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Exploring the depth and breadth of the digital divide in developing countries: The case of Pakistan

Abstract: One of the primary tasks confronting governments, civil society and international agencies in developing countries continues to be a reduction in the level and incidence of poverty, as well as the gap between the affluent and the poor. This income and wealth “divide” is reflected in a spectrum of such additional indicators of the human condition as education, healthcare, and gender empowerment. In recent years, there has also been a concern that the income divide is associated with a similar gap in terms of access to information and the means to communication—and thus to fundamental resources that enhance incomes and help overcome poverty. Information and communication technologies (ICTs) have thus gained prominence as a facilitative factor in the development equation.

Spurred by this development and the global focus on information technology, the Government of Pakistan published a much-heralded National I.T. Strategy and Action Plan in 2001.

The impact of this significant policy level commitment to technology on Pakistan’s most pressing concern—poverty—poses an interesting question for public policy. While the telecommunications infrastructure has grown, become less expensive and is more geographically accessible, today more than ever, the invisible line that separates rich from poor, men from women and the educated from the illiterate, also separates the connected to the disconnected.

As a policy issue, the utilization of information and communication technologies (ICTs) for human and social development is non-existent. Public policy continues to focus on massive investments in infrastructure and university education.

This paper will seek to explore the spectrum of ICTs policy in Pakistan, and assess it in the light of Pakistan’s human and social development conditions. In light of experience the paper will conclude by proposing recommendations on how ICTs, the digital divide and the socio-economic context of Pakistan can be dovetailed on a national policy level.

Résumé: Une des premières tâches des gouvernements, des sociétés civiles et des organismes internationaux des pays en voie de développement est de réduire le niveau et les conséquences de la pauvreté, de même que le fossé entre riches et pauvres. Ce fossé salarial et économique se reflète dans une gamme de facteurs de la condition humaine tels que l’éducation, la santé et l’égalité des sexes. Depuis quelques années, il est devenu préoccupant que la disparité des revenus est directement associée à une semblable disparité touchant l’accès à l’information et aux moyens de communication, ainsi qu’aux ressources fondamentales augmentant les revenus et l’aide allouée à la pauvreté. Les technologies de l’information et de la communication (TIC) ont quand même pris de l’importance comme facteur de progrès dans le développement de ces pays.

Encouragé par ce développement et par la concentration majeure sur les technologies de l’information, le gouvernement du Pakistan a publié en 2001 une stratégie et un plan d’action national touchant les technologies de l’information qui semble très prometteur.

L'impact de cet engagement politique significatif axé sur les technologies sur le principal sujet de préoccupation du Pakistan, soit la pauvreté, pose une question intéressante aux politiques publiques. Alors que les infrastructures des télécommunications sont de plus en plus importantes, qu'elles sont de moins en moins chères et qu'elles sont géographiquement plus accessibles, encore plus aujourd'hui, la ligne invisible qui sépare les riches et les pauvres, les hommes et les femmes, les personnes instruites et les illettrées, continue à isoler les personnes « branchées » et « non-branchées ».

Comme enjeu politique, l'utilisation des technologies de l'information et des communications (TIC) dans le développement humain et social n'existe pas. Les politiques gouvernementales continuent de se concentrer sur des investissements majeurs dans les infrastructures et l'éducation universitaires.

Cet article cherche à explorer les perspectives des politiques des TIC au Pakistan et en fait l'évaluation en regard des conditions du développement social et humain du Pakistan. Selon cette étude, cet article conclura en proposant certaines recommandations sur la manière dont les TIC, le fossé numérique et le contexte socio-économique du Pakistan peuvent être associés au niveau de la politique nationale.

1. BACKGROUND: IMPETUS FOR ICT POLICY & REGULATORY FRAMEWORK

Information and Communications Technologies (ICTs) have been among the high profile areas of priority on Pakistan's public policy agenda since the mid 1990s. The first major public sector effort to consolidate the various strands of ICTs and public policy was made under the aegis of the Pakistan 2010 program. After the dismissal of the Nawaz Sharif administration in October 1999, and the ascent of Gen. Pervez Musharraf to power, in customary fashion, nearly all policies and programmes of the previous government fell by the wayside. The reform programme that Gen. Musharraf's administration announced was highlighted by a commitment to good governance, economic reform, increased investments in the social sector, and attracting greater foreign investment in the country.

At the time, ICTs—particularly the Internet—were widely identified as the primary cause for the unparalleled growth of the U.S. and global economy through the 1990s. Businesses increasingly used the benefits of new technology to help increase efficiency and effectiveness, through faster communication at ever lower costs. Accompanied by a stock market boom that capitalized on the ubiquitously propagated benefits of technology adoption across industries and sectors, the technology-driven, or “knowledge based” economy became a central theme for economic policymakers the world over. The speculative and often irrational¹ bubble created by overzealous investments in Internet companies would burst in 2001, exposing serious weaknesses in the manner in which the Internet and telecommunications were perceived by investors.

