Information Society and public ICT policies in the Caribbean: a review of advances and challenges, policy instruments and country experiences

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UNITED NATIONS

ECLAC

December 2007

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The electronic version of this document can be found at: http://www.eclac.org/SocInfo and http://www.eclac.org/PortofSpain

Contents

List of Boxes

List of Tables

List of Figures

Introduction

The Caribbean region has an exceptional potential for becoming an international hub of Information and Communications Technologies (ICT) services hosting, outsourcing and delivery. Its strategic location, similar time zones and relative short distances to North, South and Central America major trading centers, make it an ideal choice for the establishment of "near-shore" business operations connected to business and economic activity throughout the continent.

Native domain of English and Spanish languages, cultural compatibility with the rest of the American continent and even Europe, its cultural ties with Bottom of the Pyramid (BOP) markets across the world, and the eagerness of its people to embrace new technologies and learn new skills are major competitive advantages the Caribbean has over other regions competing in the global race for ICT markets.

Intraregional Cooperation

The CARICOM Single Market Economy, and its shared trade and economic policy framework, is a first step towards regional business integration and a special opportunity for other regional organizations, such as the Association of Caribbean States (ACS), to join forces and increase the region's capacities and attractions.

Countries like Barbados, Jamaica and Trinidad and Tobago have undertaken significant Public ICT initiatives and amassed an important array of lessons learned. The region could leverage this expertise and enable mechanisms for cooperation, technical assistance, knowledge transfer so that other countries could benefit from these experiences.

Policy Instruments and National ICT Strategies

But at the same time they look at the global scenario and the importance of regional integrated policies, Caribbean nations look inward and engage in multi-tiered national processes of capacity building, infrastructure strengthening, public transparency and accountability, investment in research, development, science and technology and enabling of conducive environments for entrepreneurship and innovation.

The positive experience, in countries like Jamaica and Trinidad and Tobago, suggests that the rest of the region can benefit from participative formulation of National ICT Strategies to facilitate buy-in, understanding and awareness among stakeholders, identification of priorities and goals and harmonization of ICT initiatives throughout the public sector and other development policies.

Lack of such National ICT Strategies has created significant challenges for the coordination of ICT projects and hindered the true potential impact of ICT in human development. In addition, the unavailability of detailed information on government spending on ICT, often prevents an efficient allocation of resources and creates the conditions for redundant and duplicated efforts and initiatives.

The often cited positive impact of ICT on social and political processes has yet to be felt in the region and its immense potential to increase transparency and accountability of public authorities, facilitate local governance and civil society participation are key areas that should be prioritized in any local and regional strategy.

While a handful of Caribbean nations have enacted adequate legislation to support the development of ICT activities, most territories have yet to deliver enabling environments where such legislations can be properly enforced and stakeholders acknowledge and take advantage of their incentives. Such environments depend from awareness activities to trigger the engagement of the business sector, availability of local capacity and the designation of formal figures for the enforcement of ICT legislations and policies with real decision making capacity, autonomy and budget allocated.

Telecommunications Infrastructure and Access to ICT

In order to compete for becoming a recognized hub for ICT services, the Caribbean has to face the reliability, redundancy and affordability of telecommunications infrastructure, in particular reducing the costs of international communications and interconnection among competing providers. The goal is to make this infrastructure universally accessible, increasing the penetration of ICT - access to computers, narrow and broadband Internet included – to all citizens.

There is an urgent need of increasing the availability of facilities and programs for social access to ICT, including ICT community centers, cybercafés, universal access to ICT in schools and access points at public service offices such as libraries, post offices and municipal government spaces. Such existing initiatives currently struggle with providing an adequate response to the demand for assistance, training and relevant content from its actual and potential users. Promoting communication, collaboration and sharing of experiences among community service initiatives through national and regional networks of telecenters could greatly alleviate this burden, increase the impact of local community centers and liberate resources for user assistance and training based on methodologies and contents developed and tested by other community service centers.

Financing the ICT Initiatives

One major limitation faced by most countries in the region is the limited availability of funding and financial resources for the implementation of ICT initiatives. Although a significant number of public ICT projects have received funding from international organizations, Caribbean nations have not yet generated internal funding mechanisms for ICT development. Successful mechanisms so far could include the implementation of Universal Access Funds, such as existent in many of the neighboring Latin American countries, and the prioritization of revenue generating, cost saving and sustainable initiatives. Targeting the large Diaspora population (close

to 50% of total population in several countries) with the delivery of on-line services may also be an effective way of generating revenue and funds, in particular considering the high volume of remittances and their close ties to their home land and families in the region.

Human Capacity and Education

Given its geographical features, the region has a tradition of distance learning that has prepared a fertile ground for virtual education. Existing programs from the University of West Indies as well as other public and private institutions are currently a success and leading the way in the use of ICT to build capacity among the adult population. This growing popularity, however, must be complemented by a definition and adoption of common standards to ensure the quality of virtual education and distance learning. In a similar fashion, initial, basic and secondary education could benefit from pedagogical and technological standards for the introduction of ICT in the curriculum, the development of shareable and reusable content and proper development and evaluation of knowledge and skills. On the other hand, current challenges and creative answers for a high quality education in the Information Society need leaders and trainers that count with their own access to ICT and trained on pedagogical use of ICT to build the new capacities required by today's world.

Content and Applications

The limited availability of local and regional educational, cultural and historical content on-line is one of the few negative aspects of access to ICT in the region, since it can reduce awareness and appreciation of local and regional culture and identity. Many of the interviewed have argued that special attention and resources should be allocated to the generation of true local content, particularly in multimedia format and taking advantage of media convergence trends, but presented in ways that make them attractive to the younger generation discovering the world and the Internet at the same time.

Existing medical science programs and infrastructure, such as the facilities in Grenada and in Trinidad and Tobago, have an immense potential of serving as hot spots and coordination centers for e-Health initiatives to address the shortage of physicians and access to advanced medical services in the region.

With mobile phone penetration rates higher than 50 subscribers per 100 population and rising quickly in many countries there is an immediate potential for the delivery of information, content, services and applications to the majority of the population through mobile services and handsets. Given the low penetration of computers and the Internet, and the steady growth of mobile phone use in the region, it seems advisable to many to conduct proper assessments to compare the potential impact of the availability of content and applications available on the Internet vs. their availability on mobile platforms, including the mobile web.

Combination of both mobile and Internet applications with GIS technologies can greatly improve the efficacy of disaster preparedness, recovery and assistance. The region's vulnerability extends beyond of the annual hurricane season and also includes coastal erosion, seasonal floods and unpredictable volcano activity and earthquakes.

Another critical area that can greatly benefit from GIS and ICT, as existing experiences in Jamaica have shown, is the agricultural sector. Market information systems that provide local producers access to price information and to alternative and new markets and customers can increase the profitability of local agricultural activities and greatly improve the efficacy of investment, production and selling decisions by local farmers and agricultural industries.

General Outlook

In short, all elements are in place for the Caribbean to take off and materialize the promise of ICT for Human Development. With proper regional coordination, intelligent allocation of resources and harmonized deployment of international cooperation and local structural reforms, the region can overcome its current lag in terms of ICT penetration and transform itself into a key player in the international arena, increasing competitiveness of its business sectors, the living conditions of its citizens and the governance of its local communities.

Methodology of the Caribbean Information Society Assessment process

In accordance to the Regional Plan of Action eLAC2007 (see http://www.eclac.org/SocInfo/ eLAC) and with help of the UN Development Account project "Capacity-building for ICT policy making", ECLAC developed this research, awareness and capacity building project on Public Information and Communication Technology (ICT) policies in the Caribbean Region. The effort consists of four major components:

1.   Assessment of Public ICT Policies and Information Society in the Caribbean.

2.   A regional seminar on ICT Policy and Strategy Development for key Caribbean policy makers to review preliminary results of the research (organized on 4-5 September 2006 by the Government of Barbados, ECLAC and with the collaboration of the CARICOM Secretariat).

3.   Technical Assistance to member states in developing and strengthening their ICT policy and strategy through advisory services.

4.   Publication of final report (as presented in this document)

To do a proper assessment in combination with the technical cooperation, nine Caribbean States were visited and interviews conducted locally with representatives of the Government, Civil Society, International Organizations and Private and Education Sector and presentations were given. The countries include: Bahamas, Barbados, Grenada, Guyana, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

This group represents four (4) major geographical profiles in the region -- Small and Middle Size Islands, Archipelagic and Continental States -- as well as States with High, Middle and Low Income and High and Medium Human Development.

A detailed map of stakeholders active in ICT development and their initiatives was drawn both for the region and for each individual country in the study.

A comprehensive six parts survey was presented in advance to local stakeholders for its completion in order to facilitate the assessment on key areas:

a.   Historical Background.

b.   Policy development.

c.   State Modernization and e-Government.

d.   Access Policy.

e.   Supply of goods and services.

f.   Public budget expenditures.

Official government responses to the survey questions were received in writing from seven (7) of the countries and additional information was collected through multiple interviews with government officials and local civil society and business sector stakeholders.

An extensive collection of documents on ICT, Human Development and the Caribbean region was reviewed and it is listed in the Bibliography. On-line project databases were consulted and extensive use of search engines was done to explore issues and availability of local and regional information on-line. Throughout the duration of the research, daily monitoring of ICT related and Caribbean news was exercised, successfully updating plenty of relevant information. Active participation in Caribbean virtual groups and communities helped validate assumptions and collect additional input from regional stakeholders.

A draft of each country profile was presented to local public sector stakeholders to give them the opportunity of reviewing, validating, criticizing it and making suggestions to it.

The full Caribbean Region Public ICT and Information Society Assessment report was presented to government representatives at the Regional ICT Policy Makers Seminar for review and extensive time was allocated in the Seminar for its presentation and discussion.

The final report was completed after the Regional ICT Policy Makers Seminar and takes in consideration all the suggestions and comments made by the local stakeholders both in writing and orally in the Seminar.

I. Public ICT Policies and Human Development

1. Information Society and Human Development

1.1 The Quest for Human Development

Promoting human development, fighting poverty and achieving social impact requires more than technology itself, access to technology and the capacity to use it and take advantage of it. A conscious acknowledgement and engagement of social processes and cultural structures is needed. But just as important is a thorough understanding of how these so called Information and Communication Technologies (ICT) can improve the communication and collaboration among individuals, organizations and communities so that knowledge is built, innovation is promoted, capacities are increased, opportunities are created, wealth is generated and poverty is defeated.

These processes will not happen by themselves and left to their own devices, they will follow unpredictable paths often leading to inequalities and inefficiencies that can worsen the existing divides in our societies.

That's how we come to the urge of defining the concept of an Information Society and its participative construction facilitated by Public Policies that engage all of society's stakeholders in a joint effort forward.

FIGURE 1.1
HUMAN DEVELOPMENT IN THE KNOWLEDGE SOCIETY
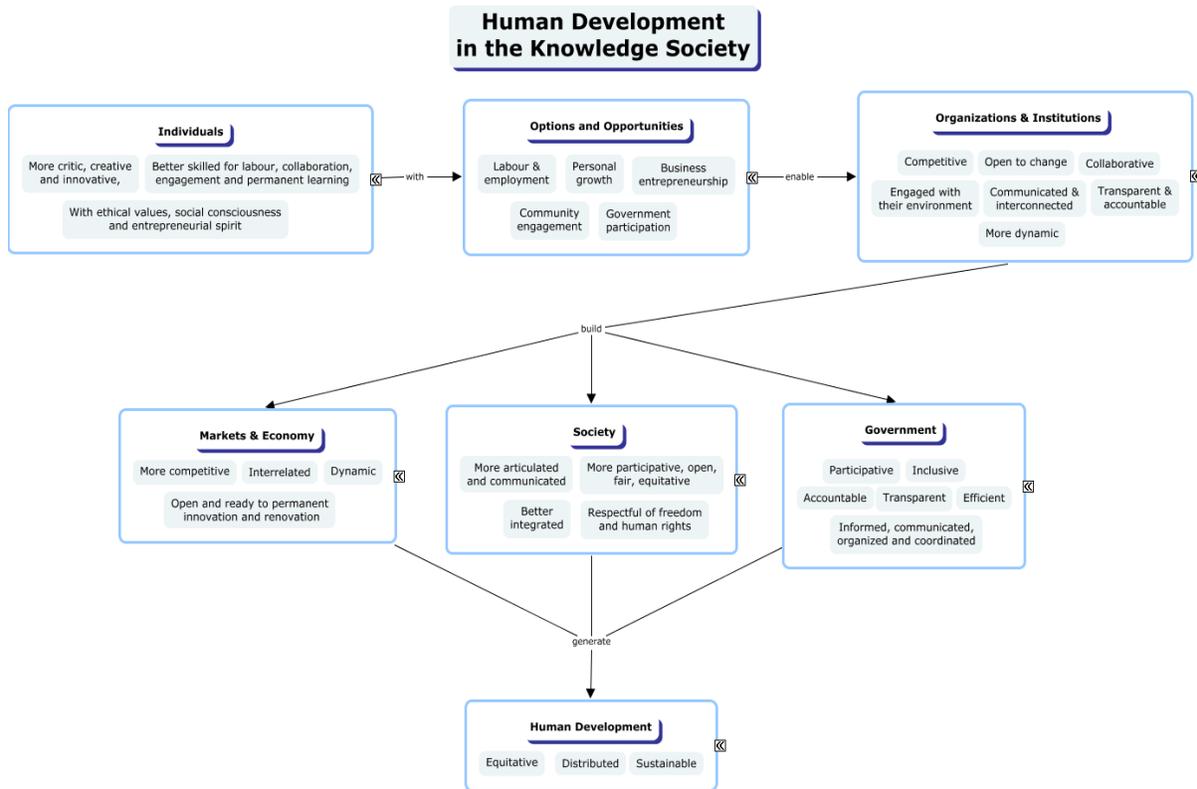
Source: Author's compilation.

1.2 Envisioning the Information Society

The so-called "Information Society" can be perceived as a collective environment where individuals, organizations and communities are empowered by the availability of information, access to it and the means to share, analyze and generate knowledge from this information to improve their interaction. Such a state would enhance the options and opportunities available to individuals, promote an innovation and creative environment and enable the generation of wealth based on knowledge, skills, open competition and increased capacity and efficiency.

But to get there we need to build a framework that supports this new society and builds a bridge to it from our conventional society; a framework that tends to the needs and relationships of all the members of society and brings them on board.

The United Nations Economic Commission for Latin America and the Caribbean has developed several frameworks for understanding the multiple dimensions that make up the information society and support its development.

1.3 A Multidimensional Model

One of the early approaches by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) to analyze the Information Society was indeed a multidimensional representation that starts with two "horizontal layers" which are the foundation of the Information Society:

Infrastructure and Generic Services. Then, upon this foundation, different sectors of society build their structures for information based processes and services, such as e-business, e-government, e-learning, e-culture, etc. But the implementation of these "vertical" structures requires the existence of institutional and social components such as Regulatory Frameworks, Financing and Human Capital.

FIGURE 1.2
HORIZONTAL LAYERS, VERTICAL SECTORS AND DIAGONAL AREAS OF THE INFORMATION SOCIETY[1]
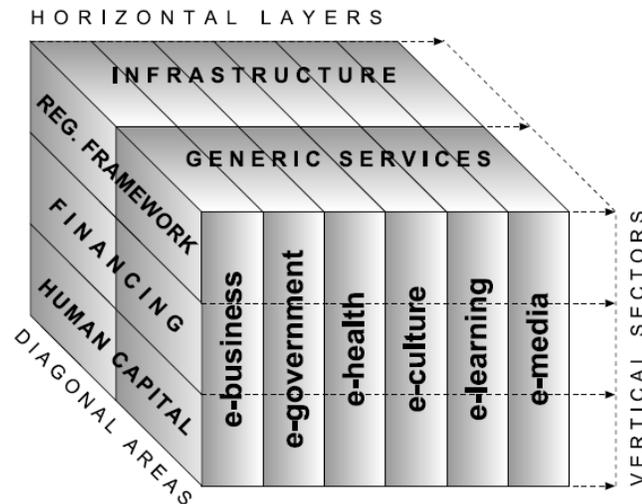
Source: Martin Hilbert, "Toward a theory on the information society"; in Hilbert and Katz, Building an Information Society: A Perspective from Latin America and the Caribbean, LC/L.1845, Santiago de Chile, Comisión Económica para América Latina y el Caribe (CEPAL), 2002

The formulation of sound and coherent public policies requires a clear definition of their area of incidence, in order to measure impact and evaluate results. Therefore and in order to facilitate the analysis and the formulation of public ICT policies, the Regional Plan of Action, eLAC2007 derived a frame of reference that groups all of Information Society's issues within four (4) major areas, which determine the structure of this report:

- Access and Infrastructure
- Capacities and Knowledge
- Content and Public Service
- Policy Instruments.

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[1] Source: Hilbert, Martin and Jorge Katz: Road maps towards an information society in Latin America and the Caribbean. UN Economic Commission for Latin America and the Caribbean (ECLAC), 2003. http://www.eclac.org/cgibin/getProd.asp?xml=/publicaciones/xml/0/12900/P12900.xml&xsl=/ddpe/tpl-i/p9f.xsl&base=/ddpe/tpl/top-bottom.xsl

II. Policy Instruments

1. Overview of the Caribbean Region

1.1 Caribbean Diversity

The Caribbean is commonly perceived as a uniform set of small islands and coastal lands, home to some of the world's most beautiful landscapes, friendliest people, warm climate and violent hurricane and volcano activity.

But the Caribbean is a universe of micro-universes comprised by dozens of states, cultures, languages and one people struggling to achieve human development against adverse conditions amidst natural, social and economical limitations.

From a geographical point of view, Caribbean States are quite diverse, including archipelagos, small and medium sized islands and continental territories in South and Central America.

From a cultural point of view, the region harbors an impressive diversity with several languages officially spoken (including English, French, Dutch and Spanish) side by side with creole variations and Amerindian dialects. This serves both as a cultural integration link among several States and as barriers among others.

