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INFORMATION ECONOMY
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The Development Perspective

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Chapter 2

REVIEWING NATIONAL ICT POLICIES FOR THE INFORMATION ECONOMY

A. Assessing the role of ICTs in development

During the past decade, ICTs have become part of many developing countries' development plans and poverty reduction strategies. Those countries have designed and are implementing national ICT policies to reach overall development goals, recognizing the potential of new technologies in fostering economic and social development. Concretely, Governments have formulated one or several ICT strategies or "master plans"[1] over the years and set goals to ensure the effective deployment and use of ICTs in their country for the benefit of their citizens and enterprises.

To support developing countries in their efforts to develop their information societies, international organizations, regional groupings and international forums have anchored ICT for development in their work programmes, while donors have been increasingly mainstreaming ICTs into their development aid programmes as a strategic, cross-cutting tool in support of countries' own development plans. The World Summit on the Information Society (WSIS) outcome documents highlighted the vital role of Governments in developing national "e-strategies" and encouraged all Governments to further the penetration of ICTs in their national development plans. The Tunis Agenda for the Information Society, encourages Governments "*to elaborate, as appropriate, comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies as appropriate, as an integral part of national development plans and poverty reduction strategies, as soon as possible and before 2010*".[2]

UNCTAD research has shown that as of June 2006, out of 181 developing and transition countries and territories, 80 (44 per cent) had already adopted a national ICT plan and 36 (20 per cent) were in the

Chart 2.1

National ICT plans in developing and transition countries and territories, 2006

No information available
Country in the process of developing a national ICT plan
Country with a national ICT plan
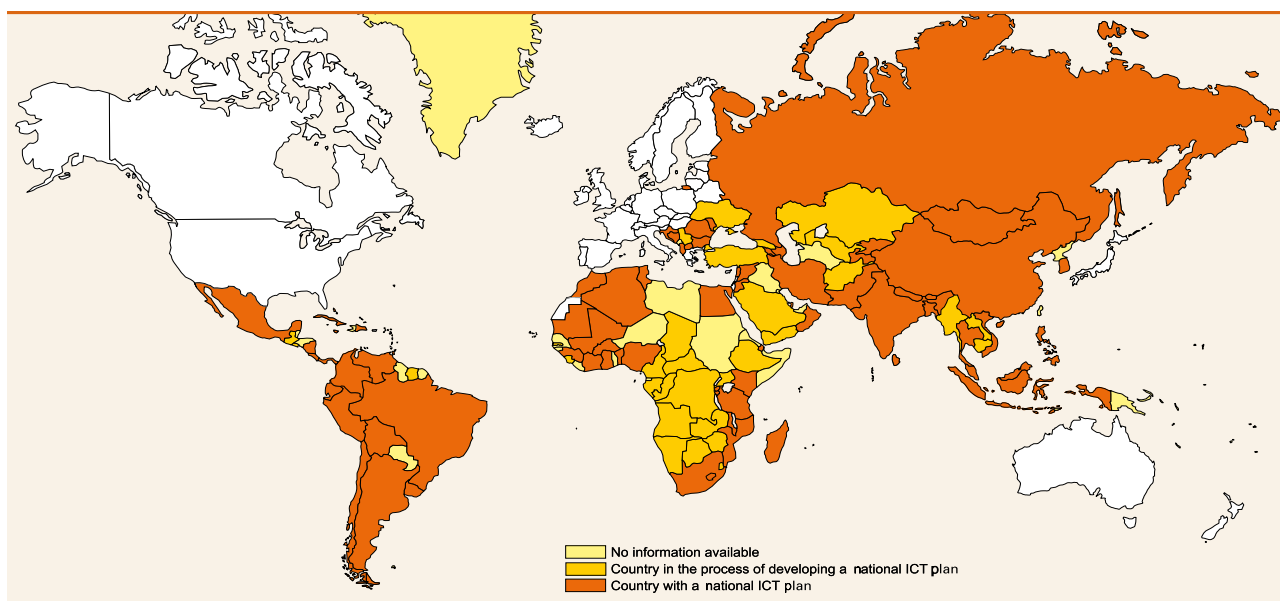
Source: UNCTAD's questionnaire and Internet research.[3]

process of designing one (chart 2.1 percent and annex II). While the map in chart 2.1 does not feature OECD member countries with the exception of Mexico, the Republic of Korea and Turkey, most of them have put in place one or several national ICT plans.

1. A call for national ICT policy reviews

Given the large number of countries, even in the developing world, that have established national ICT plans and policies, the question arises as to the impact of these policies. How can we assess the impact of ICT policies on the development of the information and knowledge-based economy? What are the main barriers that hamper the implementation of ICT policies? What are successful policies that could perhaps be multiplied, scaled up and replicated? While Governments have been formulating and implementing ICT plans and policies during the past few years, there is now a need to review the status of their plans and understand the impact they have had so far on their economies and societies, and to allow decision makers to formulate new policies. ICT policies are dynamic tools that must be continuously updated in order to keep up with national, international and technological developments.

In recent years much attention at the international level has been paid to so-called e-readiness assessments, leading to the development of a range of assessment tools by various organizations to measure a country's e-readiness.[4] At the same time, little has been done to assess the implementation of national ICT policies in developing countries, and more specifically policies for the information economy.

Assessing national ICT policies and their impact is a current concern in most countries. Several developed countries, for example Austria, Denmark and Norway, have already implemented a systematic policy evaluation process to make policy decisions more effective. In this context, they have developed a comprehensive set of internationally comparable ICT indicators, in conjunction with the Organisation for Economic Co-operation and Development (OECD). As part of its work on the contribution of ICTs to sustainable economic growth,[5] the OECD carries out national peer reviews of ICT diffusion to business. These country reports review the status of diffusion of ICTs, describe policies and provide specific recommendations aimed at ICT uptake in enterprises.

While the information economy is becoming a reality in developed countries, little is known about the extent to which the spread of ICTs fosters growth and development in the developing world. Only a handful of countries (for example, Chile, Cuba, Dominican Republic, Egypt, Nepal, Oman, Republic of Korea, Rwanda, Syrian Arab Republic and Thailand) have so far carried out an assessment of their national ICT plans. The format and scope of their evaluation vary, but their assessments are all motivated by the need to ensure that appropriate revisions of priority policies and recommendations are formulated in preparation for new ICT plans to accelerate their socio-economic development.

By conducting an ICT policy review, Governments will be able to:

- Understand the policy challenges and opportunities which ICTs present for the information economy, and quantify the main achievements regarding the implementation of a number of ICT policy measures as foreseen in the national ICT plan;

- Identify critical success factors, best practices and conditions, as well as reasons for failure to be able to adjust and reform ICT policies;

- Formulate new and targeted policy decisions to support and accelerate ICT penetration with Government, businesses and the community.

2. UNCTAD's proposal for ICT policy reviews

This chapter presents a model framework for carrying out national ICT policy reviews in developing countries. It follows from UNCTAD's ongoing work on ICT policies and on ICT measurement for economic development and trade. So far, this work has been carried out through the organization of a series of regional conferences on ICT policies, thematic expert group meetings, the provision of policy advice through analytical studies published in the E-Commerce and Development Report and the Information Economy Report, and the delivery of training courses.[6] Since 2003, measuring the information economy for policymaking has become a focus of UNCTAD's work, in partnership with other international organizations.[7] As part of its work in this area, UNCTAD collects from developing countries statistical data on the use of ICT by enterprises and on the ICT sector (see chapter 1).

In the *E-Commerce and Development Report 2003*, UNCTAD introduced a model framework for the formulation of a national ICT strategy which focuses on the special concerns of developing countries, recognizing that elements and priorities of national ICT strategies might differ between developed and developing countries. The Report identified key areas and sectors of policy action and elaborated the elements and priorities of national ICT strategies for developing countries.

Based on the 2003 model framework, the review methodology presented in this chapter will focus on policies related to the information economy, including the overall business and economic environment, enterprise development and the development of the ICT industry. Emphasis is placed on the ICT policy actions that are undertaken to promote economic growth and development and the adoption of ICTs by Government and the business sector. An ICT policy review can be used as a road map for Governments as they develop their participation in the information economy. Reviews can also help developing countries to learn from each other's experiences. Box 2.1 provides further details about the proposed model review.

The model proposes a framework for reporting and monitoring the implementation and institutional mechanisms that affect the success of ICT-based policies. This will help Governments guide their reviews, identify the main strengths and weaknesses of their policies and, eventually, revise and adjust them to ensure the enabling conditions for the development of the information economy. Chart 2.2 summarizes the proposed review model framework. It focuses on three main components:

- A **review of the general economic environment and ICT diffusion** to assess the extent to which ICTs are available and used in the country;

- An **assessment of the key policy components** of the national ICT master plan and their implementation: ICT infrastructure, legal and regulatory framework, the development of ICT human resources (capacity building), and the development of sector-specific policies and ICT applications to promote e-business, e-government, ICT-related trade and investment policies, and technological innovation;

- An **assessment of the institutional framework**, implementation mechanisms and the roles of each stakeholder.

On the basis of the proposed framework, section C of this chapter will describe how national ICT policies could be assessed, using selected developing countries
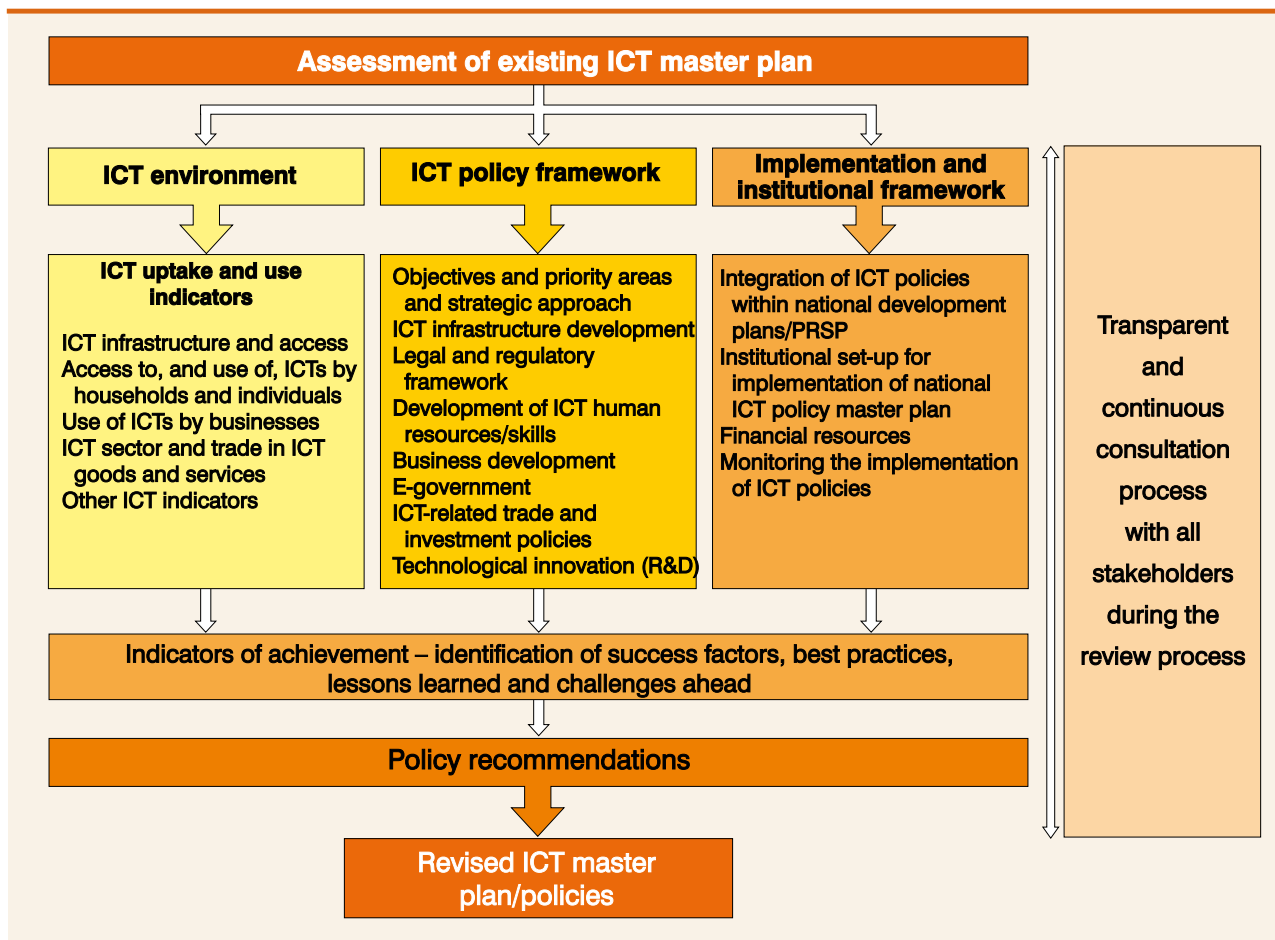