ICTs were and continue to be a source of great hope and optimism for businesses, governments, and civil society the world over. There is good reason is for policy makers and investors to maintain their faith in ICTs (Jorgenson 2001). The fundamental appeal of ICTs is irresistible. ICTs can ultimately serve the role of equalizers in an unequal world. Given the premium on information, and more importantly knowledge, ICTs represent the medium for all meaningful interaction and discourse in the 21st century economy. It is a long established fact that ICTs are drivers of increased productivity. For developing countries like Pakistan however, ICTs represented a great deal more, including:

Outsourcing: The relatively low cost of IT/ICTs skilled labour in Pakistan means that given the requisite skills, workers in a country like Pakistan can earn relatively high domestic wages, while delivering products and services to clients in developed countries that are paying only a fraction of what they would in their own countries. This also represents an opportunity for increased foreign exchange earnings for developing countries.

Labour Migration: Almost as valuable, as in the experience of India,² can be the “reverse brain drain”, IT/ICTs skilled workers who have worked in developing economies, returning to their native lands, bringing with them, expertise, capital and possibly foreign direct investment.

Given these factors, the global economy’s partiality to information technology, and the awe with which the “dot.com”³ phenomenon was viewed, there was a natural propensity for policy to be skewed towards the commercial and macroeconomic potential of new technologies.

1.1 Policy & Regulatory Framework

The process that lead to Pakistan’s IT policy was primarily driven by these considerations. This represents the theoretical impetus that catalyzed the process of formulating public policy that dealt specifically with IT in Pakistan. The policymaking exercise began with the establishment on the IT and Telecommunications (IT&T) Division in March 2000 at the Ministry of Science and Technology. The idea behind its establishment, in the words of the Ministry itself: “the national focal point for Information Technology (IT) which was previously either missing or diffused has recently been rectified with the creation of a new Information Technology and Telecommunication Division under which all Telecom and IT related organizations have been placed.”⁴

In August 2000 the Federal Cabinet approved the “Pakistan National IT Policy and Action Plan”. The taxonomy used for the policy is appropriate, because it is specific to IT, and not ICTs. The function of IT, as opposed to ICTs (traditional and/or new), is defined by software, and can be changed without changing its physical structure (Laudeman 2003). Part of the reason for the self-limiting taxonomy of the policy is the disjoint at the federal government level itself: the Ministry of Information and Media (MoI) handles media and information, while the newly established Ministry of Information Technology (MoIT) handles IT and telecommunications.⁵

Similar discord exists at the regulatory level. The Pakistan Telecommunication (Re-organization) Act, 1996 was the legislative milestone in ICTs policy in the country. It established the status of the sole national telecommunications provider Pakistan Telecommunications Company Limited (PTCL) as a monopoly until the WTO-ordained deregulation of telecom (a seven-year period that elapsed in January 2003), and also established an independent regulator for telecom, the Pakistan Telecommunications Authority (PTA). Until recently all ICTs, fixed-line telephony, wireless, cellular, satellite, radio and cable communication were the domain of PTA. In 2002 however, the establishment of the Pakistan Electronic Media Regulation Authority (PEMRA) resulted in the splitting of the PTA’s authority with radio and TV (including cable) regulation being placed under the domain of the nascent PEMRA. The disjoint has significant implications

in the context of emerging technologies, and the media convergence that characterizes the modern media paradigm.⁶

2. PAKISTAN'S NATIONAL IT POLICY AND ACTION PLAN

The National IT Policy and Action Plan's (ITPAP) stated vision is "to harness the potential of information technology as a key contributor to the development of Pakistan." ITPAP's mission is to "Rapidly develop the infrastructure in synchrony with the creation of excellently trained individuals and teams. Direct these at transforming our society into a prosperous and dynamic one—one that values and benefits from the creation and free flow of information and knowledge. Encourage and assist the entrepreneurial spirit, and make the fruits of this technology available to every citizen."

The policy lays out a set of goals that would help achieve the vision and mission, as summarized in *Table 1*. The goals fall into three categories or types: public sector goals that would produce policy and regulation, public good goals that would produce increased access to information & knowledge, and macroeconomic goals that would produce greater national income.

The focus of the National IT Policy and Action Plan is therefore two-pronged:

- To increase the direct economic benefits of information technology to Pakistan in the short and medium run, through:
 - a) The export of products, services and skilled labour to developed economies
 - b) Investments from developed economies in Pakistan's domestic information technology and telecommunications sector
- To increase the capacity of Pakistani labour market in information technology, and increase access to information for citizens, so that the indirect benefits of a better-trained and more informed population can accrue to the economy in the long run.

The policy itself outlines a more detailed list of priority areas. The list contains 23 items, many of which overlap with each other, and most of which can be categorized into four broad focus areas. These broad focus areas are: Human Capital, Infrastructure and Environment, Economic & Industry and Internet.