Population is made up of descendents of African slaves, East Indian workers, native Amerindian groups, European immigrants (mostly British, French, Portuguese, Dutch), and Chinese and Arab immigrants. These groups keep the legacy of their origins alive in their music, art, food, traditions and customs, dress codes and holidays, creating a unique plural Caribbean culture without losing their identity.

TABLE 2.1
GENERAL COUNTRY PROFILE. SELECTED COUNTRIES

Countries	Population (thou.)	Surface Area (km2)	Geographical Profile	Human Development[1]	Income[2]
Barbados	269	430	Island	High	Middle
Grenada	102	340	Archipelagic	Medium	Middle
Guyana	751	214,970	Continental	Medium	Low
Jamaica	2,651	10,990	Island	Medium	Middle
Saint Lucia	161	620	Island	Medium	Middle
Suriname	449	163,270	Continental	Medium	Middle
Trinidad and Tobago	1,306	5,130	Archipelagic	High	Middle

Source: Author's compilation.
[1.] According to United Nations Development Program Human Development Report 2005.
[2] According to Commonwealth Secretariat Economic Review and Basic Statistics Volume 10, 2005.

1.2 The Caribbean as a Unique Region

Key issues for specific Caribbean states are often sidelined or overlooked when all of the Caribbean is thrown together in a single group, ignoring its diversity and immense variety of priorities. The availability of statistics in the Caribbean is scarce. This is not always evident in international policy discussions since the region is usually aggregated into the Latin America and Caribbean group in most indicators and reports by international organizations, despite it having its own and very different conditions and levels for most indicators.

The Hispanic Caribbean presents a cultural, technological, political, and legal and development profile more closely related to the rest of Latin America than to the rest of the Caribbean, despite their geographical location and coastal and insular condition. Their larger populations (millions of people instead of thousands) and more diverse economies reduce their vulnerability, although they are highly sensible to foreign trade, given their high level of imports and dependency on foreign goods such as oil and technology. They are covered in the Latin American counterpart of this report.

1.3 Caribbean Governance

The region as a whole largely enjoys political stability and democratic continuity[2] since the emancipation of most territories from colonial powers, from which they've inherited the current structure of public institutions that plays an important role in most of the Caribbean's economic and social activities. Public Institutions play an important role in most of the Caribbean's economic and development activities, and in general could benefit from increased budgets, institutional strengthening and human capacity improvement programs. In addition, the role of Civil Society in the formulation and implementation of policy strategies is sometimes hindered by the limited presence of mechanisms for its active participation.

The Role of Governments and Public Institutions: Capacity and Accountability

Given the size of many Caribbean States and in search for efficiency, many Ministries and Ministers are engaged in governing different sectors which, although related, may involve issues quite different. This makes the allocation of funds more complex and limits the availability of skilled personnel and their institutional and policy-enforcing strength.

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[2]   There have been isolated outbreaks of political violence, such as in Grenada in 1979 and 1983, as well as several bomb explosions in Trinidad and Tobago in the first half of the 2000 decade and riots and public violence in Jamaica on 2001. Haiti remains the most notable exception to regional political stability.

Local Governance

Local government structures are limited in many Caribbean States and most major services and government activities tend to be handled by central government ministries and delivered in the larger urban centers.

Given the short distances involved, many Caribbean nationals commute to work in a different location from where they live. Citizens often feel content to live in residential areas outside the main urban centers, limiting their responsibility and concern towards the issues affecting the areas where they work and where their activities generate a significant impact.

Civil Society

Participation of civil society, private sector and other groups in strategic planning and in the implementation of social and economic programs is scarce and the region is looking for increased social partnerships.

Limited Social Responsibility and Community Engagement

Active engagement of individuals and communities in social change processes is limited by the lack of participative mechanisms and reduced local governance. This perpetuates a culture of little community articulation and engagement in most Caribbean States.

<div align="center">

BOX 2.1
CARIBBEAN CIVIL SOCIETY VIRTUAL COMMUNITIES AND INITIATIVES

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CARDICIS: Its main objective is to sensitize about the cultural and linguistic diversity in the Caribbean and the importance of this factor on the planning of regional solutions for an integrated Caribbean vision. It brings together active ICT for development (ICT4D) and civil society stakeholders in the region to establish strategies and document common positions on the matter.

CIVIC: The Caribbean ICT Virtual Community (CIVIC) was created as a response to the recommendations from the Caribbean ICT Roundtable held in Barbados in 2002. It is now a permanent virtual forum and mailing list of Caribbean ICT stakeholders. In CIVIC they share information, hold discussions, do networking and link ideas, actors, projects or initiatives o-n ICTs and development in the region. It also aims to contribute to the building of a common vision o-n ICTs and to promote a Caribbean strategy and regional Caribbean-wide actions.

CARISNET: The project is intended to contribute to the development and impact of ICTs for Development (ICT4D) in the Caribbean. Its main objective is to help establish the CIVIC forum (above) as a mechanism able to build a common perspective on ICTs in the region and to promote a Caribbean strategy and foster regional Caribbean-wide actions that address critical development issues.

It also addresses the need of improve communication across the language barriers while promoting membership in CIVIC among French and Spanish speaking countries. And work on the creation of a multilingual regional ICT clearinghouse in the form of an online database.

Source: CARDICIS: http://www.cardicis.org/index.php?lan=en ; CIVIC and CARISNET: http://www.carisnet.org/index.htm

1.4 Human Development in the Caribbean

With the exception of Haiti, all countries in the Caribbean region are ranked by United Nations Development Programme (UNDP) as part of the High or Medium Human Development Groups in the 2005 Human Development Report. Given the small size of most islands, close to universal access and physical short distance to basic services are common, but the quality of these services and their timely and reliable delivery must also be taken into consideration.

2. Policy Coordination and Cooperation Framework

The fragmented nature of the region with scores of sovereign and colonial territories, each with its own administrative and political structure, creates the need for regional coordination institutions and frameworks to facilitate interaction among the States.

With several colonies remaining and many Caribbean States having achieved Independency in the XX century, the region maintains strong ties with Europe and other parts of the world formerly colonized by Europe, in particular those colonized by the British, now grouped under the Commonwealth of Nations.

Diverse cooperation initiatives address the unequal geographic, social and economic conditions throughout the region. The role of international organizations such as United Nations, the World Bank and the Inter-American Development Bank, is key in providing resources and sharing global know-how, in particular to deal with the challenges shared by the island nations with other Small Island Developing States (SIDS) around the world. In addition, development initiatives receive financial support from the region's own financial institution, the Caribbean Development Bank.

The Caribbean Community (CARICOM) is the most relevant regional organization, but its membership is limited to twenty (20) States and does not include the Spanish speaking countries. [3]Its most recent regional initiatives include the creation of a CARICOM Single Market Economy (CSME) and the Caribbean Court of Justice (CCJ).[4]

CARICOM's membership overlaps with the Association of Caribbean States (ACS), whose membership extends to twenty nine (29) States and includes the Spanish speaking countries. On the other hand, the Organization of Eastern Caribbean States (OECS), with a limited membership of nine (9) States achieves a tighter harmonization of Policies, including a shared currency and education initiatives.

2.1 Key Institutions and Mechanisms and ICT

CARICOM[5] and CARIFORUM

The Revised Treaty of Chaguaramas (2001)[6] which governs the Caribbean Community (CARICOM) and the CARICOM Single Market Economy (CSME) makes limited mention of ICT related issues and when mentioned, it is only as very broad guidelines or as a call for undertaking protocols.[7]

Nonetheless, CARICOM has a solid and broad vision of the role of ICT in the Human Development process for the region and a comprehensive approach to an inclusive Information Society and its relationship with competitiveness, literacy, poverty reduction, migration and other key aspects of sustainable development.

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3 CARICOM Member StatesMember States (15): Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago.Associate Members (5): Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands.

4 http://www.caribbeancourtofjustice.org

5 http://www.caricom.org

6 Revised Treaty of Chaguaramas establishing the Caribbean Community, including the CARICOM Single Market Economy. CARICOM, 2001. http://www.caricom.org/jsp/community/revised_treaty-text.pdf.

7 A detailed listing of technology-related articles in the Revised Treaty of Chaguaramas is available in the Annex "Excerpts from Treaties and Legislation".

Caricom's efforts are channeled through the following 5 ICT initiatives:

- **CARICAD:** The Caribbean Centre for Development Administration promotes transformation and modernization of governments and public sector.[8]

- **CTU:** The Caribbean Telecommunications Union: Monitors the development of Telecommunication markets and technologies such as wireless spectrum, etc.[9]

- **CKLN:** The Caribbean Knowledge Learning Network promotes Capacity Building through Information Technology and interconnection of academic institutions.[10]

- **CARICOM's ICT4Dev Agenda.**

- **Connectivity Agenda.**

CARICOM's efforts towards a Single Market Economy to address the vulnerability of the small islands and States and improve market efficiency in the Caribbean region can greatly benefit from ICT initiatives and Information Society strengthening and programs.

Although CARICOM membership does not include the Spanish speaking Nations of the Caribbean, there is a Free Trade agreement with the Dominican Republic[11] and the Caribbean Forum of the African, Caribbean and Pacific states (CARIFORUM) was created to include Caribbean countries signatories of the Lome IV Convention[12] but not members of CARICOM, such as the Dominican Republic. The Secretary General of CARICOM is also the Secretary General of CARIFORUM.[13]

Association of Caribbean States (ACS)[14]

The Association of Caribbean States (ACS) was created on 1994 to promote consultation, cooperation and concerted action among all the countries of the Caribbean. It currently has twenty five (25) Member States and four (4) Associate Members, including Spanish speaking countries. Several other non-independent Caribbean countries are eligible for associate membership.

ACS Member Status (25) are : : Antigua and Barbuda, Bahamas, Barbados, Belize, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, Venezuela.

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[8]   http://www.caricad.net
[9]   http://www.c-t-u.org
[10] http://www.ckln.org
[11] http://www.jis.gov.jm/special_sections/CARICOMNew/agreement-dominicanRepublic.pdf
[12] The Lomé IV Convention was the fourth encarnation of the trade and aid agreement between African, Caribbean and Pacific countries (ACP) and the European Union. The first Lomé Convention went into effect in 1976 and was renegotiated several times throughout the years. In 1989, the Lomé IV Convention was signed for the next 10 years (1990 to 1999). It was replaced by the Cotonou Agreement in the year 2000, which is expected to extend for 20 years.
[13] CARIFORUM Member States (15): Antigua and Barbuda, The Bahamas, Barbados, Belize', Dominica, the Dominican Republic, Jamaica, Grenada, Guyana, Haiti, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago. Source: http://www.caricom.org/ and http://www.jis.gov.jm/special_sections/CARICOMNew/CaricomMemberStates.html
[14] http://www.acs-aec.org

Associate Members (4): Aruba, France (on behalf of French Guiana, Guadeloupe and Martinique), the Netherlands Antilles and Turks and Caicos.[15]

Among its ICT related initiatives are:

- the Virtual Community of International Cooperation focal points;

- the Integrated Information System of the Greater Caribbean, providing statistics and other vital information in the areas of Trade, Tourism, Transport and Natural Disasters;

- the Virtual Market of the Greater Caribbean, an online marketplace that would connect the business people of the region;

- the Internet-based Port and Maritime database to supply port and shipping information to stakeholders in the ACS region.

Organization of Eastern Caribbean States (OECS)[16]

Established in 1981 to contribute to the sustainable development of its Member States through policy and program formulation and execution by facilitation of bilateral and multilateral co-operation, these island States share a single currency, the Eastern Caribbean Dollar, overseen by the Eastern Caribbean Central Bank, and a common Supreme Court.

OECS Member States (7) are: Antigua and Barbuda, Commonwealth of Dominica, Montserrat, St Kitts and Nevis, Grenada, Saint Lucia, Saint Vincent and the Grenadines and **Associate Members** (2): Anguilla and the British Virgin Islands.17

OECS Economic Union

While six (6) states members of the Organization of Eastern Caribbean States (OECS) agreed to adjust their legislation within 2006 to be able to join the CSME (Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines), the OECS Heads of Governments signed a Declaration of Intent on June 2006 to form a Economic Union within one year.

The OECS states have conditioned their commitment to the CSME to the creation of a Regional Development Fund (RDF) to cushion the impact open market exchange would have on the smallest countries of the region. CARICOM is working on setting up that fund and OECS has assured that its Economic Union will not be incompatible with the CSME.

Caribbean Development Bank[18]

As stated in the Article 1 of the Agreement that creates the CDB, "The purpose of the Bank shall be to contribute to the harmonious economic growth and development of the member countries in the Caribbean and to promote economic co-operation and integration among them, having special and urgent regard to the needs of the less developed members of the region."

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[15] Source: http://www.acs-aec.org
[16] http://www.oecs.org
[17] Source: http://www.oecs.org
[18] http://www.caribank.org

Caribbean Forum for Development

Established as The Caribbean Group for Cooperation in Economic Development (CGCED) in 1977 and chaired by the World Bank until 2004, this consultative group for 15 Caribbean states (13 of them English speaking) aims to provide a single forum for policy makers and direct dialogue with the international donor community. In 2004, the Group moved from the World Bank to the Caribbean Development Bank and was renamed the Caribbean Forum for Development.

Member States are: Anguilla, Antigua & Barbuda, The Bahamas, Barbados, Belize, The British Virgin Islands, Cayman Islands, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Netherlands Antilles, St. Kitts & Nevis, St. Lucia, St Vincent & the Grenadines, Suriname, Trinidad & Tobago and Turks & Caicos Islands.

Participating Agencies: Canadian International Development Agency (CIDA), Department for International Development of the UK (DFID) – Caribbean, European Commission (EC), Food and Agricultural Organization (FAO), Inter-American Development Bank (IDB), International Monetary Fund/Technical Assistance Centre (IMF/CARTAC), Organization of American States (OAS), United Nations Development Programme (UNDP), United States Agency for International Development (USAID), World Bank.[19]

Caribbean Development and Co-operation Committee (CDCC)

The CDCC was created in 1975 as a permanent subsidiary body to ECLA (now ECLAC). The committee would function within the ECLA structure to promote development cooperation among Caribbean countries. Nine years later, the Commission's widened role was officially acknowledged when the Economic Commission for Latin America (ECLA) modified its title to the Economic Commission for Latin America and the Caribbean (ECLAC).

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[19]   Source: Author's compilation.

FIGURE 2.1
REGIONAL INFORMATION SOCIETY STAKEHOLDERS[20]
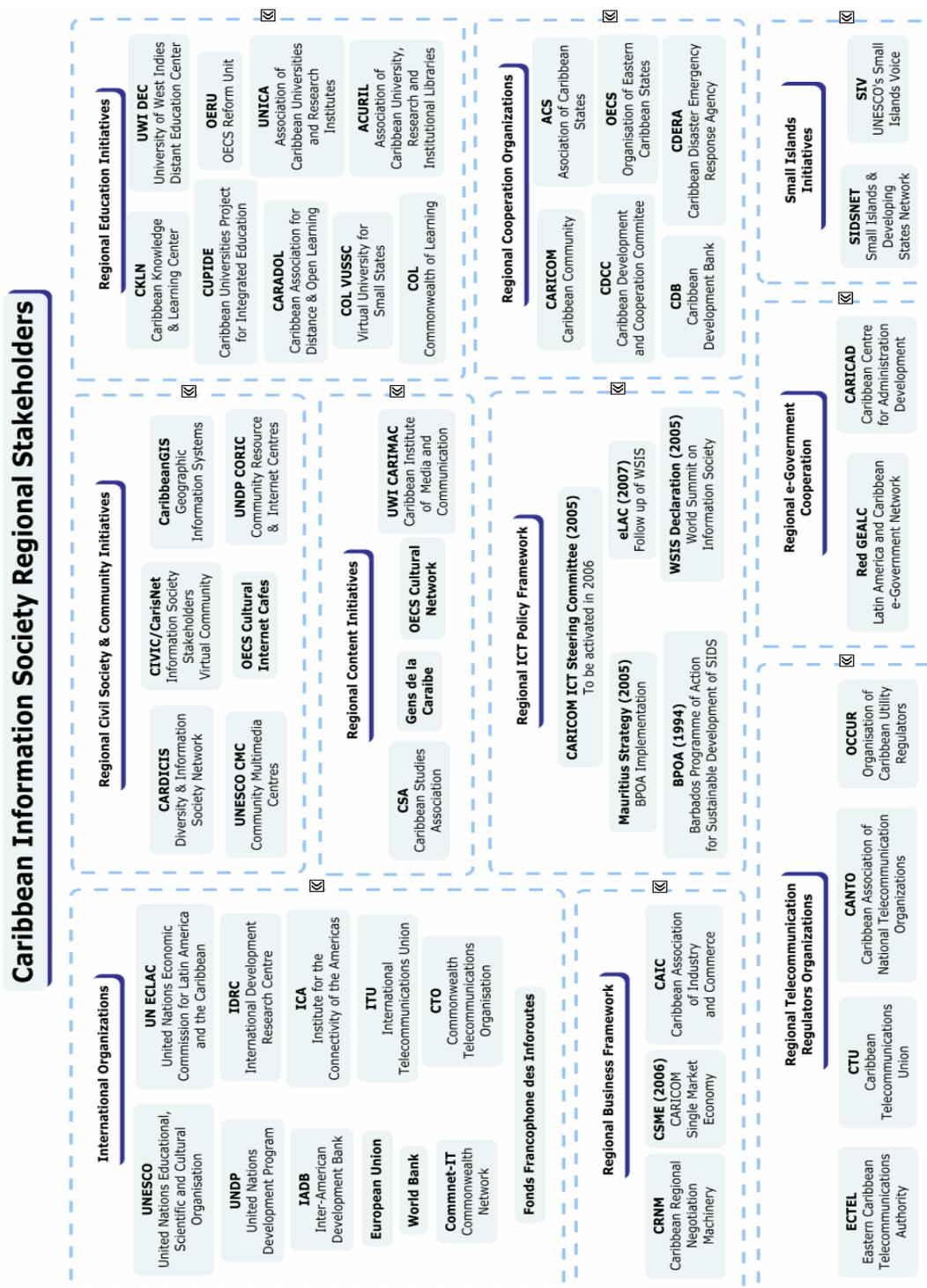
Source: Author's compilation.