Box 2.1

UNCTAD ICT policy reviews

As part of its technical cooperation activities, UNCTAD offers to carry out full-fledged country reviews to help developing countries adjust their ICT policies and implementation mechanisms aimed at developing the information and knowledge-based economy.

The reviews would assess the implementation of the national ICT master plans within the context of UNCTAD's mandate to examine how ICT and e-business development issues have been operationalized in country development strategies and to identify policies and programmes favouring the development of the information economy. In this context, specific e-business policies and cross-cutting policies that are intimately linked to the development of the information economy,[1] such as telecommunications infrastructure, legal and regulatory issues, and human resources, would be evaluated. Other components that form an integral part of an ICT national master plan, such as sectoral policies related to ICT and social development, including health and culture, could be added in partnership with other relevant organizations (e.g. WHO, UNESCO). The review methodology is intended to help policymakers, donors and the general public to assess the achievements of ICT policies and the current status of the information economy in a country, as well as to make recommendations on policy priorities.

ICT policy reviews would be carried out at the request of and in close cooperation with member States and subject to available funding. The review process would take the form of the compilation of an evaluation report prepared by UNCTAD in consultation with the national authority of the requesting member State. The process involves field missions, the active participation of the relevant stakeholders during interviews and the organization of workshops to discuss the evaluation of ICT policies related to the information economy and the recommendations of appropriate policy options, as well as indicators of achievement for future policy measures. Details on the methodological framework for carrying out the review will be part of a separate UNCTAD document and not included in this Report. Further information will be available at www.unctad.org/ecommerce.

[1] See chapter 3, ICT strategies for development, ECDR, 2003, available at www.unctad.org/ecommerce.

Chart 2.2

UNCTAD's ICT policy review model framework

Assessment of existing ICT master plan

ICT environment

ICT uptake and use indicators

ICT infrastructure and access
Access to, and use of, ICTs by
   households and individuals
Use of ICTs by businesses
ICT sector and trade in ICT
   goods and services
Other ICT indicators

ICT policy framework

Objectives and priority areas
   and strategic approach
ICT infrastructure development
Legal and regulatory
   framework
Development of ICT human
   resources/skills
Business development
E-government
ICT-related trade and
   investment policies
Technological innovation (R&D)

Implementation and institutional framework

Integration of ICT policies
   within national development
   plans/PRSP
Institutional set-up for
   implementation of national
   ICT policy master plan
Financial resources
Monitoring the implementation
   of ICT policies

Transparent
and
continuous
consultation
process
with all
stakeholders
during the
review process

Indicators of achievement – identification of success factors, best practices, lessons learned and challenges ahead

Policy recommendations

Revised ICT master plan/policies

as examples. Lessons learned from implementation mechanisms and major achievements will be used to shed light on best practices and successful ICT policies.

In preparing this chapter, UNCTAD carried out in-depth research on developing and transition countries' status as regards formulating and implementing a national ICT master plan. For this purpose, it collected and analysed information on the ICT plans and policies of 181 developing and transition countries and territories (for an overview of the status of national ICT plan and policies, see annex II). The information is based on extensive Internet research (information provided by the websites of developing countries' Governments and on a questionnaire that was sent out to collect information on national ICT master plans and to enquire whether they had been already assessed).[8]

B.   ICT policy review model framework

1.   Overview of the social and economic setting

The first section of the ICT policy review restates the objectives of an active or proposed national ICT policy. It reviews the policy against the backdrop of the economic, demographic and social environment in the country. It points out factors that can affect the implementation of the national ICT policies, and then provides a short overview of the major national economic and social key indicators at the time of the preparation of the ICT master plan, and at the time of the review. The purpose of the overview is to present the overall context in which the information economy in the country is evolving.

2.   ICT environment: ICT uptake and use indicators

This part of the review provides an overview of a country's ICT uptake focusing on the current status of ICT penetration for different economic actors (industry sectors, companies and households). As part of the national ICT plan, it is critical for Governments to set measurable targets which then need to be assessed. Through their national statistical offices, ministries or telecommunications operators, Governments should collect ICT data on a regular basis to:

- Measure the success of the formulation and implementation of ICT policies;

- Identify the effectiveness of such policies;

- Establish links between ICT policies and the performance of specific sectors, such as telecommunications, and the development of information economies;

- Monitor ICT growth and use over time; and

- Carry out research and analysis on the impact of ICTs on productivity, growth, enterprise development and trade.

Below are four sets of internationally agreed upon core indicators (see annex I and chapter 1)[9] that are suggested as a reference tool to complement the existing methodological framework in a country. The list of indicators can be adapted to the needs of individual countries, depending on their own economic and social challenges. They focus on ICT infrastructure, and ICT access and use by businesses, households and individuals, as well as on the ICT sector and trade in ICT goods. These indicators help policymakers to assess the changes that have occurred over the years as a result of their policies and plans.

Core indicators on ICT infrastructure and access

Developing countries have made the deployment of ICT infrastructure and universal ICT access a top priority in their ICT master plan, as a prerequisite for participating in the information economy. Many of them are starting to collect data on infrastructure and access to ICTs. These ICT infrastructure and access indicators correspond to individual use and measure accessibility in terms of people. For instance, those indicators include, per capita measures, fixed telephone lines, mobile cellular subscribers, Internet subscribers,

and so forth. Collecting such data helps Governments to monitor, inter alia, the advancement of ICT teledensity, geographical coverage, quality of services, communication costs and bandwidth availability.

Core indicators on access to, and use of, ICT by households and individuals

Internet public awareness campaigns and advances in access to telecommunications through policymaking can be evaluated by collecting data on access to, and use of, ICT by households. For instance, core indicators on access to, and use of, ICT by households and individuals include the proportion of households with a radio, a TV, a fixed line telephone, a mobile cellular telephone and a computer with Internet access at home. Among those indicators, information on the type of activities carried out by households helps in assessing the frequency and volume of business-to-consumer e-commerce activities.

Core indicators on the use of ICT by businesses

In addition to measuring computer penetration in the private sector, the actual level of use of computer systems to support e-business organizational activities and operations helps measure the level of development of the information economy in a country. The *E-Commerce and Development Report 2004*[10] noted that a large number of SMEs in developing countries have access to the Internet but have not yet integrated ICTs into their business functions. In most cases, computers are mainly used to carry out basic computing work such as word processing and e-mail. The Report stressed the lack of available statistical data on e-business and the implications that this may have for ICT-related policymaking. In this regard, it is essential to monitor progress in the use of high-end value-added applications, as well as the Internet. This could be done by using the core indicators on the use of ICT by business, which include the proportion of businesses using computers, those using the Internet, and proportion of businesses with a Web presence, with an intranet, receiving orders over the Internet or placing orders over the Internet.

Core indicators on the ICT sector and trade in ICT goods and services

Developing countries have recently focused on the development of the ICT sector in order to diversify their economies, to respond to demand from developed

countries for ICT-enabled services, to be less dependent on ICT goods and services imports, and to develop local human capabilities and generate job opportunities for the development of the information economy. The ICT sector core indicators that are considered in the review include the proportion of the total business sector workforce involved in the ICT sector and the value added in the ICT sector (as a percentage of total business sector value added) in a country.

Trade in ICT goods and services is among the most dynamic sectors of international trade (see chapter 1). For developing countries, exports of ICT-enabled services provide new opportunities for economic growth and employment creation, including through the continuous increase of outsourcing. Therefore, the review analyses developments in imports and exports of ICT goods and ICT-enabled services.

Other ICT indicators

In addition to the core ICT indicators recommended by the international community, national ICT policy reviews assess the development of other information society indicators, such as ICT skills and computer literacy, the level of investment in ICTs, and indicators related to e-government and education, security and trust. The choice of indicators considered in the review is made on a country basis and reflects the particularities of the country under review.

3.   Assessment of ICT policy framework

This part of the review examines national ICT policies which have been put in place by the Government and discusses whether they have been successful in terms of meeting initial goals. It identifies the components of a national ICT plan, priority actions, sectors concerned, targets and relevant projects. If necessary, it also recommends how the policies can be improved.

The primary focus is on the review of policies implemented to accelerate ICT diffusion in a country and identify successful achievements as well as bottlenecks. In particular the review outlines specific reforms aimed at providing a more enabling business environment for SMEs. The main objective is to identify lessons learned as well as challenges ahead. Specific recommendations on action needed to achieve the policy objectives are provided.

Objectives, priority areas and strategic approach

Each country, with its specific economic, social and legal context, is facing unique challenges regarding its ICT diffusion and use. Consequently, a national ICT master plan setting the overall direction and parameters for different areas of activities should address a country's specific needs and identify priorities accordingly. Related key objectives should address the identified areas of priorities and include quantitative results that make the master plan's long-term implications measurable.

The strategic approach to implementing the ICT plan defines key programmes and areas of activities in order to achieve the defined objectives and goals for the main policy components, such as ICT infrastructure, the legal and regulatory framework and the development of ICT human resources.

The process of the ICT policy formulation should be transparent and involve all stakeholders. ICT policies should be well structured and clearly formulated.

This part of the review closely examines the following issues related to policy formulation:

- Identification of a country's specific needs and areas of priority;
- Definition of ICT policy direction and key objectives;
- Focus of ICT plan;
- Key areas of activity;
- Indicators of achievement;
- Process of ICT policy formulation.

ICT infrastructure development

Developing an affordable information and communication network infrastructure and applications is central to building the information economy. All countries have recognized the critical importance of the telecommunications sector in their ICT master plans. The Governments' objective is to ensure that the country has a competitive telecommunications industry which delivers reliable and affordable services and products for the economic and social benefit of citizens. Many Governments in developing countries have in recent years facilitated the introduction of competition into a telecommunications industry traditionally structured around monopolies. The development and deployment of ICTs are changing the structure of the industry,

favouring the appearance of private operators offering advanced telecommunications networks and services.