National IT Policy Goals	Type of Goal
<ul style="list-style-type: none"> • Government a facilitator and an enabler to the private sector • Develop an enabling legislative and regulatory framework for IT related issues. • Promote use of IT in government for efficiency and transparency and to organize and facilitate access to public information. 	<p>“Policy & Regulation” Defining the Role of the Public Sector</p>
<ul style="list-style-type: none"> • Set up national databases that are reliable, secure, up-to-date and easily accessible. These would be open databases. • Establish an efficient and cost-effective infrastructure that provides equitable access to national and international networks and markets. 	<p>“Public-Good Outcomes” Promoting the Widest Possible Dispersal of IT’s Benefits</p>
<ul style="list-style-type: none"> • IT skills training at all levels to meet local and export requirements. • Encourage investment in IT through incentives • Encourage and promote the development of quality software that can capture export markets. • Develop a tradition of electronic commerce for both national and international transactions. • Encourage expatriate IT professionals to return to Pakistan and establish software houses, invest their time and effort in the development of local industry and software exports • Promote extensive use of IT applications in trade, industry, homes, agriculture, education, health, and other sectors with widespread use of Internet. • Promote manufacturing and research and development (R&D) potential. 	<p>“Macroeconomic Outcomes” Leveraging IT to Impact National Income</p>

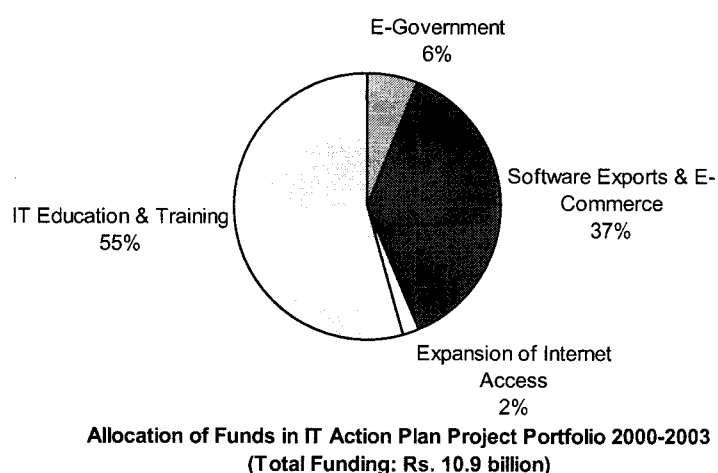
Table/Figure 1: National IT Policy Goals and their Types

The strong focus of the ITPAP on building human capacity, and leveraging that capacity for the generation of improved macroeconomic performance through both the domestic market applications of IT, as well as the export of IT labour, products and services is clear. A quantitative measure of this focus is presented in the latter part of the ITPAP, namely the Action Plan and Projects Portfolio. These sections of the ITPAP delineate the funding allocations to various elements of the strategy for adopting IT in Pakistan. A profile of the allocation of funds is presented in *Table 2*.

2.1 Funding Priorities in the ITPAP

Upon examination, the projects portfolio reveals many logical discrepancies in the allocation of funds that buttress both the notion of a weak policymaking infrastructure that is available to the Government of Pakistan, and the overwhelmingly strong focus on human capacity and the commercial application of IT to Pakistan. Consider the allocations for IT education: the Projects

Portfolio contains a project entitled, “Establishment of IT University in Abbotabad”, a small city of less than 1 million in the North West Frontier Province (NWFP), one of four provinces in Pakistan. The allocation for this project over three years is Rs. 300 million. A few rows after which there is a second project, entitled: “Establishment of IT universities in Punjab Sindh and Balochistan”. These three provinces rank first, second and fourth in terms of population in the country—exceeding 100 million. The allocation for this project too is Rs. 300 million. This puzzling imbalance in terms of funding for IT education is systemic throughout the Projects Portfolio. There is an allocation of a massive Rs. 1,500 for a Virtual University (a distance learning initiative established in the summer of 2002). Another Rs. 900 million is allocated for the improvement of IT institutes. These allocations convey the lack of a strategic and balanced vision for the specific objectives stated in the National IT Policy.



Area of Allocation	Millions of Rupees
E-Government	675
Software Exports & E-Commerce	4,100
Expansion of Internet Access	220
IT Education & Training	5,948
Total	Rs. 10,943

Table/Figure 2: Allocations Made by the National IT Policy & Action Projects Portfolio

The allocation of funds described above also indicates, in financial terms, the low priority that policy makers attach to the direct potential of ICTs as enablers of the social and human development process. The human capacity component of the ITPAP is misleading, from a development perspective because it is almost exclusively devoted to tertiary education. Pakistan’s university enrolment rate is 0.8%.⁷ While its primary education enrolment rate is 42% (CRPRID 2002).⁸ The ramification of these statistics is simple: any investments in human capital that do not contain provisions for increasing tertiary enrolment levels through improved and increased primary and secondary education will continue to yield a human capacity profile that

ignores the disadvantaged and increases the gap between the haves, and have-nots. In ITPAP, “Community Internet Centres in Rural Areas”, is the only project that directly addresses the pressing social and human development challenges faced by Pakistan—its allocation however is a mere Rs. 70 million. This despite Pakistan’s significantly greater population (66.9% of Pakistan’s population is rural) that resides in rural areas, and one that is by all accounts, the most disadvantaged demographic in the country.⁹

3. OUTCOMES AND OUTPUTS OF THE NATIONAL IT POLICY & ACTION PLAN

3.1 Failures

The jurisdictional confusion, as related in *Section 1*, instead of decreasing following the ITPAP, actually increased with the creation of the Higher Education Commission (HEC) in July 2002. The HEC has now taken over the task of human capacity building in IT, insofar as university-level programmes and initiatives are concerned. However the IT&T Division continues to be involved in training and capacity building programmes at the federal government. More importantly, many of the commitments of the ITPAP were on broad ranging issues—such as sales and income tax breaks for software exporters, and elimination of tariffs on IT imports—which were the domain of either entirely different government agencies, or the domain of multiple government agencies including the IT&T Division. Although policymakers in the IT&T Division claim complete cooperation from the Ministry of Finance, the State Bank of Pakistan (central bank) and the Central Board of Revenue (tax regulator), instances of contradicting execution of policy have been reported in the national press with regularity.