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[20]   Stakeholders in this chart are detailed in the Chapter pertaining to Regional Initiatives. Please, refer to it for more details.

3. Sustainable Development Policy Framework

Small nations and those with small populations and economies are particularly vulnerable to fluctuations in the global economy and to natural disasters and, given their location, size and resources. This phenomenon of "economic vulnerability" has been the subject of intense study in the last few decades and is shared by the Caribbean nations with other Small Developing States (SIDS) throughout the world. In 1994, the Barbados Programme of Action (BPOA) for the Sustainable Development of Small Island Developing States was agreed on by small states from around the world. It was updated 10 years later with the "Mauritius Implementation Strategy" (MIS) developed as the result of an intensive review in 2005.

3.1 Economic Vulnerability[21]

Small Island States and territories have a more vulnerable economy than larger nations. Their insular condition, combined with small domestic markets, very limited natural resources, little diversification of economic and productive activities and their strong dependence on the import of strategic goods and services render them highly vulnerable to even minor changes on market conditions abroad and susceptible to catastrophic impact from abrupt local changes.

Between 2001 and 2003 prices to producers were cut by one-third, with devastating impacts on smallholder farmers in the Caribbean and plantation workers.[22]

Hurricanes Frances and Jeanne hit The Bahamas in 2004 causing losses estimated in US$381 million or 7% of the nation's GDP.[23] Hurricane Ivan hit Grenada in 2004 causing damages estimated at US$815 million, more than 200% of the nation's GDP. Grenada's priority since has been to rebuild its infrastructure and production capacity through a Public Sector Investment Programme.[24] Hurricane Charley and Ivan hit Jamaica in 2004 and the economic participation of its agricultural sector shrank 11.5% that year.

The lack of abundant natural resources places them at disadvantage with very challenging possibilities for substituting the strategic imports with local alternatives. Furthermore, the lack of terrestrial connection with larger economical centers increases the costs of transport and transaction rendering them as peripheral economies in global trade, trends and access to market and exchange growth. Not only strategic goods are not available locally and have to be imported, but the transport cost is added to their original price.

Although this set of conditions is perceived by many as limitations for the efficient operation of free markets, often favoring monopolies and oligopolies structures, the recent developments and accelerated growth of telecommunication markets through open competition seems to suggest otherwise.

In many Small Islands, hopes of development and even the full weight of the economy rests on one or two sectors, like agriculture or tourism, with the natural limitations, cycles and endemic limitations of such markets. In Middle Size Island States the vulnerability is reduced.

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[21] BRIGUGLIO, Prof. Lino: "Economic Vulnerability and Resilience: Concepts and Measurements". Small States: Economic Review and Basic Statistics, Vol. 9, Autumn 2004, Commonwealth Secretariat, London.

[22] United Nations Development Programme Human Development Report 2005, which refers to VORLEY, Bill: Food, Inc. Corporate concentration from farm to consumer. UK Food Group, 2003.

[23] Commonwealth Secretariat, op. cit.

[24] Source: "Economic Vulnerability and Resilience: Concepts and Measurements", United Nations Development Programme Human   Development Report 2005 and Commonwealth Secretariat, op. cit.

For instance, the more developed and diverse economies of Jamaica and Trinidad and Tobago are less vulnerable and dynamic. Their larger markets allow the development of internal trade and diversified business sectors and their production volume also enables them to negotiate better terms with their trade partners. Foreign investment is also significant, in particular in the case of Trinidad, around the oil industry.

3.2 Barbados Programme of Action (1994)

The Barbados Programme of Action (BPOA) for the Sustainable Development of Small Island Developing States was adopted in 1994 on a global conference where 125 states participated, including 46 small developing states.

The BPOA served to generate formal awareness of issues specific to small developing states such as ecological, economical and social vulnerability, lack of abundant natural resources, limited local markets and high dependency on foreign markets and trade.

It also served as a guiding framework for the formulation of sustainable development strategies by small developing states.

Since it was formulated just before the technological boom that rose after the mid 90's, Information and Communications Technology is only mentioned twice in the BPOA declaration. Nonetheless out of its 15 chapters, 4 are closely related to ICT capacity and the development of Information Society:[25] National Institutions and Administrative Capacity (X); Transport of Communication (XII); Science and Technology (XIII); Human Resource Development (XIV). Also, Natural and Environmental Disasters (III) and the Implementation, Monitoring and Review (XV) would ideally be closely related to ICT.

3.3 Mauritius Implementation Strategy (2005)

In 2005, United Nations organized an "International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States" in Mauritius. The resulting "Mauritius Implementation Strategy" (MIS), reviewed the successes and limitations from the past 10 years of work in the Barbados Programme of Action, enhancing it now to 20 chapters, in order to include additional issues and lessons learned.

While there is still no ICT or Information Society specific chapter, there is now explicit mention of ICT in different sections of the document[26] and International Cooperation is repeatedly given an important role throughout the document for fulfilling most of the ICT-related goals and issues. Below is short collection of ICT issues covered in the MIS.

Digital Divide, Community and Universal Access

Chapter X on Transport and Communication stresses the need for community access and initiatives to promote Universal Access to the benefits of ICT:

"Small island developing States are committed, with the necessary support of the international community, to taking initiatives in such areas as access to and the use of information and communication technology (ICT); the development of community multimedia centres; ICT literacy; skills development; local content and applications in

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[25] See the Annex "Excerpts from Treaties and Legislation" for a complete list of the Chapters in the Barbados Programme of Action.

[26] See the Annex "Excerpts from Treaties and Legislation" for a detail of sections addressing ICT in the Mauritius Strategy.

building knowledge-based societies; and bridging the digital divide, particularly in rural communities. There is also a continuing need for the maintenance of low-technology communication solutions, such as high-frequency radio for rural and remote locations."

Key Opportunity Areas

Chapter XIII on Knowledge management and information for decision-making, identifies four (4) areas where ICT generate opportunities to overcome the "the limitations of isolation and remoteness": e-Commerce; Improved Early Warning (disaster preparedness); Telemedicine; Distance Learning.

Specific mention of "addressing issues relating to cyber-security" is also made.

Information Systems

Chapter XIII also highlights the importance of enabling national and regional development, vulnerability and geographic information systems, mechanisms for their quality control and analysis and the technology to share and access them.

Intellectual Property, Culture and Development

Chapter XX on Implementation addresses the importance of taking action to protect intellectual property and promote the development of cultural industries to generate awareness of the value of traditional knowledge and folklore through cultural exchange. Access to affordable hardware, software and connectivity is mentioned as key to the development of ICT and mandated as well.

Capacity Building and Regional Cooperation

Round Table 2 stresses the need to build capacity in order to improve competitiveness and diversify the national and regional economies through the development of ICT, science and technology and cultural industries that recognize and exploit the value of traditional knowledge and culture.

The recommendation is made to create sub-regional hubs for ICT industry development in order to avoid unnecessary competition and the resulting fatigue.

The potential of distance and virtual learning at all levels, particularly at secondary and tertiary levels, is mentioned both for improving the skills of human resources and as a palliative of migration.

4. Information Society Policy Framework

The Caribbean is still elaborating a formal Caribbean ICT strategy coordination mechanism or body. On the one hand it makes part of global processes, such as the World Summit on Information Society (WSIS) and of larger regional mechanism and activities, such as the Regional Plan of Action eLAC2007 and on the other several countries have set up national ICT strategies. The intermediate level of the Caribbean, however, is still in evolvement. Through active promotion of ICT issues, CARICOM is the natural place for such strategy and CARICOM has already done important work in the field of gathering the key actors in the advancement of ICT policies. On a more practical side, the Commonwealth plays an important role through technical assistance for ICT strategies, policy and capacity building initiatives in former British colonies.

4.1 World Summit on Information Society (2005)

Following a first phase meeting in Geneva in 2003 and an intensive preparation program of regional meetings and countless awareness and consultation initiatives, the second phase of the World Summit on Information Society took place in Tunis in 2005.

Almost 20,000 people participated, including 46 Heads of State and Government, Crown Princes and Vice-Presidents, 197 Ministers/Vice Ministers and Deputy Ministers, government representatives of 174 states and almost 1,000 international organizations, businesses, NGO's and civil society institutions.

Two documents came out of the Summit with wide support and commitment from the participating countries:

- **The Tunis Commitment**, a 40 paragraph declaration of principles and priorities for the development of the Information Society.

- **The Tunis Agenda for the Information Society**, a 122 paragraph plan of action for the development of the Information Society.

Official Caribbean participation in both phases of the Summit was limited and only three governments from the pilot states were formally present at WSIS:

- Barbados: Minister of Commerce, Consumer Affairs and Business Development.

- Jamaica: Minister of Information.

- Trinidad and Tobago: Permanent Secretary, Ministry of Public Administration and Information.

Civil Society representatives from Saint Lucia, Jamaica and Trinidad and Tobago attended the summit, too. Although not covered by our study, Cuba and the Dominican Republic were also officially present at the summit.

4.2 Main Regional Mechanisms and Initiatives

Several regional initiatives have been actively promoting the advance of the Information Society, focusing in building local capacity and the development of both regional and national strategies. The inclusion of Caribbean specific issues in regional strategies, agendas and plans has often been a challenge for both international organizations and the very own Caribbean stakeholders. Budget and geographical constraints continue to limit the Caribbean participation and representation on International events affecting the availability of cooperation funds and determining the priorities for technical assistance programs and regional policies.

Given the territorial extension of its countries, its population and its limited impact on international trade, the Caribbean is often gathering together with the larger Latin American region. The regional coordination and a common approach of a wider Latin American and Caribbean in the field of Information Society development has been relatively active. The lively participation of the Caribbean countries extends the spirit of the Declaration of Bavaro (January 2003), which has been elaborated during the preparation for the regional participation in the first phase of the World Summit on the Information Society. It is worthwhile to point out that more Caribbean –and also more Latin American—countries took part in the Bavaro negotiations,

organized by the government of the Dominican Republic and ECLAC, than in the World Summit on the Information Society itself.[27]

eLAC2007: Plan of Action for Latin America and the Caribbean

As a result of the World Summit on the Information Society, the countries of Latin American and the Caribbean have started a collaborative process for the development of a regional strategy to contribute to the implementation of the global agenda and commitment. To enhance implementation of the Plan of Action, each country in the region has to designate a National Focal Point responsible for transparently organizing national participation in the working groups established as part of eLAC2007. The implementation process is coordinated by a Regional Follow-up Mechanism that represents the four subregions, comprising Ecuador (Andean), El Salvador (Mesoamerica), Brazil (Southern Cone) and Trinidad and Tobago (Caribbean).

FIGURE 2.2
INSTITUTIONAL ARCHITECTURE ELAC2007
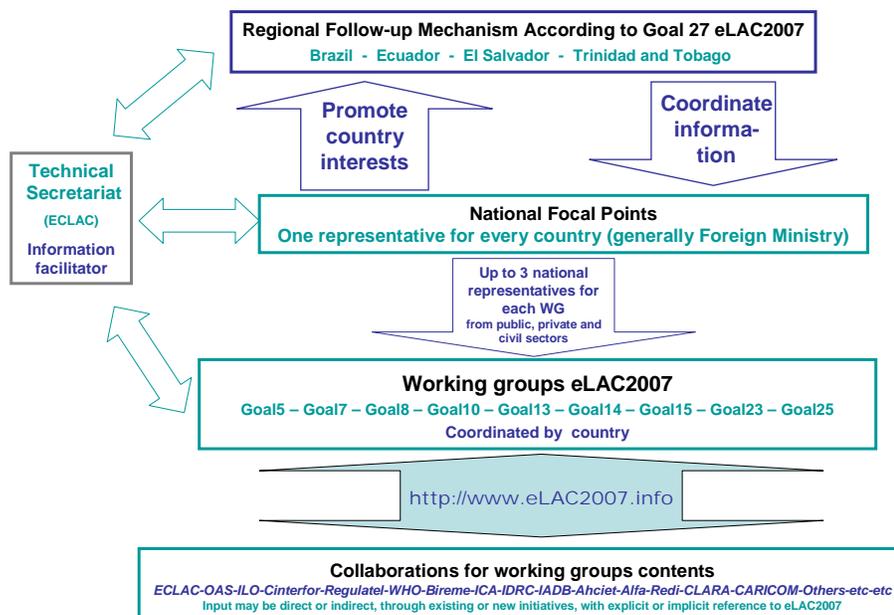
Source: Information Society Programme, ECLAC.

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[27] In the Bávaro event (January 2003) the following 33 States members of the Economic Commission for Latin America and the Caribbean participated: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, France, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Spain, Suriname, Trinidad and Tobago, United States of America, Uruguay and Venezuela. The following four associate members of the Commission were also represented: Montserrat, Netherlands Antilles, Puerto Rico and the United States Virgin Islands.

CARICOM ICT Agenda (2003)

CARICOM Steering Committee (CISC)

Put together in January 2005 to work towards a regional position in WSIS, the CARICOM ICT Steering Committee (CISC) is expected to become active once again in the near future.

It is formed by representatives of CARICOM Member States governments, private sector and civil society as well as regional organizations and CARICOM Secretariat itself.

Its creation took place two (2) years after a declaration by CARICOM Member States committing "to adopt a coordinated approach to conceptualization and development of ICT policies, and development of structural, legal and regulatory frameworks, to stimulate and promote broader access to and use of information and communication technology by the populations of the Region, and the transfer of technology; That there be established a specialized Group charged with responsibility for ICT within the CARICOM Working Group on Services, established under the aegis of the Council for Trade and Economic Development (COTED)".[28]

At the moment of its creation, it was announced that the Committee would oversee the progress of working groups in key areas identified:

- Infrastructure Strengthening.

- Human Resource Capacity Development.

- Media.

Given the close relationship of CARICOM with the governments of the region, CISC would be conveniently positioned to engage them in the development of a Caribbean regional strategy that fills the existing room between existing country strategies and broader commitments, such as eLAC and WSIS.

CARICOM's ICT and Connectivity Strategies Agenda 2003

CARICOM has been conducting regular Meetings of CARICOM Ministers Responsible for Information and Communication Technology. Enthusiastic declarations have resulted from these meetings, including an ICT/Connectivity Agenda approved by CARICOM Heads of States on July 2003,[29] which followed an earlier declaration from 2002.[30]

Unlike other regional documents and CARICOM agreements, this strategy/agenda is not officially available on-line, limiting its awareness and recognition by stakeholders and those implementing the national ICT policies.

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[28] Georgetown Declaration on Information & Communication Technology (ICT) Development by CARICOM Ministers responsible for ICT. Guyana, 2003. http://unpan1.un.org/intradoc/groups/public /documents/CARICAD/UNPAN009279.pdf

[29] At the Twenty-Fourth Meeting of the Conference of Heads of Government of CARICOM, held in Montego Bay, Jamaica, on July 2003.

[30] Towards CARICOM Connectivity: Agenda 2003 and Platform for Action. http://www.caricom.org/jsp/ projects/caricom_connectivity_annex8.jsp?menu=projects

BOX 2.2
STRUCTURE OF CARICOM'S ICT/CONNECTIVITY AGENDA[31]

1. Rationale

2. Objectives of the Document

3. Fundamental Elements a CARICOM Agenda for Connectivity

        3.1. Definition of connectivity

        3.2. Definition of Agenda for Connectivity

        3.3. Players

        3.4. Vision

        3.5. Components

        3.6. Principles

        3.7. Strategies

4. Platform for Action.

        4.1. Assessment and Planning

        4.1.1. Assessment

        4.1.2. Planning

        4.2. Execution of the Agenda for Connectivity

        4.2.1. Infrastructure

        4.2.2. Utilization

        4.2.3. Content

        4.2.4. Regulatory framework

        4.2.5. Financing schemes

5. Performance Measurement.

6. CARICOM Secretariat commitments.

On July 2006, 32 CARICOM Heads of States confirmed their endorsement of the ICT/Connectivity Agenda under the following priorities: ICT and telecommunications development, Social and human development and Advancement of the trade and economic agenda, including the CARICOM Single Market Economy (CSME).

Source: Author's compilation.

Networks

The implementation of CARICOM ICT Agenda is expected to be spearheaded by:

        Caribbean Knowledge and Learning Network (CKLN). Announced by the CARICOM Heads of States in 2004 with support from internal organizations as an initiative to increase capacity and improve competitiveness of human resources throughout the region with the use of ICT.

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[31] http://www.unpan.org/tasf/ICTAgenda2003Caricom.PDF, it is also available at
    http://www.fastforward.tt/media/release_detail.asp?id=4603

[32] At the Twenty-Seventh Meeting of the Conference of Heads of Government of CARICOM, held in Bird Rock, Saint Kitts and Nevis, on July 2006.

Regional Research and Education Network for the Caribbean (CARIBNET). Endorsed by the CARICOM Heads of States on 2006 as a measure to reduce social exclusion, digital divide, uneven connectivity and limited participation in education, knowledge and research networks. It is to be managed by CKLN.

Caribbean Centre for Development Administration (CARICAD).[33] As mentioned earlier, this CARICOM initiative aims to improve the efficiency of the public sector of its fourteen (14) member countries and modernize government institutions through technical assistance, capacity building for strategic management and regional meetings.

Latin America and Caribbean e-Government Network (Red GEALC).[34] This network of e-government professionals supported by the Organization of American States (OAS) promotes cooperation and exchange of experiences and best practices among government institutions, officials and technicians. It organizes periodic meetings and capacity building initiatives and workshops. It also enables virtual working groups, a horizontal cooperation fund and maintains a database of e-government experts in the region.

Commonwealth's Support for Public ICT Policies.[35] The Commonwealth of Nations groups fifty three (53) states which were once under the rule or politically associated with the United Kingdom, mostly former British Colonies. Among them are ten (10) Caribbean States: Antigua and Barbuda, The Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Vincent and the Grenadines, Trinidad and Tobago and Saint Kitts and Nevis. As a voluntary non-political association, the Commonwealth promotes cooperation among its members and channels technical assistance to key development areas, actively supporting policy development and capacity building initiatives in the Caribbean.

