The Development Divide in a Digital Age

An Issues Paper

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Contents

Tables

Preface

The international community is engaged in a number of important efforts to harness information and communications technologies for development. Leaders of the G–8 countries, meeting in Okinawa, recently established the Digital Opportunity Task Force. The United Nations Secretary-General, acting upon the suggestion of ECOSOC, is creating an ICT Task Force. The International Telecommunications Union has called for a World Summit on the Information Society, to be held in 2003.

One of the principal objectives of these efforts, and many others, is to improve the effectiveness of co-ordination, so that the actions of different groups and institutions are mutually reinforcing. Certainly it is necessary to use available resources wisely. But the need for coherence in development co-operation should not overshadow the necessity—also clearly expressed in these initiatives—to leave space for diversity. In the ICT field, as in any other, there are no standard models for success. Each case is to some extent unique; and to harness the enormous potential of ICTs for development requires careful consideration of specific regional, national and local situations.

In the following pages, Cynthia Hewitt de Alcántara highlights the diversity of applications and services usually subsumed under the acronym ICT, and she urges greater originality in devising programmes that put some of these tools to good use for development. She also draws attention to the frequent contradictions between hopes for ICT-led progress and the actual course of change in particular circumstances. The gap between claims and accomplishments is usually associated with insufficient attention to the broader social, institutional and policy environment that determines the usefulness of specific ICT initiatives. Often the local knowledge on which to base effective decision making in this field is simply not available.

Action-oriented research and dialogue within developing countries can provide the kind of insight required to develop innovative ICT programmes of relevance to concrete local situations. Therefore, as the international community attempts to ensure more equitable access to information and communications around the world, it should consider collaboration on a number of fronts: not only improving the physical infrastructure and the economic climate for the extension of modern technologies, but also strengthening the capacity for analysis and debate on ICT issues in relatively more disadvantaged countries and regions. This, in turn, can improve the coherence of development policy from the bottom up.

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Summary/Résumé/Resumen

Summary

This paper considers the role that information and communications technologies (ICTs) can realistically be expected to play in improving the level of living and quality of life of people in different parts of the world. It focuses above all on low-income countries, where most development assistance efforts are concentrated and where the challenge of utilizing ICTs effectively is greatest.

The title of the paper reflects its central argument. The *digital divide* is an integral part of a much broader and more intractable *development divide.* The likelihood that people in low-income countries can improve their life chances is often sharply limited not only by their lack of access to modern means of communication and sources of information, but also by a complex network of constraints ranging from unresolved problems of poverty and injustice in their own societies to the structure and dynamics of the global economic system.

When designing ICT programmes in developing countries, these broader constraints must be explicitly taken into account. Thus, at the international level, discussion of possibilities to use the Internet for improving trade and employment opportunities in low-income countries must be accompanied by a frank evaluation of impediments associated with the current global financial and trade regime. If the surrounding context for proposed innovation is not sufficiently analysed, and remedies for pressing economic problems addressed, many well-meaning efforts will have short lives and minimal results.

Lack of attention to the macroeconomic environment (and to deficiencies in basic physical infrastructure and public sector capacity) frequently leads to over-optimism concerning the development potential of e-commerce and telework in the majority of Third World countries. Inattention to these factors can also lessen possibilities for success in other areas. Even the most apparently local initiative—like the provision of access to the Internet in a Third World school or clinic—is likely to fail if that country's debt burden makes it virtually impossible for the government to maintain adequate programmes of public education and health. Similarly, it is unlikely that the potential of ICTs to improve public administration will be realized when cash-strapped local governments cannot improve incentives within an underpaid and thoroughly demoralized civil service.

Better co-ordination between international ICT initiatives and broader debates on finance for development is thus essential. If the new technologies are to be used well in the struggle against disadvantage, there must also be improved co-ordination between those who work on ICT programmes in development ministries and agencies, on the one hand, and colleagues who follow the sometimes arcane debates on telecommunications and information policies within international organizations like the ITU, WIPO and the WTO, on the other. A development focus is notably lacking in most of these technical debates, yet their outcomes directly affect conditions of access to, and use of, information technologies across the globe.

Turning from international to national policy environments, the paper considers differences among Third World countries in their capacity to use information technologies for development. The most successful efforts to incorporate modern technologies in national economies have occurred in countries with strong and efficient states, as well as a firm commitment to invest in education. In some cases, privatization of the telecommunications infrastructure has been important, but in others it has not. As numerous studies have pointed out, the quality of public service and public regulation are far more significant variables than the structure of ownership. There are virtually endless combinations of the latter, ranging from full state control through different kinds of public-private partnerships, to fully private initiatives—all of which can be effective under certain conditions.

To a very large degree, low-income countries depend on foreign institutions and actors to create both an adequate telecommunications infrastructure and a regulatory framework that is progressive and fair. Development assistance is crucial in this regard. The effort is likely to be more effective if it takes place within the context of national ICT strategies, which make explicit the need to adapt available technical and economic options to the needs of specific countries. These strategies should also provide a framework for better national co-ordination of many disparate efforts, by NGOs and others, to use ICTs to improve public administration and social services, and to support democracy in Third World countries.

It is important to keep an open mind about the kinds of ICTs that are likely to be most appropriate for these purposes. There is a tendency at present to centre discussion of information and communications technologies around the Internet and to channel development assistance largely toward facilitating access to it. But cutting-edge applications are not always what people need most. In some cases, Internet use may prove too expensive or too difficult for local people to maintain, and thus be unsustainable. And in others, the Internet is simply not the best medium for supporting local socioeconomic and political progress.

The ICT revolution is lending old technologies new relevance. In many parts of the world, mobile telephones are transforming people's quality of life. New digital radio stations are reaching a wide public in an interactive way through call-in programmes. Moreover, when reporters are equipped with mobile phones, their minute-by-minute monitoring of local elections—reported by radio—is making a significant difference in the transparency of electoral processes. Satellite television enormously expands the range of programming available to inhabitants of countries whose governments, until recently, could limit television reception to a few state-run channels. Video cassettes perform a somewhat similar function, providing uncensored news to a network of viewers, at the same time that cassettes allow millions of migrants to stay in touch with their families back home. Even such relatively simple technologies as the fax and photocopier have profoundly transformed the climate for political mobilization in some regions. A recent article on ICTs in the Middle East, for example, presents analysis of new tools for democratization under the heading "Fax, copy, rewind".

At the grassroots, just as at the national policy level, no single ICT strategy is likely to prove most effective in all cases. Decisions concerning support for one ICT approach or another can only be taken following evaluation of concrete local situations. Furthermore, in the process of designing an appropriate local strategy for using ICTs to the benefit of disadvantaged groups, success will depend at least as much on understanding the structure of economic and political constraints affecting people's livelihood as on remedying immediate problems of access to ICTs. The paper provides a series of examples to illustrate the point that improved access to information or communications is a vital element in people's potential well-being; but if surrounding institutions and policies work against empowerment, new technologies cannot accomplish miracles. What Michael Lipton has called "the principle of joint requirements", in attempting to deal with poverty, is applicable as well to all areas of work on ICTs. Specific programmes for local improvement should only be financed in conjunction with careful attention to broader issues that determine whether an "enabling environment" can be created for development.

Research can play a critical role in generating knowledge about what particular groups and countries do need, and about what approaches seem to be most effective in resolving specific problems. In fact, strengthening institutional capacity for analysis and debate in Third World countries is an indispensable element in the construction of knowledge societies. It can improve the quality of information on which effective policy must be based, as well as the solidity of the political process that stands behind formulation and implementation of that policy. It can also provide an opening for donors to reconsider their own role in the promotion of development, perhaps recasting their efforts in a more participatory fashion.

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Résumé

L'auteur s'interroge ici sur l'amélioration du niveau de vie et de la qualité de la vie que les citoyens de diverses régions du monde peuvent raisonnablement attendre des techniques de l'information et de la communication (TIC). Son attention se porte surtout sur les pays à faible revenu sur lesquels se concentre la plus grande partie de l'aide au développement et où le défi représenté par l'utilisation efficace des TIC est le plus grand.

Le titre du document est révélateur de son argument central. La fracture entre développement et sous-développement est la cause fondamentale de l'inégalité existante dans l'accès aux nouvelles technologies. Pour les habitants des pays à faible revenu, les chances de vivre mieux sont souvent très limitées, non seulement par l'inaccessibilité des moyens de communication et des sources d'information modernes, mais aussi par un ensemble complexe de contraintes allant des problèmes de pauvreté et d'injustice que leur société n'a pas encore résolus, à la structure et à la dynamique du système économique mondial.

Or, ces contraintes d'ordre plus large doivent être explicitement prises en compte lors de la conception de programmes touchant à l'information et à la communication dans les pays en développement. Ainsi, au niveau international, le débat sur l'amélioration, par l'Internet, des débouchés commerciaux et des possibilités d'emploi dans les pays à faible revenu, doit s'accompagner d'une évaluation franche des obstacles liés au système mondial actuel des finances et du commerce. Si le contexte de l'innovation proposée n'est pas analysé avec assez de rigueur et si l'on ne s'attaque pas aux problèmes économiques les plus urgents, nombre d'efforts bien intentionnés seront condamnés à brève échéance et ne donneront que des résultats minimes.

Quiconque ne porte pas l'attention voulue à l'environnement macro-économique (ainsi qu'aux faiblesses de l'infrastructure matérielle et à la capacité insuffisante du secteur public) est souvent amené à se montrer trop optimiste sur le développement potentiel du commerce électronique et du télétravail dans la majorité des pays du tiers monde. La négligence de ces facteurs peut aussi réduire les chances de succès dans d'autres domaines. Même une initiative des plus locales en apparence, comme la connexion à l'Internet d'une école ou d'un dispensaire du tiers monde, risque d'échouer si le gouvernement, accablé par la charge de la dette, est dans l'impossibilité pratique de financer des programmes satisfaisants en matière d'éducation publique et de santé. De même, il est peu probable que les TIC améliorent l'administration publique comme elles le pourraient si le manque de crédits empêche les gouvernements locaux d'encourager comme il le faudrait une fonction publique sous-rémunérée et complètement démoralisée.

Il est donc essentiel que les initiatives internationales touchant à l'information et à la communication soient mieux coordonnées et que le financement du développement fasse l'objet d'un plus large débat. Pour que les nouvelles technologies soient bien employées dans la lutte contre l'inégalité, il faut aussi une meilleure coordination entre, d'une part, ceux qui travaillent sur des programmes touchant aux TIC dans les ministères et institutions de développement et, d'autre part, les collègues qui suivent les débats parfois obscurs auxquels donnent lieu les politiques des télécommunications et de l'information dans des organisations internationales telles que l'UIT, l'OMPI et l'OMC. La dimension du développement fait visiblement défaut dans la plupart de ces débats techniques dont les résultats affectent pourtant directement les conditions d'accès aux techniques de l'information et leur utilisation dans le monde entier.

Passant de l'environnement international à la scène politique nationale, l'auteur examine ce qui différencie les pays du tiers monde sur le plan de l'aptitude à mettre les technologies de l'information au service du développement. Les pays qui ont le mieux réussi à intégrer les techniques modernes à l'économie nationale sont ceux qui ont un Etat fort, performant et fermement résolu à investir dans l'éducation. Dans certains cas, la privatisation de l'infrastructure des télécommunications a eu de l'importance, dans d'autres, pas. Comme l'ont révélé de nombreuses études, la qualité des services publics et de la régulation publique est une variable beaucoup plus importante que le régime de propriété. Or, pour ce dernier, les combinaisons sont pratiquement infinies, allant du contrôle total de l'Etat aux initiatives

entièrement privées, en passant par différentes sortes de partenariats entre le public et le privé, et toutes peuvent être performantes dans certaines conditions.

Les pays à faible revenu sont dans une très large mesure tributaires d'institutions et d'acteurs étrangers pour la mise en place d'une infrastructure satisfaisante en matière de télécommunications et d'un cadre de régulation à la fois progressiste et équitable. L'aide au développement est cruciale à cet égard. Elle a plus de chances d'atteindre son but si elle s'inscrit dans le contexte de stratégies nationales, qui rendent explicite la nécessité d'adapter aux besoins du pays les options techniques et économiques s'offrant en matière de TIC. Ces stratégies devraient aussi fournir un cadre général incitant à une meilleure coordination sur le plan national, des efforts disparates déployés par des ONG et d'autres pour que les TIC servent à améliorer l'administration publique et les services sociaux et à consolider la démocratie dans les pays du tiers monde.

Il est important de garder une grande ouverture d'esprit face aux types de TIC ayant les meilleures chances de servir ces objectifs. On a actuellement tendance à focaliser sur l'Internet la discussion des technologies de l'information et de la communication et à utiliser dans une large mesure l'aide au développement pour en faciliter l'accès. Mais les applications de pointe ne sont pas toujours ce dont les populations ont le plus besoin. Dans certains cas, l'Internet peut se révéler trop difficile ou trop coûteux à l'usage local, et donc non viable. Dans d'autres, il n'est pas l'instrument le plus apte à soutenir le progrès socio-économique et politique au niveau local.