For the most part, the commitments made in the ITPAP are soft, i.e. they are either not measurable, or not enforceable. Semantics has a large part to play in this, with the ITPAP ensuring government “*support*”, “*facilitation*” and “*enablement*” on a broad spectrum of issues. There are no accompanying benchmarks to disentangle the rhetoric from the real. The Action Plan component of the ITPAP foresees this problem and explicitly spells out a bi-annual review of policies, along with the establishment of an indicators regime, by issuing a set of 20 benchmarks. However the accompanying survey and data collection exercises that the ITPAP commits to have never been carried out. This means that not only has the IT&T Division been limited in its ability to enforce or carry out many of its policies, but that no data exists for the verification of many of the claims of either proponents of ITPAP’s success, or detractors of ITPAP’s failure.

The global economic downturn following September 11, 2001 has had a significant impact on Pakistan’s IT market as well. Investors previously signed up to MoU’s with local software and outsourcing vendors left the country en masse, either prior to initiating operations in Pakistan, or soon afterward.

3.2 Successes

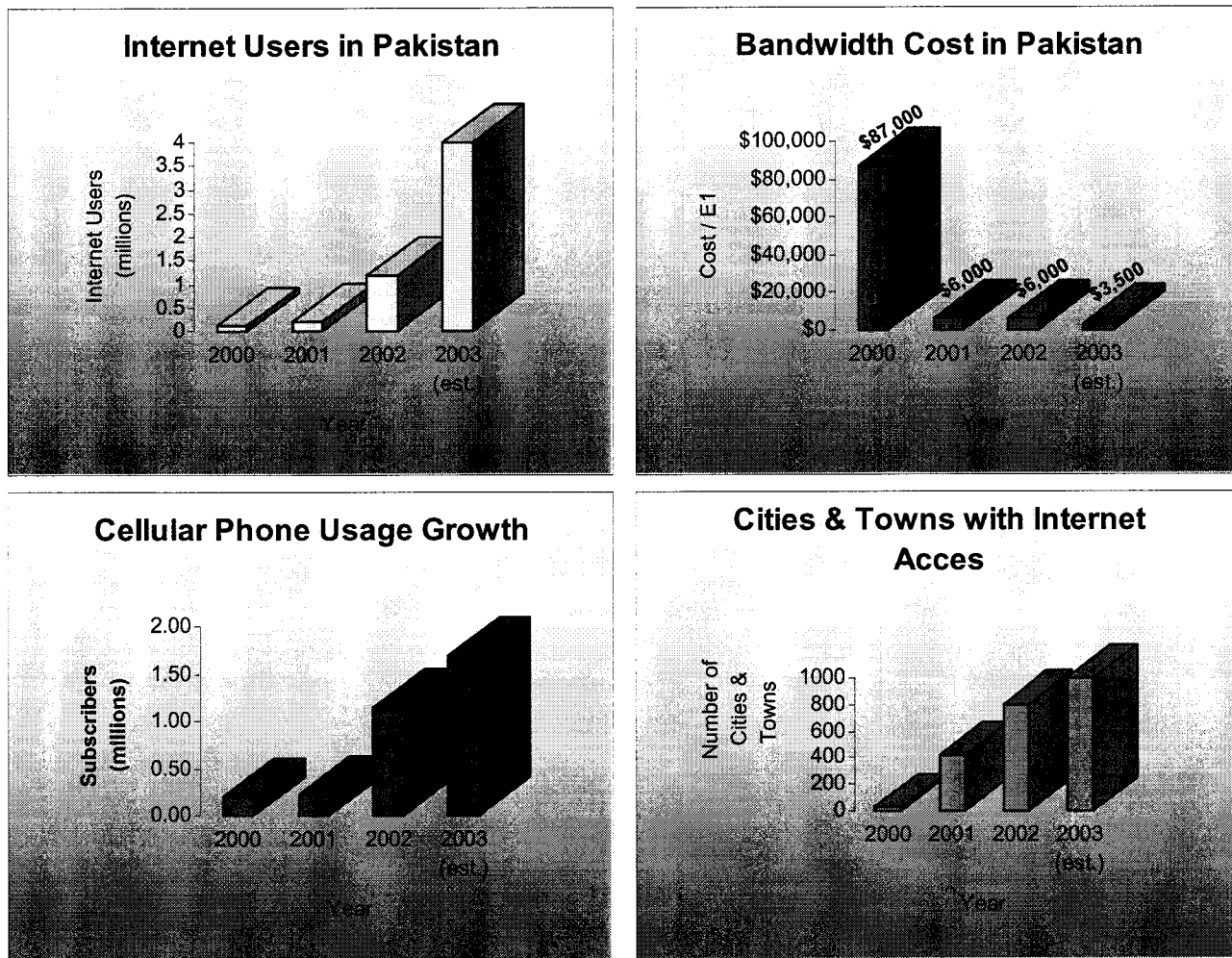
On the other hand the progress that has been made on some of the commitments made by the National IT Policy has been phenomenal. The objective of Pakistan having its own satellite in

orbit was realized in January 2003 with the launch of PAKSAT-I. The satellite presence of Pakistan will enable Internet Service Providers to extend their reach into areas where broadband terrestrial capacity is not available. The ramifications of the creation of connectivity in remote and rural areas through the launch of PAKSAT-I are immense from a development perspective.