The Commonwealth Network of Information Technology for Development (COMNET-IT).[36] Established in 1995 and endorsed by the Commonwealth Heads of Government, COMNET-IT actively promotes and supports "policy resources and best practice in e-government and informatics strategies".

The Commonwealth Telecommunications Organization (CTO).[37] The current structure of CTO as an international partnership of governments, businesses and civil society institutions evolved from its former role as the Pacific Cable Board, established in 1901. Through a large number of funding, co-operation, technical assistance, knowledge sharing and capacity building initiatives the CTO aims to "bridge the digital divide and achieve social and economic development" and "fulfill the global development agenda for ICT".

Commonwealth Connects.[38] The Commonwealth Heads of State, following up on the commitments from the recent WSIS Summit, launched the Commonwealth Action Programme for the Digital Divide at the end of 2005. The program, later re-branded as "Commonwealth Connects", makes ICT policy recommendations to bridge the digital divide on five areas:

- Building policy and regulatory capacity.

- Modernizing education and skills development.

- Entrepreneurship for poverty reduction.

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[33] http://www.caricad.net
[34] http://www.redgealc.net
[35] http://www.thecommonwealth.org
[36] http://www.comnet-it.org
[37] http://www.cto.int
[38] http://www.commonwealthconnects.net

- Promoting local access and connectivity.
- Regional networks, local content and knowledge.[39]

5. National ICT Strategies

There certainly is no doubt among Caribbean ICT Policy Makers of the importance and benefits of developing a National ICT Strategy and most countries are currently engaged in one way or another in developing at least early draft versions of their National ICT plans. However, the approach to their formulation and status of their implementation vary greatly and a significant number of countries in the region have yet to develop a formal National ICT Strategy and articulation, coordination and funding mechanisms for Public ICT planning and implementation. The presence of coordination agencies is limited and their role is often sidelined to the visible role of individual government agencies implementing ICT initiatives. Funding is limited, both for coordinating agencies and for the National ICT Strategy and even for individual initiatives, and mechanisms for making funds available for ICT initiatives are rare.

TABLE 2.2
SUMMARY OF NATIONAL ICT STRATEGIES

Countries	ICT Strategy Formulated and Published?	Coordinating Agency Appointed?	Backed by Strategy Specific Budget?	Being Implemented?
Barbados	◖[1]	◖[2]	○	◖[1]
Grenada	●	●	○	○
Guyana	●	◖[3]	○	○
Jamaica	●[4]	●	●	●
Saint Lucia	◖[5]	●	○	○
Suriname	○[6]	○	○	○
Trinidad and Tobago	●[7]	●	●	●

Source: Author's compilation.
● Yes
○ No
◖ Partial
1. Barbados has a draft National ICT Strategy. There is a section on ICT on the National Strategic Plan 2005-2025.
2. Barbados has several coordinating agencies. A new centralized structure has been proposed.
3. There has been a coordinating unit, part of the office of the President, for the formulation of the Strategy, which was completed in 2006. A coordinating authority for the implementation is yet to be formally appointed.
4. Jamaica has an ICT Public Policy Strategy that dates back to 2000, which was reviewed in 2002-03 and is being revised and updated on the second half of 2006.
5. There is an "e-Gov Proposal – Blueprint for ICT in Public Sector".
6. There is a proposal under discussion with the government of India for support in the development of a National ICT Strategy.
7. The National ICT Strategy has been under implementation since 2003, with short term goals to reach in 2005, 2006 and 2008.

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[39]   http://www.cto.int/chogm2005/the_capdd.html

5.1 A Second Generation of National ICT Strategies and Implementations

Countries like Barbados, Jamaica and Trinidad and Tobago have been explicitly implementing National ICT Strategies for several years and are now moving to a second phase or generation, upgrading their plans and strategies with lessons learned from good practices, success stories and their share of difficulties encountered on their initial exercises.

These experiences have enabled them to build a large body of knowledge and practical know-how, documented in their internal reviews and assessments and detailed in the country profiles completed as part of our report.

BOX 2.3
SUMMARY OF NATIONAL ICT STRATEGIES REVIEWED

Bahamas has naturally responded to the priorities of its 2 main industries - Tourism and Financial services – by focusing its efforts on legislation reform and the habilitation of an enabling environment for these sectors.

Grenada has focused in internal systems and processes out of a need to save money and make more efficient use of scarce resources after been hardly hit by Hurricane Ivan in 2004.

Jamaica has focused its initiatives in the delivery of services that facilitate private sector transactions and operations. The country has a clear vision of its government systems and revamped services as an integral and fundamental component to increase the country's competitiveness in response to the pressure of globalization and to make sure the country becomes a key player in the international market in the years to come.

Guyana completed an open multi-stakeholder consultation process, with support from UNDP, to put together a comprehensive National ICT Strategy for Development, which was completed in 2006. The country had presidential elections in September of the same year, resulting in the authorities being reelected, which should clear the way for better definition and implementation in the near future.

Saint Vincent and the Grenadines has worked on a draft strategy and consulted with the private sector, but it is on an early stage and is looking for support to review it, engage all sectors and complete it.

Suriname has been working in the computerization of its government systems, collecting data and interconnecting some agencies, but has yet to formulate a formal National ICT Strategy. Discussions are been held with the Government of India for technical assistance and support for doing so.

Trinidad and Tobago launched its National ICT Strategy on 2003, branding it with a very marketable image and naming it "Fast Forward". Two interesting features of Fast Forward are the definition of short term goals for 2005 (Telecommunications liberalization), 2006 (Government information on-line) and 2008 (Schools, business and citizens on-line) as well as the identification of "Pathfinder" projects to fuel and support other projects and short-circuit the development process.

Source: Author's compilation.

5.2 A Pragmatic Approach to Public ICT Implementation

Many Caribbean States have followed a pragmatic approach to Public ICT implementation by focusing on the development of internal systems to make the government processes more efficient. This enables a more transparent and efficient government that serves the public better and increases the competitiveness of the country by reducing transactions time and cost through initiatives whose impact and completion can be clearly identified and measured.

Besides this top-down approach, the region is still in search for the benefit from increasing awareness on the social role of technology to empower citizens and communities, beyond capacity building and telecenters initiatives, through civil society participation, consultation and participation processes, self-administered sustainable initiatives and self-reliance.

On almost all countries researched there was little awareness by the public on the government initiatives and plans regarding ICT development. Even key stakeholders like Chambers of Commerce and Industry Associations had little information or understanding of the governments plans, priorities, goals and undertakings. This is interesting, considering that several countries held multistakeholder consultations at one point or another and surveys to gather input and help define the priorities of their strategies and initiatives. In contrast, Jamaica uses billboards and advertisement in public spaces to promote awareness among citizens of the public services available on-line.

And in 2006, Guyana undertook a massive multistakeholder consultation process that engaged the President interacting directly with broad sectors of the Guyanese society, from private sectors to NGO's to education, entrepreneurs and government representative in order to validate, gather feedback and complete the e-Guyana National ICT for Development strategy. [40]

5.3 Formulation and Implementation Processes

In most cases, formulation of National ICT strategies and agendas has been preceded by formal assessments and consultation processes. Both Guyana and Trinidad and Tobago went through extensive multistakeholder consultation processes to formulate their National ICT Strategies and Barbados and Jamaica did complete detailed assessments of needs before defining their strategies.

In most cases where a coordinating agency for public ICT initiatives has been defined, either the responsible figure for it is yet to be formally appointed and resources have yet to be allocated or its authority and budget are limited.

Coordination and Connection to National Development Strategies

There is a common disconnect between the practical approach of developing and deploying technical solutions and services through dispersed initiatives and the National Development Strategies priorities that each State has gone through extensive dedicated process to eventually guide all government initiatives.

Countries with significant advances and developments in Public ICT initiatives are now struggling to coordinate and interconnect their many independent administrative systems.

TABLE 2.3
NATIONAL ICT STRATEGIES AND PUBLIC SECTOR REFORM

Countries	Public Sector Reform Programme in place	Coordination among ICT and Public Sector Reform Programme
Barbados	●	●
Grenada	●	○
Guyana	●	○
Jamaica	●	●
Saint Lucia	●	●
Suriname	○	○
Trinidad and Tobago	●	●

Source: Author's compilation.
● Yes
○ No

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[40] Source: Author's compilation.

TABLE 2.4
E-GOVERNMENT PROJECTS COORDINATION

Countries	e-Government Projects			
	Related to Public Reform Program	Part of a National Coordination Mechanism	To foster the development of an ICT industry	Periodically monitored and evaluated
Barbados	●	●	●	●
Grenada	○	○	○	○
Guyana	○	○	○	○
Jamaica	●	●	●	●
Saint Lucia	●	○	○	○
Suriname	○	○	○	○
Trinidad and Tobago	●	●	●	◖

Source: Author's compilation.
● Yes
○ No
◖   Evaluation of IT projects is common, but not formally scheduled periodically.

Systems Interconnection and Coordination

As governments advance in the deployment of ICT, they are now starting to realize the importance of a coordinated strategy and the adoption of open technological standards. The governments of Barbados, Jamaica and Trinidad and Tobago have started formal initiatives to foster compatibility and integration of their public ICT systems in order to facilitate the exchange of information and improve the efficiency of public services. Prior to this, the traditional approach followed had been to deploy national networks that would provide access to one system, for example the public finance system, from all government agencies. While this improves the efficiency and the input and accessibility of information, it does not address the need for interconnection of systems and access to information from other processes.

TABLE 2.5
PUBLIC ICT BUDGET COORDINATION

Countries	Is there a National Coordination Mechanism?	Among ICT Strategy and Public Institutions	Does the Coordination Mechanism influence budgetary decisions?
Barbados	●	●	●
Grenada	○	○	○
Guyana	○	○	○
Jamaica	●	●	○
Saint Lucia	○	○	○
Suriname	○	○	○
Trinidad and Tobago	●	●	●

Source: Author's compilation.
● Yes
○ No

TABLE 2.6
NATURE OF E-GOVERNMENT SERVICES

Countries	Access to Information	On-line Transactions	On-line Payment of Services	Interconnection of Agencies	To Support Business Sector
Barbados	●	●	●	●	○
Grenada	●	○	○	◖	○
Guyana	●	○	○	◖	○
Jamaica	●	●	●	●	●
Saint Lucia	●	○	○	◖	○
Suriname	●	○	○	◖	○
Trinidad and Tobago	●	●	●	●	●

Source: Author's compilation.
● Yes
○ No
◖ Limited.

6. Funding and Sustainability

Availability of financial resources remains one of the main constraints for implementing ICT initiatives in the Public Sector in the Caribbean. Expenditure on ICT is seldom coordinated among agencies and information on aggregated ICT expenditure is rarely available. In addition, while Universal Access Funds are often defined in recent Telecommunications Legislation, they have been implemented only by a handful of countries.

As a result, ICT projects have to compete with other national priorities and urgent issues for allocation of funds within National budgets and governments have relied heavily on International Cooperation and Financial Assistance for implementing Public ICT initiatives.

TABLE 2.7
NATIONAL ICT BUDGETS

Countries	Availability of Central ICT Budget	Availability of Specialized ICT Budget			
		For National ICT Strategy	For e-Government Projects	To Promote Universal Access	To Promote IT Industry Development
Barbados	○	○	◖[1]	○	◖[2]
Grenada	○	○	●	○	○
Guyana	○	◖[3]	◖[1]	○	○
Jamaica	○	●	●	●[4]	◖[2]
Saint Lucia	○	○	◖[1]	○	○
Suriname	○	○	◖[1]	○	○
Trinidad and Tobago	○	◖[5]	◖[1]	○	◖[2,6]

Source: Author's compilation.
1. Internal funds allocation within government agencies as opposed to formal allocation in public budget.
2. Through Business/Technological Parks.
3. Funds available for IT Strategy formulation.
4. The Universal Access Fund has been redefined to be used for ICT in Education.
5. Funds available for IT Strategy formulation and some specific projects.
6. Technology Park and Clusters strategy under development.
● Yes
○ No
◖ Limited.

TABLE 2.8
PUBLIC ICT FUNDS

Countries	Existence of Universal Access Fund	Information Available on Total Government ICT Expenditure	
		Available	Being Estimated
Barbados	○	●	●
Grenada	○	○	○
Guyana	○	○	●[2]
Jamaica	●	○	●
Saint Lucia	○	○	○
Suriname	○	○	○
Trinidad and Tobago	◖[1]	○	○

Source: Author's compilation.
1. The definition exists in the Telecommunications Law, but is yet to be implemented and enforced.
2. Unit created by Office of the President is expected to collect/generate this info.
● Yes
○ No
◖ Partial

6.1 Universal Access Funds

The figure of a Universal Access Fund is absent in most Caribbean nations, although it is present in some form in most Telecommunications reform acts.

There is heated debate about the efficiency of Universal Access Funds and the necessity to establish them, given the high levels of penetration. One side argues that Universal Access Funds tend to be inefficiently managed with extensive bureaucratic procedures that make them slow and that, given the recent high level of mobile penetration, the market is proving that it can function quite well, given the proper incentives, without intervention. The other side argues that Universal Access Funds can provide much needed resources for implementing ICT initiatives beyond basic connectivity, such as community access centers, educational content and e-learning initiatives.

In Jamaica provisions for a Universal Access Fund were included when the Telecommunications Act enacted in 2000, setting the framework for the government to collect 5% of the telecommunication providers' revenues. Its introduction, however, found strong resistance from the local telecommunications industry, which argued that mobile coverage was already providing universal service all over the country. The government countered by defining the use of the fund as not limited to voice services and started a process of consultations with the private sector. The result was a compromise to impose a levy on voice-calls of 2 cents per mobile call and 3 cents per PSTN call, with the government's commitment to set interconnection of schools (through the Ministry of Education) as the top priority in using this funds. The Universal Access Fund went finally into effect in June 2005.

The Dominican Republic has benefited from having established it as part of its Telecommunications reform and has used it to finance remote public phone access points, rural telecommunication centers, communication facilities in health institutions and educational projects.

Jamaica struggled for five years to implement its fund until it finally announced several projects to improve the education system through ICT.

The figure of a Universal Access Fund exists in the Trinidad Telecommunications Act, but it has yet to be enforced. [41]

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[41]   Source:Author's compilation.

6.2 International Cooperation

International Cooperation has played a key role in the development of ICT projects in the region, providing not only financial resources but also technical assistance and alignment to regional development goals.

Governments of the region have shown a high level of interest on the creation of a Digital Solidarity Fund announced on the WSIS process that would provide developing countries the opportunity to overcome their economic limitations to develop ICT capacity and advance into the Information Society without being at disadvantage.

7. ICT Related Legislation

As ICT open new markets, generate new paths for development, new business opportunities, increase communication and enable virtual and digital spaces for citizens and institutions to interact, a whole set of new conditions, situations, relations and transactions is created that may prove challenging for existing social, economic and legal structures.

Caribbean countries have been slowly enhancing their existing legal framework with legislation to address issues on privacy and data protection, cybercrime and digital systems misuse, freedom of information, digital signatures, electronic transactions and e-commerce.

7.1 Challenges of ICT Legislation in the Caribbean

In general, these new legislative pieces are not related or coordinated among countries, which could lead to future challenges, in particular with the arrival of the CARICOM Single Market Economy (CSME) and the common difficulty of determining a proper jurisdiction to on-line conflicts in the digital world.

Supporting institutional and legal structures for enforcement of the new legislation, including formal administrative roles, human resources, training, equipment and infrastructure are yet to be put in place in most cases. In addition, there is little awareness by common stakeholders about the availability, impact and benefits of the recently enacted legislation.

TABLE 2.9
INFORMATION SOCIETY RELEVANT LEGISLATION AS OF JUNE 2006

Countries	Electronic Transactions	Misuse and Cybercrime	Data Protection	Consumer Protection	Freedom of Information
Barbados	●	●	◖	●	◉
Grenada	○	○	○	●	◖
Guyana	◖	○	○	●	◖
Jamaica	◖	○	○	●	○
Saint Lucia	○	○	○	◖	○
Suriname	○	○	○	○	○
Trinidad and Tobago	●	●	◉	●	◉

Source: Author's compilation.
● Enacted as a Law or Act.
◖ Under development, in Bill form.
◉ Under development.
○ Does not Exist.

7.2 Internet Regulation

Infrastructure Regulation

Other than the telecommunication regulation and reform process embraced in recent years by most of the Caribbean states, the regulation of the Internet infrastructure and operation is perceived as (and in consequence ends up being) something external to the region and there has been little official engagement from the Caribbean in the international governance discussions promoted by ICANN and the Internet Governance Forum of the United Nations.

Usage Legislation

Barbados and Bahamas have approved Internet-related legislation and other countries have already prepared draft bills, but public awareness around this legislation pieces is low and in many cases the supporting technological infrastructure to enforce them and the proper business incentives to take advantage of them is still missing. In many interviews it has been argued that the Caribbean could benefit from a consistent legal framework to address consumer and data protection legislation against identity theft, unauthorized access of information, e-commerce fraud and other forms of cybercrime.

7.3 Internet Governance Awareness

While the Caribbean has started its process of governance over the Internet by developing its own set of National ICT Strategies, infrastructure, technological and regulatory frameworks, it still has a long way to go, particularly in the aspects of international communications infrastructure, content access and development, electronic trade and on-line applications.

Efforts to increase awareness in this area include an Internet Governance Forum held by CARICOM in 2005 and the active involvement of the Internet Corporation for Assigned Names and Numbers (ICANN) which has been touring the region lately organizing meetings and seminars with government, business and civil society stakeholders.

On 2006, ICANN appointed the first Caribbean representative to its At-Large Advisory Committee (ALAC) which provides advice on the interests of individual Internet users.[42] ICANN has been increasingly present in virtual discussions and communities and promoting participation and awareness among the Caribbean stakeholders.

The concept of e-Governance is used in several public strategy documents, in particular from Jamaica and Trinidad and Tobago, to address only a limited set of conditions related to an enabling physical and technological infrastructure and logistics for the interconnection of e-government initiatives.

8. Telecommunication Policies

The Telecommunications Sector in the Caribbean is going through a fast transformation, with new legislation reforming the sector in several nations since 2000 and even earlier. Open markets are becoming the norm in telecommunications; although competition is present so far mostly in the delivery of mobile services and other areas remain serviced by a local monopoly, despite being open to competition through legislation.