In particular, the performance of the ICT sector itself is dependent on ICT policy measures that address the particular needs of ICT-sector firms and foster an enabling ICT environment. Policy measures can make an essential contribution to the national and international business environment, as well as to corporate strategies and enterprise performance, and hence the overall competitiveness of companies. If Governments define the enhancement of national software and IT services as a priority concern, the promotion of the ICT sector firms must also be a priority within a national ICT

master plan. Corresponding policy measures should enhance the ICT infrastructure with regard to access, pricing and local content, and they should be related to providing finance, skills and education. Moreover, they should encourage the development of a strong and competitive ICT sector in enabling ICT companies to enhance their competitiveness, at both the national and the international level.[11]

As part of the review, the effectiveness of policy measures on ICT infrastructure development is assessed and the challenges that remain in closing the connectivity and accessibility gaps are identified. The review closely examines the following issues:

Box 2.2

ICT infrastructure development in Nepal

Nepal's first National Communications Policy was adopted in 1992, and the Nepal Telecommunications Authority was established in 1997. In 1999, the National Policy was modified in order to initiate the liberalization of the Nepalese telecom sector, by encouraging the participation of the private sector. The same year, telephone penetration grew by 22 per cent.[1] In 2004, the telecommunication sector had been fully opened to private service providers and competition, through open licensing and by restructuring the State-owned operator. Some notable results were:

- Growth in the total telephone penetration rate from 1.4 per cent in August 2002 to 3.1 per cent (2 per cent for fixed lines and 1.1 per cent for mobiles) in July 2005;[2]

- Growth in the number of distributed (fixed) lines, which increased from approximately 65,000 in 1992 to over 470,212 in January 2006;[3]

- A mobile phone service was launched in 1999, and in January 2006 there were already over 99,000 post-paid and 200,000 pre-paid mobile subscribers. The network is now fully digital and offers full national and international direct dialing services.

Nepal's *Information Technology Policy 2004* states the policy measures to further the development of the ICT infrastructure in order to continue the progress made under the *IT Policy 2000*.

Provide Internet facilities

- Starting with very low levels, Internet connectivity grew by 150–160 per cent per annum between 1995 and 2002.

- There was a rapid fall in the cost of Internet access ($0.20 per minute in 1995 to $0.20 per hour in 2004). Unlimited Internet access via dial-up cost $70 per month in 1998, which fell to $10 per month in 2004.

- There are about 200,000 Internet users, of whom 40,000 are subscribers. In 1999, there were about 290 domain names registered under ".np", and close to 4,600 at the beginning of 2004.

Develop virtual and physical Information Technology Parks

- With the active participation of the private sector, the construction of the IT Park was completed and it is now in operation.

- With assistance from the Indian Government, the construction of an optical fibre link (the East–West Highway, 880 km) between Katmandu and Southern Indian terrestrial networks is nearly complete.

The growth in the telecommunications sector has been heavily skewed in favour of urban areas, in particular the Katmandu valley, which accounts for two thirds of the total number of telephone connections in the country. To remedy to this situation, around 200 telecentres in rural and sub-urban areas were set up in 11 districts.

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[1] High Level Commission for Information Technology of Nepal (2005).

[2] http://www.itu.int/ITU-D/ict/informationsharing/index.html.

[3] Nepal Telecommunications Authority, Management Information System (MIS) Report, http://www.nta.gov.np/mis_report.html.

Table 2.1

Egypt's major telecom infrastructure indicators

Telecommunications Infrastructure Indicators				
Indicator	October 1999	March 2004	March 2005	December 2005
Exchange capacity (million)	6.4	11.6	12.1	12.7
No. of telephone fixed lines (million)	4.9	9.1	9.6	10.4
No. of public phone booths	13 305	48 983	54 346	55 700
No. of mobile phone subscribers (million)	0.654	6.1	8.6	14
No. of Internet users (million)	0.3	3.15	4.3	5
No. of PCs (million)	0.85	1.7	2	2.54
Total number of IT companies	266		1 374	1 716

Source: Arab Republic of Egypt (2006).

- Telecommunications market (access, affordability, etc.);

- Deployment of broadband access network, fibre optic backbone networks, and increased access points for the Internet;

- Investment incentives;

- International and regional cooperation for infrastructure development;

- Resources;

- Technical and legal capacities to implement these policies;

- Coordination between public and private stakeholders;

- ICT sector.

As an example, box 2.2 – on the ICT policies related to infrastructure development in Nepal – presents some achievements in developing ICT use in the country by citizens and enterprises.

The Egyptian Information Society Initiative in the past five years has also taken significant steps forward in the modernization of ICT infrastructure. *Access to the Internet and Related Services* is one of the three main pillars that the Egyptian Government has established, where policy and development are currently concentrated (together with Research and Development and Maintaining Regulatory Policies). Table 2.1 presents some major telecommunication infrastructure indicators.

The following case study illustrates how liberal policies such as privatization and opening up to trade can be successfully blended with other trade policy instruments to ensure more social and economic benefits. Taking as an example Peru's telecommunications service sector from 1992 to 2004, the study combines elements of trade (subsidization), competition and broader economic policy.

Legal and regulatory framework

An enabling legal and regulatory framework is one of the key policy pillars of an information-based economy – and one of the key elements of a national ICT plan.

An appropriate legislative framework is fundamental for any electronic commercial transaction, ensuring that the latter is legally valid, binding and enforceable. It builds confidence in the electronic transmission of sensitive information, creating trust between commercial partners and providing security for customers. It is a facilitator of domestic and international electronic trade, controlling and regulating the use of ICT-enabled services and ensuring legal protection for the provider and users in the global market.[12] Strengthening the trust framework, including information and network security, authentication and privacy, is a prerequisite for the growth of ICT uptake by businesses and the development of e-business.

Telecommunications regulations are essential in promoting telecommunications access, fostering

Box 2.3

Peru: Subsidizing the universal provision of telecom and Internet services at minimum cost

Following the 1992 privatization of the incumbent, Peruvians living in rural areas were still provided with very little access to basic telecom services.[1] In order to address this market failure, the Peruvian Government intervened to extend public fixed voice telephony and Internet access to the rural areas, seeking to achieve universal access in the long run. For this purpose, a special fund (Fondo de Inversión en Tele-comunicaciones, FITEL) was established in 1993 for the purpose of subsidizing private telecom companies to provide service for targeted rural areas. The fund started to function in 1999 and was financed by a 1 per cent mandatory levy on the gross operating revenues of telecom companies. The positive aspects of Peru's initiative are the following:

- The fund is managed by an independent regulator, OSIPTEL, as opposed to government-dependent bodies. It made it more accountable to stakeholders since the moneys could not be transferred for other policy objectives.

- OSIPTEL was also in charge of attracting private investments in the Peruvian telecom sector. Foreign services suppliers were guaranteed the same level of fair treatment as their domestic counterparts.

- The subsidy scheme relied on a market distribution system, which minimized the cost of service provision. Private companies bid for the lowest subsidy to provide service in a given area, where they obtained a 20-year concession. For the pilot project (2000), the winning bid required a subsidy 74 per cent lower than the previous offer by the incumbent operator and 50 per cent lower than the mobilized funds.

- Following consultations with stakeholders and comprehensive assessments, the first projects focused on rural localities with 500 to 3,000 inhabitants. The challenge was to best allocate subdivisions in those areas to favour competition between providers, but without compromising economic viability. This approach had potential disadvantages for the smaller localities, for women and for the disabled (see chapter 2 for a discussion of telecentres' failure to address all aspects of poverty). However, disadvantages should be balanced against the scarcity of financial resources, and the intention to gradually expand the scope of the policy.

- OSIPTEL was also aiming to make the service provision to rural areas a stand-alone profitable commercial activity by the end of the 20-year concession. Therefore, the subsidy was granted only for the first five years, in periodic instalments and conditional on the provision of a minimum contracted service (including as measured by quality standards). Fines were collected when the provider under-delivered.

Several projects were conducted successfully. During the first stage (1999), 4,938 villages gained access to the telecom infrastructure and benefits accrued to 3.9 million inhabitants. In the targeted area, this improved the proportion of people with telephone access from 48 per cent in 1999 to 88 per cent in 2000. During the second stage (2000–2002), another 1.8 million people and 1,616 villages benefited. The last project was initiated in 2001 with a view to extending access to telephone and Internet for rural health establishments.

According to the OECD (2004), there are as many as 60 developed and developing countries in the world currently implementing or planning to put in place a universal access fund.

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[1] *Sources*: OECD (2004), Intelecon Research (2005), Cannock (2001), Maddens (2005), World Bank (2002) and the OSIPTEL website.

competitive markets and attracting investment. Regulations and policies creating an overall enabling economic and business environment are important facilitators of foreign investment, as well as of ICT adoption by domestic business entities. In this regard, trade and investment policies, standard setting, banking and finance are important areas.

An ICT policy review examines policy measures related to the following:

- National regulatory institutions;

- Telecommunications regulations;

- Investment regulations;

- E-commerce laws (digital signatures, intellectual property laws, etc.);

- E-payment (see box 2.4);

- Trade policies (e.g. import duties in IT products; signatory to the Information Technology Agreement).

Box 2.4 gives an example of how a government policy has led to an increase in online payments.

Box 2.4

Tunisia's e-Dinar initiative

Credit cards operations have appeared only recently in Tunisia, and thus a majority of Tunisians still cannot make online payments. To address this problem and to promote e-commerce, Tunisia has issued a virtual currency, the electronic Dinar or "*e-Dinar*", also called the electronic purse. Created in August 2000 by the Ministry of Communication Technologies, it consists of an anonymous and virtual account, rechargeable through prepaid cards (with different values) that can be bought in Tunisian post offices. Various merchant websites (about 200) are connected to the "*e-Dinar*" platform, and offer different types of products and services, such as university registration, payment of national taxes, online bookings and payments (flights, hotels, car rentals). The Tunisian Post Portal[1] itself integrates 14 websites that offer e-commerce possibilities (Web Telegram, e-learning, stamps, flowers, etc.). In 2005, 54,000 persons used the "*e-Dinar*" system (with a total of 61, 288 cards sold[2]) to make online payments, compared with 3,000 users registered in 2001.[3] The platform was certified by Visa International and MasterCard in 2005.