The telecommunications infrastructure in Pakistan since the National IT Policy was approved in 2000 is vastly improved (See *Table 3*). Internet access in particular has been one of the hallmarks of the government's telecom infrastructure expansion drive. In 2000, only 29 cities in Pakistan had Internet access, today that figure stands at over 1000.

The growth in Internet access has been achieved in part due to the formulation of consistently good policy measures, highlighted by the decision to make all calls to dial-up ISPs non-multimetered. This has resulted in the ability of the rural and semi-urban population to make calls to ISPs that would otherwise be charged at long-distance rates, on a per minute basis, without the added expense of doing so.

By most accounts, the expansion of access has not been accompanied by a corresponding adoption of the Internet in rural Pakistan (Walcott & Goodman 2002). Growth in the overall usage of the Internet however has been tremendous, going from 130,000 users in 2000 to over 4 million in 2003. Another achievement in the implementation of the National IT Policy has been the reduction in bandwidth prices, which have plummeted from US \$87,000 in 2000 to US \$3,500 in 2003. Again, while the current costs are still not reflective of the regional costs of bandwidth, the movement towards what is aptly described as the "rationalization" of costs in the National IT Policy is visible.



Table/Figure 3: Telecom Infrastructure in Pakistan Since the National IT Policy

Cellular phone usage has also seen an enormous increase as a result of the policies pursued by the government since the National IT Policy was unveiled. In December 2000, partly to enable the entry of PTCL's cellular service subsidiary, Pakistan Mobile Telecommunications Limited (under the brand name U-fone), the PTA issued a directive that introduced the Calling Party Pays (CPP) regime for cellular telephony. The CPP regime has been instrumental in the growth of cellular phone usage, increasing from 200,000 in 2000 to over 1.7 million in 2003¹⁰.

These gains in telecommunications infrastructure must not be confused with any notion of a universal access regime taking place in the country. Despite significant growth, teledensity in Pakistan—that is the number of telephone subscribers per 100 people—remains woefully low, at 2.41.¹¹

On the legislative and regulatory front, with the notable exception of the promulgation of the Electronic Transactions Ordinance 2002 (ETO), there has been little progress. Unfortunately

without a host of accompanying legislation, the relevance and applicability of the ETO is negligible.

The positive accomplishments and progress in telecommunications infrastructure have been made despite the overall inertia in implementation that has delayed perhaps the most critical element of the National IT Policy and Action Plan, as well as the overarching economic reform agenda of Pakistan: the deregulation of the telecom sector. As of March 2003, despite the procurement of international consultants to assist in the drafting a roadmap for the deregulation of the telecommunications sector, there has been no official activity. The IT&T Division issued a working draft of the policy for public comment in December 2002, however since then, no further action has been taken.

3.3 Suitability to Pakistan's Context

When the National IT Policy and Action Plan (ITPAP) was announced in August 2000, it represented the culmination of a process that took four months to complete and “galvanized the entire Pakistani IT community to participate wholeheartedly”.¹² In that sense, it was a nearly unprecedented manifestation of the evolving public policy apparatus in the country—actualizing the long held contention of those outside government, that policy making must be a collective process involving all key stakeholders. Ironically, this very facet of the ITPAP is the source of possibly its greatest shortcoming. The ITPAP does not adequately address issues in the adoption of ICTs, or IT in the context of Pakistan's human and social development situation. One of the key reasons for this is that the policy was drafted by businessmen and IT professionals, with little input from economic policy makers, members of civil society and Pakistan's vast network of NGOs (non-government organizations).

4. PAKISTAN'S HUMAN AND SOCIAL DEVELOPMENT CONTEXT

The UNDP's Human Development Report for 2002 estimates Pakistan's population at the end of the 20th century at 141.3 million. Pakistan's per capita GDP is US \$1,928, which compares unfavourably with both the world average of US\$7,446, the South Asia average of US\$2,404, and the average for developing countries at US\$3,783. Per capita GDP represents only the tip of the iceberg as far as human and social development in Pakistan is concerned. Development needs to be viewed from the perspective of poverty, education, the status of women and access to healthcare.

4.1 Poverty

The poverty line in the country is defined by minimal level of consumption, that is 2350 calories per day (the rupee equivalent for this level of consumption is Rs. 673.54 per capita, per month).¹³ At that level, 33.5% of Pakistanis fall below the poverty line. To put Pakistan's poverty in perspective, that equates to *47.3 million people who live on less than 45 cents (US) a day*.

Poverty is a pervasive phenomenon in Pakistan, deep-rooted, and the major cause of Pakistan's low level of human development—Pakistan is 138th on the UN's Human Development Index—

particularly in terms of key human and social development indicators such as education, health and gender.