La révolution des TIC confère à d'anciennes technologies une utilité nouvelle. Dans de nombreuses régions du monde, les téléphones portables sont en train de transformer la qualité de la vie. Les nouvelles stations de radio numériques atteignent un large public de manière interactive par des émissions à lignes ouvertes. Par ailleurs, lorsque des reporters équipés de téléphones portables suivent pas à pas le déroulement des élections locales et en rendent compte à la radio, ils ajoutent beaucoup à la transparence du processus électoral. La télévision par satellite élargit énormément l'éventail des émissions proposées dans les pays où le gouvernement, récemment encore, limitait la réception à quelques chaînes publiques. Les cassettes vidéo remplissent une fonction comparable en apportant des nouvelles non censurées à un réseau de spectateurs, tandis que les cassettes permettent à des millions de migrants de rester en contact avec leurs familles restées au pays. Même des technologies relativement simples telles que le télécopieur et le photocopieur ont, dans certaines régions, profondément transformé le climat en faveur d'une mobilisation politique. Un récent article consacré aux TIC au Moyen-Orient, par exemple, propose une analyse des nouveaux outils de démocratisation sous le titre "fax, copy, rewind".

Au niveau local, tout comme dans la politique nationale, aucune stratégie relative aux TIC n'a de chance de se révéler la plus efficace dans tous les cas. La décision de soutenir telle ou telle approche dans ce domaine ne peut se prendre qu'après évaluation de la situation locale concrète. De plus, lors de l'élaboration d'une stratégie locale de mise des TIC au service des groupes défavorisés, le succès dépendra au moins autant de la compréhension de la structure

des contraintes économiques et politiques affectant les moyens d'existence des populations que de la solution que l'on aura su ou non apporter aux problèmes immédiats d'accès aux TIC. L'auteur donne une série d'exemples pour démontrer qu'un meilleur accès à l'information et aux communications est certes capital pour le bien-être potentiel des citoyens mais que, si les institutions et les politiques militent contre leur autonomisation, les nouvelles technologies ne feront pas de miracle. Ce que Michael Lipton a appelé "le principe de conjugaison des conditions requises" dans la lutte contre la pauvreté s'applique à tous les domaines d'activité touchant aux TIC. On ne devrait financer des programmes spécifiques destinés à apporter des améliorations au plan local qu'après avoir soigneusement étudié des questions plus générales qui font qu'il est ou non possible de créer un "environnement propice" au développement.

La recherche peut jouer un rôle important en produisant un savoir sur les besoins particuliers de tel ou tel groupe ou pays et sur les démarches qui semblent les plus propres à résoudre des problèmes spécifiques. En fait, le renforcement de la capacité institutionnelle d'analyse et de débat dans les pays du tiers monde tient une place essentielle dans l'édification de sociétés du savoir. La recherche peut améliorer la qualité de l'information sur laquelle doit reposer une politique efficace, et donner de la solidité au processus politique qui précède nécessairement la définition et la mise en œuvre de cette politique. Elle peut aussi permettre aux donateurs de reconsidérer leur rôle dans la promotion du développement et peut-être de donner à leur action un tour plus participatif.

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Resumen

En este documento se considera el papel que objetivamente cabe esperarse que desempeñen las tecnologías de la información y de la comunicación (TIC) en lo concerniente a mejorar el nivel y la calidad de vida de las personas en diferentes partes del mundo. Se centra fundamentalmente en los países de bajos ingresos, donde se concentra la mayoría de los esfuerzos encaminados a la asistencia para el desarrollo y donde el desafío de utilizar dichas tecnologías es mayor.

El título del documento refleja su argumento central. La brecha entre desarrollo y subdesarrollo es causa fundamental de la inequidad en el acceso a las nuevas tecnologías. La probabilidad de que las personas de los países de bajos ingresos puedan mejorar su nivel de vida está a menudo considerablemente limitada, no sólo por su falta de acceso a medios de comunicación y fuentes de información modernos, sino también por una compleja red de restricciones, que abarca desde problemas no resueltos de pobreza e injusticia en sus propias sociedades hasta la estructura y dinámica del sistema económico mundial.

Al elaborar programas de tecnologías de la información y de la comunicación en países en desarrollo, deben considerarse explícitamente estas numerosas limitaciones. Así, a escala

internacional, el debate en torno a las posibilidades de utilizar Internet para mejorar las oportunidades comerciales y de trabajo en los países de bajos ingresos debe ir acompañada por una franca evaluación de las restricciones asociadas al régimen financiero y comercial actual en el mundo. Si no se analiza suficientemente el contexto para la innovación propuesta y si no se buscan soluciones para los problemas económicos urgentes, muchos esfuerzos bien intencionados no tardarán en abandonarse y obtendrán unos resultados mínimos.

La falta de atención al entorno macroeconómico (y a deficiencias en la infraestructura física básica y en la capacidad del sector público) a menudo conduce a un excesivo optimismo en lo que respecta al potencial de desarrollo del comercio virtual y del teletrabajo en la mayoría de los países del tercer mundo. La desconsideración de estos factores también puede reducir las posibilidades de éxito en otros ámbitos. Incluso es probable que fracase hasta la iniciativa aparentemente más local – como facilitar el acceso a Internet en un colegio o clínica del tercer mundo-, si la carga de la deuda de dicho país prácticamente impide que el gobierno mantenga los programas adecuados de educación y salud pública. De igual modo, es improbable que el potencial de las tecnologías de la información y de la comunicación mejore la administración pública, si los gobiernos locales, por falta de presupuesto, no pueden mejorar los incentivos en una administración pública mal pagada y totalmente desmoralizada.

De esta manera, es fundamental que mejore la coordinación entre las iniciativas que se basan en las tecnologías de la información y de la comunicación y los debates más amplios sobre los recursos para el desarrollo. Para que se utilicen adecuadamente las nuevas tecnologías en la lucha contra la desventaja, hay que mejorar la coordinación entre los que se dedican a los programas TIC, en ministerios y organismos internacionales por una parte, y por otra, sus colegas que a menudo siguen los misteriosos debates sobre las políticas de información y telecomunicaciones en organizaciones internacionales como la UIT, la OMPI, la OMC. En la mayoría de estos debates técnicos se observa una importante falta de atención al desarrollo y, sin embargo, los resultados de los mismos afectan directamente las condiciones de uso y de acceso a las tecnologías de la información en todo el mundo.

Al pasar del marco internacional al nacional, en este documento se consideran las diferencias entre los países del tercer mundo, en cuanto a su capacidad de utilizar las tecnologías de la información para el desarrollo. Los esfuerzos que han obtenido mejores resultados con respecto a la incorporación de las tecnologías modernas en las economías nacionales, se han desplegado en países con estados sólidos y eficientes, y comprometidos firmemente a invertir en la educación. En algunos casos ha sido importante la privatización de la infraestructura de las telecomunicaciones, pero no siempre. Como se ha señalado en numerosos estudios, la calidad del servicio público y de la reglamentación pública son variables mucho más importantes que la estructura de la propiedad. Existen combinaciones prácticamente interminables de propiedad, que abarcan desde el pleno control estatal, hasta diferentes tipos de asociaciones entre el sector público y el sector privado, y que llegan hasta iniciativas totalmente privadas. Todas estas pueden ser efectivas en determinadas condiciones.

Los países de bajos ingresos dependen en gran medida de instituciones y actores extranjeros para crear, tanto una infraestructura de telecomunicaciones adecuada como un marco normativo progresivo y justo. La asistencia para el desarrollo es fundamental al respecto. Es probable que los esfuerzos sean más efectivos si se despliegan en el contexto de las estrategias nacionales de las tecnologías de la información y las telecomunicaciones, que ponen de manifiesto la necesidad de adoptar las opciones técnicas y económicas a las necesidades de países específicos. Estas estrategias deberían facilitar asimismo un marco para mejorar la coordinación nacional de muchos esfuerzos de diversa índole, desplegados por las ONGs y otras entidades, para utilizar dichas tecnologías a fin de mejorar la administración pública y los servicios sociales, y de apoyar la democracia en los países del tercer mundo.

Es importante tener un criterio amplio en lo que respecta a los tipos de tecnologías de la información y de la comunicación que sean más apropiados para estos fines. Actualmente, el debate en torno a estas tecnologías tiende a centrarse en Internet, canalizando la asistencia para el desarrollo en gran medida hacia la facilitación del acceso a la misma. Pero las aplicaciones de vanguardia no siempre responden a las necesidades más urgentes de las personas. En algunos casos, el uso de Internet puede resultar excesivamente caro y de difícil manutención para las personas locales, resultando así insostenible. En otros, Internet simplemente no es el mejor medio de apoyar el progreso político y socioeconómico local.

A raíz de la revolución informática, las viejas tecnologías están adquiriendo nueva importancia. En muchas partes del mundo, los teléfonos móviles están transformando la calidad de vida de las personas. Las nuevas estaciones de radio digitales están llegando a un público amplio de modo interactivo, a través de programas en los que el público participa por teléfono. Además, cuando los corresponsales disponen de teléfonos móviles, sus reportes sobre las elecciones locales minuto por minuto –emitidas por radio- están logrando que haya una gran diferencia en la transparencia de los procesos electorales. La televisión por satélite da lugar a que aumente enormemente la gama de programas disponibles para los habitantes de los países cuyos gobiernos, hasta hace poco tiempo, podían limitar la recepción televisiva a algunos canales controlados por el Estado. Las cintas de vídeo desempeñan un papel similar, al ofrecer noticias no censuradas a una red de telespectadores, al mismo tiempo que permiten a millones de migrantes permanecer en contacto con sus familias en su país de origen. Incluso tecnologías tan simples como el fax y la fotocopiadora han transformado profundamente el marco para la movilización política en algunas regiones. Un artículo reciente sobre las tecnologías de la información y de la comunicación en Oriente Medio, por ejemplo, presenta un análisis de los nuevos instrumentos para la democratización, con el encabezamiento “Fax, copia, rebobinar”.

Tanto a nivel comunitario como de política nacional, es improbable que haya una sola estrategia en materia de tecnologías de la información y de la comunicación que sea más eficaz para todos los casos. Las decisiones relativas al apoyo de uno u otro planteamiento de estas tecnologías sólo pueden adoptarse tras evaluar las situaciones locales concretas. Además, en el proceso de elaboración de una estrategia local adecuada para utilizar estas tecnologías con objeto de que beneficien a los grupos desfavorecidos, el éxito dependerá, al menos por igual, de que se

comprenda la estructura de las limitaciones políticas y económicas que afectan a los medios de vida de las personas, y de que se remedien los problemas inmediatos de acceso a las tecnologías de la información y las telecomunicaciones. El documento contiene una serie de ejemplos para demostrar que el acceso mejorado a la información o a las comunicaciones es un elemento vital para el bienestar de las personas; pero si las instituciones y políticas existentes no son propicios a la redistribución del poder en favor de los que menos tienen, las nuevas tecnologías no pueden hacer milagros. Lo que Michael Lipton ha llamado "el principio de las condiciones conjuntas", al tratar de hacer frente a la pobreza, también puede aplicarse a todas las esferas de estudio de las tecnologías de la información y de la comunicación. Los programas específicos para la mejora a nivel local sólo deberían financiarse si se llevan a cabo con una especial atención a cuestiones más amplias que determinen si puede crearse un "ambiente propicio" para el desarrollo.

La investigación puede desempeñar un papel importante al ayudar a conocer las necesidades de los grupos y países concretos, y al plantear políticas que parezcan más eficaces para resolver problemas específicos. En efecto, reforzar la capacidad institucional de análisis y debate en los países del tercer mundo es un elemento indispensable en la creación de sociedades del conocimiento. Puede mejorar la calidad de la información en que debe basarse una política efectiva, así como la solidez del proceso político que sea necesario para la formulación y aplicación de dicha política. Asimismo, puede ofrecer una oportunidad a los donantes para que reconsideren su propio papel en la promoción del desarrollo, logrando quizá que se replanteen sus programas de manera más participativa.

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Introduction[1]

What contribution to development in different parts of the world can realistically be expected from information and communications technologies (ICTs)? What role can development assistance programmes play in making sure that important new opportunities are seized to improve the lives and livelihoods of people who need it most?

Rapid—some would say revolutionary—changes in ICTs during the past decade have lent these questions particular urgency. At the same time, however, they have made it very difficult to answer the questions convincingly. New products and services succeed each other with dizzying speed. And with each new demonstration of technological prowess, extraordinary claims are made. Recent breakthroughs in the fields of semiconductors and digital communications, it is said, will soon ensure that sharing information will be both instantaneous and relatively costless. The world will evolve—in fact, is evolving—toward a seamless "information society", organized in global networks, in which individuals and countries can escape the confines of poverty or underdevelopment, simply through exploiting new access to information. Societies can "leapfrog" over entire stages of economic and social reorganization formerly thought to be essential for the creation of modern nations. Furthermore, in such scenarios, the concept of national development—and of the nation state itself—tends to become less and less relevant, as the course of human progress is increasingly determined by free agents associating with like-minded others across the borderless world of cyberspace.

For those who engage in day-to-day efforts to improve the life chances of people in developing countries at the beginning of the twenty-first century, such claims can only provoke scepticism. They do not reflect the real world in which the vast majority live. Therefore, far from inspiring imaginative new approaches to development policy, they tend to close off avenues of discussion. The purpose of this paper is to re-open the discussion on a more realistic note, taking into account both the enormous potential of new information and communications technologies to improve people's lives, and the great difficulties thrown up by existing structures of power, patterns of resource distribution and social organization.

The paper focuses above all on lower-income developing countries, where most development assistance efforts are concentrated and where the challenge of utilizing ICTs effectively is greatest. Situations in advanced industrial societies, newly industrializing and middle-income nations, and countries in transition from socialism are sometimes mentioned as well, when it is useful to contrast less difficult circumstances with those prevailing in the majority of Third World countries. Making these distinctions among very different places is especially important

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[1] This paper is a result of collaboration between UNRISD and the Netherlands Minister for Development Co-operation. It was commissioned through the International Institute for Communications and Development (IICD), in The Hague, and discussed at a series of seminars held at the Netherlands Ministry of Foreign Affairs during early 2001. Piet de Lange (Division for Research and Communication, Netherlands Ministry of Foreign Affairs) played a central role at all stages of writing. Peter Ballantyne (IICD), Solon Barraclough (UNRISD), David Woolnough (DFID), Sergio Alcántara Ferrer and participants in the Ministry seminars provided many useful ideas. Responsibility for the final argument is nevertheless mine alone.