Source: Chaffai El Sghaier (2006).
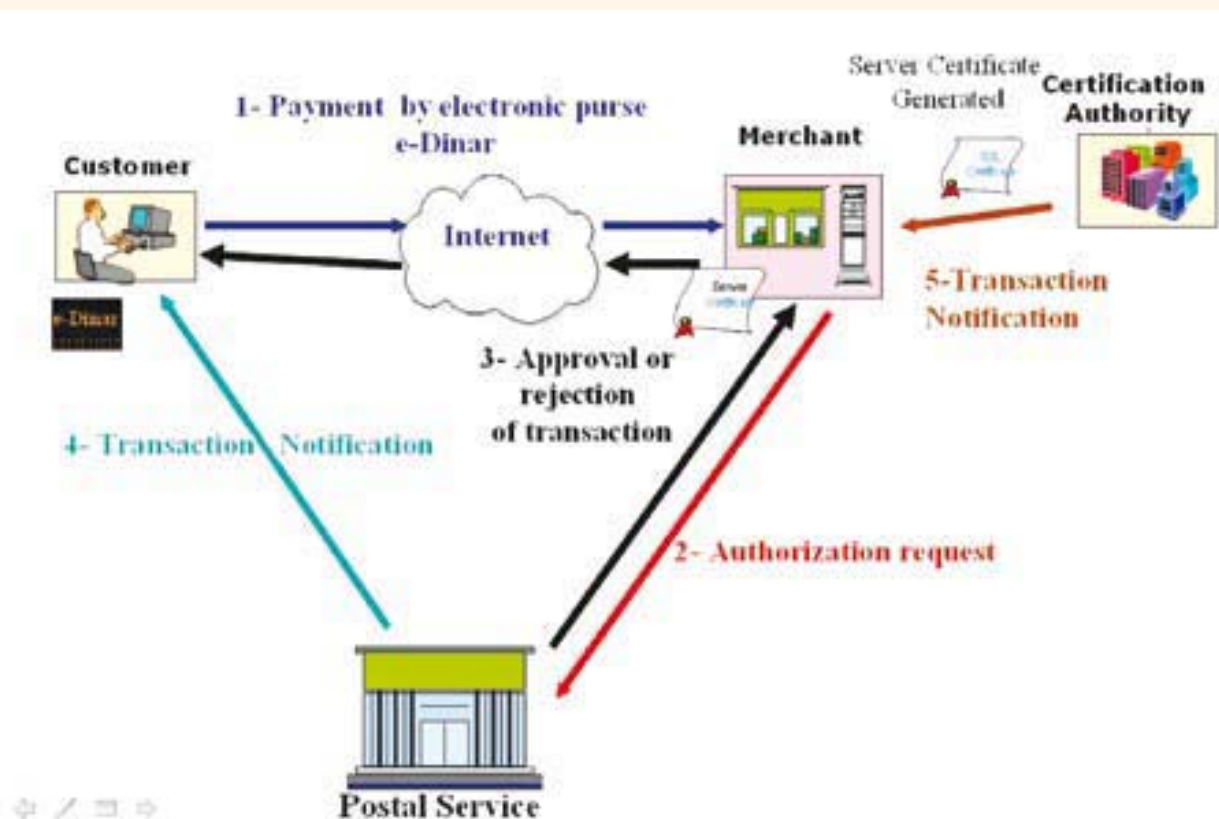
[1] http://www.poste.tn.
[2] http://www.infocom.tn/index.php?id=272.
[3] For a case study, see Chaffai El Sghaier (2006).

Development of ICT human resources/skills

ICT skills are a fundamental enabler for actively participating in, and benefiting fully from, the information economy. Knowledge creation is vital for both the production and the use of ICTs. Many countries have introduced ICT training in the public and private sector, in ministries and related institutions, and in schools to increase educational opportunities and augment the supply of ICT graduates.

The ICT review looks at the policy measures aimed at developing:

- ICT skills in primary and secondary schools;

- IT graduates and programmes (universities);

- Training projects to enhance the IT workforce in the public sector (including ministries and NGOs) and the business community;

- Incentives for private sector companies to organize/support IT capacity building.

Box 2.5 presents the actions and results of Rwanda's first ICT plan and policy review in the field of development of ICT human resources.

Business development

In their ICT plans, some countries have designed and are implementing specific policies to increase the diffusion of ICTs to SMEs to encourage their participation in the global economy. The development of e-business is carried out in cooperation with the business sector to identify the needs of SMEs, offer training programmes and improve their capacity on a continuous basis for use and innovation in the available technologies (see *E-Commerce and Development Report 2004,* chapter 4). Another important area for developing countries relates

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Box 2.5

Review of the development of ICT human resources in Rwanda

The Rwanda Information Technology Authority (RITA),[1] started in 2001, is the national coordinating body to support the development and the implementation of Rwanda's first ICT Plan (National Information and Communications Infrastructure Plan, NICI, 2001–2005). Human resources development was one of the pillars of the NICI Plan and various programmes and initiatives were implemented in different areas. Following are some of the policy measures on human resources development that were implemented:

- National Human Resource Development Agency (NHRDA) was set up in 2002 to monitor national human resources needs, to mobilize funds and to develop appropriate training structures.

- Various ministries and public sector organizations put in place training to develop skills within the civil service *(special basic computing and Internet use training programme,* s*pecial professional-level ICT training programmes*). IT literacy will become an essential requirement for all future civil servants.

- A programme was put in place to enrol students in ICT-related courses and to add ICT courses to all types of degrees and diplomas within the National University of Rwanda (NUR), the Kigali Institute of Science Technology and Management (KIST), the Kigali Institute of Education (KIE) and other institutions of higher learning.

- A national programme was deployed to increase the use of ICTs in universities and colleges. It included the implementation of *Computer Science* or *Computing Departments* in universities, initiatives to increase the number of ICT students, availability of Internet access, the creation of a Rwandan Academic and Research Network (RARN), and the setting-up of ICT R&D centres within universities.

- Specific programmes were implemented to increase the enrolment of women in ICT-related higher education and professions.

- To increase the number of computers in schools, various programmes and policies were prepared, such as tax policy instruments (to facilitate the import of computers and related equipment), the forthcoming obligation for ministries, public agencies and public sector organizations to give their old computers to schools, and the implementation of the *Adopt-and-Sponsor a School*[2] initiative.

- A specific initiative has been implemented to ensure the IT literacy of teachers, via the creation of a *Train-the-IT Teachers (TITT) Certificate Programme.* During the first NICI Plan, about 3,000 teachers were trained.[3]

As a result of these measures, some progress has been made, especially in providing computer access in schools. For instance, in 2001, only one school (primary and secondary schools included) in the whole country had a computer. In 2005, 1,138 out of the 2,300 primary schools had one, and 100 of these schools had two.[4] However, a review carried out in 2005 identified the lack of qualified human resources as one of the main barriers to the implementation of the NICI Plan. As at June 2005, RITA had achieved only 26 per cent of the plan in five years.[5] The revised plan will have to put more emphasis on building ICT capacities.

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[1] http://www.rita.gov.rw/about.htm.

[2] This specific initiative aims at looking for sponsors within the private sector, civil society and international agencies involved in Rwanda.These sponsors provide computers, resources and educational facilities to a school they have «adopted».

[3] Review of the implementation of the Rwanda ICT4D/NICI-2005 Plan, http://www.uneca.org/aisi/nici/Documents/The%20NICI-2005%20Plan%20Review-Final%20Report.pdf.

[4] Review of the implementation of the Rwanda ICT4D/NICI-2005 Plan, http://www.uneca.org/aisi/nici/Documents/The%20NICI-2005%20Plan%20Review-Final%20Report.pdf.

[5] http://africa.rights.apc.org/index.shtml?apc=21873n21845e_1&x=194393.

to the development of the ICT sector to improve their local capabilities and to diversify their economies by producing ICT goods and services.

The review examines the policies related to the following:

- Promoting the use of ICTs and e-business by enterprises (text processing, e-mails, e-business processes);

- SME capacity building;

- Financing SMEs (venture capital);

- Public procurement;

- Online e-business sectoral initiatives (e-marketplaces).

Box 2.6 presents some specific initiatives implemented by Nepal to encourage the participation of all businesses, including SMEs, in the global economy.

E-government

In many developing countries, Governments are the main users, enablers and pioneers of ICT diffusion. E-government consists of the following electronic interactions: government-to-government (G2G), government-to-business (G2B) and government-to-citizen (G2C). Governments can provide non-commercial and commercial services to optimize administration costs and deliver better and more efficient services to their citizens, and stimulate the efficiency of their operations.[13] The Tunis Agenda for the Information Society noted the increasing use

of ICTs by Governments and encouraged countries that have not yet done so to develop e-government programmes and policies. It encouraged the development and implementation of e-government applications based on open standards. Working on infrastructure and uniform standards for interchange of data between administrations will help streamline G2G and G2C communications. Challenges to e-government applications are often a combination of both policy and technology issues. Interoperable open standards among different government departments are the prerequisite for a seamless information flow and integration within e-government operations.

According to the latest UNDESA E-government readiness survey, published in 2005, 179 out of 191 member States had a website presence. A few countries utilized the full potential of e-government to provide information and services to their citizens, and transactional services online remained limited mostly to the developed countries.[14]

The review examines the policy measures aimed at developing:

- E-government non-commercial and commercial services;

- E- procurement;

- E-business systems.

Box 2.7 presents the actions undertaken by South Africa in the field of development of e-government, with a unique Initiative, called the "*Batho Pele Initiative*".

Box 2.6

National ICT plan and e-business development in Nepal

As part of the policy measures to foster the development of e-business in Nepal, the Government has planned to transform traditional industries into ICT-enabled businesses.

The Rural–Urban Partnership Programme (www.rupp.org.np) runs a B2B site (www.b2b.com.np) promoting business transactions among entrepreneurs, and also aims to establish regional linkages among 12 partner municipalities. Nepali e-Haat Bazaar is the national B2B e-commerce marketplace, a single electronic gateway to promote market linkages within the country and with the international markets.

The Government has set up business incubators (www.incubation.org.np) to develop SMEs (June 2005) and was planning to allocate a budget for the development of business incubation in order to gear up developmental and business activities. The Government also developed web portals and B2B marketplaces in selected market segments, such as:

- AgriPriceNepal (http://AgriPriceNepal.com) provides comprehensive agricultural commodity intelligence to traders.

- The enterprise site www.thamel.com, which provides information on business in the Thamel area of Katmandu, won the Worlds Bank's Tony Zeitoun Award for successful entrepreneurship and innovation in 2003.

Box 2.7

South Africa: The "Batho Pele Initiative"

South Africa's e-government policy is led by the Centre for Public Service Innovation (CPSI), created in 2001 to "*enable the South African Public Service to be able to effectively implement innovative ideas in its quest for improved service delivery*[1]" in partnership with the Department of Public Service and Administration[2] and the State Information Technology Agency.[3]

In this context, the "*Batho Pele Initiative*[4]" – or "People First Initiative" – has been established to provide a single entry point to government services and information, and to enhance the quality and accessibility of those services.

A Government Portal index page has been put in place (see www.gov.za), and provides online access to a large number of services and information. Services available online are dedicated to personal life events (such as birth, education, disability, citizenship, etc.), to organization – specific needs (such as taxes, intellectual property issues and other business issues), and to foreign nationals (people who want to move to, work in or visit South Africa).

Detailed information, steps to follow and downloadable administrative forms are available on the Portal. For instance, people can register a birth, renew their driving licence, apply for registration as a voter, apply for water and electricity, apply for VAT registration, register as a service provider/supplier for government, register a copyright, apply for naturalization, apply for a study permit, or apply for a visa, and so forth.

This project is planned to be extended to citizens living in poor or remote areas, via public information terminals available in post offices, and via an increasing number of community centres.

[1] http://www.itweb.co.za/office/sita/0108310825.htm.
[2] http://www.dpsa.gov.za/.
[3] http://www.sita.co.za/.
[4] http://www.info.gov.za/aboutgovt/publicadmin/bathopele.htm.

The following case study illustrates how the evaluation of Chile's electronic procurement system, which was near to failure, in 2002 and the consequent development and implementation of a strategic plan helped to make the platform a model of success.