4.2 Education

Pakistan's literacy rate according to the Pakistan Economic Survey 2001-2002 stands at 49%. This figure indicates basic literacy, which is defined as the ability to "read a newspaper, and write a letter, in any language," rather than functional literacy, for which figures for Pakistan do not exist. The medium-term outlook for improved literacy rate is also limited by the fact that current primary school enrolment rates hover around 42%. At best, this will help maintain current literacy rates, rather than stimulating upward improvement.

4.3 Women

Women in Pakistan are among the least fortunate demographic group in the country. The Asian Development Bank reports that Pakistan is one of the world's few countries that has gender population imbalance to the tune of *108 males to every 100 females*. Female labour force participation rates in Pakistan are *more than 5 times lower* than men (13.7% for females, 70.4% for males)¹⁴. In education, the female primary enrolment is among the worst in the world in Pakistan, with a nationwide average 29% (Easterly, 2001).

4.4 Health

Healthcare is another area in which Pakistan faces severe challenges. The average life expectancy in Pakistan is 60.0 years, 4.7 years less than that of other *developing countries*, and almost seven years less than the world average life expectancy of 66.9. The Human Development Report 2002 states that 18% of all Pakistanis are malnourished, and 38% of children under the age of five are underweight for their age. 39% of Pakistanis do not have adequate sanitation facilities, and skilled physicians attend to only 20% of all births.

These statistics present a rather dismal state of human and social development in Pakistan. Volumes of research and commentary have tried to assess the political, economic and social causes for these shortcomings, yet on sum, there has been little to no improvement in the well being of the Pakistani people. The Pakistan Human Condition Report 2002 in fact reports an overall increase in poverty since the 1970s, all while Pakistan's GDP grew at a rate of over 5% for over two decades, and while inflows of aid—loans and grants—from friendly countries and donor agencies flooded the country—particularly in times of geopolitical instability such as the Afghan-Russian War that began in the late 1970s, and the US War on Terror, following September 11, 2001.

All of the human and social indicators in Pakistan are essentially indicative of deep-rooted inequality in the country. The urban-rural divide, the gender divide and the gulf between the elite—both urban and rural—and the poor are what define the challenge of development in Pakistan.

5. THE DIGITAL DIVIDE IN PAKISTAN

There is limited data available to gauge the exact dimensions of the digital divide in Pakistan. Experience from other nations however suggests that the fault lines for the digital divide will follow the same pattern as other human, social and economic divides in society. In Pakistan's case, there are added compelling reasons to believe that there is a deep and persistent digital divide in the country.

Urban Bias of Infrastructure: Despite massive growth in infrastructure, Pakistan's electricity supply grids, the fixed line telephone network, and the cellular network are all heavily skewed towards urban areas where reservation prices, purchasing power, and user demand are greater.

Language Barrier: Internet access, almost ubiquitous as far and wide as the fixed line network extends, is relatively meaningless for people, who cannot speak, read or write English. The national language of Pakistan, Urdu, is yet to have a standardized computer script, and regional languages are therefore, much further away from making a useful appearance on the Internet. The limited Internet content in Urdu that does exist is almost entirely image-based, which means that upload times are significantly higher, and accessibility is therefore curtailed. The absence of Urdu on the Internet can be explained through both a supply and demand side failure. Either enough investment has not been made into developing Urdu-language content, or enough people have not demanded Urdu language content, for there to be a justification for the development of an Urdu script. In either case, it is a manifestation of the yawning digital divide in Pakistan.

Cost of Access: While the Internet itself is relatively easy to access, given a phone line and a computer, the costs related to procuring a computer are prohibitively high, even as prices plummet. A run-of-the-mill Pentium II computer can cost between Rs. 10,000 and Rs. 15,000. In light of a poverty line of about Rs. 674 per month, only the moderate to sufficiently wealthy of Pakistan can afford such costs.

6. INFORMATION, KNOWLEDGE AND HUMAN & SOCIAL DEVELOPMENT

There is something unique and distinguishing about ICTs that makes them significantly more complex than other technologies. The array of useful things that ICTs do is unprecedented—no other technology offers as diverse and rich a spectrum of utility, as do ICTS. More importantly, the scale, speed and scope of the way ICTs do them are unprecedented. By very virtue of their nomenclature, ICTs have a significant impact on the availability of and access to information. Information itself represents the proverbial tip of the iceberg. Using ICTs, knowledge—the organization and presentation of information—can travel from one place to another, uninhibited, and unfettered. Herein lies the spectacular nature of the modern day, “knowledge-based” economy. It recognizes and rewards the creation, pursuit, acquisition and application of knowledge to all spheres of life.

6.1 The Relationship between Information and Knowledge

The relationship between knowledge and information is an important one, and it underscores the tremendous potential for the role ICTs can play in the development equation. Information is any data gathered in any way—with no inherent qualitative connotations and no underlying assumptions about integrity or reliability. In contrast, knowledge connotes understanding obtained through one's own or other peoples' studies and observations of reliable information. "Knowledge therefore also connotes analysis and deduction while information at best only permits induction" (Sharma, 2002). Knowledge is the evolved, more refined manifestation of information. This evolved status of knowledge is what makes it a central element of the development equation. Since, "knowledge is the sense that people make of information and is infused with the insights, expertise and capacities of those who have it" it plays a critical role in people's ability to process, interpret, evaluate and deploy information in their own context in pursuit of their own interests (Lloyd-Laney, 2003).