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[42]   http://www.icannalac.org

Nonetheless, the new regulatory agencies face several challenges to improve the efficiency of local markets, like finding ways to lower currently high interconnection rates among mobile service providers, lower rates of international phone calls, increasing the penetration of Internet access and extending competition to services other than mobile telecommunications.

Given the autonomy of the Caribbean sovereign States, international providers have to deal with higher costs and a variety of national legislation and regulations to enter the regional market. The successful experience of the Eastern Caribbean Telecommunications Authority (ECTEL) in formulating a coordinated telecommunications policy among five Caribbean states is an interesting example of the potential for harmonizing policies in the region and the advantages of doing so.

8.1 Market Liberalization Process

The liberalization process of the Caribbean telecommunication markets started mostly in the late nineties and early 2000 and is currently at different stages throughout the region: While Barbados has reached full market liberalization and Jamaica benefits from competition in the mobile and data sectors, the process has just begun in many Caribbean states and in others such as Guyana it is a legislative challenge.

TABLE 2.10
TELECOMMUNICATIONS LEGISLATION IN THE CARIBBEAN

Countries	Telecommunications Legislation	Enactment
Barbados	Telecommunications Act, Cap 282B	2002[a]
Grenada	Telecommunications Act 31	2000[b]
Guyana	Telecommunications Act, Cap 47:02	1990[c]
Jamaica	Telecommunications Act	2000[d]
Saint Lucia	Telecommunications Act 27	2000[e]
Suriname	Wet Telecommunicatie Voorzieningen (Law for the Provision of Telecommunications)	2004[f]
Trinidad and Tobago	Telecommunications Act	2001[g] (amended on 2004) [h]

Source: Author's compilation
[a] http://www.barbadosbusiness.gov.bb/miib/Legislation/documents/telecommunications_act_cap282b.pdf
[b] http://www.ectel.info/grd/Legislations.htm
[c] http://www.gina.gov.gy/gina_pub/laws/Laws/cap4702.pdf
     Although under this Act an exclusive license for landline services was granted to GT&T for 40 years in 1990, the government awarded a mobile services license to Cel*Star in 2004, and a second license to Digicel in 2006.
[d] http://www.our.org.jm/new/pdf/telecomsact.pdf
[e] http://ectel.int/ectelnew-2/Telecommunications%20Regulations/St.%20Lucia/Telecommunications2000.pdf
[f] http://www.mintct.sr/telecom.htm
     Telecommunication concessions were granted in 2006, but at the time of writing newcomers had yet to enter the market and offer their services.
[g] http://www.ttparliament.org/bills/senate/2001/b2001s03.htm.
[h]   http://www.ttparliament.org/bills/house/2004/b2004h08.htm.

In those countries that have begun the process, a three phases approach is common, starting with the liberalization of the mobile market, while others – given their small size and concerns on market saturation and sustainability - have chosen to explicitly maintain a monopoly in the fixed lines voice service.

BOX 2.4
PHASES OF TELECOMMUNICATIONS LIBERALIZATION IN JAMAICA

Opening the local telecommunications market to competition in Jamaica followed a progressive path which involved three (3) stages:

Phase 1 (March 2000): Cellular, Reseller (Data, Internet and International Voice), Free Trade Zone Service and Carrier licenses could be issued.

Phase 2 (September 2001): Licenses now include domestic carrier and service provider licenses and Internet licenses for licensed cable operators.

Phase 3 (March 2003): All types of licenses can be issued and from this moment on, the market is formally fully liberalized.

Source: Author's compilation.

In the first four (4) years some 350 licenses were issued to 139 companies.

While mobile phone usage has more than doubled and tripled and prices of local calls and Internet access have fallen in many countries thanks to competition, the process, however, has not been smooth or without complications as some of the following examples illustrate:

- Difficulties in reaching an agreement on interconnection costs with the incumbent in Trinidad and Tobago delayed Digicel's entrance to the mobile communications market.

- Guyana's government has been unsuccessfully trying to revoke the 40 year monopoly on landline telephone service awarded to GT&T in 1990.

- Jamaica struggled for five years until it could finally reach an agreement with the telecommunication companies to enable its Universal Access Fund, which was formally contested and rejected by them.

Cable and Wireless reign as the native incumbent in fifteen former British colonies dated back to the 1880's and made it the sole provider of telecommunications services for a large part of the Caribbean. Similar monopolies existed in the rest of the region. GT&T is still the formal exclusive provider of landline telephone services in Guyana, having been granted a 40 year monopoly in 1990. The current administration is actively seeking to revoke this exclusivity and has already awarded to mobile phone services licenses since 2004.[43]

On the other hand, the liberalization of the Telecommunications Sector, has generated a significant level of foreign investment, revenue for governments in the form of taxes and licenses, activated consumer expenditure and has generated new employment and small business opportunities.

8.2 Autonomy of Telecommunications Regulators

Despite successful telecommunication reform process and the enactment of new legislation, concern remains in many countries of the region regarding the susceptibility of the telecommunications regulators to political influence. In several countries, the government still maintains a stake on the former incumbent and the Telecommunications regulator is not an autonomous agency.

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[43]   Source:Author's compilation.

8.3 Regional Telecommunications Regulatory Framework

Caribbean Telecommunications Union (CTU)[44]

CTU is a Caribbean intergovernmental organization dedicated to facilitating the development of the regional telecommunications sector. The CTU has a multi-stakeholder membership that includes States, private sector organizations and non governmental agencies.

The vision of the CTU Secretariat is "to position the CTU to be the prime catalyst facilitating regional cooperation, economic, social and cultural development of the peoples of the Caribbean through the provision of efficient and advanced information and telecommunication services."

Caribbean Association of National Telecommunication Organizations (CANTO)[45]

Founded in 1985, this regional industry association of telephone operating companies in the Caribbean groups sixty eight (68) members from thirty countries in the region. It promotes capacity building and exchange of information and expertise through workshops, seminars and its Annual Conference and Trade Exhibition, attended by a significant number of stakeholders in the telecommunications sector.

CANTO's committees address issues of regulation, connectivity, and disaster preparedness and coordinate technical assistance through its membership. Among its support initiatives are the coordination of a technical team to assist reconstruction of Grenada's infrastructure after Hurricane Ivan and the "Computers for Schools" Project, currently implemented by Cable and Wireless in Jamaica, as a result of a cooperation agreement between the Caribbean Association of National Telecommunication Organizations (CANTO) and the General Secretariat of the Organization of American States through the Inter-American Agency for Cooperation and Development (IACD).

Organization of Caribbean Utility Regulators (OOCUR)[46]

This association of regulatory bodies with responsibilities in telecommunications, electricity, natural gas, water and transportation sectors in the Caribbean was created in 2002 "to foster transparent and stable utility regulation through autonomous and independent regulators in member countries". It also promotes awareness, information exchange and capacity building through research, seminars, workshops and its annual conferences. OOCUR Members are Eastern Caribbean Telecommunications Authority (ECTEL) (OECS); Fair Trading Commission (FTC) (Barbados); Office of Utilities Regulation (OUR) (Jamaica); Public Utilities Commission (PUC) (Bahamas); Public Utilities Commission (PUC) (Belize); Public Utilities Commission (PUC) (Guyana); Regulated Industries Commission (RIC) (Trinidad & Tobago); Virgin Islands Public Services Commission (VIPSC) (US Virgin Islands).[47]

Eastern Caribbean Telecommunications Authority (ECTEL)[48]

In the year 2000, Grenada, Saint Christopher and Nevis, Saint Lucia, Saint Vincent and The Grenadines and the Commonwealth of Dominica created the Eastern Caribbean

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[44] http://www.c-t-u.org
[45] http://www.canto.org
[46] http://www.oocur.org
[47] Source:http://www.oocur.org
[48] http://www.ectel.info

Telecommunications Authority (ECTEL). This joint regulatory agency, articulated through National Telecommunications Regulatory Commissions (NTLRC), enabled them to fast track their market liberalization process by sharing a common and harmonized set of policies, legislation and regulations. In a relatively short period of time (1-2 years), all 5 countries were able to introduce proper legislation and regulations to liberalize their markets and open then to competition.

ECTEL is actively pushing for additional legislation and undertaking related consultation processes. On 2006, it held consultations on Convergence and on guidelines and regulations for Universal Service Funds, releasing documents draft documents for public review and comments.

FIGURE 2.2
EASTERN CARIBBEAN TELECOMMUNICATIONS REGULATION
AND POLICY FRAMEWORK
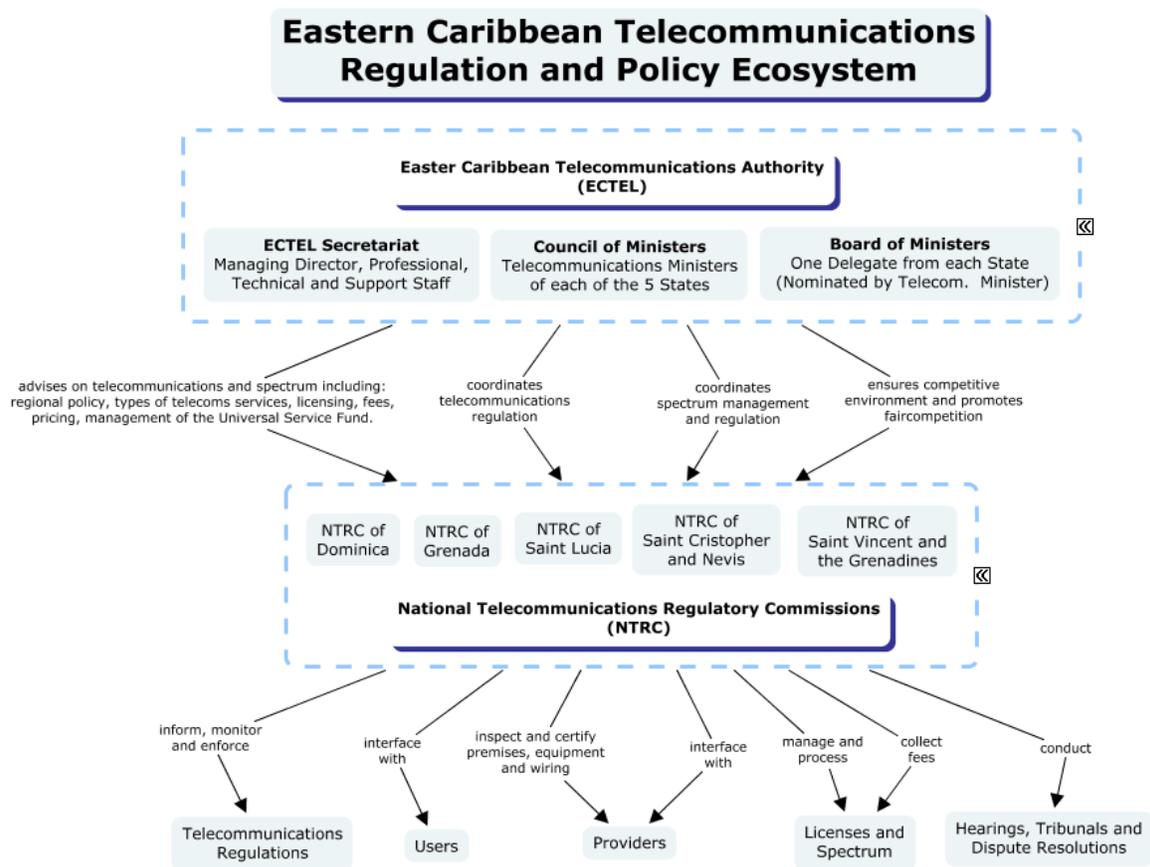
Source:Author's compilation.

9. Top Level Domains Governance

In most cases, Caribbean nations do not assume control of the individual two letter code used to identify countries in the Internet (country code Top Level Domains ccTLD).

9.1 National Control

Except for Barbados, Guyana, Jamaica and Suriname, the surveyed countries do not have total control and management of their top level domain, relying on most cases on the University of Puerto Rico to provide technical support and services for them. In the case of Barbados and Suriname, the former local telecommunications monopoly, which is partly owned by the State handles the top level domain. In Guyana and Jamaica the top level domain is managed entirely locally and by a local university.

TABLE 2.11
TOP LEVEL DOMAIN GOVERNANCE IN THE CARIBBEAN

Countries	tld	Sponsoring Org.		Admin. Contact		Technical Contact		DNS Servers	
		Location	Nature	Location	Nature	Location	Nature	Location	Nature
Bahamas	.bs	Local	Educ.	Local	Educ.	Foreign	Educ.	Foreign	Educ.
Barbados	.bb	Local	Private	Local	Private	Local	Private	Local	Private
Grenada	.gd	Local	Educ.	Local	Educ.	Foreign	Educ.	Foreign	Educ.
Guyana	.gy	Local	Educ.	Local	Educ.	Local	Educ.	Local	Educ.
Jamaica	.jm	Local	Educ.	Local	Edu.	Local	Educ.	Local	Educ.
Saint Lucia	.lc	Foreign	Educ.	Local	Private	Foreign	Educ.	Foreign	Educ.
St. Vincent and the Grenadines	.vc	Local	Gov.	Local	Gov.	Foreign	Private	Foreign	Private
Suriname	.sr	Local	Private	Local	Private	Local	Private	Local	Private
Trinidad & Tobago	.tt	Local	Educ.	Local	Educ.	Foreign	Educ.	Foreign	Educ.

Source:Author's compilation.

9.2 Market and Sales

None of the Caribbean Top Level Domains are available through any of the large on-line competitive and fully automated retailers, which means that individuals and organizations can not take advantage of the active competition in the Internet domain sale market.

Although several international on-line retailers advertise and offer domains under the TLD of the surveyed countries, in every case, they act as mere intermediaries, overcharging consumers and doing the manual process themselves.

Purchase of an Internet domain under the top level domain of all the pilot countries is formally only available through a single source in each country and in most cases through a non-automated process that involves personal interaction and physical payment.

TABLE 2.12
COMMERCIALIZATION OF DOMAIN NAMES

Countries	tld	Price	On-line Commercialization			
			Info Request	Availability Check	Order	Payment
Bahamas	.bs	.com.bs, .org.bs, .net.bs, .edu.bs: - National US$100 reg.; US$50/yr renew - Internacional US$200 reg.; US$100/yr renew .gov.bs, .org.bs: - free for govt. .bs: US$500 reg. + 2yr; US$100/yr renew	●	●	◐	○
Barbados[49]	.bb	BB$115/yr (US$57/yr)	●	●	●	●
Grenada	.gd	US$100 register US$50/yr renew	○	○	○	○
Guyana	.gy	US$25/yr	●	○	◐[50]	○
Jamaica[51]	.jm	.com.jm: intl. US$29.95/yr nat. US$19.95/yr .gov.jm: US$9.95/yr .org.jm: US$9.95/yr .edu.jm: free	●	○	◐	●
Saint Lucia	.lc	US$75/yr	○	○	○	○
St. Vincent and the Grenadines	.vc	US$55/yr	●	●	●	●
Suriname[52]	.sr	Locally from Telesur: US$25 registration US$35/yr renew On-line from Register.sr: US$299/yr	●	○	◐	◐
Trinidad and Tobago	.tt	National: .co.tt: US$50/3yr .tt: US$500/2yr; US$500/5yr renew International: .co.tt: US$100/3yr .tt: US$1000/2yr; US$1000/5yr renew	●	●	◐[53]	○

Source:Author's compilation.
● Yes.   ○ No.   ◐ Partially.

Commercial Exploitation of the .sr Top Level Domain TeleSur, Suriname's telecommunications monopoly, offers local domains to its consumers at not uncommon rates (US$25/35 registration/renewal) with no on-line ordering or payment facilities, oblivious to the potential market value of .sr domains. On the other hand, the website www.register.sr markets the TLD as "The Top-Level Domain for seniors" and offers .sr domains at a very expensive

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[49] .bb domains are only available to nationals and organizations registered and operating in Barbados.
[50] Order can be placed by downloading (or copying and pasting) a text-based form and submitting by e-mail.
[51] While an order can be placed and payment for it can be done on-line, the order is only complete upon manual verification by the registrar.
[52] On-line order placement and payment available only through register.sr.
[53] While an order can be placed on-line, it is only complete with offline payment (via cheque or wire transfer).

US$299/yr, but allows on-line payment. There is no availability check and orders are placed via e-mail, though. Scores of.sr domains such as diabetes.sr and GlaxoSmithandKline are listed as recently registered on the website.

10. Science, Technology and Innovation

ICT can support the development and reduce the cost of local Science and Technology research and development strategies by facilitating communication among researchers and research centers, access to technology and information, collaborative work, improved dissemination, awareness, archiving and documentation of regional research work and even advanced digital simulations.

Until now, there is little investment in Research and Development and in Science and Technology in the region, partly because the lack of a structured and institutional research culture but largely due to the little short-term return of those activities and their mid and long term prospective.

While CARICOM members have acknowledged the importance of establishing a regional Science and Technology Policy, there have been little advances in this regard in the past fifteen (15) years. In addition, national policies lack strength and require further investment and improved follow-up. Provisions for the free movement of researchers and technology and to promote the transfer of technology are included in the Revised Chaguaramas Treaty that governs CARICOM and the CSME, in particular on "Article 64: Research and Development" which can be found in detail in the Annex "Excerpts from Treaties and Legislation".

10.1 Regional Science and Technology Policy

In 1981, the Caribbean Development and Cooperation Committee (CDCC), with support from the United Nations Educational, Scientific and Cultural Organization (UNESCO) established the Caribbean Council for Science and Technology (CCST).[54] Years later, a proposed regional Science and Technology Policy was adopted by the CARICOM Heads of States in 1988. Although this policy has been repeatedly endorsed in subsequent meetings, it has failed to be implemented or articulated properly.

In an effort to jump start the regional policy, the CCST was designated in 2000 by the CARICOM Heads of States as the agency for coordinating and implementing of CARICOM's policies and programs in Science and Technology and received the mandate of formulating a draft regional Science, Technology and Innovation (STI) Policy Framework. This draft strategy was completed on September 2004 and circulated among CARICOM member States but it has not yet been adopted or endorsed.