ICT-related trade and investment policies

Trade and investment policies play an important role in helping countries take advantage of the benefits offered by the information economy. They are critical to ensuring the growth and dissemination of ICT products and services, the development of an affordable and high-quality ICT infrastructure, and the development of human resources and technological innovation needed to advance a knowledge-based economy.

Policies that enhance international trade in ICT-related products and services range from a reduction of import and export duties on ICT goods, and the promotion of outsourcing of ICT-enabled services, to the liberalization of information and communication services. The WTO Information Technology Agreement has significantly reduced import duties on IT products of WTO member States. However, in some countries, high import duties on certain ICT products still keep prices artificially high in the domestic market and remain an obstacle to the development of the local information economy.

A policy framework that promotes open markets, competition and private-sector investment will attract companies not only in ICT-related industries but other sectors that support and benefit from the information economy. Proactive ICT-related investment policies include financial or/and non-financial incentives or the promotion of national and foreign investment via tax incentives, unlimited employment of foreign workers or guarantee of loans. To create an investment-friendly environment, the establishment of a legal framework that protects intellectual property rights is also critical.

A well-known example from South Asia is the Malaysian Super Corridor,[15] which is a key component of the Malaysian ICT plan. It is a dedicated 15 x 50 km corridor located 30 km south of Kuala Lumpur and hosting (in 2006) more than 900 ICT companies,[16] including national SMEs in the ICT industry. To attract the targeted companies, the Malaysian Government has committed itself to, inter alia, (1) a bill of guarantees, (2) a world-class infrastructure, (3) a suite of cyber laws, and (4) financial, as well as non-financial, incentives. Similar examples exist in other Asian countries, and in some developing countries in Latin America.

Box 2.8

Chile's e-government system: A best practice model

Chile's e-government system is regarded as the most advanced in Latin America and as best practice – not only for its variety of services and information, but also for the high degree of usability, efficiency and transparency.[1] In particular, the electronic procurement platform of the Chilean Government, ChileCompra,[2] is a centralized public sector procurement and contracts system that benefits both government agencies and private companies. According to the World Bank (2004), "*Chile has adopted a well thought and comprehensive strategy and action plan for procurement of goods and services that is a best practice example to be followed*". Moreover, it is recognized that ChileCompra has brought a high degree of transparency to public procurement.

However, in its early years (1998–2002) "*ChileCompra failed to take off*" (Gobierno de Chile, 2002). An evaluation of the platform in 2002[3] identified the underlying reasons: (1) a lack of leadership and political commitment within the implementation process; (2) a lack of awareness of the importance of public procurement among public agencies; (3) a lack of professionals in procurement and use of technologies; and (4) a cultural resistance to e-commerce tools. Furthermore, the platform itself revealed deficiencies such as misclassification of business areas or late postings. In 2002, only 9 out of 257 public agencies and 577 out of 6,193 suppliers were regular users of ChileCompra.

How could ChileCompra develop from a near-failure into a model of success? One of the driving forces to reinvigorate the project was the evaluation and the development and implementation of the Public Procurement System Strategic Plan 2002–2004. The plan is embedded in Chile's overall Digital Agenda 2004–2006 and reveals a realistic strategy to relaunch the online platform, with a clearly defined vision, mission and objectives, and specific action lines.

The strategy fosters small companies and regional participation, provides for more training and technical assistance, and includes the redesign of the platform in order to increase usability, security and standards – and client satisfaction. Furthermore, it defines appropriate indicators that will regularly evaluate the achievement of goals. For example, the achievement of "e-government promotion" and "e-commerce promotion" goals was defined in terms of numbers of member public agencies and member suppliers. Thus, the platform should have been joined by 250 government institutions as buying entities and by 10,000 providers on the supply side by the end of 2004. In point of fact, 879 public agencies and municipalities and more than 100,000 providers were registered by 2004.[4]

Further factors for success were a strong commitment by the Chilean president to promote the system, and the enactment of the Electronic Signature Law (2002) and the Government Procurement Law (2003). The latter established ChileCompra as the electronic procurement platform for all governmental agencies (regional, provincial and municipal) and the Armed Forces, and provided for a large increase in the number of users.[5] Another revitalizing factor was the Pro-Growth Policy Agenda of 2002, a key road map plan of the Ministry of Economy that prioritized the improvement of transparency and efficiency in the public sector, and set out a commitment to develop an electronic market. Furthermore, bilateral trade agreements with the United States and the EU forced Chile to provide foreign companies with access to its government procurement scheme.

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[1] United Nations (2004, p.35).

[2] See http://www.chilecompra.cl.

[3] Dagnino (2004).

[4] Digital Agenda Technical Secretariat, Digital Agenda: Main Achievements, April 2005 (English version), http://www.agendadigital.cl/aws00/servlet/aawsconver?2,,115006.

[5] Gobierno de Chile, Digital Agenda 2004–2006 (English version), http://www.presidencyofchile.cl/upload_documentos/Digital_Agenda_2004-2006.pdf.

This part of the ICT policy review thus looks at policy measures aimed at:

- Increasing trade in ICT-related goods and services;

- Attracting FDI in ICT-related industries (investment incentives, taxation, regulations);

- Promoting specific economic sectors and activities, for example business process outsourcing.

Technological innovation (research and development)

Science and technological innovation is acknowledged as an essential contributor to the overall social and economic development of a country: not only might it help solve problems which a country is facing (e.g. in providing infrastructure), but also it can be regarded as a *base* for economic development. As stated in a report by the UN Millennium Project Task Force on Science, Technology and Innovation, "*technological innovation is …*

not simply a matter of installing devices, but of transforming society and its value systems".[17] The Tunis Agenda for the Information Society recognizes the enabling role of an international and domestic policy environment for encouraging investment and innovation, and the driving forces of the private sector and civil society[18] for innovation and private investment.

Given the increasing scientific gap between developed and developing countries, Governments need to become more active.[19] Moreover, "*the risk of a scientific divide arises when leading decision makers fail to regard science as a priority economic and human investment*".[20] Governments play a crucial role not only in providing the legal environment, but also in encouraging the private sector in the field of technology and innovation – through goal-oriented policies, for example, as successfully pursued by Brazil.

A country's research and innovation capacity depends on the interaction between all stakeholders, complementing each other – the public sector as well as the private sector, civil society and academia. The greater the integration and interaction of and among stakeholders, the more successful a system of research and innovation will be. Developing countries, however, often reveal a lack of integration capacities.[21] Here, Governments play a crucial role in creating research networks, at national, regional and international levels. Moreover, the nature of innovation calls for long-term oriented, consistent policies.

In this regard, the review examines:

- Policy measures that aim at developing capabilities through research and development programmes;

Box 2.9

ICT policy with focus on ICT R&D: The case of Thailand

One of the key strategies defined in Thailand's ICT Master Plan 2002–2006 is to strengthen ICT research and development (R&D).[1] This Master Plan is linked to the Ninth National Economic and Social Development Plan as well as to the National Information Technology Policy 2001–2010 (which is built on the principles of *building up human capital, promoting innovation and investing in information infrastructure,* and *promoting the information industry*).

The Master Plan's ICT R&D strategy involves the participation of the public and private sector as well as educational institutions. Among its overall goals are "80 per cent of locally made PCs used in the country by 2004" and "at least 70 per cent of total developers should be software developers who can use network computing technology or web services by 2004". Furthermore, the plan defines several areas of activities contributing to goal achievement, including the promotion of R&D for products with potential commercialization. The strategy also identifies the roles and responsibilities of the agencies involved. Goal achievement is linked to a specific time frame of operation as a basis for the monitoring and evaluation process.

Could Thailand's ICT R&D strategy reach its goals? On the basis of data available as of June 2006, the general increase in R&D expenditures as percentages of GDP from 0.1 per cent in 1999 to 0.3 per cent in 2003 indicates a development in the right direction.[2] A survey published by the National Research Council of Thailand (NRCT) on Thailand's R&D expenditure and personnel in 2001 compared Thailand's R&D expenditures as percentages of GDP (0.2 per cent) with those of other countries, and noted that expenditures were below those of the United States and many Asian and European countries. Thailand's IT market has expanded, continuously with an average annual growth rate of 17 per cent between 1999 and 2004. In 2001, 45 per cent of R&D personnel were researchers (25,100 persons). The figure for Thailand's full-time equivalent research personnel was 3.9 per 10,000 inhabitants, also below that of other countries (7.5 in China and 4.3 in Malaysia). There were no data available indicating the development of R&D personnel within the last few years.

In its executive summary of the Strategy and Action Plan Development 2005–2007, Thailand's Office of the National Research Council identifies two key limitations to the development of a knowledge-based society in Thailand in the past.[3] The first is the lack of coherence in terms of policy directions and objectives and hence of research strategies, goals, resources allocation and systematic evaluation. The second limitation is a lack of cooperation among the research community and stakeholders from the private and public sector, as well as civil society. Accordingly, the recent overall strategy of the NRCT tries to address those obstacles.

Thailand seems to be making progress in terms of ICT R&D development itself, but also in terms of measuring its progress as a basis for monitoring and evaluation procedures. Furthermore, the NRCT has made an effort to analyse Thailand's R&D development in an international context. It also tries to identify, address and overcome non-measurable policy obstacles. Thailand's efforts to assess the national ICT R&D developments at different levels provide a good example for a country's ICT policy review practice – and illustrate the challenges of a long-standing and gradual process of implementing sustainable policy assessment measures.

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[1] National Electronics and Computer Technology Center of Thailand (2003).
[2] All figures from National Research Council of Thailand. See http://www.nrct.net/eng/.
[3] See http://www.nrct.net/eng/downloads/strategy05_07.doc.

- Key incentives which support industry investment in research and development, such as tax rebates or exemption.

Box 2.9 highlights Thailand's ICT research and development policy, which is part of the country's ICT master plan and integrates indicators for measuring the achievement of goals.

4. Assessment of the institutional framework and implementation mechanisms

This part of the national ICT policy review considers the adequacy of implementation mechanisms and institutional framework and the extent to which changes have to be made to implement the policies contained in the ICT master plan.

The lack of efficient institutional framework and consultations with all stakeholders are the major bottlenecks for a limited implementation of ICT programmes. At the government level, for example, the various stakeholders involved in preparing and implementing policies should regularly hold consultations to review the situation and any difficulties they may encounter.

Consequently, the focus is on the role of the main bodies that formulate, implement and monitor ICT plans, through the collaboration of all stakeholders in the Government, civil society and also the private sector, with the involvement of the latter encouraging the adoption of ICT policy and the use of new technologies.

Integration of ICT policies within national development plans

The need to embrace ICTs as tools for sustainable development and to mainstream them into overall national development plans has been stressed in different forums, notably the WSIS. The review analyses the link between the national ICT plan and the overall national development and poverty alleviation plans, and considers the degree of integration of ICT policies into such plans. Indeed, many developing countries have anchored them in major policy plans such as national development plans and Poverty Reduction Strategy Papers (PRSPs). According to a study published by OECD in January 2004,[22] only 13 countries in the 34 PRSPs analysed included ICTs as an independent strategic component for poverty

reduction. But in all countries except three, ICTs (sometimes limited to telecommunications) are always mentioned in the document as a significant component of the poverty reduction strategy. Nevertheless, some efforts have to be made to fully integrate ICT policies within national development or poverty reduction plans. For an analysis of pro-poor ICT policies, see chapter 3 of this Report.