Different societies have different information regimes and knowledge structures. All societies however require the constant and consistent growth of knowledge, both in magnitude and in diffusion, in order to sustain themselves. The importance of knowledge and information to development cannot be overstated. Knowledge empowers individuals, organizations and communities by providing them with choices far beyond those that may be available in the absence of knowledge. Those choices generate opportunities for increased participation—economically, socially and politically (CIDA, 2002). ICTs offer infinite potential to societies for dealing with and leveraging knowledge. Since knowledge, or organized information, is a fundamental building block of all societies, regardless of their level of development, ICTs represent a universal opportunity for an improved social and human condition.

7. WHAT ICTS CAN DO FOR DEVELOPMENT

Traditional views of the mechanisms for information delivery include direct personal delivery, and printed material while knowledge delivery takes place at institutions such as schools and universities. The evolution of ICTs however, and the increased access to, and capacity of ICTs provide potentially enormous increases in efficient information delivery, while simultaneously injecting synergetic efficiencies into knowledge acquisition and creation (Sharma 2002). In the context of the social and economic function of technology (and by extension the development of a country), the significance of ICTs is thus two-fold.

7.1 ICTs as Process-Enablers

ICTs serve as instruments that improve the speed, efficiency and effectiveness of processes. Traditionally, these processes are seen to be predominantly those that relate to purely commercial economic activity. Since the challenge of development is one that entails economic growth, the symbiosis of ICTs and development is a natural one. In addition, the myriad challenges of development also entail the successful conduction of complex, multifarious and wide-ranging processes. These too can be subject to the same improvements ICTs offer to commercial activity. Finally, the distinction between purely commercial economic activity, and

purely social and human development activity (both by the public sector and civil society) is one that is increasingly ambiguous. For good reason, given the efficacy of public-private partnerships, the enormous impact of civil entrepreneurship, and the pool of private sector resources commonly employed by civil society and the public sectors in developing countries such as Pakistan. From every conceivable angle then, ICTs have a vital role to play in the improved efficiency, speed and effectiveness of the social and human development agenda.

7.2 ICTs as Substance Enablers

ICTs assist in the proliferation of knowledge. The substance of development is knowledge. The criticality of knowledge to development is founded not only by the inherent empowering nature of knowledge for individuals, organizations and communities, but also by the specific benefits that accrue from the leveraging of knowledge in all spheres of life. This aspect of the link between ICTs and development is crucial to both the identification of opportunities that exist for agents of social and human development.

Both the process and substance elements of the ways in which ICTs serve social and economic functions has been demonstrated widely, first generation ICTs such as the wireless telegraph improved the administrative and managerial capacity of governments to assure law and order, and collect revenue. Second generation ICTs such as radio and later television redefined the boundaries of communication, through both intangibles such as cultural permeability, and tangibles such as distance learning programmes administered through community radio stations and state-owned TV broadcasters.

The “new wave” of ICTs has fundamentally altered and enhanced the ICT function in society and in economics. Primarily because mediums such as the Internet, or instruments and specific applications like the Simple Message Service (SMS) available on all GSM-based cellular phone networks allow for two-way, interactive communication. The verifiability and integrity of exchanges through new technologies thus represents a revolution in the possibilities offered by technology in the social and economic sphere.

8. REDEFINING THE NOTION OF BRIDGING THE DIGITAL DIVIDE

According to the mission statement of the National IT Policy and Action Plan (ITPAP), the Pakistan government formulated the policy to enhance prospects for human and social development—“*transforming our society into a prosperous and dynamic one*”—and to bridge the digital divide—“*make the fruits of this technology available to every citizen.*”

In its current shape and form however, Pakistan’s policy response to the new global knowledge-based economy is more likely to *increase*, not decrease, the distributive inequalities that characterize the Pakistani economy and society. The ITPAP has no concrete provisions for social and human development—directly or indirectly—and fails to address the fundamental lack of *social infrastructure* in the country. Social infrastructure can be defined as the social conditions that are prerequisites for a society to engage with ICTs in a manner that is beneficial to all of society—not merely small segments of it.

To the extent that the ITPAP has catalyzed a significant momentum toward increasing the breadth and quality of ICT infrastructure in Pakistan, the policy has been successful. There are strong cases to be made for the incidental economic benefits that arise from telecommunications investments. The International Telecommunications Union contends that for every 1 million fixed line telephone subscriptions increase in an economy; there is a 1% increase in the GDP. This may, although empirically untested, be true. However it fails address the distributive nature of that increase in GDP. Given Pakistan's experience with GDP growth, any such growth is likely to be absorbed by an already advantaged elite, with little or no residual effect on poverty, on women's equality, on education levels and on access to healthcare.

Bridging the digital divide in Pakistan then is not a matter of simply universalizing Internet, telephone and cellular access. In Pakistan's context, physical access serves only a statistical utility. True access to ICTs requires simultaneous investments in key human and social indicators—education, gender and health—that would then feed back into a virtuous loop generating a demand for ICTs, and a supply of affordable, context-specific, and meaningful ICT applications.