10.2 Investment on Research and Development

Other than Barbados, Guyana, Jamaica and Trinidad and Tobago, there is limited availability of indicators on which to base the formulation and monitor the implementation of Science and Technology policies.[55]

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[54] http://www.ccst-caribbean.org
[55] Manual for the compilation of science and technology indicators in the Caribbean, UN ECLAC, 2003. http://www.eclac.cl/publicaciones/xml/3/13853/G0753.pdf

TABLE 2.13
INVESTMENT ON RESEARCH AND DEVELOPMENT

Countries	Investment on R&D as % of GDP
Middle Income	
Barbados	N/A
Grenada	N/A
Jamaica	0.1%[1]
Saint Lucia	0.4%2
Suriname	N/A
Trinidad and Tobago	0.1%3
Low Income	
Guyana	N/A

Source: UNESCO Institute for Statistics
[1] Data from 2002; 2. Data from 1999; 3. Data from 2003

11. Key Impact Areas for the Advancement of e-Government

Upon a close review of existing ICT initiatives by Caribbean governments, a list of strengths and challenges became clear throughout the region. The following are issues and areas that have a big potential for increasing the impact ICT services and projects engaged by the public sector.

11.1 Mobile Services

Governments across the region are spending resources developing on-line services and e-government applications that only a fraction of the population will have access to. Although Universal Access initiatives are expected to increase Internet penetration, this growth will always lag behind the massive and accelerated penetration of mobile phones and devices. However, in most cases there is no budget for the development of mobile applications or at least interfaces to allow access to government systems from mobile phones. If only a fraction of the current budget would be allocated to develop interfaces so that citizens could access and benefit from government services via their mobile phones, the impact of such investments would be significantly higher than the current level of use through personal and business Internet connections and through cybercafés and tele-centers.

11.2 Data and Systems Harmonization

One recurrent challenge found throughout the region is the interconnection of government systems and exchange of information among existing initiatives. Substantial time and resources can be saved and increased positive impact can be achieved by promoting the adoption of standards for systems development, functionality and data handling and storage.

Provisions for "Standards and Technical Regulations" are included in the Revised Chaguaramas Treaty that governs CARICOM and the CSME on Article 67 which can be found in detail in the Annex "Excerpts from Treaties and Legislation".

11.3 Diaspora Services

It is often pointed out that on-line government services and e-government initiatives are bound to cater or benefit only a limited segment of the population. But in the Caribbean a significant portion of the population has not only migrated to more developed countries but frequently moves from one island to another in the pursue of a better quality of life.

Services to Nationals Abroad

The migration phenomena generates an opportunity and niche market to governments that can now provide document renewals, permits and other services to their citizens abroad and charge them for it. These citizens abroad increase the size of the market and size of the demand for on-line government services by opening an additional market and by having a higher penetration level of access to the Internet and often higher income (or at least willing to pay higher prices).

Digital Diaspora Network for the Caribbean (DDN-C)

On January 2003, CARICOM and the United Nations ICT Task Force announced the creation of the Digital Diaspora Network for the Caribbean as the culmination of the "Meeting on Bridging the Digital Divide for the Caribbean". The DDN-C was inspired on the promising initiatives involving the Indian Diaspora in the USA and on the Digital Diaspora Network for Africa, launched by UN the year before on 2002. It was part of UN push for multi-stakeholder initiatives through the United Nations Fund for International Partnerships (UNFIP).

The Network, which was meant to be facilitated by the Caribbean American Chamber of Commerce, targeted mainly Caribbean nationals living in North America. It proposed the creation of an ICT Steering Committee for the region and a 10 components action plan:

- ICT Policy Framework for the Caribbean

- Infrastructural Framework, Connectivity and Costs

- Human Capacity Development- E-education

- Health and Telemedicine

- E-business Environment – Enabling Effective E-commerce

- Enabling Efficiency and Productivity in the Tourism sector

- Strengthening civil society and Governance – Focus on E-government

- Developing Agriculture with Information

- Identifying resources for the Caribbean Digital Diaspora Network

- ICT and Outsourcing.

On September 2003, the UN ICT Task Force announced the creation of the Digital Diaspora Network for the Caribbean (DDN-LAC).[56] However, neither the DDN-C nor the DDN-LAC actually took off.[57]

11.4 Modernization of Customs and Taxes

Customs and taxes systems make excellent cases for e-government development, as they enable the authorities to save money, generate more revenue, provide a better service to society and improve the country's competitiveness.

The efficiency of customs, taxes and tariffs operations can greatly improve with the deployment of ICT systems that can help authorities achieve a better control and audit of international trade, national business and commerce activities and individual and household

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[56]   http://www.unicttaskforce.org/ddnc.
[57]   Source: http://www.unicttaskforce.org/ddnc.

economic behavior. The information collected, properly processed is a valuable asset for fraud prevention, risk assessment and economic policy planning.

By making tax and customs declarations easier and more accessible, collections improve, new sectors are reached, and trade and local business benefit from increased competitiveness as the time and paper work involved to process goods in and out of the country are reduced.

In Jamaica, for instance, an Emergency Text Messaging Service is avalaible. The partnership between Digicel and the Jamaica Constabulary Force (JCF) allows citizens to send text messages using their mobile phones to the police, denouncing crime or requesting assistance. Messages are sent using a short code (119) and cost the user J$1 (about US$0.015). The service was launched on June 2006 and some 3,000 messages had been sent by August 31 of the same year.

11.5 Disaster Preparedness and Recovery

Digital Disaster Management is recognized as very important and strategic for the Caribbean, such as recently pointed out by ECLAC's recent publication on Regional Perspectives on Digital Disaster Management in Latin America and the Caribbean.[58] Proper assessment of risks and dangerous conditions is one of the major challenges faced by the Caribbean states in relation with natural disasters. Early warning systems are required to save lives and diminish disaster effects, on the other hand, efficient recovery is needed and that means communications, information and logistic.

The Mauritius Strategy on ICT and Disaster Preparedness point out   the importance of ICT and early warning systems. It was highlighted in the conclusions of Round Table 2 - The way forward: building capacity of the Mauritius Strategy:

"11 i) Support ICT networks, early warning systems, remote sensing, computer based systems for mapping and wireless technologies. A number of countries highlighted new initiatives and ongoing efforts to advance capacity-building in these areas". (See the Annex "Excerpts from Treaties and Legislation" for more information.[59])

Simple ICT solutions readily available throughout the world can help monitor conditions in remote places and better plan and predict the outcome of dangerous events and situations when combined with digital models. This is a case where ICT can help save lives and at the same time a lot of resources that are often wasted by the inability to estimate the level of impact of a predictable or unpredictable phenomenon.

On May 2006, Suriname suffered floods that displaced 30,000 people from their homes. Several international organizations responded providing GIS technology, information and services to assist the disaster relief efforts and to integrate data in visually effective ways in almost real time. Among them were MapAction (www.mapaction.org), GSDI (www.gsdi.org), ESRI, GISSAT (www.GISSAT.com) and regional organization Caribbean GIS (www.caribbeangis.org).

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[58]   Kathrin Stolzenburg (2007), "Regional Perspectives on Digital Disaster Management in Latin America and the Caribbean", Information Society Programme, DDPE, ECLAC, http://www.eclac.org/socinfo/publicaciones, http://www.eclac.org/cgibin/getProd.asp?xml=/publicaciones/xml/9/28529/P28529.xml&xsl=/ddpe/tpl/p9f.xsl &base=/socinfo/tpl/top-bottom.xsl

[59]   Source: Excerpts from Treaties and Legislation, Mauritius Strategy

And when the inevitable happens, ICT can help streamline the logistics of resource allocation, maintain communication among remote parties and gather, transmit, organize and allocate data from different sources for rapid planning, strategy formulation, decision making and deployment.

Regional Initiatives using ICT for Disaster Preparedness:[60]

- Caribbean Disaster Emergency Response Agency - www.cdera.org

- CaribbeanGIS - www.caribbeangis.org

- UNESCO/IOC Ocean Data and Information Network for the Caribbean and South America regions (ODINCARSA) - www.odincarsa.net

- UNESCO/IOC Portal Oceánico - www.portaloceanico.net

11.6 e-Health

While nothing can still replace the presence of a physician, many of the interviewed have pointed out that local physicians and auxiliary health personnel can be assisted from professionals in other parts of their very own country or even or far away places in order to improve the quality of diagnostics and of medical services in general. National programs of collaboration with health professionals abroad are common place today and it is not hard to find groups of professionals with good reputation willing to offer their services on diverse way of arrangements.

On the other hand, given the different conditions among the Caribbean States, some nations have found a growing niche market offering medical services to the population of other states where some services are not yet available or are prohibitively expensive. The availability and use of ICT and skilled personnel can further develop these markets, extending their outreach and facilitating and advancing remote services (pre and post) as extensions of the local services.

It has been pointed out during the interviews that e-Health initiatives could take advantage of existing infrastructure, establishing links among telecenters and medical facilities and associations within the Caribbean to coordinate the delivery of remote consultation, diagnose and support services from within the Caribbean and with Diaspora by engaging local stakeholders. Regional Health Initiatives empowered by ICT[61] are the Caribbean Epidemiology Centre (CAREC)[62] and the Caribbean AIDS Telecommunications Information Network (CATIN).[63]

11.7 Potential for Intra-Regional Cooperation

The Caribbean as a whole shares a common identity and a long history of cooperation that goes beyond national boundaries and good will and is tangible in an active legal, logistic and institutional framework for cooperation among its States.

This creates an excellent opportunity for Caribbean states to learn from each other, share experiences and know-how, even technologies and solutions, and through regional cooperation initiatives promote a more even development of the entire region aligned with the current integration

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[60] Source:www.cdera.org, www.caribbeangis.org, www.odincarsa.net, www.portaloceanico.net
[61] Source: www.carec.org and www.catin.org
[62] www.carec.org
[63] www.catin.org

process spearheaded by CARICOM's many initiatives, which currently include enabling a single market and facilitating mobility of citizens and professionals among the Caribbean states.

BOX 2.5
SUCCESS STORIES AND POTENTIAL FOR COOPERATION

Barbados:	ICT-related Legislation.
Dominican Rep.:	Administrative Systems for Public Education.
	Crime Enforcement Information Systems.
Guyana:	Multi-stakeholder consultation process for National ICT Strategy definition.
Jamaica:	Trade Facilitation System (Customs, Import and Export, e-Manifests, etc.) Interconnection of Government Systems.
Saint Lucia:	Geographical Information System (GIS). Census data and information mapping. Digital form processing.
Suriname:	Wireless broadband and VoIP services by private sector. Suriname National CMC Network
Trinidad & Tobago:	Government Infrastructure and Backbone. Implementation of National ICT Strategy. Smartcards. Small and Medium-Sized Enterprises Business to Business e-Marketplace.
Eastern Caribbean States:	Shared legislation.

Source: Author's compilation.

12. Main Challenges for Public ICT Policies

During the interviews and research of secondhand sources, several common challenges were mentioned frequently. The following summarizes the most repeatedly raised issues that, according to the consulted sources, would be required to address in current Public ICT Policies throughout the Caribbean.

12.1 Regional Policy Coordination

- Harmonization and coordination among the many regional institutions, projects and initiatives.

- Harmonization of ICT related legislation and legal framework.

- Support an inventory of regional initiatives and a continuous stocktaking initiative.

- Promote intra-regional cooperation and sharing of experiences, technical expertise, lessons learned and good practices.

- Promote former regular regional meetings on ICT policies and initiatives.

- Increase the Caribbean's participation in international consultation processes and formulation of strategies.

12.2 Formulation and Implementation of Policies at a National Level

- Promote the formulation and adoption of National ICT Strategies.

- Coordinate Public ICT initiatives with Public Sector Reform programmes.

- Promote the enactment of ICT related legislation and legal framework.

- Promote the transfer of knowledge to local personnel and public servants from advisors, consultants and foreign developers.

12.3 Budget and Finances

- Promote the allocation of funds for ICT initiatives within the national budget.

- Enable mechanisms for estimating public spending on ICT.

- Enable mechanisms for coordinating funds allocation and public spending on ICT.

- Take advantage of the aggregated purchasing power of the public sector to negotiate better conditions through economies of scale when purchasing and licensing products and services.

- Enable a Universal Access Fund.

- Properly allocate budget for systems maintenance and both software and hardware upgrades.

12.4 e-Government Initiatives

- Prioritize Sustainable and cost-saving Initiatives, such as:

  – e-Procurement

  – Land survey and registry systems, digital records of land ownership and on-line collection of land related taxes.

- On-line solicitation and process of:

  – On-line tax declarations and payment.

  – On-line payment of public utilities and services.

  – Promote adoption of industry standards to facilitate interconnectivity among government systems.

12.5 Accessibility and Reach

- In multilingual countries, promote the deployment of multilingual systems and require systems to be developed multilingual-ready.

- Include accessibility features and alternative interfaces for:

  – People with physical disabilities.

  – People with literacy limitations.

- Promote the development of mobile access to public services to take advantage of the higher penetration rate of mobile phone services compared to Internet access penetration.

- Facilitate citizens' access to clear information on which public agency is responsible for specific issues and areas and facilitate communication with them.

- Promote the establishment of community access centers.

- Take advantage of existing infrastructure and facilities by conditioning them to serve the public.

12.6 Strengthening Local ICT Capacity

- Provide tax exemptions to import of ICT related goods and services.

- Provide tax incentives to ICT business and endeavors.

- Promote the establishment of community technology centers.

- As access points to public services and the general benefits of ICT.

- As capacity building centers for the communities.

- Increase governance of country code top level domains (ccTLD's).

12.7 Research and Information Collection

There is an urgent need to undertake additional research and enable mechanisms and initiatives for gathering information on several key issues to support policy formulation processes and decisions. Some of the areas that require special attention are:

- Impact of Mobile phones on:
  - Individual and household income distribution and consumption patterns.
  - Informal commercial activities and informal workers.
  - Increased mobility of single mothers (parents).
  - Social relationships.

- Impact of ICT in education and in the development of practical skills among students.

- Potential roles of Diaspora in ICT for development initiatives.

12.8 Telecommunication Issues

- Increase autonomy of telecommunication regulation agencies.

- Lower interconnection rates among mobile service providers.

- Lower the cost of international phone calls.

- Reduce the vulnerability of international connection infrastructure.

III. Access and Infrastructure

1. Telecommunications Infrastructure

The Telecommunications Infrastructure is usually modern and up to date throughout the region. The main issue faced by most countries is the common bottleneck of their international connection for both data and voice communication, followed by the vulnerability of the infrastructure. In many cases, a single provider, often through a submarine cable, is responsible for connecting entire countries to the outside world.

Recent public and private initiatives are addressing this issue and new submarine cables have been and are being laid by international providers in 2006 and some redundancy and increased bandwidth and communications capacity should benefit several Caribbean nations between 2006 and 2007.

But, while service coverage in the smaller islands should not present major challenges, the archipelagic states (such as Trinidad and Tobago, Saint Vincent and the Grenadines and The Bahamas, which have from two to hundreds of small islands) have to deal with providing communications service to territories and communities not accessible by land. In a similar fashion, the large continental territories (such as Guyana and Suriname) are challenged by providing service coverage to remote isolated regions not easily accessible by land either.

1.1 International Communications Governance

Although most of the countries in the region have one large telecommunications provider with at least partial ownership of by local government or business groups, interconnection to international networks relies usually on foreign providers through limited options, often in the form of international submarine cables.

And while satellite terminals (v-sats) are somehow common in several countries, the growth of additional and alternative international links is limited not only by the high investment required, but in many cases by legislation, regulatory conditions and in some cases remaining monopolistic market structures.

1.2 Vulnerability of Communications Infrastructure

Given the insular (or isolated continental territory) nature of the Caribbean states, there is an inherent vulnerability of the data infrastructure and a significant risk for ICT based solutions and services.

It is the issue of non-redundant data connections (or nodes) to the outside world. Many countries rely on a single fiber-optics submarine cable connection (or a set of with limited redundancy) that could be disconnected by nature disasters or even minor accidents. This is currently being addressed by several countries, as illustrated below.

New submarine connection for OECS Countries: The Eastern Caribbean States are expected to benefit from an enhancement of their international communications infrastructure before the end of 2007 through an initiative coordinated by ECTEL, their Regional Telecommunications Authority.

New Fiber Optic Cable in Jamaica: International data communications provider Flow announced in April 2006, the imminent launch of their fiber optic cable in Jamaica, further enhancing and strengthening the country's international connectivity.

Antigua & Barbuda hires New Undersea Fiber Optic Cables: The Government of Antigua & Barbuda, announced on May 2006 that new undersea fiber optic cables will be deployed and in service by French Group Loret before the end of the year. French Group Alcatel Submarine Network was completing the ocean survey work for Southern Caribbean Fiber, a subsidiary of Loret in mid 2006.[64]

1.3 Reliability of Services

During the course of this study, several mobile and data services outages were experienced in different countries throughout the Caribbean. In different occasions Internet access, mobile networks or international calls were out of service for several hours. When apologizing to consumers, providers explained the interruptions as the result of power outages, network upgrades or submarine cable issues.

In some cases, providers blamed the outages on the connectivity services provided to them by the former local telecommunications monopolies, which still play a major role managing the basic infrastructure and international connections in many countries.

During the same period, several websites were down at one time or another. This was experienced when researching both the smaller islands and the more ICT advanced countries. It was also experienced with both institutional and official government websites.[65]

2. Availability of Data Services

Most countries have several Internet Service Providers (ISP's) regardless of the presence of a monopoly or not. Often these services rely on connectivity provided by the current or former monopoly and generally the services provided present bandwidth constraints and limitations, network latency issues, packet drops, slow speed, and higher prices. This generates interesting situations where broadband wireless (Suriname) and satellite (Guyana) communication and data

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[64] Mansoor welcomes new fibre optic system, Antigua Sun, May 30, 2006, Antigua. http://www.antiguasun.com /paper/?as=view&an=342457077905302006&ac=Local

[65] Telecommunications provider Cable & Wireless, the former monopoly in many Caribbean States and still a major player in the region, stated in June 6, 2006 that "over $150 million has been invested in our mobile, data and fixed line networks to ensure that they are as resilient as possible in the event of a hurricane".

services providers take advantage of legal gray-areas to provide services to underserved or discontent consumers.