Box 2.10 presents the case of The Gambia, where the national ICT plan fully supports the objectives set out in the national PRSP (The Republic of the Gambia Strategy for Poverty Alleviation was adopted in 2002), and provides an illustration of the integration of an ICT national policy within the national development and poverty reduction plans.

Institutional set-up for implementation mechanisms of national ICT policy master plan

Implementation mechanisms are a prerequisite for ensuring the efficient execution of a national ICT plan.

This part of the review looks at:

- Policy coordination and participating institutions;
- The role of stakeholders and partnerships;
- The implementation mechanisms;
- The challenges and lessons learned.

Examples of successful ICT policies formulation and implementation worldwide show that one critical factor has been a strategic political leadership involvement through the lead of one policymaker at the highest level (President or Prime Minister), an institution or a group of institutions.

Furthermore, the adoption of an institutionalized multi-stakeholder approach allowing all relevant stakeholders to participate in and contribute to the formulation and implementation of the ICT policy is essential. It will promote a strong commitment by all stakeholders and close cooperation among them, and will enhance the integration of the ICT policy into all levels.

For example, the development of Chile's Digital Agenda 2004–2006 brought together government agencies and institutions – among them the Ministries of the Interior, Economics, Finance, Education, Justice and Health – business organizations, academia and civil society. In total, more than 170 persons worked together for ten months to define Chile's Digital Agenda.[23]

Box 2.10

The Gambia: Integrating national ICT and poverty alleviation plans

As mentioned in the National Strategy for Poverty Alleviation,[1] "*Research and development of Information and Communication Technology (ICT) applications in development is a major priority of Government, and has resulted in the setting up of a Department of State to that effect. ICT application in Health, Government and Communications in Rural Areas will be systematically explored as an adequate strategy to improve service delivery through the introduction of telemedicine, e-government opportunities and development of rural telecentres.*"

In order to achieve the development objectives, and to maximize the poverty alleviation impact of ICT, the National Information Society Infrastructure (NICI)[2] Policy, currently being developed, supports the ambitions of the PSRP through ICT-led plans of action and initiatives. The following table[3] illustrates some of the major ICT initiatives proposed for reaching the PRSP objectives.

PRSP objective	NICI policy & plans
1. Enhancing the productive capacity of the poor	
a. Promoting labour-saving devices for women	Rural multimedia centres for women
b. Providing access to credit	Credit/loan opportunities information online
c. Reorganizing agricultural R&D to encourage labour-intensive agriculture and development of small ruminant	Agricultural information systems for rural community information centres
2. Enhancing access to and the performance of social services	
a. Expanding access to basic social services in rural areas	Launching e-government initiatives/providing access at local area councils
b. Delivering responsive social programmes to the poor	
c. Enhancing sustainability and quality of social services	
3. Local-level capacity building	
a. A political and legislative framework for decentralization	Local government leadership training for local government representatives
b. Empowerment of local government authorities to assume decentralized responsibilities	
4. Promoting participatory communications processes	
a. Enhancing participation beyond consultation	Planning feedback/local government representative links up to the National Assembly level
b. Addressing gender at national and local levels	Rural multimedia centres for women as the participatory hub/link to the national development processes/programmes
c. Institutionalizing dialogue between government, civil society and donors	NGO/CSO link through NGO associations (e.g. TAGNO, Action Aid in The Gambia)

Source: Baharul Islam (2005).

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[1] See http://poverty2.forumone.com/files/12016_GambiaPRSP.pdf.
[2] See http://www.uneca.org/aisi/NICI/.
[3] See Baharul Islam (2005).

Box 2.11

Achieving the Ghana ICT for accelerated development policy

In 2005, the Government of Ghana adopted the Ghana ICT for Accelerated Development Policy, which is intended to be integrated within the Government's three-pronged development strategy, which revolves around the development and enhancement of the human resource capacity, the renewal of the private sector and the strengthening of good governance.

The adoption of the national policy follows an extensive nationwide consultative process that was intended to associate all stakeholders in order to build a national consensus on the key policy and plan development issues, and on the implementation process. A *National ICT Policy and Plan Development Committee*[1] was launched in August 2002, with the aim of developing an integrated ICT-led socio-economic development policy and a corresponding plan, on the basis of an "*extensive national consultative exercise*".[2]

This consultative exercise took the Committee to seven regions for briefings, public lectures and conferences, and to meet with a large number of public and private sector stakeholder organizations, including Parliament, the Council of State, the National House of Chiefs, ministries, universities, polytechnics, private sector companies, telecom operators, ICT service providers, labour organizations, security agencies, regional coordinating councils, UN organizations and other development partners.[3] Fifty-one meetings and presentations (usually on a daily basis) were conducted in the country between August 2002 to May 2003, with about 800 persons involved, as well as the entire student population.[4] A major result of this process was to facilitate the ownership of the policy and of its implementation process, and to implement a plan that takes into account the needs and suggestions of national key socio-economic actors.

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[1] See http://www.ict.gov.gh/.

[2] See http://www.ict.gov.gh/.

[3] Statement by the Minister of Communication on the ICT policy for Ghana, http://moc.gov.gh/moc/PDFs/Statement%20on%20the%20ICT%20Policy%20for%20Ghana.pdf.

[4] The full list of organizations, agencies, institutions and individuals consulted is available in the *Integrated ICT-led Socio-economic Development Policy and Plan Development Framework for Ghana* document, available on the UNECA website, http://www.uneca.org/aisi/NICI/Ghana/ghana_consulted.htm, pp. 186– 207.

Box 2.11 presents the case of the *Ghana ICT for accelerated development policy*, where an extensive nationwide consultative process was conducted.

Financial resources

National ICT plans are subject to the resources available and hence the need to assess regularly whether the priorities are still the same and whether the best use is made of the funds being allocated. Policy measures must be continuously examined to see whether there are more efficient ways of accomplishing the same ends and whether the measures are still effective over time. An important aspect of evaluating current policy measures is the potential to leverage existing resources and to reallocate funds. The information on the financial resources allocated to various policies and programmes should be available so that it is possible to budget and to keep transparent records of costs arising from ICT development programmes in order to increase the efficiency of policymaking.

According to the World Bank's report *Information and Communications for Development 2006*, the majority of ICT plans do not specify the budgetary mechanism of the implementation process (40 per cent of 40 selected national ICT plans did not provide any budget information).[24]

For example, in Thailand's ICT Master Plan 2002–2006, it is mentioned that "*there must be a mechanism to link the operational plan with the budget as well as human resources plans. The framework and guidelines to assess the operational plan as well as ICT projects of government agencies should be established, by cooperation among the central agencies including … the budget bureau, and the Office of Civil Service Commission*".[25] However, it does not specify the concrete budgetary mechanism, but expects government agencies in charge of the implementation process to define their own five-year implementation plan, including a budgetary mechanism.

In general, the definition of a budgetary mechanism creates transparency and assigns roles and responsibilities to the government bodies involved. Lack of a budgetary mechanism within the ICT policy framework could lead to the unsuccessful implementation of an ICT plan. Lack of budget responsibility and planning might create budget constraints and the risk that the implementation process might be delayed or not finished at all.

This part of the review looks at:

- Allocation of resources;

- External and internal resources;

- Deployment of budgetary resources;

- Assignment of roles and responsibilities;

- Control mechanism.

Monitoring the implementation of ICT policies

To monitor and review ICT policies, transparent and continuous policy coordination and discussion with all stakeholders (Government, business associations, chambers of commerce, academia, civil society, etc.) are essential, as well as the involvement of national statistical offices (NSOs) for data collection. In most developing countries, data are still scarce, not up-to-date or inconsistent. It is therefore highly recommended that a coordination entity (e.g. an NSO) be appointed to use standard indicators and to regularly conduct surveys (see chapter 1 on ICT indicators for development).

National ICT master plans should include monitoring and evaluation procedures, and identify institutions responsible. A study by the World Bank (2006) reveals that the majority of the 40 selected national ICT plans do not specify the monitoring and evaluation process.

An example of a developing country that has included monitoring in its national ICT plan is Thailand.

Chart 2.3

Relationship between Thailand's National ICT Master Plan and the ICT plans of ministries and departments
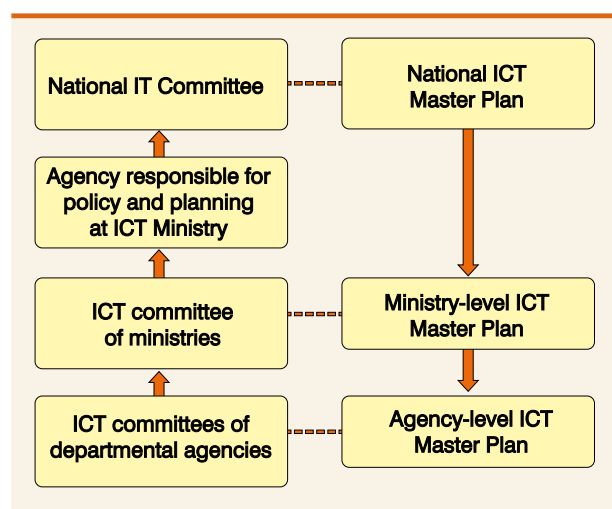
Source: National Electronics and Computer Technology Center (2003, p. 82).

Thailand's ICT Master Plan 2002–2006 provides that the ministries and departments as well as other government agencies involved in the implementation process have to create an ICT committee that oversees their ICT Master Plan and its implementation process. The committee is obliged to report the progress of implementation every six months to the next-higher-level committee. Chart 2.3 outlines the relationship between the National ICT Master Plan and the organizational ICT Master Plans of the ministries or government agencies concerned, as well as the monitoring of plans at each level.

Chart 2.4

Chile's Public Procurement System Strategic Plan, 2002–2004

Goal	Indicator	Baseline situation as of October 2002	Goal to December 2003	Goal to December 2004
E-government promotion	Member public agencies (using the system at least once a year)	144	200	250
E-commerce promotion	Suppliers generating at least 1 offer a year in the system	2 907	5 000	10 000
Platt form Quality	ChileCompra users satisfaction: maximum grade 7.0	4.9	5.5	6.0

Source: Gobierno de Chile (2002).

National ICT master plans should also map defined goals with indicators and include a time frame to measure the progress of implementation. Chart 2.4 presents, by way of example, the proposed goal achievement of Chile's Public Procurement System Strategic Plan. Each goal is mapped to a specific indictor and a time frame; this makes the goal achievement measurable and therefore transparent. Such an operational definition of goal achievement could serve as the basic component of the monitoring and evaluation process within a national ICT master plan.

5.   Evaluation and recommendations

The final part of the national ICT policy review analyses key lessons learned from the assessment of the country's policies as well as the measures, implementation and coordination mechanisms.

Each country has unique circumstances and conditions characterizing its ICT diffusion and therefore specific needs that require to be addressed within a national ICT master plan. Against that background, this part outlines the strengths and weaknesses of a national ICT master plan and identifies opportunities and threats for the implementation process. Furthermore, it makes in-depth recommendations on specific policy measures as well as on the institutional and implementation mechanisms. Regarding the latter, it recommends in particular how to optimize the monitoring and evaluation process in order to guarantee a sustainable policy.