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because a number of well-known assertions concerning developmental applications of ICTs rest on experiences in high- or middle-income countries, and are simply assumed to be valid in other settings, although that may not in fact be the case.

There is no doubt that improved access to information and communications is central to improving the lives of people in the Third World. For example, a large part of the population of lower-income developing countries—as well as disadvantaged groups in highly unequal middle-income nations—desperately need access to a telephone. Few would doubt that remedying this situation is one of the imperatives of our day. Citizens, or potential citizens, also need the kinds of information that vigorous promotion of independent radio and television can provide. And institutions in many Southern countries, ranging from public bureaucracies and large enterprises to small businesses and NGOs, have obvious need to improve their efficiency and effectiveness through access to computers and basic software—even if these are stand-alone personal computers with no networking capabilities whatsoever.

If there were no constraints (or relatively malleable constraints) on governments, communities and individuals attempting to improve the quality of life in the developing world, all of this would be done, and much more—just as it has been done in the advanced industrial world. Unfortunately, however, there are extremely serious constraints on using ICTs to improve the situation of most people in the Third World—constraints flowing not only from unresolved problems of poverty and injustice in particular countries and regions, but also from the structure and dynamics of the global economic system. The inhabitants of lower-income developing countries do not have the same options that Northern counterparts take for granted. They do not confront the same structure of opportunity. Furthermore, whatever efforts may be made to improve access to ICTs in these countries take place within extremely varied cultures and social structures, which shape the outcome of technological change in particular ways. Both the need for certain ICT applications and products, and the outcome of providing them, may thus differ markedly from what might be expected in advanced industrial societies.

In the following pages, some of the special dilemmas surrounding the introduction and use of ICTs in Third World settings are highlighted. These dilemmas are only partially technical. To a far greater extent, they are economic, social and political; and when they are brought into the discussion, the futility of imagining that ICTs alone provide a way out of underdevelopment is patent. Although broadening access to new information and communications technologies is often a *necessary* step in improving the climate for progress in Third World settings, it is almost never a *sufficient* one. At every stage in the discussion of how to use new information and communications technologies for social and economic improvement, it is therefore essential to ask not only whether a particular problem is amenable to any improvement through the introduction of ICTs, given surrounding constraints, but also—assuming that this answer is

positive—how to shape the broader environment in ways that may make particular applications and services as useful as possible in the struggle against disadvantage.[2]

The tone of the following discussion is tentative and questioning. This reflects real gaps in knowledge about the way different kinds of ICTs are being used in specific Third World contexts. Given the newness of many digital possibilities, there is often relatively little accumulated experience on which to draw. The field is open for experimentation and learning. As it will be pointed out below, this presents an unusual opportunity for development co-operation to play a new role—moving from reliance on standard policy prescriptions, designed from above, to much more open-minded support for Third World research, evaluation and dialogue on a subject of central importance to the course of world development.

What Are ICTs? Perspectives on a Complex Technological Field

The enormous diversity of applications and capabilities included within the general category of "information and communications technologies" poses analytical and practical challenges for people who work in the field of development.[3] When considering the implications of ICTs for improving the quality of life of particular groups, should one think primarily about broadcasting and publishing (radio, television, newspapers and so forth), or about telecommunications (including what now are known as "plain old telephones", mobile phones, satellite communications), or about the quantum leaps in computing capacity that have marked the past half century? Or should one simply concentrate on understanding the uses of the Internet?

Although certain products and services will be more relevant in some situations than in others, the general answer to this question is that one must keep all of these applications in mind. In the first place, the current process of convergence within the ICT field means that differences among these formerly separate areas are rapidly disappearing. From the 1980s onward, digitalization—the process through which information, whether relayed through sound, text, voice or image, is converted into the binary language of computers—has facilitated integration of computers, telecommunications, broadcasting and consumer electronics. Since information now increasingly flows through all these systems in a form that computers understand, this spins off remarkable new combinations of capabilities and products. For the public at large, the Internet provides the most tangible illustration of benefits that flow from digital convergence.

As convergence occurs, possibilities within the field become more complex rather than less so. For example, the Internet is now rightly praised for its unprecedented potential to link people into new interactive networks, which—unlike "old" communications technologies such as

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[2] In a more general discussion of the struggle against poverty, Michael Lipton (1996) refers to this imperative as "the principle of joint requirements". UNRISD calls this the "integrated approach to development" (Wolfe, 1981 and 1996).

[3] The Organization for Economic Co-operation and Development (OECD) panel of statistical experts defines ICTs as the set of activities that facilitate, by electronic means, the capturing, storage, processing, transmission and display of information (see http://www.oecd.org/dsti/sti/it/stats/). For a breakdown of products contained under each of these headings, see Hamelink (1997:3). Like many colleagues in the ICT field, Hamelink would not insist that all activities be facilitated by electronic means alone.

television and radio—allow all members of the network to take an active part in discussions with each other. But it is important to remember that somewhat similar possibilities are being created through new uses of radio and telephone technologies. In many parts of the world not yet served by the Internet, new digital radio stations are reaching a wide public in an interactive way through call-in programmes (in which people give their views on the air). Reporters equipped with mobile phones are greatly improving the quality of local news programmes. And when resource-strapped radio or television stations have access to e-mail (but not to the World Wide Web), they can now download news bulletins and pre-packaged audio-visual programmes sent out by NGOs as e-mail attachments.

It is important, then, to maintain an open mind about which of the many options contained in the ICT field are more relevant and useful in particular social settings. Certainly, mobile telephones have enjoyed extraordinary success in developing countries during the past few years—much more so than the Internet, because they meet immediate communications needs in places where access to fixed telephone installations is not available. Compared to the cost implied in travelling from out-of-the-way places to the nearest stationary telephone, using a mobile telephone can be relatively inexpensive, especially when it is shared among neighbours. And it allows for privacy, which can be at a premium in situations where many people must live in close proximity.

Of course, promoting development involves more than facilitating access to needed devices and services. It also implies an effort to shape broader structures of opportunity in ways that further social and economic progress. This is another reason why groups and institutions working in this field must not lose sight of the complexity of information and communications technologies. Mobile telephones, digital broadcasting and the Internet are worthy of note in the history of world development. But they pale into insignificance when compared with the role of expanding computing power in changing the economies and societies of advanced industrial countries, and thus the nature of the world system.

Information Technologies and the Structure of Global Opportunity

Over the past 40 years, global computing power has increased a billionfold. The process has advanced exponentially since the invention of the microprocessor, or chip, in 1971. But even before that time, computers were being linked to telecommunications systems to provide essential infrastructure for the modernization of banking, shipping and aviation in the industrialized world. The international air transport network has been served by this kind of system since 1949, and the international banking settlement system since the 1960s. As new applications became available, they formed the backbone for the increasingly global operations of large corporations and for the expansion of world markets.

Contemporary trade and financial regimes are unthinkable without ICTs. Computer-mediated communications underlie the enormous expansion of air, sea and terrestrial transport that moves ever-greater volumes of goods and people around the world. They also facilitate the

virtually instantaneous movement of capital across borders, as investors shift over a trillion dollars a day from one country to another in search of profit. They allow multinational corporations to adopt new forms of production. In fact, the just-in-time strategies that define successful manufacturing today depend fundamentally on advanced communications and data processing networks. So do the outsourcing strategies that allow large corporations to lower their costs and reduce their direct responsibility for certain lines of production.

Quantum leaps in computing power, combined with remarkable advances in software for industrial and scientific purposes, allow companies and governments to accomplish extraordinary feats. Using state-of-the-art sonar imagery, petroleum prospectors can find oil fields on the deep ocean floor. Construction giants can design dams and dikes that protect low-lying areas by responding automatically to the conditions of the sea. Space probes send almost unbelievably clear pictures back to Earth. Powerful surveillance satellites hovering a few hundred miles above the planet capture and record millions of telephone calls and can provide photographs of almost any place on the globe at a resolution that allows the viewer to distinguish streets, buildings and vehicles.

This is only a foretaste of things to come. In fact, humankind is caught up in a self-reinforcing process of scientific and technological change that generates not only enormous opportunities, but also enormous risk. ICTs stand behind revolutionary new developments in biotechnology and genetic research, creating both the capacity to decode the human genome (and thus to help decipher the causes of disease) and the possibility that new forms of life can wreak havoc on the planet. ICTs are essential to research in robotics, which can both lighten the burden of work and create intelligent robots that might run out of control. And ICTs sustain cutting-edge research in nanotechnology (e.g., the creation of molecular-level robots), whose potential is as enormous as it is frightening.[4]

The accelerating pace of change, and the way evolving technologies have shaped the economies and societies of advanced industrial countries, are defining elements in the current context for world development. When combined with, and facilitated by, a growing commitment to liberal economic policies, they have contributed to the formation of a world economy and society in many ways more integrated than it has ever been before. People, goods and services, and capital flow through the international system with a facility never before possible. Goods consumed in one part of the world are increasingly likely to have been produced thousands of miles away. Inhabitants of different parts of the globe are more likely to be aware of other cultures than they ever could have been in the past. New structures of international governance provide forums for debate on problems that now are defined as “global”. Sociologists remark on “increasing interdependence at distance”, as the life chances of people (even in formerly remote areas) begin to intertwine in unsettling and unexpected ways.

[4] In an April 2000 article in **Wired** magazine, Bill Joy (co-founder of Sun Microsystems and co-author of the Java programming language) warned of nightmarish problems created by technologies like genetic engineering, robotics and nanotechnology that can unleash runaway, or non-reversible, processes and programmes. See a review of Joy’s article in Martin (2000:12).

This new global order offers unprecedented opportunities to some. But it also generates enormous disparities among people and countries, and these disparities are growing at an alarming rate. The income gap between the fifth of the world's people living in the richest countries and the fifth in the poorest was roughly 30 to l in 1960, 60 to 1 in 1990 and 74 to 1 in 1997 (UNDP, 1999:3). A recent study for the World Bank—the first study ever to calculate world income distribution on the basis of household surveys—confirms the seriousness of the situation. Between 1988 and 1993, the income of the richest 20 per cent of the world population increased by 12 per cent (more than double the rate of growth of mean world income, which was 5.7 per cent), while the income of the poorest quintile dropped (Milanovic, 1999). By the late 1990s, assets of the three richest billionaires in the world were greater than the combined GNP of all least developed countries.

The dynamics of current world development are thus fundamentally polarizing. Furthermore, these dynamics rest in good measure on the uses that have been made of ICTs over the past 50 years. Almost miraculous levels of well-being are being generated alongside an ever-growing groundswell of misery. Is there any reason to think that very recent changes in the products and services being generated within the information and communications fields can rapidly reverse the overall trend? Can the world expect to see a true breakthrough in development opportunities for poorer nations and households, as ICTs eliminate major barriers to progress?

ICTs and Qualitative Change in the Global Economic Context for Development: Evaluating Four Claims

The case for qualitative change in the global economic context for development—for a revolutionary improvement in the life chances of disadvantaged nations and groups, brought about by information technologies—rests upon a number of suppositions. The first is the belief that the nature of the world economy itself is undergoing fundamental change. In the "new economy" now under construction, it is said, existing limits to growth will be surpassed; and technological change will so significantly improve the global environment for development that everyone will benefit, no matter what their initial circumstances may be. This is an argument with considerable currency at the moment—a variation on the widespread belief among economists that growth will "trickle-down" to everyone, without any particular need to consciously redistribute benefits.

The second case for qualitative alteration in the economic context for development is put forward by those who see the emergence of a "knowledge economy", based not primarily on old-fashioned commodities and manufactured goods, but on services and products of the human mind. This claim is closely associated with two others: one holding out the hope that e-commerce will provide a powerful engine for growth in developing countries during coming decades, and another suggesting that the Internet will create millions of new jobs in Third World countries. On balance, none of these four claims seems very convincing; but all deserve closer scrutiny.

1. Growth and productivity: Implications of the "new economy" for development

If the latest developments in ICTs—greatly expanded telecommunications capabilities, new robots, new computer applications and new networking tools, like the Internet—enable industrial economies to produce and distribute goods and services far more efficiently than before, and thus to move toward new levels of growth, this should create an atmosphere of increased economic opportunity for many other countries around the world. For a short space of time during the latter 1990s, this seemed to be occurring. Heavy business investment in the latest ICT equipment and services in the United States did seem to lead to increased productivity, after almost a decade in which observers could find no sign of such a trend. And this, coupled with rapid growth of the American economy in the same period, lent support to the idea that advanced technologies were creating a "new economy", in which the average level of growth would not only be higher, but also more sustainable. Traditional problems associated with high growth, including tight labour markets and rising inflation, could be avoided. And in fact, in the view of some, many of the rules of economics could probably be discarded, as ICTs relaxed a number of existing constraints, including those within the investment market.

Sceptical economists have always doubted the veracity of the more wildly optimistic or revisionist elements in this argument. Many have pointed out the difficulties of proving that high growth has been causally related to investment in information and communication technologies, even in the United States. And in fact, one large study showed that sectors of the American economy that have invested most in ICTs have seen smaller than average productivity gains.[5] Others have pointed to the central role played by the Year 2000 phenomenon in fuelling extraordinary investment in technology sectors and thus in stimulating high rates of growth. This is a once-in-a-millennium phenomenon whose effects are quickly spent. Still others have noted that, contrary to what the "new economy" argument would lead one to expect, ICT investment has not yet led to increasing productivity in most of Europe or Japan.