The introduction and availability of new technologies, such as GPRS, Wi-MAX, wireless broadband Internet access and additional international data cables in those States where market has been opened to competition is a clear advantage of the market liberalization process.

TABLE 3.1
ICT PENETRATION IN THE CARIBBEAN

Countries	Population	No. of Computers		Internet Users		Broadband Internet Users	
		Total	Per 100 pop.	Total	Per 100 pop.	Total	Per 100 pop.
Barbados	268,881	33,745	12.55	148,960	55.4	27,157	10.1
Grenada	105,747	16,423	15.53	17,871	16.9	1,216	1.15
Guyana	751,223	26,443	3.52	141,981	18.9	75,873	10.1
Jamaica	2,644,593	163,965	6.2	1,054,399	39.87	25,388	0.96[66]
Saint Lucia	163,651	28,361	17.33	36,003	22%[67]	n/a	n/a
Suriname	446,460	20,741	4.7	30,493	6.83	n/a	n/a
Trinidad and Tobago	1,301,307	102,803	7.9	159,280	12.24	n/a	n/a

Source: Internet Users, No. of Computers (ITU, 2004); Broadband Users, World Bank ICT at a Glance (2004).

2.1 Dial-Up Services

Internet is readily available in most places with landline based phone services via dial-up connections. In addition, access to Internet services is often available without an Internet account or subscription through pre-paid access cards or through services that charge the phone number from which the connection is made.

2.2 Broadband Services

While DSL services are rapidly expanding in the region, other forms of high speed access, such as V-Sat and dedicated lines, have been available for years, although their market share is reduced and diminishing.

However, service availability is uneven and prices remain relatively high. Access to broadband is not common for households with low income and individuals outside an institutional, academic or business environment.

Computer and Computer-less Broadband Marketing Strategies

In order to reach individuals and households without computers, the Telecommunication providers are putting together marketing packages for their broadband services, such as:

- Bundles of notebook computers with DSL service plans, available for about US$800 in several Eastern Caribbean countries (promotion from 11/25/05 to 12/31/05).

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[66] This figure is from 2004 as listed by the World Bank's World Development Indicators 2006. The Ministry of Information and Development places broadband penetration at 3-4% in 2006.

[67] The Internet penetration rate of 22% listed was provided by the Government's Department of Statistics as of early 2006 and is lower than ITU's estimate of 36.67% for 2004.

- At the end of 2005, CaribSurf (Cable and Wireless Internet Service Provider in Barbados) offered "Max",[68] a complete basic computing - broadband solution that comes with a keyboard, mouse, monitor and high speed Internet modem, manufactured by microchip maker AMD, running a custom version of Microsoft Windows with pre-installed applications.

Growth of Broadband DSL in the Cayman Islands[69]

In 2006, Cable & Wireless announced that the customer base for its broadband service had increased in more than 700 percent during the previous year. Two factors make this statement interesting: Broadband service has been available in the Cayman Islands for five years and the majority of its consumers are individuals, not business or institutions. It may be worth it to look further into this case, especially collateral issues as income, economic stability, computer use, marketing campaigns, etc., for some interesting lessons may be learned.

2.3 Wireless Broadband

WiFi hotspots are not yet common in the region, although the service is available for free or at a fee at large hotels and several airports including the main terminals at Bermuda, Jamaica and Trinidad and Tobago. Some international restaurant and entertainment franchises offer free WiFi access in their cafes and bars, but it is seldom use by the customers.

Local Cases

An independent provider in Paramaribo, Suriname's capital city, has been offering wireless Internet broadband services for years by through an extensive network of hotspots and pre-paid "cards" with activation codes.

As part of service tests and introduction, Telecommunications Services of Trinidad and Tobago (TSTT) has been offering for some time now free public access WiFi nodes at three locations in or near the capital city of Port of Spain: The Piarco airport, a popular franchise restaurant and on the open space of Queen's Park Oval.

In 2006, TSTT introduced a high speed EV-DO network servicing in Port of Spain that allows customers to access the Internet at broadband speed from almost anywhere in the city with a notebook, even on the move.

WiMax Networks

In 2005, during July, August and September three months of high weather related wireless network stress (Hurricane season in full swing), Digicel conducted a successful WiMax pilot in the Cayman Islands. The company announced in December 2005 plans to extend the network in Grand Cayman and to introduce the service in Barbados and Jamaica in 2006.

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[68] http://www.caribsurf.com/services/access/max
[69] "The Broadband Era", Cayman Net News, June 5, 2006, Cayman Islands.
http://www.caymannetnews.com/ cgi-script/csArticles/articles/000025/002582.htm

2.4 Voice over IP

Voice over IP is starting to penetrate the local markets in the Caribbean, especially in places like Suriname, where lack of competition in the long distance market translates into high prices for conventional international phone calls.

Local entrepreneurs have been offering VoIP services in several countries and former regional monopoly Cable & Wireless has been actively offering their Netspeak solution through its local subsidiaries with the advantage of full integration with their conventional voice network and their broadband services.

Cable & Wireless Netspeak – VoIP in a box

The package consists of a Nortel Networks IP phone that plugs into a DSL Internet connection and does not require the use of a computer, making its adoption easier for non-technical users. It is available stand alone or as a bundle with a new DSL Internet connection.

The service includes a new telephone number for making and receiving international phone calls and supports calling emergency and information services (911, 611, 411, etc.) in many of the countries where it is available.

Consumers can choose from several plans with flat monthly fees that offer a combination of limited/unlimited local and international phone calls.

The service was available as of June 2006 in Anguilla, Antigua & Barbuda, Barbados, Cayman Islands, Dominica, Grenada, Jamaica, Saint Kitts & Nevis, Saint Lucia and Saint Vincent and the Grenadines. There are plans to introduce it in other Caribbean islands including the British Virgin Islands and Turks & Caicos.

3. Community Access Initiatives

There are several international cooperation initiatives supporting the establishment of community access centers to ICT and capacity building initiatives, which are covered in detail in the Community Engagement and Empowerment section of Chapter 4.

In general, most countries could benefit from assigning multiple uses to their existing infrastructure; saving valuable resources and facilitating the deployment of community access initiatives in public buildings, government agencies and, with proper supervision and control, even in schools.

National Public Access Networks in the Caribbean

- **Trinidad and Tobago's LibraryNet:** The National Library and Information System (NALIS)[70] has been providing Internet access and ICT services, including facilities for visually handicapped and physically disabled persons, to citizens at a number of local libraries at no charge for several years.

- **Jamaica's National Information System (NATIS):**[71] Established in the 1970s, it links public, private, academic and scientific libraries and provides access to their information resources. Lead by the National Library of Jamaica, the network includes 508 access points in libraries throughout the country. About half of them count provide Internet

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[70] http://www.nalis.gov.tt
[71] http://www.nlj.org.jm/docs/Natis.htm

access to the public for less than US$1 for half an hour. These public access centres are financed by the different agencies themselves, without central support.

- **Jamaica Library Service (JLS):**[72] This national library system includes over 120 physical libraries and some 450 computers throughout the island. A significant number of the libraries are equipped with computers and facilities for providing Internet access, basic IT services and IT training to the public. It also serves 522 communities through its BookMobile service, started in 1957. In August 2004, the Kingston and Saint Andrew parish mobile library was equipped with computers and Internet access, sponsored by Cable and Wireless.

4. Private Sector's Response to Liberalization

The private sector has responded aggressively to the new opportunities created by the liberalization of the telecommunications sector, with new providers entering the local markets, in particular to deliver mobile phone services. This has resulted in a dramatic increase of mobile phones penetration, lower local communications costs and new services being delivered.

However, in most cases interconnection costs among local providers remain high as well as international phone calls. And even though several countries have completely liberalized their telecommunications sector, competition is present or highly visible only in some services, like mobile communications.

TABLE 3.2
PENETRATION OF FIXED AND MOBILE PHONE SERVICES IN THE CARIBBEAN

Countries	Population	Fixed Line Subscribers		Mobile Line Subscribers	
		Total	Per 100 pop.	Total	Per 100 pop.
Barbados	268,881	134,683	50.09	198,569	73.85
Grenada	105,747	33,575	31.75	44,467	42.05
Guyana	751,223	110,204	14.67	250,082	33.29
Jamaica	2,644,593	341,153	12.9	2,693,518	101.85
Saint Lucia	163,651	52,287	31.95	101,463	62
Suriname	446,460	80,586	18.05	231,490	51.85
Trinidad and Tobago	1,301,307	322,334	24.77	797,181	61.26

Source: Fixed Line and Mobile Subscribers (ITU, 2004).

4.1 Reflections on the Penetration of Mobile Phone Services

To many in the Caribbean, the result of the liberalization process has been a surprise. However, this is a multidimensional and multi-layer phenomenon that needs to be looked closely and requires further research to properly assess not only its social and economic impact, but the existing market relations and efficiency.

Figures collected in Saint Lucia indicate a high level of household expenditure per month on mobile phone calls. Unless these calls translate into revenue, the result may be an actual reduction of the available income in each household.

On the other hand, the penetration of more than 100 mobile phones per 100 inhabitants population in Jamaica, clearly illustrates that there is a significant number of people with more

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[72] http://www.jamlib.org.jm

than one phone. One quick explanation is that informal workers (such as handymen, carpenters, electricians, etc.) tend to own more than one handset and are easier to be reached by the clients at any time. Users are charged higher rates when phone calls are made among competing provider, thus the advantage of owning more than one handset.

In short, high penetration rates, while clearly an indicator of market performance, may also indicate market inefficiencies such as high interconnection rates. Also, while the availability of mobile services increases the availability and productivity, efficiency and revenue of informal workers, it may also be reducing the available household income when a significant portion is spent in telecommunication services.

TABLE 3.3
MONTHLY EXPENDITURE ON MOBILE PHONE CALLS IN SAINT LUCIA

Region	US$	EC$	Region	US$	EC$
Castries City	57.22	155.49	Laborie	9.96	27.06
Castries Sub-Urban	98.25	266.99	Vieux-Fort	9.44	25.66
Anse-La-Raye	56.79	154.31	Micoud	4.65	12.63
Soufriere	6.78	18.42	Dennery	17.86	48.54
Choiseul	5.05	13.72	Gros-Islet	66.80	181.52

Source: Department of Statistics, Government of Saint Lucia (2006).

4.2 Digicel's Push in the Caribbean

On April 2000, Irish-based telecommunication company Digicel acquired a Jamaican mobile license and 1 year later on April 2001, it launched in Jamaica with 119 retail stores, starting a fast paced expansion to the rest of the Caribbean. By 2006, Digicel had expanded its presence and operations to 20 Caribbean states, becoming the fastest growing mobile communications provider in the region.

The competitive environment generated by market liberalization has enabled Digicel to aggressively compete and introduce new technologies and services such as GPRS, WiMAX, Rollover minutes and Pre-paid Roaming.

But the impact of Digicel in the Caribbean States economy goes well beyond the prices and services in the telecommunications market. Their arrival to new markets has been marked by the launch of extensive network of retail stores (119 in Jamaica, 500 in Cayman Islands, 200 in Trinidad and Tobago, etc.), generating employment and economic activity in many small markets. Throughout the region it employs a total of 1500 people, 90% of which are Caribbean nationals.

Its investment of over US$1 billion is significant, particularly in small economies like Haiti, where its launch in May 2006 meant the largest corporate investment ever in the country.

BOX 3.1
DIGICEL'S FAST EXPANSION IN THE CARIBBEAN

2000	Acquired Jamaican mobile license.
2001	Commercial launch in Jamaica.
2003	Launched operations in St. Vincent, St. Lucia, Aruba, Grenada.
2004	Launched operations in Barbados and in the Cayman Islands.
2005	Acquired Curaçao Telecom. Granted first GSM Mobile licence in Haiti. Agreement to acquire Cingular Wireless' Bermuda and Caribbean operations.

2006	Launched services in Anguilla, Bermuda and St Kitts & Nevis. Launched advanced WiMAX technology in Cayman Islands Earns a WiMAX license in Jamaica. Launched operations in Antigua & Barbuda, Trinidad and Tobago, Haiti and Dominica. Awarded License to operate in the Turks & Caicos Islands. Acquired GSM license in Bonaire. Acquired French West Indies mobile operator Bouygues Telecom Caraibe.

Source:Author's compilation.

4.3 Cable & Wireless

Cable & Wireless has had a historic presence in the form of local monopoly in Britain's former Caribbean colonies. But its comfortable market dominance is poised to change as Caribbean countries enter market liberalization processes and in particular given the aggressive market penetration of newcomer of Irish origin Digicel.

The impact of competition and need for adjustment from former local monopolies is visible not only on the delivery of new services by them, but also by personnel and operations re-structure, such as Cable & Wireless recent announcement in the Cayman islands voluntary severance packages to some 35-40 employees.

4.4 Cingular Wireless Withdrawal

Amidst increased competition in the region and in Continental US, Cingular Wireless made the decision to withdraw from the Caribbean market (except Puerto Rico), selling its assets to Digicel.

In this fashion, Digicel entered the markets of Anguilla, Antigua & Barbuda, Bermuda, Saint Kitts & Nevis, Dominica and expanded its services in Barbados, Cayman Islands, Grenada, Saint Lucia and Saint Vincent & the Grenadines where it already had operations.

Monopolies Field Stories

The President of Guyana is publicly opposing the existing monopoly that was extended exclusivity rights a few years ago, but complains that, since the Monopoly is one of the largest members of the business community, the business sector has failed to provide support or air their voice in the matter. As a result, there is a proliferation of v-sat services set up by the competition outside the monopoly, taking advantage of an apparent gray area in the current legislation which even the very own government uses for its National Financial Network.

Suriname completed the formal Telecommunication reform process going through all the legal and constitutional steps, but has no deadline for it coming into effect. There has been criticism around the fact that although a new Telecommunications authority is defined in the reform, it fails to achieve autonomy for it, since its head can be fired by the central government, which also retains its shares in the local Telecommunications Monopoly. It has been claimed that the negative impact of this local monopoly is evident in the local connectivity prices, where a fiber optic connection is several times more expensive than in nearby Curaçao.

In Trinidad and Tobago, newcomer Digicel and former local monopoly TSTT struggled for several months to agree on interconnections costs for their mobile networks. Digicel finally decided to go ahead and launch its services on April 2006 without such an agreement, still waiting for the outcome of a special Committee appointed by Trinidad and Tobago's Telecommunication Authority to resolve this issue.

IV. Capacities and Knowledge

1. Education and Capacity Building

In recent years, Caribbean nations have been approaching universal coverage of Primary and Secondary Education. Many of the interviewed pointed out that significant deficits remain in access to tertiary education, but the advantage of languages and standards compatible with those used in developed countries, properly accredited has developed a dynamic sector for graduate and undergraduate programs. The region's characteristics suggest that distance and virtual education could give it a special strength for addressing these deficits, build capacity and foster the expansion and modernization of the education sector.

On the other hand, the lack of standards to ensure the quality of distance learning and virtual education programs is an important issue that needs to be addressed, as well as the formulation of proper pedagogical-technological methodologies, development of local educational content and improved coordination of existing programs and initiatives to share resources and experiences.

1.1 Literacy Rates

While the conventional literacy rate reported for Caribbean States is usually high (above 80% and above 95% in many cases), several studies and surveys[73] point out that the percentage of adult population that can be considered functionally literate is significantly lower (up to 20% lower).

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[73] More information on literacy issues and measurement available at:
a) JULES, Vena and Aignald Panneflek: The State of Education in the Caribbean in the 1990s, Volume II: Subregional Synthesis Report. UNESCO, 2000. http://www2.unesco.org/wef/en-docs/findings/caribbean.doc;
b) "Literacy Survey Reading Diagnostic Project in the Windwards and Barbados",conducted by the Faculty of Humanities & Education of the University of West Indies in the academic year of 2003/2004.
c) The work of the Adult Literacy Tutors Association (ALTA) in Trinidad and Tobago with support from UNDP and several foundations and diplomatic missions. More info at http://www.alta-tt.org.

TABLE 4.1
LITERACY AND EDUCATION

Countries	Adult Literacy Rate (%)	Education Enrolment Ratio		
		Primary	Secondary	Tertiary
High Human Development				
Barbados	99.7	109	106	27.12
Trinidad and Tobago	98.5	100	82	9
Medium Human Development				
Grenada	98.01	N/A	N/A	N/A
Guyana	98.6	125	95	6
Jamaica	87.6	100	84	17
Saint Lucia	82.01	N/A	N/A	N/A
Suriname	94.0	126	74	123

Source: Commonwealth Secretariat: Small States Economic Review and Basic Statistics, Vol. 10, 2005. Data is from 2002-2003, except where indicated.
[1] Data is from 1995. 2 Data is from 1990. 3 Data is from 2001-2002.

1.2 Basic and Secondary Education System

Access to both primary and secondary education is close to universal on most of the region, with coverage being a little lower in the continental states with remote populations in the hinterlands. However, the education system faces the challenge of updating its methodologies, contents, programs and environments in order to provide citizens with new skills that match the requirements of a changing labor market and the increased competition from skilled labor in other regions.

There are some projects and programms aimed to help states in updating education methodologies, contents and programs:

- The New Horizons Program in Jamaica is a holistic intervention in 72 schools that has confirmed and re-affirmed that through collective focus and innovative leadership, we can raise the bar of achievement".[74] According to official assessments, literacy levels in some of the participating primary schools have gone from 16 to 50 percent and significant improvements have been observed also on the results of Grade Six Achievement Test (GSAT).

- Jamaica's Technology in Early Childhood Education Programme,[75] launched in 1999, engages children in 19 basic and infant schools in an innovative learning methodology that combines physical activities and manipulation of real objects with computer-based activities. Research has shown improved performance in visual motor co-ordination, visual and auditory perception, number and letter knowledge in children four to six years-old participating in the program. Thanks to a mobile computer learning lab, the program now visits regularly schools in different regions of the island.