C.   Concluding remarks and recommendations

This chapter has presented a model ICT policy review framework for developing countries, which consists of three major components:

- A review of the global ICT environment (e.g. ICT access and use);

- An assessment of the main ICT policy areas (e.g. ICT infrastructure development, the legal and regulatory environment, the development of ICT human resources, e-business and e-government, ICT-related trade and investment policies, and technological innovation); and

- An assessment of the institutional framework and the implementation mechanisms (e.g. the integration of ICT policies within national development plans, the institutional set-up, the financial resources and the monitoring mechanisms).

Using selected developing country examples, the chapter illustrated how specific ICT policies could be monitored and assessed. There is a wide range of stages at which countries are with respect to their ICT policymaking. Although many countries have adopted national ICT plans, only a few have already carried out an ICT policy review or are in the process of doing so. Since there are no international guidelines for developing countries to define and implement such a review, the model framework presented here is a first step in that direction. The proposed framework is a generic model that could be used as a basis by developing countries. It will have to be adapted to the needs of each country, and could include additional elements to reflect specific national aspects not covered by the model.

Potential challenges related to the use of the proposed model review may include:

- The limited availability of information related to the implementation of policy measures, including data, achievements and failures;

- The lack of defined indicators of achievements, both qualitative and quantitative, which can be used to benchmark and assess ICT policies;

- The lack of commitment on the part of the relevant stakeholders in charge of policy planning and implementation to provide information, as well as their lack of willingness to conduct self-appraisals;

- Potential institutional conflicts among different (public and private) stakeholders; and

- The limited participation of relevant stakeholders in the evaluation process.

- Developing countries that are considering carrying out an ICT policy review should pay attention to the following:

- Planning the adequate timing of the review is essential. Time requirements vary and are subject to the demand of each country, while largely depending on the progress made in the implementation of the ICT master plan.

- Clearly defining policy objectives and indicators of achievements at the time the policy decisions are made is vital for assessing the success of a measure and planning future policy decisions; policymakers need to be able to establish such evaluation indicators and they should work closely with NSOs to obtain relevant statistical data.

- Committing financial resources is a prerequisite for undertaking a review.

- Promoting a multi-stakeholder process helps temper potential conflicts between stakeholders and increases the commitment of all involved.

A sustainable, long-term-oriented national ICT master plan calls for the implementation of continuous monitoring and evaluation procedures at different levels. As illustrated by the example of Thailand, the implementation process itself is a comprehensive and gradual process which cannot be realized overnight. It is in the nature of policy reviews that they demand a continuing and sustainable commitment by all relevant stakeholders. Policymakers should guarantee this through the definition of clear monitoring and evaluation procedures, including a realistic time frame, the creation of budgetary mechanisms and the assignment of roles and responsibilities. These notions apply to all countries, regardless of how advanced their

ICT policy and review process is:

- Countries that are at an early stage in formulating and developing their ICT master plan can already start anticipating an ICT policy review by ensuring the integration of monitoring and evaluation procedures into their master plan.

- Countries whose national ICT master plan is at an advanced stage should review their monitoring and evaluation procedures and try to optimize them on an ongoing basis.

- Countries that have already defined monitoring and evaluation procedures should make sure that reviews are carried out regularly, including the measurement of related ICT indicators.

National ICT policy reviews help policymakers revise and formulate policies taking into account the evolution of ICTs and their impact on the information economy, in the context of their overall development plans and poverty reduction strategies. UNCTAD highly recommends developing countries to carry out ICT policy reviews to continuously adjust their ICT plans, policies and implementation mechanisms. To support these efforts, UNCTAD, as part of its technical cooperation activities, offers to carry out complete national ICT policy reviews, at the request of and in close cooperation with member States (see box 2.1).

Annex I

Core ICT indicators[27]

(a) Core indicators on ICT infrastructure and access

Basic core	
A1	Fixed telephone lines per 100 inhabitants
A2	Mobile cellular subscribers per 100 inhabitants
A3	Computers per 100 inhabitants
A4	Internet subscribers per 100 inhabitants
A5	Broadband Internet subscribers per 100 inhabitants
A6	International Internet bandwidth per inhabitant
A7	Percentage of population covered by mobile cellular telephony
A8	Internet access tariffs (20 hours per month), in $, and as a percentage of per capita income
A9	Mobile cellular tariffs (100 minutes of use per month), in $, and as a percentage of per capita income
A10	Percentage of localities with public Internet access centres (PIACs) by number of inhabitants (rural/urban)
Extended core	
A11	Radio sets per 100 inhabitants
A12	Television sets per 100 inhabitants

(b) Core indicators on access to, and use of, ICT by households and individuals

Basic core	
HH1	Proportion of households with a radio
HH2	Proportion of households with a TV
HH3	Proportion of households with a fixed line telephone
HH4	Proportion of households with a mobile cellular telephone
HH5	Proportion of households with a computer
HH6	Proportion of individuals who used a computer (from any location) in the last 12 months
HH7	Proportion of households with Internet access at home
HH8	Proportion of individuals who used the Internet (from any location) in the last 12 months

HH9	Location of individual use of the Internet in the last 12 months
	At home
	At work
	Place of education
	At another person's home
	Community Internet access facility (specific denomination depends on national practices)
	Commercial Internet access facility (specific denomination depends on national practices)
	Others
HH10	Internet activities undertaken by individuals in the last 12 months
	Getting information
	About goods or services
	Related to health or health services
	From government organizations/public authorities via websites or e-mail
	Other information or general Web browsing
	Communicating
	Purchasing or ordering goods or services
	Internet banking
	Education or learning activities
	Dealing with government organizations/public authorities
	Leisure activities
	Playing/downloading video or computer games
	Downloading movies, music or software
	Reading/downloading electronic books, newspapers or magazines
	Other leisure activities
Extended core	
HH11	Proportion of individuals with use of a mobile telephone
HH12	Proportion of households with access to the Internet by type of access
	Categories should allow an aggregation to narrowband and broadband, where broadband excludes slower speed technologies, such as dial-up modem, ISDN and most 2G mobile phone access. Broadband will usually have an advertised download speed of at least 256 kbit/s.
HH13	Frequency of individual access to the Internet in the last 12 months (from any location)
	At least once a day
	At least once a week but not every day
	At least once a month but not every week
	Less than once a month

(c) Core indicators on the use of ICT by businesses

Basic core	
B1	Proportion of businesses using computers
B2	Proportion of employees using computers
B3	Proportion of businesses using the Internet
B4	Proportion of employees using the Internet
B5	Proportion of businesses with a Web presence
B6	Proportion of businesses with an intranet
B7	Proportion of businesses receiving orders over the Internet
B8	Proportion of businesses placing orders over the Internet
Extended core	
B9	Proportion of businesses using the Internet by type of access Categories should allow an aggregation to narrowband and broadband, where broadband excludes slower speed technologies, such as dial-up modem, ISDN and most 2G mobile phone access. Broadband will usually have an advertised download speed of at least 256 kbit/s.
B10	Proportion of businesses with a local area network (LAN)
B11	Proportion of businesses with an extranet
B12	Proportion of businesses using the Internet by type of activity Sending and receiving e-mail Getting information About goods or services From government organizations/public authorities via websites or e-mail Other information searches or research activities Performing Internet banking or accessing other financial services Dealing with government organizations/public authorities Providing customer services Delivering products online

(d) Core indicators on ICT sector and trade in ICT goods

Basic core	
ICT1	Proportion of total business sector workforce involved in the ICT sector
ICT2	Value added in the ICT sector (as a percentage of total business sector value added)
ICT3	ICT goods imports as a percentage of total imports
ICT4	ICT goods exports as a percentage of total exports

Annex II

National ICT plans in developing and transition countries and territories, 2006

Country/territory	Date	Title of the national ICT plan	Status of the plan
Afghanistan	2003	Information and Communication Technologies (ICT) Policy	Under development
Albania	2003	National Information and Communication Technologies Strategy	Approved
Algeria	2000	Law n. 2000–03	Approved
Angola			Under development
Anguilla	2002	A Strategic Framework for an Information Economy for Anguilla (Draft)	Under development
Antigua and Barbuda		Information and Communication Technologies (ICTs) Draft Policy	Under development
Argentina	2002	Estrategia Nacional para la Sociedad de la Información	Approved
Armenia	2001	ICT Master Strategy for Republic of Armenia	Approved
Azerbaijan	2002	National Information and Communication Technologies Strategy for the Development of the Republic of Azerbaijan (2003–2012)	Approved
Bahamas	2003	Policy Statement on Electronic Commerce and the Bahamian Digital Agenda	Approved
Bangladesh	2002	ICT Policy of Bangladesh	Approved
Barbados	2005	Barbados' National ICT Strategic Plan (Draft)	Under development
Benin	2000	Plan de développement de l'Infrastructure d'information et de communication du Bénin 2000–2004 (NICI Plan)	Approved
Benin	2002	Bénin 2005: Une société de l'Information solidaire, épanouie et ouverte	Approved
Bhutan	1999	Bhutan Information Technology Strategy (BITS)	Approved
Bhutan	2001	ICT Master Plan for Bhutan	Approved
Bhutan	2004	Bhutan Information and Communications Technology Policy and Strategies (BIPS)	Approved
Bolivia	2002	Estrategia Nacional para la transición hacia una Sociedad de la Información boliviana	Approved

Annex II *(continued)*

Bosnia and Herzegovina	2004	Policy, Strategy and Action Plan for the Development of an Information Society in Bosnia and Herzegovina	Approved
Botswana			Under development
Brazil	2000	Information Society in Brazil, Green Book	Approved
Brunei Darussalam	2000	National IT Strategic Plan – IT 2000 and Beyond	Approved
	2005	Brunei Darussalam Information Society: Strategy Paper	Under development
Bulgaria	1999	National Program for the Information Society Development (IS)	Approved
Burkina Faso	1999	Plan de développement de l'Infrastructure d'information et de communication du Burkina Faso 2000–2004 (NICI Plan)	Approved
Burundi	2002	Projet de stratégie nationale de développement des Technologies de l'Information et de la Communication au Burundi	Approved
Cambodia	2004	Draft ICT Policy Cambodia	Under development
Cameroon			Under development
Cape Verde	2000	Plan National de Développement d'Infrastructure des Technologies d'Information et Communication	Approved
Central African Republic			Under development
Chad			Under development
Chile	2003	Agenda Digital	Approved
China	2005	State Informatization Development Strategy (2006–2020)	Approved
Colombia	2000	Agenda de Conectividad CONPES 3072	Approved
Comoros	2004	Lettre de politique de développement des Nouvelles Technologies de l'Information et de la Communication (NTIC) 2004–2008	Approved
Congo	2004	Stratégie nationale pour le développement des TICs au Congo	Under development
Costa Rica	2001	Agenda Digital	Approved
Côte d'Ivoire	2000	Plan de Développement de l'Infrastructure Nationale de l'Information et de la Communication 2000–2005	Approved