Since growth began to fall sharply in the United States during late 2000 and early 2001, the idea of a "new economy" has become much more difficult to defend. The country seems headed for recession, taking much of the rest of the world with it; and sharp declines in stock markets suggest that unrealistic price/earnings ratios for technology stocks are as unsustainable in the new economy as in the old one.

Nevertheless it is still perfectly plausible that, when this recession is overcome, the incorporation of new ICTs—with all they imply in terms of rapidly falling communications and information costs—will eventually increase mean productivity and growth throughout the industrial world. This is the optimistic conclusion of a recent OECD (2000) study, which emphasizes complementary changes in the organizational structure and training programmes of member-country firms. The increase in average level of growth in the global economy may be much less dramatic than "new economy" prophets have hoped, but it may still be significant.

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[5] Dale Jorgenson and Kevin Stiroh, **Raising the Speed Limit: US Economic Growth in the Information Age**, May 2000; cited in Woodall (2000).

Would this turn of events really be sufficient, however, to stimulate strong and sustained growth in most of the developing world? And will the perennial problem of economic instability be overcome? There is little reason to support such a conclusion—particularly if macroeconomic policy continues to be oriented by a widespread commitment to austerity, and if most developing countries continue to struggle under a heavy burden of debt. A global effort to stimulate employment and high growth, combined with productivity gains, could make a significant difference in the overall climate for development. Finding a workable solution to the long debt crisis would be even more significant. But simply to talk about technology-induced efficiencies, without relating this to a changing macroeconomic climate, seems unrealistic.

On the question of overcoming periodic cycles of boom and bust, a similar point could be made. The new technologies by themselves play no role in reducing instability. On the contrary, in the current context they facilitate it by underwriting the broadening and deepening of business networks and production chains that span the world. As the 2001 *World Employment Report* notes, an increasingly integrated world economy amplifies the risk of instability.[6] Furthermore, in the financial sector, instantaneous computer-mediated financial markets are far more destabilizing than earlier, less technologically advanced systems. ICTs can surely be useful instruments for better financial management, if new institutions are eventually established to curb speculation. The key element in such a scenario, however, is policy reform at national and international levels—not the creation of a crisis-free "new economy".

In the meantime, the "new economy" looks very much like the old one, and it will continue to create the same environment for growth in developing countries as before. When the economies of advanced industrial countries expand, demand for some Third World products and services will increase; and when those economies contract, Third World exports will be extremely hard hit.

2. The "knowledge economy": Exporting intangibles?

One of the central problems confronted by many developing countries is slow growth of the international market for many of their traditional exports—particularly commodities like copper, tin and other basic metals. Innovation in the industrial world reduces dependence on primary products. "Copper is displaced by fibre optics. Natural rubber and jute are displaced by new synthetic materials". And the terms of trade for commodities in general move relentlessly downward.[7]

Such trends are, of course, less damaging for Third World countries that have been able to develop relatively strong industrial sectors—in some cases, within the rapidly growing field of ICTs. The Republic of Korea is a world leader in the manufacture of semiconductors. Malaysia, Singapore, Taiwan Province of China, and Thailand are major suppliers of mobile telephones, personal computers, monitors and disk drives. In fact, around 30 per cent of Asian export revenues are generated in the information and communication technology sector.

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[6] "Value chains integrated in real time create dependencies that, in turn, increase vulnerability to disruption at any stage in the chain" (ILO, 2001:4).

[7] See Sachs (2000). Petroleum is, for the moment, an exception. But innovation in the field of renewable energy (wind, water, sun) will eventually reduce this advantage.

Pointing to such examples, those who believe in the revolutionary potential of ICTs to improve the global context for development sometimes suggest that many Third World countries will be able to follow in the footsteps of the Asian Tigers—either importing the kinds of technical know-how they need to leapfrog into high-technology industrial production, or perhaps avoiding that stage altogether and going directly into some form of post-industrial knowledge economy.

Like the new economy, the knowledge economy is a concept that is intuitively compelling but extremely difficult to document. Those who use the term cite the increasing rate of (patented) technological innovation in modern societies—linked to the growing role of research and development activities in large corporations and the enormous facilitating effect of new information technologies. This, they suggest, creates a vast pool of knowledge that can be placed at the disposal of entrepreneurs the world over—although such a position seems at odds with current trends in the protection of intellectual property. At the same time, they envision a relatively lesser role for industry in the economies of the future, and a relatively greater role for services of all kinds. A frequently cited indicator of the increasing importance of the knowledge economy is thus longer-term growth in the service sector of advanced industrial countries.

Unlike an industrial economy, then, a knowledge economy rests to a large degree on intangibles. Its principal products are not material goods, but creations of the human intellect. Such an image is especially appealing in the wealthiest countries around the world. In societies in which most people's material needs are met, it is no doubt true that intangible goods (music, learning and a wide array of services) take on greater importance in the daily lives—and budgets—of the population. Furthermore, in any society, no matter what the level of living of its people, creations of the mind lie at the heart of well-being. (In this sense, the idea that a knowledge economy is new or modern is startlingly ethnocentric.) But in settings characterized by very low levels of living, development requires more than the provision of intangibles.

Like reliance on the new economy, then, too much emphasis on the knowledge economy allows its proponents to avoid addressing hard policy questions in the field of world development. Lower-income countries need to produce and distribute more basic goods and to generate more foreign exchange through international trade. They need not only more specialized know-how and education, but also more capital. What can these countries profitably export in the field of intangible goods and virtual services? Fashion design, art on the Internet, music, religious instruction.[8] Will this generate sufficient revenue to improve national social services, pay the foreign debt, strengthen basic infrastructure (ports, roads, electricity)?

3. E-commerce

The question can be answered in part by citing the undoubtedly important role that electronic commerce will play in the international economy of the future. The Internet is a vast and borderless bazaar, a potentially important new economic resource for anyone around the globe with a good idea, a novel product or a needed service to offer. It creates unusual openings for

[8] Pornography, including child pornography, should not be mentioned in the same sentence. But the phenomenal growth of this sector of the Internet suggests that this is an intangible product for which there is a ready market in all regions of the world.

small businesses to break into the market, at very low cost, and to reach a very large number of potential customers in any part of the world. It also provides modern firms with useful new tools for cutting costs and increasing the efficiency with which they manage their procurement and sales.

It is important to note, however, that e-commerce has not developed smoothly, even in the most industrialized and computer-literate societies. In 1999, it accounted for only 1 percent of total sales in the United States. For a number of reasons, including inadequate provision of security for electronic transactions, large numbers of consumers in Northern countries have been willing to shop online, but not necessarily to buy online. In addition, e-commerce ventures involving the physical delivery of goods (as opposed to the transmission of electronic programmes or services) require creation of a sophisticated warehousing and organizational infrastructure that has not been easy for start-up ventures anywhere to provide. And the opening of new, borderless channels of exchange has raised a series of questions concerning intellectual property rights, taxation and consumer protection that have yet to be resolved.

For the moment, the participation of Third World entrepreneurs in global e-commerce is marginal. No doubt, over the longer term, some large new Internet-based companies will spring up in developing countries to fill unmet or poorly met needs. And some small entrepreneurs—individuals and associations, public and private—will find a niche through the Internet within the international economy. But there is every indication that, indispensable as gaining access to the Internet may be, it is not by itself sufficient to markedly stimulate economic growth in Third World countries. Like every other element in the relation between new ICTs and development, many parallel improvements must take place in order for e-commerce to make any real qualitative change in the global structure of economic opportunity.

For example, although communication over the Internet is borderless and instantaneous, the sale of concrete products is not. If small businesses in developing countries would like to sell handcrafts or natural food products or fine shoes and clothing to customers outside their region, they must be able to count not only on a new ability to communicate with foreign consumers, but also on access to the infrastructure required to handle and ship these goods. They must also be supported by efficient banking services, with the capacity to receive payment through credit cards. These are not impediments in some parts of the developing world, but in others they seriously hinder efficient e-commerce.[9]

Furthermore, in places where the relevant support services are in place, increasing use of e-commerce implies significantly sharper competition from foreign products. Consumption through electronic markets is, after all, a two-way street. Just as it provides new opportunities for people in developing countries to sell in the North, it also improves possibilities for

[9] NGOs have provided assistance not only with building Web sites for small businesses in Third World countries, but also with providing the shipping and banking facilities that are so essential to success in e-commerce. PeopLink is an interesting example of this type of development organization. Through its Web site, it links small artisans in Latin American countries with potential Northern buyers. Then it ships handcrafts from its warehouse and receives payment, later credited to the artisans. Important though this kind of effort may be, it does not yet represent a self-sustaining business model. See http://www.peoplink.org.

developed-country firms to strengthen their presence in Southern markets. Seen from the perspective of most Third World businesses, this implies enormous risk. Most do not operate at levels of efficiency and technical capacity that allow them to compete with Northern firms, and they know that if local consumers can obtain foreign products and services more easily, they will do so.

The same dynamic holds for local business-to-business supply chains. According to a study prepared for the 2001 **World Employment Report**, only 26 per cent of business-to-business purchases are made domestically in Latin America, compared to 90 per cent in the United States.[10] The competitive advantage of large Northern firms is heightened by the likelihood that they will establish themselves first within key global markets and thus will build a dominant position that is difficult for latecomers to assail. In fact, this kind of advantage is currently being built into popular business software. Ricardo Gómez of Canada's International Development Research Centre (IDRC) reports that Microsoft's small-business version of Office 2000 allows users anywhere in Latin America to link directly to Office Depot megastores, now scattered across the hemisphere. Customizing that software to order office supplies from a local retailer is much more difficult.[11]

Intangible e-business—in investment services and insurance, for example—presents still greater challenges to Third World economies. As countries further liberalize their financial sectors, in compliance with WTO agreements and as a necessary condition for expanding their own ability to take advantage of e-business opportunities, they run the risk of facilitating capital flight. With Internet-based trade in services, it becomes still easier for better-off local inhabitants to keep money abroad and to manage it abroad. And this, in turn, increases pressure on Third World governments to pay investors well, even when this means keeping interest rates high, and thus reducing the access of national entrepreneurs to credit on terms they can afford.

Trade in services over the Internet also poses serious problems in the field of taxation. All governments around the world are wrestling with the fact that it is notoriously difficult to tax intangibles sold online, particularly if the proceeds are deposited in foreign banks. For developing countries, this can have particularly worrisome implications. Tax revenue as a percentage of GDP tends to be low already; and if e-commerce picks up markedly, income from both business and personal taxes will be affected (Wachtel, 2001; South Centre, 1999).

In sum, then, the Internet is a powerful instrument for increasing competition, but this competition takes place internationally on a far from level playing field. The Internet is also a device that tends to strengthen the position of consumers over both retailers and governments. If—in particular developing country circumstances—this weakens the ties between national consumers, on the one hand, and national suppliers and governments, on the other, then the

[10] See ILO (2001:9), chapter 3.4, "The enterprise in the digital economy".
[11] See Gómez (2000:74). Soete (1998) also notes the "'winner takes all' features in the production of many digital, non-rivalry goods" and suggests that "e-commerce will increasingly raise questions about competition policy".

dynamics of national economic development are fundamentally altered; but not in a way that stimulates broad-based economic progress.[12]

4. ICTs, employment and wages

No one really knows what the longer-term employment implications of the information revolution may be. All studies of trends in the advanced industrial countries point to deep dislocations in the labour market, associated with the rapid modernization of certain industries, the automation of areas like banking and telecommunications, and the transnational consolidation of corporate giants. Millions of people have lost their jobs during this process of reorganization, and millions more will undoubtedly do so. It is also true, however, that millions of new jobs have been created in ICT-related industries. On balance, the jury is still out (ILO, 2001).

Those who foresee significant improvement in the structure of economic opportunity in Third World countries, as information technologies spread, are convinced that "telework" will generate a great deal of new employment in coming years. They note that the Internet increasingly facilitates outsourcing of many routine corporate tasks, including data entry (particularly in the airline and insurance industries) and customer service, which can as easily be carried out in Kingston or Accra as in London. Smaller businesses in advanced industrial societies, like accounting and architectural firms, are also anxious to take advantage of well-trained people in developing countries who are willing to work for a fraction of Northern labour costs. And software companies are creating extensive networks of programmers across the world, to ensure that their projects can advance without letup, around the clock.

The ILO's **World Employment Report** estimates that up to 5 per cent of all service sector positions in the industrial countries could be relocated to developing nations. This would amount to about 12 million jobs—a tiny fraction of the overall number required. Certainly this income would be welcome in Third World countries—and, in fact, it is already welcome in the places where services have been outsourced. But the extent to which it can provide a strong stimulus to national development is uncertain. With the exception of some groups (like software programmers), it seems that most teleworkers—who are predominantly women—are receiving extremely low wages; and some of them work in the kind of modern-day sweatshop conditions that characterize export-oriented manufacturing throughout the developing world. Wages in data-entry and call service jobs in developing countries can be as low as one-tenth of those in the United States. Stress is high, not only because operators must work quickly, but also because they are subject to close electronic surveillance and monitoring. Labour rights are usually restricted. When they carry out their assignments in an "informal sector" setting, these teleworkers also have no right to social security, pensions, childcare or other social services (Pearson and Mitter, 1993).