9. POLICY RECOMMENDATIONS

In order for the human and social development agenda to be properly incorporated into national strategies and policies for ICTs, the following measures must be taken:

Reformulate the Policy Apparatus: Policymaking, not only in ICTs, but across the board, needs to be cognizant of the human and social development challenges Pakistan faces. It is inconceivable that a fully aware policy apparatus would knowingly produce policy that is skewed severely in favour of tertiary education, given that tertiary education has significance to only 0.8% of the eligible cohort of 18- year old Pakistanis. More importantly, poverty—and all its manifestations such as education and health—need to be made the central focus of all policy-making. The current commerce-centric nature of policy is unsustainable because it is more than likely to generate more inequality, rather than less. This is because the prerequisites of a commerce-centric policy—education, knowledge of the English language—are severely skewed in favour of a minority elite.

Change the Mindset—What's Good for Business is Good for Civil Society: ICT applications that can enable the process of development already exist; yet their application to Pakistan's scenario is limited. One example is poverty-reducing micro-credit programmes. As the lenders of last resort, micro-credit programmes in the public sector, as well as the private, not-for-profit and NGO sectors are the bulwarks against rapid poverty growth in Pakistan. Yet no reported incidents of ICT-applications that would support these programmes exist. The growing pool of IT qualified graduates in the country finds it increasingly difficult to get jobs, in the depressed global and domestic IT markets. Civil society, particularly those elements that work directly in areas of human and social development, needs to utilize these relatively cheap human resources to become *digitally enabled*.

Expand the Lens of Vision: The human capacity element of ITPAP is almost exclusively about the development of a massive cadre of IT graduates. ICTs however can be both the sources, and the product of any and every discipline of study, not just IT. More importantly, Pakistan lacks more than just IT graduates. Pakistan lacks graduates altogether. ICT-centric education policy is good if it grapples with using ICTs to deliver any kind of education, not so good if it has a singular focus on delivering IT/ICT education.

Invest in Social R&D: Research and development are among the most used clichés in the ITPAP. They relate exclusively to traditional science and technology. Social research and development—such as devising ways to develop cheap personal computers, producing Urdu content en masse, providing multimedia tools for villagers’ education—requires a little more creativity, and provides a lot more bang for buck. The long-term benefits of such investments are obvious—a 100% literacy rate for example would automatically ensure the relevance of Internet content, and the development of even more of the same.

Look Inside for Inspiration: The stimulus that drove the ITPAP formulation process was sourced in two geographic locations: Bangalore, India, and Silicon Valley, California. Policymaking that attempts to reproduce the success of similar interventions or events in other places at another time is risky business. The annals of developing countries are full of cautionary tales that advise against emulating success stories based in a different context. Pakistan’s approach to ICTs must be homegrown, capitalizing on its strengths, strategizing to minimize its weaknesses, and ensuring long-term sustainability. The purely commercial focus of the ITPAP (i.e. e-commerce and software exports: both of which have fizzled quite dramatically following the bursting of the “tech-bubble”) has rendered it relatively irrelevant in the new economic climate of 2003.

ENDNOTES

¹ A detailed analysis of the “bubble economy” is provided in Pearlstein, Steven, “*In a Bubble Economy, Recognition Comes too Late*”, Washington Post, Page A01, November 10, 2002

² The return of immigrant workers from the US—particularly those employed in new technologies, in areas such as Silicon Valley—to India, has been attributed to various factors, including the impact of the terror attacks of September 11, 2001, but a sense of contributing to the ‘homelands’ development is cited as one of the chief motivations for reverse migration. From, Vonderheid, Erica, “*India’s Brain Drain May Reverse Flow*”, The Institute, Institute of Electrical and Electronics Engineers (IEEE), July 2002

³ The “dot.com” phenomenon is the term used to describe the proliferation of Internet-related companies during the late 1990s that developed business plans, acquired funding from banks and venture capital funds, reaped the rewards of successful initial public offerings (IPOs) and soon afterward, became insolvent upon the corrections in the equities markets in the US.

⁴ As related on the Ministry of Science and Technology website (<http://www.most.gov.pk>)

⁵ At the time of the approval of the National IT Policy and Action Plan, IT and telecommunications policy and regulation was the domain of the Ministry of Science and Technology. In November 2002, the MoST was split into the Ministry of Information Technology, and the Ministry of Scientific and Technological Research.

⁶ Simply put the implication of this dual regulatory structure implies that a cable operator must get approval from PTA for the provision of value added services (such as Internet access) over cable, and must get approval from PEMRA for the provision of broadcast TV.

⁷ From “*Summary of Final Report to the President*”, Steering Committee on Higher Education, Government of Pakistan, August 2002

⁸ From “*Pakistan Human Condition Report 2002*”, Centre for Research on Poverty Reduction and Income Distribution, Planning Commission, Government of Pakistan, 2002

⁹ Ibid.

¹⁰ Statistics for Internet access, Internet users, bandwidth costs and cellular usage all originate from the IT&T Division. These particular statistics are widely accepted to be reflective of the true nature of the telecommunications infrastructure in the country.

¹¹ From “*ITU Telecommunications Indicators*”, International Telecommunications Union, Geneva, 2001

¹² From “*National IT Policy and Action Plan*”, IT&T Division, Government of Pakistan, 2000

¹³ Ibid.

¹⁴ From “*Labour Force Survey 1999-2000*”, Federal Bureau of Statistics, Islamabad, 2001

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