailed assessment of where the greatest levers for positive change exist in a specific country.

9. Learning new lessons is good, but fully absorbing old lessons is just as important.

There is a strong and welcome emphasis in ICT-for-development circles on learning from experience and finding best practices. Yet often this learning is focused on “what works” in the use of ICTs in specific contexts rather than on the broader enabling conditions for successful ICT use, without which the successful use of ICT cannot possibly be replicated elsewhere; it is impossible to understand what worked in a given context without exploring more deeply *why* it worked. Furthermore, this learning rarely includes an effort to absorb lessons from earlier, sometimes unsuccessful efforts to introduce technologies into developing countries (e.g., automation of government ministries, television for education, radio for rural extension). Since the success or failure of these earlier efforts most probably had similar underlying causes, such as the enabling environment, appropriateness of the technology, human and institutional capacity, the structure of local and global markets, etc., there is much to learn from these earlier efforts. There is, furthermore, much that could be learned from studying the history of development theories and practices that focused attention on one factor (finance, infrastructure, human capital) presumed to weigh heavily on the success or failure of economic growth, since ICT-for-development thinking is prone to some of the pitfalls encountered in these earlier approaches. Finally, we need to learn from the failures of past international calls for measurable increases in ICT access by given dates, such as the Maitland Commission's call in December 1984 for universal access to telephone service by the year 2000.

Priorities for Action

The above analysis suggests certain priorities for ICT-for-development efforts. This is by no means an exhaustive list; it is meant simply to point to some particularly important priorities, particularly for the international donor community.

1. Deeper, more rigorous analysis of the ICT-related dimensions of poverty and low growth and of the possibilities and limits of ICTs as tools to address poverty and promote development.

As this report has suggested, there is an urgent need to imbed ICT initiatives in a more rigorous understanding of the complex causes of poverty and low growth, the dimensions and drivers of pro-poor change in developing countries, and the broader enabling factors that determine whether and how ICT can make a difference. Any diagnosis of a country's development challenges that begins from, and focuses on, the relative absence of ICT is bound to be incomplete and risks being misleading and the source of misguided policy priorities. There is a scarcity of rigorous and context-specific analysis of the ways in which, and the circumstances under which, ICT can and should be a priority tool of poverty reduction and economic and social opportunity.

2. More extensive and honest assessment of experience thus far with ICT-for-development programs.

There is abundant anecdotal evidence of successes and failures in ICT-for-development projects, and some spotty data on the scope of such efforts. There is a serious shortage of rigorous impact evaluations of these projects, however, and an equally serious shortage of analysis of the underlying conditions for success and failure of these projects. This leads to a tendency to want to replicate and scale up putatively successful projects without an adequate understanding of *why* they worked in a given context, and to avoid repeating experiments that are deemed to have failed without understanding whether the failure had anything to do with the specific ICT initiative or was based on other factors. The problem is exacerbated by the fact that many ICT applications are imbedded in larger sectoral projects, and the contribution of the ICT component to the success or failure of that project is often not independently evaluated.

Improving our collective knowledge of these matters requires not only a greater commitment to evaluate past experience frankly, but also a much greater attention to information-sharing among the large number of organizations involved in these efforts — multilateral, governmental, private sector, and NGO.

3. A greater strategic focus, in ICT programs, on levers of change and agents of change.

If the fundamental objective of ICT-for-development programs is to foster pro-poor change and sustainable development in poor countries, then there is an urgent need to understand better the key levers of (and impediments to) desired change in a given country and the key groups and institutions that can serve as agents of change. This would permit a more effective targeting and prioritization of ICT-for-development programs, since they would be then be based on a context-specific model of how to bring about desired deeper changes, not just on observed disparities of levels of ICT access.

4. A priority focus on development and poverty-reduction, and on the MDGs, not on ICTs.

The focus on the absence of ICTs as the problem leads all too easily to the presumption that the supply of ICTs is the solution. Mainstreaming ICTs into broader development and poverty-reduction strategies means seeing ICTs as one of many important tools (along with policies, money, institutions, human capacity, and political will, among others) in fostering pro-poor change in developing countries. The measure of such change is progress on the MDGs and broader, sustainable growth, not the increased presence of ICTs.

This means that ICT strategies and “e-strategies” should be strictly subordinated to, and designed to be instrumental to, national development and poverty reduction strategies. While this may seem simplistic, it is all too often the case that e-strategy exercises skew the analysis of a developing country's fundamental challenges and opportunities both by seeing them primarily through the lens of ICTs and by largely bypassing a deeper analysis of the structural, institutional, political, and resource-related impediments to growth in a given country.