Telework, in other words, is only as good a stimulus to improved living conditions as national laws and regulations require it to be. In advanced industrial countries, ministries of labour and

[12] Of course, e-commerce can also win customers away from local retailers in industrialized countries. Steinfield and Whitten (1999) suggest strategies for offsetting this danger.

social welfare are drawing up new guidelines for protecting those who engage in employment at distance, facilitated by ICTs. As the Danish Ministry of Labour pointed out in a recent report, "The form of new employment relationship entailed by IT development is a challenge to the government and to the collective bargaining system", and requires special attention. For Third World countries, however, it is difficult to insist on adequate standards in the highly competitive global market for outsourced jobs. Therefore, as a 1999 ILO study of data-entry work in Jamaica and Barbados explained, "the struggle for global competitiveness is being advanced to the detriment of workers' rights".[13]

Customized software services represent the high end of the Internet-related employment spectrum. In a small number of enclaves around the world, highly skilled computer programmers can make a very good living. The booming software industry in Bangalore, India, for example, creates new jobs for 60,000 to 70,000 engineering graduates per year. Their salaries have been rising at a healthy rate of 16 to 20 per cent per year since 1996, and now reach 20 to 40 per cent of the level prevailing in the United States.[14] The remarkable growth of the value of software exports—some 50 per cent per year, with revenue reaching almost $6 billion in 1999/2000—stimulates great hope that this will continue to spur job creation and contribute to national development.

Up to now, however, there has been little linkage between prosperous software enclaves and the wider regional and national economy.[15] Moveover, the ability of the Indian software industry to maintain very high levels of growth is in some doubt. To remain competitive, it must invest a great deal more in research. At present, it spends only 3.4 per cent of its revenues on research and development (R&D), compared to 14–19 per cent in leading Northern software companies, whose annual income is incomparably larger. Strengthening R&D capacity is particularly important, because as salary levels for programmers rise in India, the comparative advantage of what was once a relatively low-wage industry falls. At the same time, the growing scarcity of ICT professionals in the OECD countries creates incentives for Indian programmers to accept jobs abroad, thus increasing the cost of replacing trained workers in the national software sector.

The largest part of growth in ICT-related employment in India during the next few years will come not in software programming but in data entry and other low-end "back office" jobs. Even this kind of telework, however, is unlikely ever to be an option for the vast majority of people in the developing world. There is simply not sufficient demand for the services of most people who need to earn a living in Third World countries. Therefore until a way is found to stimulate broad-based growth in these economies, large numbers of people—both skilled and unskilled—

[13] Both the Danish Ministry report and the 1999 ILO report are cited in Di Martino (2001:104 and 51). More generally, Di Martino concludes that "the inherent problem of the first wave of offshore teleworking is that [it] is continually seeking out the lowest labour costs. This clearly makes it difficult for individual governments, or workers' representative organizations, to attempt to introduce or maintain fair levels of remuneration and decent employment conditions" (p. 52).

[14] The following paragraphs are based on Kumar (2000).

[15] "The export enclave nature of the industry has generated little if any vertical inter-firm linkages with the rest of the domestic economy. … Its impact in reducing regional disparities is negligible" (Kumar, 2000).

will continue to suffer un- and under-employment; and many will leave their homes and towns to go to the advanced industrial countries.

Migration of highly trained people—a particularly telling indicator of dissatisfaction with local conditions—is being exacerbated by the new ease of access to information in Third World countries. To paraphrase a recent article in **The Economist** (2000a), as information about every aspect of life in advanced countries becomes much more easily available, well-educated people in other places "need only click on their screens to see what a raw deal they are getting"; and then they can move. Although there is nothing new about this "brain drain", its implications are no less worrying. Unless investment in tertiary and higher education is accompanied by the sustained generation of new—well-paying—jobs and the improvement of the general quality of life in many parts of the developing world, it will produce better-educated people who search for a more satisfying life elsewhere.

Differing National Capacities to Incorporate Information Technologies

Arguments presented up to this point suggest that nothing in the current information revolution seems to be changing the underlying dynamics of unequal development at a global level. It is not certain that the new economy exists; and if it is in the making, it is characterized by the same tendency toward instability and declining commodity prices as the old one. In an age of instantaneous communication, the most powerful economies also have a growing capacity to draw investment capital from any part of the world into their own high-tech ventures. At the same time, the world employment situation shows few signs of becoming qualitatively more favourable to most Third World workers, except when the more highly skilled among them leave their countries of origin to find better working conditions in more developed countries. And finally, neither telework nor e-commerce shows promise for the moment of providing the stimulus to exports that most Third World countries so desperately need.

Nevertheless, even given this difficult international context, some countries are far more effective than others in using information technologies to defend or improve their position. For example, the Republic of Korea and Taiwan Province of China have managed over the past 40 years not only to import and adapt cutting-edge technologies, but also to become innovators in selected areas. A second tier of countries, like Brazil, China, Malaysia and Mexico, are incorporating ICTs into the modern sectors of their economies at a rapid rate, although they have not been able to break into the ranks of top-level innovators. A few large national ICT enterprises in these countries have become transnational, floating shares in international stock exchanges and serving an expanding regional market. More generally, the new technologies in second-tier countries support the participation of modern national enterprises in world markets, even if they generally do not allow them to capture a larger market share. A third tier, containing countries like Costa Rica or Mauritius, use ICTs to create a market niche, hosting giant multinational investors and serving as export platforms for the international market. At a still simpler level of involvement, a fourth tier of countries (like Bolivia and Senegal) make use of new information technologies on a small scale, in a few businesses and enterprises, but not in

a way that seriously affects production and productivity. In the remainder—perhaps the majority of all countries around the world—ICTs play no significant role in the economy at all.

What accounts for these differences? Size and location are important, of course. The larger the national economy, the more likely it is that local markets can support investment in ICTs. And the closer a country is to a major centre of innovation (as Mexico is to the United States, and the Republic of Korea is to Japan), the more likely it is that major foreign firms will want to invest. But these are certainly not the most important elements determining ability to incorporate modern information technologies in national economies. Far more critical is the existence of a strong and relatively efficient state, as well as the commitment of the national government to promoting economic modernization. The developing countries in which ICTs are now significantly improving the way goods and services are produced and distributed have all had a history of mobilization for national development. Although production for export may have played an important part in these development strategies, very few relatively successful ICT adopters could be characterized as "free traders", in the classic liberal sense of the term.

The Asian countries that have taken greatest advantage of the new technologies have been able to attract critical foreign investment and expertise while protecting their economies and firms over many decades from too much competition from abroad. Through a long-term alliance between government and business, national savings have been channelled toward national corporations, which then have been forced to accept the challenge of exporting efficiently. At the same time, enormous public and private investments have been made in education. This relatively large pool of educated people, combined with already well-developed industrial and service sectors in these countries, will underpin their continuing ability to use the latest ICTs in a competitive fashion.

The critical role played by education—and by an active, developmentally oriented government—in ensuring relative success in the information age is well illustrated by the Singaporean experience. Singapore is one of the world's smallest and most resource-poor nations; yet the ability of the government to channel revenue from the second largest port in the world toward education, and then toward "wiring" every public housing project, school and office, has made the country perhaps the most successful adopter of new ICTs anywhere. Successful, at least, in the sense that collateral business from the port—like shipping and insurance, financial clearing, electronic contracts, and so forth—are handled by Singaporeans with access to state-of-the-art technologies. Whether the same technologies will eventually be employed in support of democratic opening is uncertain (Chapman, 1999).

Large Latin American nations like Brazil and Mexico have strong public universities with excellent research facilities in some fields. In the past, both countries developed significant technological capacity and tried to protect it long enough to ensure its ability to compete internationally. Brazil, for example, protected the national computer industry. In the end, this was unsustainable; and, like their Asian counterparts, both have become importers, not generators, of new technologies. In comparison with Asian ICT adopters, however, Latin

American countries tend to have a far worse distribution of income and a much more unequal access to education within the population at large. This means that access to new information technologies is very unequally spread and that incorporation of ICTs often serves to widen the gap between modern and traditional sectors of the economy.

In sub-Saharan Africa, the situation is still more problematic. Although gaps between high- and low-income groups, and between the modern and traditional sectors of the economy, may not be as large in many countries as they are in Latin America, governments tend to be weak and infrastructure relatively undeveloped. National markets are restricted in size, both because population density is often low and because most people have limited purchasing power. On the whole, educational levels are inadequate. With the possible exception of some sectors of the South African economy, information technologies are not being incorporated into national economies in a way that significantly improves productivity or supports higher growth.

Obviously, national telecommunications policy plays a central role in determining the place of any given country in this worldwide hierarchy of ICT innovation, adoption, adaptation and exclusion. A modern telecommunications system is essential to effective use of most ICTs; and if both public and private sectors cannot create this precondition for progress, exclusion is inevitable. During the past few decades, the challenge has frequently been addressed by recommending privatization of publicly owned telecoms. In some cases, when national communications infrastructures are badly run and underfunded, this is no doubt essential. But it is important to maintain historical perspective in this area, and to remember that some of the most effective drives to modernize telecommunications infrastructure have in fact been carried out by public corporations. There is no necessary correlation between privatization and efficiency. As numerous studies have pointed out, the quality of public service and public regulation are far more significant variables; and there are virtually endless combinations of approaches, ranging from full state control through different kinds of public-private partnerships, to fully private initiatives—all of which can be effective under certain conditions.[16]

It is especially important to keep this continuum of policy options in mind, because in a large number of developing countries now virtually without access to modern telecommunications—many of them in Africa—the size of local demand is too small to interest private investors. Furthermore, in countries with sharp regional or class differences, there is no market incentive to extend modern telecommunications infrastructure—often available in better-off parts of the national territory—into remote or low-income areas. The population of densely settled and relatively more egalitarian Asian societies has a clear advantage in this regard, since the cost of infrastructure per inhabitant is markedly lower than in more sparsely populated or widely polarized societies. For many inhabitants in the latter, redistributive public policy of some kind is the only answer.

The situation *within* the developing world thus tends toward growing polarization, much as it does within the world economy as a whole. A large number of countries, and areas within

[16] For a useful comparative study of these different options, see Petrazzini (1995). See also Cukor et al. (2000).

countries, are simply marginal. And among those which are not, competition to remain internationally competitive is ferocious. Ever-changing products and services—adopted as standards by multinational corporations, importers and other members of global networking ventures—constantly raise the level of technological modernity that must be met by anyone who wants to remain within the system.[17] In such an environment, developing countries that cannot provide their people and firms with access to state-of-the-art technologies can see their hard-won comparative advantage disappear within a very short time. Those who stand still go backward.

Digital Divide/Development Divide

In response to this challenge, concerned observers around the world have focused on the enormous disparities in access to ICT equipment and services that now exist between one region and another, or one country and another, as well as between groups divided by income category, ethnic origin or gender. The "digital divide" has become a primary indicator of unequal opportunity, measured in terms like number of telephones per thousand inhabitants, or number of Internet hosts or fax machines or personal computers. An overview of the regional digital divide, including not only essential products but also essential inputs into the generation and maintenance of digital services, is provided below.

Table 1: Selected technological outputs by region (1992–1997)

	Television sets	Mobile phones	Personal computers	Internet hosts	Fax machines	GDP per capita
OECD	522.57	102.21	195.37	138.25	31.43	20,113.50
Middle East	254.87	24.58	32.16	5.31	7.06	8,941.47
East Asia	164.08	24.36	46.10	6.26	6.34	6,270.63
Latin America and Caribbean	242.03	14.43	20.33	5.69	9.05	5,635.80
Eastern Europe and Transition Economies	288.47	6.34	28.21	6.99	2.27	4,027.36
Sub-Saharan Africa	47.76	1.61	5.05	0.50	1.66	1,971.51
South Asia	32.70	0.69	4.72	0.13	1.60	1,764.33

Note: Figures for Internet hosts are per 10,000 people; all others are per 1,000 people. GDP figures are calculated at purchasing power parity. Source: Rodríguez and Wilson, 2000.

[17] Large American buyers like WalMart and J.C. Penney, for example, no longer deal with suppliers who are not on the Internet. Yet Third World users pay, on average, three times more than rich-country users to access the net (**The Economist**, 2000b:42).

Table 2: Selected technological inputs by region (1992–1997)

	R&D as % of GDP	Technicians	Scientists	Telephone mainlines	GDP per capita
OECD	1.8	1,326.1	2,649.1	517.9	20,113.5
Middle East	0.4	177.8	521.0	136.5	8,941.5
East Asia	0.8	235.8	1026.0	140.3	6,270.6
Latin America and Caribbean	0.5	205.4	656.6	197.4	5635.8
Eastern Europe and Transition Economies	0.9	577.2	1,841.3	167.9	4,027.4
Sub-Saharan Africa	0.2	76.1	324.3	24.3	1,971.5
South Asia	0.8	59.5	161.0	14.2	1,764.3

Note: Technicians and scientists are per 1 million people; telephone mainlines are per 1,000 people. Source: Rodríguez and Wilson, 2000.

Differences among countries within these regions are highlighted in the annex.

The picture is, of course, changing rapidly. Between 1994 and 1996, for example, an index of access to products included in table 1 jumped markedly in all regions of the world—although more rapidly in developed countries (23 per cent) than in developing ones (18 per cent). The evolution of Internet access has been remarkable. In Africa, the number of Internet subscribers grew from under 15,000 to over 400,000 between 1996 and 1999.[18] In Latin America, the figure jumped from 5.8 to 13.3 million between 1998 and 2000 (US Internet Council and ITTA Inc., 2000).