Annex II *(continued)*

Croatia	2002	Information and communication technology – Croatia in the 21st century	Approved
Cuba	1997	Lineamientos Estrategicos de Informatización de la Sociedad	Approved
Democratic Republic of the Congo			Under development
Djibouti	2003	Djibouti National ICT Strategy and accompanying Action Plan	Approved
Dominica	2005	Estrategia Nacional para la Sociedad de la Información	Under development
Dominican Republic	2003	Estrategia Nacional para la Sociedad de la Información Dominicana: e-dominicana	Approved
Ecuador	2002	Agenda Nacional de Conectividad Plan de Acción 2005–2010	Approved
Egypt	1999	National Plan for Communications and Information Technology, incorporates revised Egypt Information Society Initiative (EISI)	Approved
El Salvador	2000	Política Nacional de Informática	Under development
Ethiopia	1999		Under development
Gabon			Under development
Gambia			Under development
Georgia			Under development
Ghana	2005	The Ghana ICT for Accelerated Development (ICT4AD) Policy	Approved
Grenada	2002	Information and Communication Technology: A Strategy and Action Plan for Grenada 2001–2005	Approved
Guatemala		Propuesta hacia la Iniciativa de la Sociedad de la Información en Guatemala	Under development
Guinea	2000	Plan de développement de l'infrastructure nationale d'information et de communication de la République de Guinée 2001–2004	Approved
Guyana	2001	Draft Guyana IT Policy	Under development

Annex II *(continued)*

Hong Kong (China)	1998	Digital 21 IT Strategy (1998)	Approved
	2001	Digital 21 IT Strategy (2001)	Approved
	2004	Digital 21 IT Strategy (2004)	Approved
India	1998	IT Action Plan I: Software; IT Action Plan II: Hardware; and IT Action Plan III: Long-term National IT Policy	Approved
Indonesia	2001	2001 ICT Policy Framework	Approved
Islamic Republic of Iran	2002	TAKFA — Extension of Application of ICTs in Iran	Approved
Jamaica	2002	A Five Years Strategic Information Technology Plan for Jamaica	Approved
Jordan	1999	REACH	Approved
Kazakhstan			Under develoment
Kenya	2006	Kenya ICT Policy	Approved
Kyrgyzstan	2002	National Strategy Information and Communication Technologies for Development in the Kyrgyz Republic	Approved
	2003	National ICT Action Plan	Approved
Lao People's Democratic Republic			Under Development
Lebanon	2004	National e-Strategy for Lebanon	Approved
Lesotho	2005	Lesotho ICT Implementation Plan	Approved
Madagascar	2005	Stratégie Nationale des TIC pour le développement	Approved
Malawi	2003	An Integrated ICT-led Socio-Economic Development Policy for Malawi	Approved
Malaysia	1996	The National IT Agenda (NITA)	Approved
Maldives	2003		Under development
Mali	2005	NICI Policy and Plan documents	Approved

Annex II *(continued)*

Mauritania	1999	Plan de développement de l'Infrastructure nationale d'Information et de Communication: 1999–2002	Approved
Mauritius	1998	National IT Strategy Plan (NITSP)	Approved
Mexico	2000	Sistema Nacional e-México	Approved
Mongolia	2000	National Vision for ICT development of Mongolia up to 2010 ("ICT Vision 2010")	Approved
Morocco	2001	Stratégie Maroc 2005	Approved
Mozambique	2002	Draft Policy for Information and Communication Technologies	Approved
Myanmar	2005	Myanmar ICT Development Master Plan/Action Plan (draft)	Under development
Namibia	2002	Information and Communication Technology Policy for the Republic of Namibia	Under development
Nepal	2000	Information Technology Policy, 2057 (2000)	Approved
Nicaragua	2005	Estrategia nacional de desarrollo TIC	Approved
Nigeria	2000	Nigerian National Policy for Information Technology (IT)	Approved
Oman	2003	Digital Oman Government Strategy	Approved
Pakistan	2000	2000 IT Policy & Action Plan	Approved
Panama	2003	Programa e-Panamá	Approved
Peru	2001	Lineamientos de politicas generales para promover la masificación de Internet en el Perú	Approved
	2001	e-Perú: Propuestas para un plan de acción para el acceso democratico a la Sociedad de la Información y el conocimiento	Approved
Philippines	1994	National Information Technology Plan 2000	Approved
	1998	IT21	Approved
	2003	e-Philippines: ITECC Strategic Roadmap	Approved

Annex II *(continued)*

Qatar	2005	Qatar National ICT Strategy	Approved
Republic of Korea	1996	First Master Plan for Informatization Promotion	Approved
	1999	CYBER KOREA 21 (Second Master Plan of Infomatization Promotion)	Approved
	2002	e-Korea Vision 2006 (The Third Master Plan for Informatization)	Approved
	2003	Broadband IT KOREA VISION 2007 (Revision of the Third Master Plan for Informatization Promotion)	Approved
Republic of Moldova	2005	National Strategy on Building Information Society – "e-Moldova" (2005–2010)	Approved
Romania	2002	National Strategy for the New Economy and the Implementation of the Information Society	Approved
Russian Federation	2002	Electronic Russia (2002–2010)	Approved
Rwanda	2001	An Integrated ICT-led Socio-Economic Development Policy and Plan for Rwanda: 2001–2005	Approved
Samoa	2002	ICT Policy and Strategic Plan	Approved
Saudi Arabia		The National IT Plan (NITP)	Under development
Serbia	2005	National Strategy for an Information Society in Serbia	Under development
Sierra Leone			Under development
Singapore	1980	National Computerisation Plan	Approved
	1986	National IT Plan	Approved
	1992	IT2000	Approved
	2000	Infocomm 21	Approved
	2003	Connected Singapore	Approved
	2006	iN2015	Approved
South Africa		Strategic Plan 2005–2008	Approved

Annex II *(continued)*

Sri Lanka	2005	e-Sri Lanka Development Project	Approved
Swaziland			Under development
Syrian Arab Republic	2006	National ICT Strategy for Socio-economic Development	Approved
Tajikistan	2003	ICT for Development of the Republic of Tajikistan	Approved
Thailand	1996	IT 2000 Policy (1996–2000)	Approved
	2002	IT 2010 Policy (2001–2010), National Information and Communication Technoloy (ICT) Master Plan (2002–2006)	Approved
TFYR Macedonia	2005	National Information Society Policy	Approved
	2005	National Strategy for Information Society Development and Action Plan of the Republic of Macedonia	Approved
Trinidad and Tobago	2003	National ICT Strategy	Approved
Tunisia		Stratégie Nationale	Approved
Turkey	2005		Under development
Uganda			Under development
Ukraine	2003	National Strategy for Information Society Development in Ukraine	Under development
United Republic of Tanzania	2003	Tanzanian National ICT Policy	Approved
Uruguay	1999	Uruguayan National E-Commerce Strategy	Approved
Uzbekistan			Under development
Venezuela	2001	Plan Nacional de Tecnologías de Información	Approved
Viet Nam	2002	Master Plan for Information Technology Use and Development in Vietnam by 2005	Approved
Yemen	2003	Information Technology Master Plan for Yemen (Draft)	Under development
Zambia			Under development

Annex II *(continued)*

Zimbabwe			Under development

Source: Questionnaire sent by UNCTAD to developing countries to collect information on their national ICT master plans and to enquire whether those have been already assessed and extensive Internet research on developing countries' ICT plans and policies. Please note that countries without an explicit ICT master plan are not included in this table, although they might have developed specific sector policies such as e-government programmes.

Annex II *(continued)*

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Notes

1. There is no internationally agreed terminology concerning national government activities on ICTs. Terms such as ICT or e-strategies, programmes, plans and policies are often used interchangeably. Similarly, names of national ICT plans feature all of the above-mentioned terms. In this chapter, we will refer to national ICT "plans" as the documents containing the countries' strategies and policies, and ICT "policies" as the core components describing the measures implemented to enhance access to, use and impact of, ICTs. The proposed national ICT policy reviews will cover an assessment of both the measures and the related implementation mechanisms.

2. Tunis Agenda for the Information Society, http://www.itu.int/wsis/docs2/tunis/off/6rev1.html.

3. See annex II.

4. For a description of e-readiness assessment tools, see http://www.bridges.org/ereadiness/where.html.

5. http://www.oecd.org/sti/information-economy.

6. More information is available at http://www.unctad.org/ecommerce.

7. More information available at http://measuring-ict.unctad.org.

8. UNCTAD received questionnaire responses from the following 29 countries: Afghanistan, Belize, Brunei, Chile, Cuba, the Democratic Republic of the Congo, the Dominican Republic, Egypt, Ethiopia, Ghana, Guyana, Lesotho, Madagascar, Mauritius, Mexico, Montenegro, Morocco, Oman, Philippines, Qatar, the Republic of Korea, Romania, Sri Lanka, Sudan, Swaziland, the Syrian Arab Republic, Thailand, Trinidad and Tobago, and Ukraine. Out of those countries, 11 had already carried out a review, and 1 country was in the process of doing so. However, there is no information available on the complexity of those reviews.

9. For more information and a methodological approach on ICT core indicators, refer to the publication on core ICT indicators, Partnership on Measuring ICT for Development, available at http://measuring-ict.unctad.org/QuickPlace/measuring-ict/Main.nsf/h_Index/21B143B6971D3863C12570C70037130A/?OpenDocument&Form=h_PageUI.

10. Chapter 2, E-business and SMEs, ECDR 2004, available at http:/www.unctad.org/ecommerce.

11. See also *E-Commerce and Development Report 2004,* chapter 7, A case study on Tunisia's ICT sector and related policies.

12. See also *E-Commerce and Development Report 2003,* chapter 3, ICT strategies for development, available at http:/www.unctad.org/ecommerce.

13. For more on e-government, see ECDR 2004, at http://www.unctad.org/ecommerce.

14. http://www.unpan.org/egovernment5.asp.

15. http://www.mdec.com.my/.

16. Pioneer Companies with MSC Status: Sun Microsystems, Telekom Malaysia MSC, MIMOS and NTT MSC. Others with MSC Status: Microsoft, Oracle MSC, HP, Netscape, Ericsson, Intel MSC, MEASAT, Sumitomo, NEC, NCR, Lotus, Digital Equipment, EDS, Nortel, Siemens, Fujitsu, DHL, Astro, ICON, Sapura, Sime, Motorola, Binariang, Newbridge, IBM, Lotus, ATI, BT Multimedia, Lucent Technologies, Bridgestone, Nokia, EDS, MCSB, Unisys, etc., http://www.mdc.com.my/cs/company/default.asp.

17.   UN Millennium Project, Task Force on Science, Technology and Innovation (2005, p. 15), referring to Sagasti (2004).

18.   In this context, one example might be the initiative of the Science and Development Network (http:www.scidev.net), which aims at providing information and recommendations about how science and technology can contribute to economic and social development.

19.   For a more in-depth discussion on the role of national policies in R&D, see UNCTAD (2005).

20.   UNESCO (2005, p. 100).

21.   UNESCO (2005, p. 99).

22.   OECD Informal Expert Meeting on ICTs for Poverty Reduction (7 July 2004), ICTs in Poverty Reduction Strategy Paper (PRSPs) as of January 2004.

23.   Mena (2005).

24.   World Bank (2006, p. 93).

25.   National Electronics and Computer Technology Center (2003, p. 81).

26.   National Electronics and Computer Technology Center (2003, p. 81).

27.   Partnership on Measuring ICT for Development, available at http://measuring-ict.unctad.org/QuickPlace/measuring-ict/Main.nsf/h_Index/21B143B6971D3863C12570C70037130A/?OpenDocument&Form=h_PageUI.