5. More rigorous priority-setting both in ICT programs and between them and other interventions.

Any development and poverty-reduction strategy involves difficult choices, since the resources, time and capacity of relevant actors and institutions are finite. It is not enough to posit that a given ICT intervention will create benefits for the poor or will help economic growth. In fact, the ability of ICT projects to show certain tangible results (more teachers trained, more farmers informed of current prices)

sometimes serves as a way to avoid the tougher questions of whether those first-order changes lead to the desired deeper changes (better education results, more sustainable agricultural livelihoods) in ways that justify giving priority to them relative to other interventions and relative to their cost. More broadly, the difficult, frustrating, and often bewildering job of combating poverty and promoting sustainable growth often understandably leads to the temptation to look for “quick wins,” visible results that we can measure and that have some arguable connection to the larger changes we hope to effect. The ability of ICT interventions to create, in certain cases, these kinds of “quick wins” (often of the photo opportunity variety) should make us especially careful about focusing first on core objectives, and only then on tools and strategies to meet those objectives.

6. Greater cooperation and information sharing among donors and others involved in ICT-for-development programs.

While general information-sharing and dialogue on ICT-for-development programs has improved somewhat in recent years, there is still considerable duplication of effort and failure of coordination among donors and other key actors in this area, as evidenced by the blizzard of competing “e-strategy” initiatives in the past few years. While everyone agrees in principle on the need for better information-sharing and joint learning, key participants need to make that cooperation a priority and take concrete actions to advance cooperation, perhaps by focusing first on a small group of priority areas for information-sharing, such as evaluation of telecenters and other common-access models.

7. Stronger support for pro-poor innovation and innovators.

ICTs have the greatest potential to effect positive change in developing countries and create opportunity for the poor when they are specifically adapted to local needs, priorities and circumstances. Pro-poor innovation entails designing not only ICT appliances and applications relevant to the needs of the poor but also ICT-related or enabled services for the poor, as well as new financing and business models for provision of ICT access and services to the poor. A wide range of organizations — public, private and nongovernmental — are involved in this innovation. Yet they are often constrained either by lack of adequate resources for scaling up their innovations or the inability to find partners, and the international private sector, particularly in the current global economic context, is wary of investing in such innovation, since the short-term risks seem to outweigh

substantially the long-term hope for profits (and since long-term is an increasingly unattractive time horizon for many investors.) Without either seeking to replace or second-guess private sector innovation and investment, the development community should look for ways to increase the resources and partnerships available to pro-poor innovators.

Taking Advantage of the World Summit for the Information Society (WSIS) Two-Stage Process

The roughly two-year period between Phase 1 and Phase 2 of WSIS provides a good opportunity for the international community to set concrete, phased targets for improved cooperation, better priority-setting, and enhanced evaluation, analysis and information-sharing in ICT-for-development programs. Rather than setting indicative ICT targets that are not meaningfully attainable through direct action (as long experience has shown), the donor community should make concrete commitments for progress in cooperation, information-sharing, monitoring and evaluation, and more coherent division of labor in ICT programs. Programs would be reviewed at the second phase of WSIS in Tunis in late 2005.

Such an approach might be viewed by some as a retreat from the more ambitious approach of adopting ICT targets in Geneva. However, one can argue that it is ultimately not only a more realistic strategy, but one more likely to produce results. Changes in the penetration and use of ICTs in developing countries and in their impact on the MDGs can only be meaningfully achieved as part of a broader and more comprehensive approach to poverty reduction and sustainable development. The best contribution that the ICT-for-development community can make to these broader efforts is to make the case for ICTs as tools of poverty reduction and economic growth, and of pro-poor change, in a more rigorous and evidence-based fashion, and to cooperate more effectively in applying ICTs to specific development challenges. The measure of success, however, will and must remain progress toward the MDGs and concrete improvements in the lives of the poor.

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This is by no means a comprehensive, or even necessarily representative, list of recent writings on ICT for development. The ICT-for-development pages of the Development Gateway website (www.developmentgateway.org) provide a much more extensive list, organized by theme, of available materials, and illustrate by their sheer volume the difficulty of providing a manageable list of reading materials on the subject. This bibliography is restricted to items that either are directly cited in this report or were particularly influential in shaping the argument.

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