For a number of reasons, however, it is hard to know whether a rapid rate of growth in access to certain products or services indicates significant progress toward narrowing development divides, among countries or within them. The figures just cited do not imply a reduction in the North-South divide, since progress remains faster in advanced industrial countries than in the rest of the world. Moreover, until research is carried out in specific local settings, there is little information on the kinds of sectors, groups and individuals that are actually gaining access to new ICTs in developing countries. Since this usually depends on purchasing power, it seems logical to suppose that most have incomes significantly above the mean. In that case, growing access reinforces advantage rather than reducing it.[19] Nevertheless, this is not always the case. Even low-income families who are fortunate enough to have someone working abroad, in Europe or the United States or the Gulf, for example, can frequently count on receiving a mobile telephone when the migrant comes to visit (Tall, 2001).

Furthermore, figures like those in table 1 measure consumer access, not the effect that increasing use of new information technologies may have on the economy or on people's livelihood. When mobile telephones, fax machines, computers and software are imported (as they are in most African, Latin American and Middle Eastern countries), there is nothing

[18] These figures are from Kelly Wong's Database on African Internet Users (data file), Center for International Development and Conflict Management, University of Maryland (cited in Rodríguez and Wilson, 2000).

[19] One study of Internet users in Latin America concludes that they are "primarily urban, male, white, middle-aged, upper-class and somewhat English proficient" (Gómez, 2000:73). Another, focusing on Peru, found that up to 1995 the Internet fundamentally benefited "professionals, intellectuals and students in the most modern sectors of Peruvian society" (Díaz-Albertini F., no date; author's translation).

necessarily "developmental" about their availability. And since it is usually costly to use mobile telephones and the Internet in developing countries, the figures also say little about how frequently the new appliances can be used.

National ICT Strategies: Creating Conditions for Progress

Making new ICTs relevant for development in a broad sense—harnessing them to improve not only the productivity and competitiveness of Third World economies, but also the life chances of less-advantaged groups and the quality of social relations within society as a whole—requires a conscious effort on the part of governments and citizens. This effort was made during the early twentieth century in advanced industrial countries. With greater or lesser degrees of concern for absolute equality, all of these nations have confronted the worrisome polarizing implications of earlier technological revolutions—the danger, for example, that access to new amenities like electricity or telephones or public transport would not reach all parts of the country or all income groups. Developed countries resolved these problems of access through public policy, subsidizing the extension of services to poorer or more remote citizens and insisting that private enterprises not forget their public duties. Governments also made sure that all citizens had access to public education, public libraries and non-formal instruction in a wide range of fields.

In such a context, harnessing ICTs for development is not a fundamentally new challenge. The institutions and values required to extend access widely throughout societies in the industrialized world are in place. The same could be said for some of the countries in transition from socialism—particularly those of Eastern Europe—and for countries like the Republic of Korea, Taiwan Province of China, and Singapore, where unusual circumstances have forced governments to promote development within a relatively egalitarian context. A few Latin American countries with a strong democratic tradition and a historical legacy of egalitarianism, like Costa Rica and Uruguay, are also well prepared to integrate ICTs into effective development strategies.

In many other cases, essential resources, institutions and/or degrees of civic commitment are missing. In highly unequal and partially modernized societies, for example, it has been possible to provide the telecommunications infrastructure required by the new technologies, but not on conditions that allow the low-income majority to enjoy easy access. To change the situation requires public mobilization and a new politics of solidarity, manifest in changing the institutional context for access to information and communications technologies. This, in turn, implies commitment to alter patterns of taxation and spending, so that revenue can be obtained from undertaxed upper-income groups—and from the corporate sector—and destined to subsidizing extension of the telecommunications infrastructure, lowering telephone charges, building community Internet access, improving the use of information technologies in schools, and so forth. It also implies strengthening public telecommunications regulation, so that private service providers in the IT field are required to use part of their revenue to improve conditions in low-income areas.

In countries (like many in Africa) where a large number of informal, community or religious institutions are in place to promote solidarity, but where development of the economy is limited and access to investment low, the dynamics that underlie construction of an enabling environment for inclusion in global information networks are different from those in middle-income developing countries or in Asian newly industrialized countries (NICs). Governments often cannot form alliances with important national enterprises or count to a significant extent on raising new tax revenue that can be used for extending ICT access into new regions or social strata. Low-income countries are largely dependent on foreign institutions and actors. Capacity to co-ordinate these actors is thus particularly crucial to progress.

The landmark study of ICTs, carried out by the United Nations Commission on Science and Technology for Development (UNCSTD) in 1995-96, underlined the importance of co-ordination when it called for the formulation of *national ICT strategies* (Mansell and Wehn, 1998). At the same time, it pointed out the complexity of strategies to attract and maintain support for installation and maintenance of an ICT infrastructure in relatively low-income developing countries. Building or updating transmission infrastructure increasingly requires the mobilization of global coalitions, including investors and banks, service and equipment suppliers, corporate communications giants, public authorities and local telephone operators. This is a daunting task, even for governments with wide access to technological expertise and the support of strong public administration. It is all the more overwhelming for governments that cannot count on these advantages.

Furthermore, creating coalitions is only the beginning of the process. To promote as efficient and equitable a development of the national information infrastructure as possible, developing country governments must also create a negotiating environment in which banks, local telecoms and corporate giants are willing to act in a developmentally responsible way. A regulatory component is central to such an environment, and includes rules and public institutions that are progressive and fair. Again, this is extremely difficult—not only because power is so unequally distributed among "partners" in the venture, but also because regulatory statutes and measures are notoriously complex, even in countries with long experience in designing and implementing them.

Development assistance has an absolutely fundamental role to play in bolstering national capacity to bargain effectively with communications giants and to create the institutional structure required to defend the public interest in Third World settings. Donor countries that have a long tradition of publicly owned telecommunications companies, or of public-private alliances governed by rules for ensuring equal access to services, are already making important efforts in this regard. For example, without the active participation of the Norwegian corporation NORTEL, the recent success of the Grameen Bank in setting up a cellular telephone company for low-income people in Bangladesh would have been impossible. NORTEL was

willing to work out arrangements that many more single-mindedly competitive companies would not have touched.[20]

Once good-quality telecommunications infrastructure is in place, even disadvantaged groups in Third World societies will make use of it, paying out of their pockets to gain access to a vital service. It is important, however, to provide opportunities for collective access, allowing volume per line to rise and costs to fall. In Bangladesh, the Grameen Bank provided credit allowing village women to buy a mobile phone that could be rented out to nearby inhabitants. In Senegal, SONATEL sold franchises to fixed-line telephones on credit to small private businesses. The programme, begun in 1992, generated over 10,000 "phone shops" by 2000. In the interim, the cost of a unit of use for consumers dropped by as much as 30 per cent, and these small enterprises came to generate over 30 per cent of SONATEL's revenue (Sagna, 2001).

When good-quality telecommunications infrastructure is available but institutional credit arrangements are not, the earnings of migrants can also play an important role in financing expanded access to ICTs. In the region of Touba, Senegal, for example, three factors—strong out-migration to international destinations, a highly developed informal commercial sector, and widespread membership in Mouride religious brotherhoods—have combined to create favourable conditions for the spread of information technologies over large areas and within even relatively poorer social strata. Migrants who are members of the brotherhoods need videos, fax services and telephones to stay in touch with their families in Senegal. Merchants also need these appliances and services in order to supply migrants' families with provisions. Finally, the religious brotherhoods, which receive income from migrants, need Web sites and radio programmes to deliver their message of faith across the world. The high level of organization of all three groups, and close connections among them, have stimulated the local information economy, in which mobile phones are so widely available that their price is lower than in most developed countries, technicians manufacture spare parts for these phones and build parabolic antennas from scratch, and state-of-the-art computers are not difficult to find (Gueye, 2001).

It is important to note, however, that even in Senegal—one of the most favourable technical and regulatory environments for ICT access in Africa, and perhaps in the low-income developing world—the provision of access to relatively low-cost, high-quality communication has not proved capable of overcoming the serious structural problems that mire the country in poverty. The Senegalese economy continues to reel under the impact of accumulated foreign debt and structural adjustment. Open urban unemployment stands at 29 per cent, and there is no sign that the opportunities provided by the information revolution are relaxing the tight resource constraints underlying a continuing deterioration in health services, education and wages.

The obvious conclusion to draw from this example is that while investment in telecommunications infrastructure, hardware and software is necessary for social and economic

[20] Anachronistic regulations ensured that the existing Bangladeshi telecommunications company would not collaborate in this venture either (see Richardson et al., 2000).

progress in Third World countries, it is not sufficient.[21] If expanding access to ICTs is to play a significant role in Third World development, it must form part of a much broader effort to improve social welfare and economic opportunity within specific national and local contexts. As the UNCSTD report points out, this is another important reason for the formulation of national ICT strategies.

Using ICTs to Improve Public Administration and Social Services

The majority of all efforts to use ICTs for improving social welfare in Third World countries—and particularly in lower-income countries—are currently being supported by non-governmental actors. People who know a great deal about the technical side of ICTs, as well as people who have experience in education, health, nutrition or agricultural extension, are contributing time and resources to set up pilot programmes that create synergies between technology and social development. Through their efforts, community telecenters have been established. The records of clinics and hospitals have been computerized. Satellite communications have helped health specialists communicate with each other over great distance. Full access to key scientific journals has been provided to Third World medical schools. The list could be extended at length.

All of these efforts are important. They illustrate the enormous potential of information and communications technologies to create a better world, as well as the problems that must be overcome to bring about change. For most of them to proceed beyond an experimental stage, however, they must be integrated into public or private programmes with sustained funding and professional personnel. In addition, there must be congruence between voluntary efforts and the overall public policy framework. In other words, voluntary efforts must eventually become part of a credible national development strategy.

The current international economic environment works consistently against such an outcome. So does the narrow revenue base and level of administrative efficiency of many Third World governments. Working with donors and development banks, a growing number of governments in lower-income developing countries are therefore attempting to use ICTs in the modernization of public sector administration and infrastructure. Efforts have been made to improve executive and parliamentary access to information, through computerizing national laws and facilitating access to legal data banks in other countries. Steps have been taken to computerize record-keeping in government offices and upgrade the information facilities of public agencies. Again, however, surrounding constraints must be taken into account. When public-sector salaries are plummeting—thus undermining the morale of staff—and when most good computer technicians are migrating to the private sector, such projects may be difficult to sustain.

[21] In fact, a more general study of the relation between investment in ICTs and economic growth in Third World countries shows that there is no pattern of congruence—i.e., higher ICT investment does not seem to be associated with higher growth (Pohjola, 2000).

Governments in lower-income countries are also weighing the costs and benefits of using the new technologies to improve the effectiveness of basic social services. This is an area in which a great deal of international advice has been proffered—sometimes in the form of relatively standardized propositions and often to little avail. In fact, it has become increasingly clear over the past few years that applications of ICTs which may be perfectly feasible and logical extensions of existing capabilities in the health and education sectors of advanced industrial societies—and even of newly industrialized nations—may be inappropriate in resource-strapped developing countries.

Distance education provides a case in point. For many years, this has been an important social policy tool in the developed world, expanding access to secondary and tertiary instruction among people who could not attend classes on a regular basis. Many of the beneficiaries have been women with household responsibilities, or working people with limited time to study. Others have lived in areas insufficiently served by the formal educational system. Distance education, which also has a long history in countries like Argentina, Brazil, Mexico and South Africa, has traditionally relied on a combination of mailed materials, radio and television, as well as periodic visits to classrooms and discussions with tutors.

The latest ICTs open new vistas, not only for distance education as formerly conceived, but also for new forms of "virtual learning"—primarily over the Internet. The interactive capabilities of this medium allow "real-time" conversations among students and teachers across great distances. Multimedia applications permit the development of novel teaching programmes, audio-visual presentations and imaginative problem-solving software. A growing number of Northern universities are taking advantage of these capabilities, not only to change the way traditional courses are taught, but also to create on-line learning opportunities and degrees that are entirely separate from usual procedures and curricula.

In many international publications on development, a great deal is made of the need to support "virtual education" in Third World countries. This is, in fact, one of the ICT applications that is most often said to create conditions for leapfrogging over poverty and underdevelopment.[22] But there are enormous problems with this approach. In the first place, distance education is expensive and in its multimedia, Internet form it is extremely expensive. It eats up bandwidth, and it tends to rely upon programmes that must be bought from commercial content providers. The prestigious group of educators assembled by the United Kingdom's Department for International Development (DFID) to prepare the Commonwealth of Learning report thus urged extreme caution in proceeding down this path (Farrell, 1999).

Unless a great deal of money can be devoted to distance learning within a country, this form of education is likely to be available only to the small minority with access to requisite hardware, software and the Internet—a situation that increases gaps between haves and have-nots, rather than reducing them. A recent IDRC evaluation of experiences in Kenya and Senegal has also

[22] The new on-line journal, **TechKnowLogia**, contains a large number of articles espousing this argument (see http://www.techknowlogia.org/).

highlighted problems in developing appropriate local content, maintaining equipment and developing tutorial and student support services.

The fundamental problem with current proposals like those for virtual education is that they attempt to avoid basic policy dilemmas in developing countries, instead of solving them. The educational systems of most Third World countries are in deep crisis: schoolrooms are crowded, teachers are underpaid and overworked, buildings are close to collapse, pupils have no books and school supplies. New ICTs have an enormous potential to help people learn; but it is unrealistic to think that this can take place to any significant extent unless the public school system is functioning adequately. National ICT strategies thus must balance the benefits of investing in computers and Internet access against the need to improve basic services.

Donors play a significant role in influencing these choices; and unless they are willing to provide long-term funding for experimental projects, they may increase the costs of schooling for people who have a very limited capacity to pay. In the case of the World Links for Development programme, for example, the World Bank provides equipment and software for public secondary schools in some parts of Africa. It also provides training for instructors. But the government must cover the cost of subscribing to Internet services, as well as telecommunications charges, computer maintenance and salaries for project co-ordinators. To do so, it often passes costs on to parents in the form of higher school fees. And when computers break down or are infected by viruses, there is no provision for replacing them.

This is not a problem confronted by donor-sponsored programmes alone. The South African government has made remarkable efforts to equip schools in disadvantaged neighbourhoods with computers, and parents have been willing to make sacrifices in order to support this endeavour. Despite all best efforts, however, the record is not encouraging: equipment is stolen or breaks down, and viruses attack. Schools thus repeatedly lose their investment, and parents are disillusioned.[23]

Similar problems arise when attempting to introduce new ICT applications in the health sector of lower-income developing countries. Private clinics and hospitals catering to better-off groups within the population can import and maintain modern electronic equipment. They can also pay adequate salaries to well-trained nurses and doctors. But the situation in most public health systems in the Third World is so precarious that staff are withdrawing in droves (Zachary, 2001:1). Even relatively well-known public hospitals are in disrepair, the sick are crowded into corridors and supplies of medicines are erratic. In such situations, an Internet connection may be the least of anyone's worries, no matter how important such a resource can potentially be.

Clearly, then, it is unlikely that new ICTs can play anything more than a marginal role in improving public social services in low-income developing countries until the pervasive fiscal crisis of many governments is resolved. In the meantime, some co-ordinating body in each

[23] Tom Baloyi of the Soweto Technology Project gave a presentation on experiences in Soweto at the UNRISD Conference on Information Technologies and Social Development, held in Geneva on 22–23 June 1998.

country must be aware of ongoing private sector initiatives, NGO efforts and special donor programmes. Even in a minimalist fashion, these should form part of a national ICT strategy. Important projects should be evaluated—perhaps in a periodic ICT forum—and the lessons they generate should be made available to a broader public. In this way, co-ordination of disparate projects can generate some information of use in national development debates.

"Old" ICTs, Quality of Life and Empowerment

Most NGO efforts to improve social welfare in low-income countries seem to focus on ensuring Internet access. The advantages of equipping communities, schools or clinics with this tool are significant. But, for many millions of people around the world, other ICTs can be equally useful. In fact, it is difficult to conceive of a Third World scenario in which increasing the proportion of the population with easy access to telephone service, local radio and television would not do a great deal to improve quality of life.

The ability to communicate is a fundamental—in fact, axiomatic—element in a meaningful life. Many would say that it is a universal human right. A mother in a small village whose child is sick should have the right to pick up the telephone and talk to someone at the nearest rural clinic, or to a friend. Migrants living thousands of miles from their homes should have the possibility of talking to their families. A mechanic with a small shop beside the road into the capital city should be able to call his suppliers to ask about availability of a spare part, before spending a great deal of time and money going across town to look for it. This is a basic amenity, no matter what one's other problems may be. Yet it is a service still beyond the reach of most people on the face of the earth.

Current advances in telecommunications technology should soon change this situation, long before access to the Internet becomes a comparable option. Digital radio, combined with new wind-up or solar-powered receivers, is also providing new opportunities for people to speak out and be heard. And satellite television enormously expands the range of programming available to inhabitants of countries whose governments, until recently, could limit television reception to a few state-run channels.

The ICT revolution is thus lending "old" technologies new relevance. Whether expanded access to information will also promote empowerment is another question—and not necessarily one for which a straightforward answer is possible. In a sense, it is empowering simply to feel that one can get in touch, that one can hear and see new things. But, as in all other areas discussed above, surrounding resource constraints, institutions and values condition the extent to which a new ability to communicate, or to gain access to information, is sufficient to increase the ability to shape one's own destiny.

To illustrate this point, it is useful to look more closely at the oft-cited example of how access to the Internet can enable small farmers to escape from the exploitative hold of middlemen. The argument is generally presented in a simple, and apparently compelling, manner: if small

farmers had accurate and up-to-date information on prices in the nearest wholesale market, they could challenge local middlemen to pay a fair price for their crops. Once telephone or Internet access in the village is assured, this condition can be easily met. Therefore the arrival of ICTs will coincide with a certain increase in farmers' income.

As anyone who has lived in small farming areas of the developing world would quickly point out, however, there is no necessary connection at all between a more accurate knowledge of wholesale prices and the ability of cultivators to demand a fair price. The power of middlemen often rests on their control over credit, their monopoly of transport from village to market, their ownership of the only local outlet for basic consumers goods, their central role in village social relations (as godfather or chief)—and sometimes on their control of local gunmen and thugs. None of this is immediately affected by awareness of the wholesale price for any local product in real time. Furthermore, even in areas where middlemen are not important elements in determining prices, access to better information does not solve the farmers' problems of how to finance, transport and store their crops. In many cases, their production is perishable, local storage facilities are inadequate, and transport is both expensive and undependable. Smallholders then do not have the option of scheduling their deliveries to market in an optimally efficient manner. They need an array of services, ranging from public storage facilities and price supports to low-interest loan facilities, which simply may not be not available.

This is not to say that small farmers do not need good information on markets. Of course, they do. The point is that information alone often is not sufficient to change existing relations of power. The same kinds of questions can be raised about the relation between access to ICTs and empowerment from a gender perspective. There is no guarantee that access to a telephone, for example, will improve the status of women who live within patriarchal societies. In fact, when male heads of families go abroad to work, mobile telephones may allow them to micro-manage their households far more effectively than in the past. Nor is it necessarily the case that the kinds of information provided on radio or television will be useful for local women in their efforts to improve the quality of life of their households, and their own position within them. How ICTs—whether old or new—can be used to the benefit most women is a complex question, on which much local research is needed.[24]

ICTs as a Tool in the Struggle to Promote Democracy and Human Rights

Access to information assumes a central role in empowerment when it contributes to social mobilization. This is why radio and the press are usually so important in uprisings, insurgencies and revolutions. It is also why democratization movements the world over have made good use of the Internet—and of Ethernet, Fidonet and off-line e-mail. For example, an

[24] For an excellent series of essays on this subject, see Rathgeber and Ofwona Adera (2000). The experiences of the Tanzania Media Women's Association (TAMWA) provide a vivid example of how a determined group of African women have systematically used radio, television and publishing—as well as theatre, art and dance—to promote discussion of the position of women in their country. Access to hardware and software for desktop publishing has also permitted the group to print posters, brochures, popular education materials and a magazine (see Alloo, 1995).

attempted coup against Gorbachev in 1991 was successfully thwarted because, even after an official news blackout, the unofficial computer network Relcom / Demos maintained the flow of essential information, via packet-and-forward e-mail, to supporters of democracy, within the Soviet Union and outside it.[25] Earlier struggles against repressive regimes in Latin America took advantage of similar technologies to escape censorship. Current international campaigns to support democracy and expose human rights abuses in China, Myanmar, Saudi Arabia and a host of other countries, however, can count on far more sophisticated facilities, including Web sites, chat rooms and on-line videos.

The Internet is an extraordinary tool for mobilizing people in support of any venture. Its capacity to span the globe and to involve like-minded individuals in collaborative networks, in real time, is unique in human history. However, access to the Internet is still extremely limited. In many Third World countries, the Net is primarily an instrument for communicating with the outside world, not for communicating with fellow nationals. It informs and mobilizes beyond national borders, and only secondarily within them. Observers of social change are thus quick to point out that—even today—relatively simple technologies still have more profound implications than the Internet for political mobilization in many regions.

A recent article on ICTs in the Middle East, for example, presents analysis of new tools for democratization under the heading "Fax, copy, rewind".

> The photocopier has become so mundane in Western societies that people no longer think of it as a high-tech device. But [in the Middle East] no single invention has so democratised the wide dissemination of a message at such a low cost. … Photocopies are inexpensive and they do not belie the printer's identity. Equally important, any individual can create a message to be photocopied without involving typesetters or other specialized professionals. While leaflets and broadsheets are not new, what is new is the availability of the technology to individuals even in small villages (Alterman, 2000:25).

Photocopiers also interact with the Internet, serving to disseminate Web pages and messages available only to a few. Faxes fulfil an important independent mobilizing function. Videocassette players, which were a rarity in the Middle East 10 years ago, now carry powerful messages to local populations. All this creates "a basic shift in the regional information environment".

Reform of restrictive public policies is of course an essential element in creating a more open information environment. Lifting governmental restrictions on the ownership and programming of local radio and television stations has proved extremely favourable to democracy in a number of countries—as has the decision to open national borders to the transmission by satellite of foreign radio and television programming. In Senegal, for example, the state's authorization of private commercial FM radio in the 1990s reinvigorated democratic debate. During the presidential elections of 2000 (won by the opposition for the first time since independence), these FM stations transmitted reports submitted over mobile telephones from a

[25] The experience is analysed in Rohozinski (1999).

network of reporters and citizens stationed at polling booths around the country; and in consequence, fraud was never a widespread problem (Paye, 2001).

The new technologies are also facilitating innovative television broadcasting. A hard-hitting satellite television channel based in the Gulf emirate of Qatar is attracting a great deal of attention in the 22 Arab countries where it is seen. Basing its programming on the principle that all coverage should be free of censorship or bias, it explores long-suppressed issues, including the lack of democracy, the persecution of political dissidents and the repression of women. A recent *New York Times* article reported that "in Algiers' Casbah, in Cairo's slums, in the suburbs of Damascus, even in the desert tents of Bedouins with satellite dishes, the channel has become a way of life." In countries like Iraq, which ban satellite dishes, "videos of its shows are traded eagerly in bazaars" (Burns, 1999:2).

Television, radio, and even photocopiers and faxes, are the principal means through which "civil societies" are being formed and reinforced in the majority of all Third World countries. Policies affecting the quality of broadcasting therefore merit careful attention in national and international ICT strategies. So do policies affecting the freedom of the press. In the digital age, access to the Internet affects both these areas: all media content is increasingly enriched by the information and services currently being provided over the net.[26] Thus the relatively small number of actual Internet users belies the much greater influence it is having on the information environment in the Third World.

In fact, this behind-the-scenes influence of the Internet on mainstream media may, in some specific cases, be a more significant factor in creating the conditions for democracy than a number of its other uses receiving far more attention in international development circles. The most salient of these is no doubt the vital role played by the Internet in supporting the work of NGOs. Certainly the contemporary strength of non-governmental development organizations and advocacy groups is unthinkable without the Internet. And clearly, local NGOs have enormous potential to improve the lives and livelihoods of the people they serve in developing countries. But, important as NGOs may be in certain fields (and particularly in fields like human rights, environmental protection and governmental transparency), they still occupy a relatively small niche in the political culture of a great many nations. Many may be much more visible outside their countries than they are within them.

The impact of the Internet on democracy, then, is not standard across regions or even easily explained. Some applications that may be relevant in industrialized countries are much less so in many areas of the developing world. E-governance is a case in point. This is a somewhat fuzzy term. If it simply means improving voting mechanics and the availability of public records through computerizing voter registration and vote counting, and through placing public archives on-line, there is no reason to question its utility anywhere. The same could be

[26] For example, the Dutch development organization HIVOS, in collaboration with OneWorld, has established an Internet platform for local radio stations in Balkan countries, which allows 170 of them to exchange programmes and news free of charge, across ethnic and political divides (see HIVOS, 2001:3).

said of encouraging government ministries and parliaments to be more transparent in their provision of information to the general public. These can be very important innovations, deserving full support from all citizens and from the development community in general. But if—as in the industrial societies—e-governance means supplementing the usual procedures of representative government with some forms of direct government, through use of the Internet, the proposition is more problematic. First, access to the Internet in many developing countries is far too limited; and second, the institutional setting for this kind of experiment may not yet exist. Many countries are still struggling to create the network of political parties and the culture of citizenship that underpin representative democracy. Pushing too hard for individual participation could, in some situations, do more to weaken democracy than to strengthen it.

Global ICT Policy Issues

In addition to supporting freedom of speech and of the media in Third World countries, the international development community should play a more informed role in the sometimes arcane policy debates that define the global context for access to, and use of, information and communications technologies everywhere. Development NGOs and counterparts in donor governments are often not sufficiently aware of these debates, because they take place in trade and telecommunications forums attended primarily by representatives of ministries devoted to these highly specialized fields. In other words, there is a division of responsibility within governments that can make it difficult to ensure that a developmental perspective is integrated into official positions on ICT-related policies.

Some international agreements profoundly affect the ability of Third World governments to expand and improve ICT capabilities.[27] For example, the 1997 World Telecommunications Agreement, negotiated within the framework of the General Agreement on Tariffs and Trade/World Trade Organization (GATT/WTO) discussions on liberalization of trade in services, provides for "most favoured nation" treatment of all telecommunications providers—foreign or domestic—in the markets of all signatory countries. No local policy can hinder competition or discriminate in favour of particular groups. This may, in some situations, have regressive implications for universal service. National efforts to ensure that all citizens have telecommunications access could be considered anti-competitive or "more burdensome than necessary". Cross-subsidization schemes (charging higher rates for international calls, and using revenue to lower rates in rural areas, for example) could be disallowed. It is therefore important for those with an interest in ICTs and development to keep close watch on discussions in the WTO.

It is also important to follow discussions, in the International Telecommunications Union (ITU) and outside it, about how to distribute communications revenues among operators in different countries through which telephone calls pass on their way from initiation to completion. Since most international calls are initiated in the industrialized world (and callers are charged for this

[27] This section is based on Hamelink (1999).

service by the telephone company that places the call), transnational telecommunications giants in the North have first access to revenue. In the past, however, net transfers of up to 10 billion dollars a year eventually flowed from these companies to telephone operators in developing countries, to cover charges for completion of calls. This revenue has been used by some Third World telecoms to provide access to people who would otherwise remain unconnected and to upgrade existing infrastructure. The Senegalese experience is a case in point. Other telecoms, however, have simply served as conduits for channelling incoming revenues into government coffers, to be used for any number of purposes. During the past few years the rate of payment to Third World companies has been sharply reduced. Not only do Northern corporations refuse to pay high settlement costs, but new forms of telephony (by satellite, through phone cards, and so forth) make it easy to bypass the existing system altogether. The evolution of this contentious area should be monitored.

The growing importance of satellite services raises other issues of relevance to Third World development. These services are generating a great deal of information that is useful for such purposes as resource management, weather and crop monitoring, disaster warning and relief. But how are people in developing countries to gain access to this information? As Cees Hamelink (1999:9) notes, "The technology is there, but policy choices tend to privilege commercial exploitation over development benefits".

The list of critical ICT policy issues could be extended at length.[28] Management of the world's electromagnetic spectrum—a global public resource—requires close attention. So, too, do negotiations on intellectual property rights taking place in both the World Intellectual Property Organization (WIPO) and the WTO. Too restrictive a regime in this field can negate much of the potential for knowledge generation that is inherent in new ICTs. Rapid consolidation of ownership and control within this sector is a further concern. Although international agreements ensure liberalization of markets, they make no provision for effective, open competition within an increasingly oligopolistic industry. Therefore it will probably be up to national governments to devise regulatory approaches that ensure diversity of information and equality of access for their citizens.

Conclusion: Guidelines for Effective Development Co-operation Strategies

The digital divide is symptomatic of a far more serious development divide, constantly limiting possibilities for progress among most inhabitants of the planet. New information and communications technologies by themselves cannot bridge this divide, and if not employed in a conscious effort to improve equity, they can worsen it. It is therefore important for the development community to confront the situation squarely and to integrate a new concern with ICTs into its work—not with a view to finding miraculous solutions to deep-seated problems, but in an effort to understand the dynamics of polarization and attempt to offset them.

[28] The Web site of the Association for Progressive Communications (APC) contains useful updates on negotiations in a number of these areas (see http://www.apc.org).

What guidelines should orient this effort? The preceding discussion would suggest that a first step toward effective action in this field is simply to *recognize the complexity of the problem* at hand. Information and communications technologies are evolving quickly, and they are being used in very diverse ways by groups with different capacities, cultures and access to resources. National experiences and policy-making settings create distinctive incentives and disincentives for improving the information and communications environment. Moreover, international forces play a major role in circumscribing the options among which countries and citizens can choose.

For this reason, it is useful to *steer clear of any simple recipes* for progress in the field of ICTs and development. In fact, no single ICT application or policy strategy is likely to prove most effective in all cases. Introducing access to the Internet is essential in some situations, much less so in others. Extending the land-based telephone system may have priority in some cases, while mobile telephony is more realistic in others. Privatizing state-owned telecommunications systems may solve a host of problems in some national settings and create them in others. The efforts of NGOs may greatly improve the life chances of people in one experimental programme, but have far less successful outcomes in villages or towns only a few miles away.

One element in developing a flexible and effective ICT strategy is thus to maintain an open mind about the kinds of devices and services that may prove most effective in specific situations. *Cutting-edge applications do not always make the most appropriate contribution* to resolving the problem at hand. In fact, they may prove too expensive or too difficult to maintain, and thus be unsustainable. Often, a combination of products and services—one Internet connection, associated with a radio programme or a fax or photocopier, for example—may be an effective option.

Obviously, there are situations in which investment in ICTs is not warranted. This is the case, for example, when it would be likely to drain resources from other areas enjoying higher priority. Introducing computer-mediated communications in primary schools may sometimes fall into this category, or attempts to equip local clinics with Internet access when they cannot even pay their staff. In many other cases, *ICTs should only be financed in conjunction with attention to the surrounding institutional and policy setting that is required to make them relevant to development*. Improving this "enabling environment" for effective information and communications flows is, in fact, a more difficult task than the introduction of ICTs themselves.

1. Steps toward improving the international policy context

In this regard, it is very important for the development community to be present in international policy forums that play a major role in determining the likelihood that low-income countries and disadvantaged groups can use ICTs effectively. Experts acting on behalf of *development ministries and/or development NGOs in both North and South should introduce an "ICT-and-development" focus into discussions routinely taking place in at least three areas*:

1. National and international deliberations on *science and ethics*. Development specialists are not usually involved in this highly contentious area of public policy, which falls within the purview of scientific academies and national oversight bodies. But in an increasingly "global" age, the needs of people in low-income countries should be taken into account in discussions on how to use the vast new capabilities of modern science well.
2. *International debates on key macroeconomic policy questions, like debt relief, trade and investment policy, and technology transfer.* The outcome of these debates has an immediate effect not only on fulfilment of economic and social rights in Third World countries, but also on the right to communicate and obtain access to needed information. Links between the macroeconomic environment and ICT-related issues should be pointed out and explored.
3. Decisions on *global ICT issues*, including intellectual property rights, management of the electromagnetic spectrum, use of information gained through remote sensing, and so forth (as outlined in the preceding section). *A development perspective is notably lacking in most debates on these issues,* which usually take place in the ITU, WIPO and WTO.

2. Improving the national context for ICTs and development

Improving national capacity to use ICTs for development in poorer Third World countries almost always implies work on basic telecommunications infrastructure. Here, development assistance can obviously be extremely important in *supporting the modernization of the telecommunications system and its extension into poorly served regions*, as well as in promoting universal access among disadvantaged groups. Technical expertise and finance can be invaluable. So can assistance in forming and co-ordinating the multinational group of investors, communications corporations, and other service and equipment suppliers taking part in the project. Donors can help to *create a negotiating environment in which these entities are willing to act in a developmentally responsible way*.

Development co-operation can also play a central role in *improving the regulatory capacity of Third World governments* in the telecommunications field. This is a complex area in which many different models have emerged. When establishing new regulatory commissions and laws, there is a great deal to be said for learning from the experience of others. Donors can facilitate the exchange of experiences within and between regions.

Both the technical upgrading of telecommunications systems and their eventual regulation should ideally take place within the framework of a broader *national information strategy*. Virtually all major studies of ICTs and development emphasize the importance of such efforts, and development co-operation should attempt to make a significant contribution to supporting them. This is the setting in which specific links between the new technologies and the surrounding institutional setting (in fields as diverse as health and education, public sector reform, export promotion or e-commerce) can be made.

The purpose of these strategies is to integrate ICTs into work on development throughout the country, in a broad effort to improve economic opportunity and social welfare. Poverty alleviation is one important element in such an effort, but not the only one. Large segments of the population in most developing countries, who may not be classified as poor—the working class, the lower middle class, and small farmers living in relative remote areas, for example—must also be

granted access to ICTs in ways that not only improve their quality of life but also create economic dynamism in the country as a whole. Their citizenship rights are equally as valid as those of the poorest members of society. Therefore *the development community should be careful not to exercise pressure for reducing national information strategies to anti-poverty strategies.* If this were done, some of the most significant synergies between information technologies and development might be overlooked.

Research can play a critical role in generating knowledge about what particular groups and countries do need, and about what approaches seem to be most effective in resolving specific problems. In fact, one of the major stumbling blocks to progress in the field of ICTs and development is the paucity of information at local and national levels about how different kinds of people are using available ICTs and what difficulties they are encountering. It is paradoxical that, in the wider effort to create information societies, so little attention has been given to research.

Any effort on the part of the development community to strengthen national information strategies could therefore be reinforced by *supporting good local research on ICTs and development*. Donors could finance new programmes in Third World universities or support old ones, provide scholarships and awards for studies in this area, contribute to the establishment of institutes pursuing multi-disciplinary research on applications of ICTs in key sectors of the economy and for various groups within society. They could also provide opportunities for researchers in different developing countries to learn from each other, through periodic seminars and conferences.

Strengthening institutional capacity for analysis and debate in Third World nations is an indispensable element in the construction of knowledge societies. It can improve the quality of information on which effective policy must be based, as well as the solidity of the political process that stands behind formulation and implementation of that policy. It can also provide an opening for donors to reconsider their own role in the promotion of development, perhaps recasting their efforts in a more participatory fashion. In other words, improving the environment for analysis and debate on the implications of the digital age can be a significant element in the ongoing effort to “do development differently”.

Annex

Annex table: Intraregional differences in ICT access
(Internet hosts per 10,000 people; all others per 1,000 people)

	Radios (1997)	**Television sets** (1998)	**Mobile phones** (1998)	**Fax machines** (1998)	**Personal computers** (1998)	**Internet hosts** (1999)	**Telephone mainlines** (1998)
Western Europe							
Finland	1,496	640	572	38.5	349.2	1,116.78	554
Norway	915	579	474	50.0	373	754.15	660
Sweden	932	531	464	50.9	361.4	581.47	674
Netherlands	978	543	213	38.4	317.6	403.49	593
Ireland	699	403	257	27.4	271.7	156.68	435
United Kingdom	1,436	645	252	33.9	263	270.6	557
Germany	938	580	170	73.1	304.7	173.96	567
Greece	477	466	194	3.8	51.9	59.57	522
Portugal	304	542	309	7.0	81.3	59.4	413
Eastern Europe and Transition Economies							
Estonia	693	480	170	---	34.4	174.65	343
Slovenia	406	356	84	9.8	250.9	99.34	375
Hungary	689	437	105	17.7	58.9	93.13	336
Czech Rep.	803	447	94	10.4	97.3	85.58	364
Poland	523	413	50	---	43.9	40.86	228
Lithuania	513	459	72	1.7	54.0	30.45	300
Russia	418	420	5	0.4	40.6	13.06	197
Albania	217	109	1	3.6	---	0.24	31
Ukraine	884	490	2	0	13.8	4.56	191
Americas and Caribbean							
United States	2,146	847	256	78.4	458.6	1,508.77	661
Canada	1,077	715	176	33.3	330.0	422.97	634
Uruguay	607	241	60	---	91.2	38.34	250
Trinidad and Tobago	534	334	20	3.9	46.8	28.20	206
Argentina	681	289	78	2.0	44.3	27.85	203
Mexico	325	261	35	3.0	47.0	23.02	104
Brazil	444	316	47	3.1	30.1	18.45	121
Haiti	55	5	0	---	---	0	8
Cuba	353	239	0	---	---	0.06	35
Middle East							
Israel	520	318	359	24.9	217.2	187.41	471
United Arab Emirates	345	294	210	21.0	106.2	39.44	389
Kuwait	660	491	138	27.6	104.9	23.76	236
Turkey	180	286	53	1.7	23.2	8.06	254
Oman	598	595	43	2.7	21.0	2.87	92
Iran	265	157	6	---	31.9	0.05	112
Egypt	324	122	1	0.5	9.1	0.28	60
Iraq	229	83	0	---	---	0	31
Jordan	287	52	12	8.6	8.7	1.17	86

Annex table, continued

	Radios (1997)	Television sets (1998)	Mobile phones (1998)	Fax machines (1998)	Personal computers (1998)	Internet hosts (1999)	Telephone mainlines (1998)
South Asia							
Sri Lanka	209	92	9	---	4.1	0.52	28
Pakistan	98	88	1	1.9	3.9	0.22	19
India	121	69	1	0.2	2.7	0.18	22
Nepal	38	6	0	---	---	11.73	8
Bangladesh	50	6	1	---	---	0	3
South East Asia							
Japan	955	707	374	126.8	237.2	163.75	503
Singapore	822	348	346	31.6	458.4	322.30	562
Rep. of Korea	1,033	346	302	---	156.8	55.53	433
Hong Kong, China	684	431	475	54.3	254.2	142.77	558
Malaysia	420	166	99	6.9	58.6	23.53	198
Thailand	232	236	32	2.5	21.6	4.49	84
China	333	272	19	1.6	8.9	0.50	70
Indonesia	156	136	5	0.9	8.2	0.76	27
Philippines	159	108	22	---	15.1	1.29	37
Oceania							
Australia	1376	639	286	48.6	411.6	477.85	512
New Zealand	990	508	203	---	282.1	476.18	479
Papua New Guinea	97	24	1	---	---	0.49	11
Caucasus							
Armenia	224	218	2	0.1	4.2	1.85	157.00
Azerbaijan	23	254	8	---	---	0.23	89.00
Georgia	555	473	11	---	---	1.59	115.00
Kazakhstan	384	231	2	0.1	---	1.42	104.00
Kyrgyz Rep.	112	45	0	---	---	4.13	76.00
Mongolia	151	63	1	2.7	5.4	0.04	37.00
Uzbekistan	465	275	1	---	---	0.05	65.00
Tajikistan	142	285	0	0.3	---	---	0.24
Turkmenistan	276	201	1	---	---	0.56	82.00
Africa							
South Africa	317	125	56	3.5	47.4	33.36	115
Namibia	144	37	12	---	18.6	11.73	69
Sudan	271	87	0	0.6	1.9	0	6
Côte d'Ivoire	164	70	6	---	3.6	0.25	12
Nigeria	223	66	0	---	5.7	0	4
Senegal	142	41	2	---	11.4	0.28	16
Ethiopia	195	5	0	0	---	0.01	3
Rwanda	102	0	1	0.1	---	0	2
Tanzania	279	21	1	---	1.6	0.05	4

Source: World Bank, 2000; adapted by Christopher Brading.

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