- At the end of 2006, Jamaica announced a six year, JA$500 million (US$7.6 million) revolving fund to enable teachers to upgrade their teaching qualifications to a Bachelor's degree or a Diploma in Teacher Education on a part-time basis.

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[74] Jamaica's Sectoral Budget Debates, 2005.
http://www.jis.gov.jm/special_sections/BudgetDebates2005/newHorizon.html
[75] http://www.moec.gov.jm/projects/bsp/index.htm

- CANTO's Computers for Schools Project[76] aims to provide computers and ICT training to schools at low cost, in particular those in underserved communities. It's coordinated by the Caribbean Association of National Telecommunication Organizations (CANTO) and the Organization of American States through the Inter-American Agency for Cooperation and Development (IACD). It was first deployed in Jamaica, where more than 400 computers to schools where distributed in partnership with Cable and Wireless Jamaica.

- In Barbados, an interesting pilot in two (2) primary schools and one (1) secondary school, where students are assigned rugged notebook computers (StudyPros) they carry home to do their research and homework as an attempt to bridge the economic divide that generates a gap among students whose families can afford to have a computer at home and those whose families don't. The notebook computers have wireless network connections via infrared ceiling access points and also enable students remote access to the school network from home, via a telephone line. In Barbados, Edutech program provided teacher multimedia centres in classrooms to enhance classes and PCs and laptops for the staff room.

- In Saint Lucia, extensive training of Ministry of Education staff has been undertaken at all levels, from high end administrative staff to low end non-ICT related personnel, on the use of ICT tools and the Internet, pedagogical skills, web page design and authoring, databases and workshops on software evaluation and selection;

Education Portals in the Caribbean

Most of the Caribbean territories lack a full featured, interactive and dynamic virtual learning environment with content, services and collective spaces to support its educational programs and showcase the advances and initiatives of teachers and students.

Some regional portals are:

- Educando: The Dominican Republic's Ministry of Education Portal, with ample local content and interactive services for students, teachers and parents. www.educando.edu.do

- Caribbeanedu: A regional initiative by a leading Caribbean IT solutions provider, Illuminat, includes regional content and initiatives in English. www.caribbeanedu.com

- Educar: This large education portal in Spanish that serves Latin America and the Caribbean since 1998 was born in the Dominican Republic. www.educar.org

- Commonwealth of Learning Knowledge Finder: Lists over one million documents relevant to Commonwealth countries on open and distance learning, course programs, governance, development, health and other topics. www.colfinder.org

1.3 Tertiary Education in the Caribbean: Deficit and Abundance

There is a deficit in access to higher education, in particular in the smaller islands and remote regions in the continental territories.

This has promoted a proliferation of distance education programs, virtual learning environments and the establishment of local campus across the Caribbean by the universities.

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[76] http://www.canto.org/doc/pc_schools_project.pdf

On the other hand, the attractiveness of Tertiary Education in English with programs that follow US and European standards has set the stage for a dynamic sector that attracts a large number of foreign students from around the world to complete undergraduate and graduate studies.

There are now some 70 tertiary education institutions registered in the Caribbean, including some 15 medical schools. A growing number of them is engaged in programs for international accreditation and curriculum equivalence with established Universities outside the region to increase the appeal and recognition of their programs.

Other regional higher education initiatives in the Caribbean

- Virtual University for Small States of the Commonwealth of Learning (VUSSC)[77]

- The Association of Caribbean Higher Education Administrators (ACHEA)[78]

- Association of Caribbean Universities and Research Institutes (UNICA)[79]

- Association of Caribbean University, Research and Institutional Libraries (ACURIL)[80]

1.4 Distance Learning in Higher Education

The Caribbean has a well established tradition of distance learning and has been an early adopter of ICT to deliver education programs to remote locations. The University of West Indies has been a leader in this field and many other private and public institutions, offer training programs with technical and academic degrees.

One key area that needs attention is the definition and adoption of standards and good practices for the use of ICT within the Adult-education through distance learning to ensure the quality of education.

Relevant Regional Initiatives

University of West Indies (UWI).[81] The leading higher education institution in the English-speaking Caribbean, UWI has pioneered and spearheaded several initiatives related to ICT in the region. Its Distance Education Centre (DEC)[82] was founded in 1996 to formally engage ICT in the distance learning programmes it had been offering since the late 70's and early eighties, mostly through audio teleconference systems. Today, UWI DEC serves 30 locations in 16 countries throughout the Caribbean.

Caribbean Universities Project for Integrated Education (CUPIDE).[83] This joint project of UNESCO and the University of West Indies (UWI) seeks to build Human Capacity in Distance Teaching, Administration and Materials Distribution. It is funded by the Japanese Funds in Trust for Capacity Building (JapanODA) and has the support of CARICOM. Its main objective is to improve the ability of higher education staff and educators to develop and deliver quality distance education programmes using ICTs. To this end, a virtual learning environment (VLE)

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[77] http://www. wikieducator.org/VUSSC
[78] http://www.uwi.tt/achea
[79] http://www.unphu.edu.do/UNICA
[80] http://acuril rrp.upr.edu
[81] http://www.uwi.edu
[82] http://dec.uwi.edu
[83] http://www.cupide.org

based on the open source platform Moodle has been set up, enabling collaboration among five (5) universities from the five (5) Caribbean countries participating.[84]

Caribbean Association for Distance and Open Learning (CARADOL).[85] Lunched on February 2005 with support from the Commonwealth of Learning, this association, born as part of the CUPIDE project, aims to support the advance of open and distance methodologies of education in the region by facilitating research, networking institutions and professionals, promoting partnerships, building capacity and establishing standards to ensure its quality.

Caribbean Knowledge Learning Network (CKLN).[86] Launched by the Caribbean Community (CARICOM) and the Organization of Eastern Caribbean States (OECS) in 2004, the Caribbean Knowledge and Learning Network (CKLN) is a multilateral project, supported by the OAS, the World Bank, the European Union and the Canadian International Development Agency (CIDA). The project is designed to enhance the competitiveness of Caribbean countries, using information and communication technologies to connect the Caribbean to the global pool of knowledge, developing human resources and facilitating greater regional integration. One of its aims is to establish a digital network that interconnects the academic and research institutions of the region in a similar fashion to other academic networks around the world and from which the Caribbean institutions remain isolated and at a disadvantage. On May 2006, the European Commission (EC) announced a financing agreement of 2 million euros to support for CKLN.

2. Building ICT Capacity in the Region

Most governments in the region have acknowledged the need to build ICT capacity among citizens as an important priority. As a result, several public institutions and programs have been created to train and certify citizens with the skills demanded by the global labor market. In addition, the private sector has also been active in providing training programs. This has help reduce the gap and increase the availability of local skilled personnel, but without a supporting industry that remunerates them properly, trained workers often migrate abroad.

In recent years, the increased use of distance learning and virtual education has boosted the reach and penetration of capacity building programs. A better coordination of ICT capacity building initiatives and integration with programs for strengthening the ICT sector and attracting foreign investment could help capitalize and build upon this existing strength and the successful experiences.

In addition, the promotion of ICT Skill Certification Programs, such as those developed by the CXC and CANTA, to standardize, promote and accredit ICT capacities at different levels and for different sectors would have a significant impact in strengthening the ICT Sector and ensuring the availability of skilled labor that responds to the needs of the local and regional markets.

2.1 Certification of ICT Skills

The Caribbean Examinations Council (CXC) includes Information Technology as a subject among its secondary and post secondary certificates. It also launched a Computer Science Associate Degree in 2005.

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[84] University of the West Indies, University of Technology, Jamaica, University of Guyana, Guyana, University Quisqueya, Haiti, Anton de Kom University of Suriname, Suriname.

[85] http://caradol.dec.uwi.edu

[86] http://www.ckln.org

The CXC has also been working with the Caribbean Association of National Training Agencies (CANTA) to establish a Caribbean Vocational Qualification (CVQ) for Technical and Vocational Education and Training (TVET).

2.2 Main Regional Initiatives

Caribbean Association of National Training Agencies (CANTA)

The National Training Agencies (NTAs) of Barbados, Jamaica, Trinidad and Tobago have formed the Caribbean Association of National Training Agencies (CANTA)[87] to advance the regional coordination of Technical and Vocational Education and Training (TVET).

CANTA aims to help the region respond to the needs of the CARICOM Single Market Economy (CSME) and is expected to play an important role in the transformation of its labor market.

The Caribbean Examinations Council (CXC)[88]

Established in 1972, this regional organization provides examinations and certification at the secondary and post-secondary levels for sixteen (16) Caribbean States. Its Caribbean Secondary Education Certificate (CSEC) examination for students at the end of the Secondary Education Cycle is accepted by higher education institutions in Canada, the United Kingdom and the United States. On the other hand, its Caribbean Advanced Proficiency Examinations (CAPE) provides certification for post-secondary candidates.

CXC Participating States are: Anguilla, Antigua and Barbuda, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent & The Grenadines, Trinidad & Tobago and Turks & Caicos Islands.[89]

Information Technology is included among the core subjects of both the CSEC and the CAPE certifications, which could serve as the starting point for more advanced and specialized regional ICT skills certifications. And Computer Science is one of nine (9) Associate Degrees Programmes launched by the CXC in 2005.

Recent ICT Capacity Building Initiatives in the Caribbean are: [90]

The University of West Indies Telecommunications Regulation and Policy Programme:[91] The University of West Indies offers a Telecommunications Regulation and Policy programme at its Saint Augustine Campus in Trinidad and Tobago. It's available for completion with a post-graduate Diploma or a full Master's Degree. The two-year program is delivered over the Internet with complementary face to face seminars.

Jamaica's Caribbean Institute of Technology:[92] Launched on 1989 by the Government to promote the development of the national software industry by increasing the availability of skilled developers and programmers through specialized courses. The institute offers industry

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[87] http://www.ilo.org/public/english/region/ampro/cinterfor/news/canta.htm
[88] http://www.cxc.org
[89] Source: www.cxc.org
[90] Source: The University of West Indies Telecommunications Regulation and Policy Programme, Jamaica's Caribbean Institute of Technology and Jamaica's Management Institute for National Development
[91] http://mrp.uwi.tt.
[92] http://www.caribbeantech.org

standard certifications on CISCO and Linux as well as GIS certifications endorsed by the Ministry of Land and Environment. It also houses a "Development Center" that offers commercial IT development services.

Jamaica's Management Institute for National Development (MIND):[93] A government initiative to improve human capacity through an accredited tertiary level institution, MIND provides management and ICT training for both public and private sectors. On November 2003, it launched an on-line Associate Degree program that improved access to adult education on-line.

2.3 The Role of Telecenters in Community Empowerment

The Caribbean is home to a growing number of ICT enabled community centers aiming to empower disadvantaged communities to overcome economic challenges, close the digital gap and enhance human development in remote regions.

During the interviews it has been argues that these initiatives could benefit from increased communication and collaboration mechanisms and the establishment of National and Regional Networks of Telecenters, like Suriname's National Community Multimedia Centres (CMC) Network. These networks would facilitate the exchange of information, experiences, best practices, content, digital and human resources. Participation levels in the Caribbean Community Telecentres Workshop,[94] which took place in June 2006 with support from UNESCO, UNDP, ICA and others, show the commitment of the stakeholders and their interest in working together.

Nonetheless, ICT community centers still face sustainability challenges and the road towards being "owned", operated and managed by the communities they serve is filled with bureaucratic, legal and economic obstacles. Governments can facilitate the process by allocating resources, licenses and permits and partnerships with the private sector can help alleviate the financial burdens.

One common big challenge is to put the telecenters at the service of all other local development initiatives taking place in the community so they are not just isolated ICT or training centers and can empower other capacity building, business, social and cultural initiatives.

The definition of alternative non-financial compensation methods to motivate volunteers can turn local telecenters into volunteerism hubs, enabling, promoting and channeling local and foreign support offers and requests.

Telecenters can also increase the levels of civil participation by allowing remote communities to become informed and participate in national consultations processes. On the other hand, additional resources and awareness are required in order to provide accessibility features for handicapped people with, which are missing in most telecenters.

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[93] http://www.mind.edu.jm
[94] http://www.taiguey.org/CTW

BOX 4.1
ICT COMMUNITY CENTERS NETWORKS IN THE CARIBBEAN

UNESCO's Community Multimedia Centres (CMC):[95] Currently engaging or supporting 19 centers throughout the Caribbean.

OECS Cultural Internet Cafés:[96] The Organization of Eastern Caribbean States (OECS) has deployed more than 30 Internet access centers in coordination with local cultural centers in Antigua & Barbuda, Dominica, Grenada, Saint Lucia, Saint Kitts & Nevis, Saint Vincent & the Grenadines.

UNDP Community Resource and Internet Centres (CoRICs):[97] This United Nations Development Programme (UNDP) initiative provides Internet access, computer facilities and training mostly to young adults and single mothers in underserved areas. It focuses on empowering the community it serves and having it actively engaged in the centre's maintenance and operation. Several CoRICs are operating throughout the Caribbean, including in Grenada and Saint Lucia.

Source: UNESCO's Community Multimedia Centres, The Organization of Eastern Caribbean States and UNDP Community Resource and Internet Centres.

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[95]   http://www.unesco.org/webworld/cmc
[96]   http://www.oecsculture.com/member_pages/ext_icafe_info_temp.php?id=1&pg=icafe_home
[97]   http://www.unites.org/html/projects/ongoing.htm

V. Business and Commerce

1. Regional Economic and Business Outlook

In the past, Caribbean states have benefited from preferential trade arrangements with developed countries, in particular their former colonial powers, but this situation has changed significantly and rapidly in recent years. Not only do businesses and countries have to compete with countries from all over the world, but the region as a block has to compete with other regional blocks for foreign investment. As we move towards a global economy ruled by free trade agreements and increased competition, the Caribbean must adjust to the disappearance of the benefits provided by the European Union through the Cotonou Agreement (ACP-EU), the USA through the Caribbean Basic Initiative and Canada through the Caribbean-Canada Trade Agreement (CARIBCAN), among others. The advent of globalization not only means that individual countries need to be more competitive and efficient allocating resources, but that the region as a whole has to become more attractive to investment and be more competitive in the light of other regional blocks around the world. Hence the interest of many in the CARICOM Single Market Economy, which facilitates the movement of goods, services, capital and labor among participating Caribbean States, as well as a harmonized legislation, trade, economic, fiscal and monetary policies. The advent of the CARICOM Single Market Economy (CSME) is seen as a positive step towards tighter regional integration, focusing and a common market and legislation. Changes experienced by international markets in recent years have reduced the revenue from traditional sectors, such as the Banana Industry and the export of locally manufactured and assembled goods, and have had a negative ripple effect throughout the local and regional economies. Tourism, Financial Services and Call Centers have emerged in several countries. All three can benefit significantly from ICT. Besides, the natural reliance of international commerce for small economies provides another opportunity for trade facilitation through the coordination through digital networks.

TABLE 5.1
SECTORAL PARTICIPATION AND TRADE OPENNESS

Countries	Sectoral Distribution (% of GDP)			Trade Openness (% of GDP)	
	Agriculture	Industry	Services	Product Exports	Product Imports
Barbados	6	21	73	7.3	45.7
Grenada	8	23	70	10.7	56.9
Jamaica	5	30	65	19.7	49.9
Saint Lucia	5	18	77	7.2	53.0
Suriname	11	22	67	11	22
Trinidad and Tobago	1	49	50	64.1	35.1
Guyana	38	20	42	76.8	77.1

Source: Commonwealth Secretariat: Small States Economic Review and Basic Statistics, Vol. 10, 2005.
[1] Data is from 2002.

Impact of Infrastructure Vulnerability and Monopoly on Guyana's Call Centers

"A call centre was recently established in Guyana and President Jagdeo said that the company has had difficulties with the unreliability of the service. He noted that twice the Americas II cable went down. The call centre conducts business with foreign clients and hence, depends on the internet access for communication. Failure in centres' systems would result in a loss of clients. The said call centre has a potential to employ 1000 Guyanese, but to date has only employed 200 because its growth is constrained by the unreliable and costly bandwidth." (Office of the President of Guyana).[98]

Some ICT programs and projects aimed to improve competitiveness are:

Pan-Caribbean SME-ICT Sector Competitiveness Development   Programme 2005-2006.[99] This two year program is coordinated by the Caribbean Association of Industry and Commerce (CAIC). It aims to increase institutional capacity and improve competitiveness among both small and medium enterprises and in the ICT sector through supporting the development of regional and national policies and strategies, contacts and information exchange.[100] Its country specific objectives include:

- Antigua & Barbuda: An effective Small Business development strategy.

- Belize: An effective Small Business policy and plan aimed at enhancing competitiveness.

- Dominica: Development of the E-Commerce sector aimed at small businesses.

- St Kitts and Nevis: An effective Small Business development strategy.

- St Lucia: An effective ICT/E-Commerce strategy.

IADB's Social Entrepreneurship Program (SEP) in Suriname: The KKF is the local executing agency for this Inter-American Development Bank (IADB) to foster an entrepreneurial spirit and the development of sustainable initiatives that contribute to the wellbeing of local communities through a business approach. The program is executed through the University of Suriname, whose students are taught to develop business plans, which are evaluated by the KKF and those approved received small funding from the IADB for their implementation. However,

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[98] http://www.op.gov.gy/stories/060614.html
[99] http://www.iberpymeonline.org/Trinidad/CarolAyoung.pdf
[100] Source: http://www.smexchange.com.

none of the projects submitted in 2006 involved the use of ICT or an innovative use of technology in a significant way and most were conventional micro and small business proposals.[101]

Small and Medium-Sized Enterprises Business to Business e-Marketplace in Trinidad and Tobago.[102] The government promoted the development of an on-line marketplace where small and medium enterprises (SME) could advertise their products, services and interests and search for business opportunities, as well as network with other businesses and access and e-Business guide for SMEs. This virtual space was implemented as a private endeavor by two local ICT companies[103] based on e-readiness and best practice reports and stakeholder consultations held by the government.[104]

1.1 Tourism Sector

Barbados and Bahamas rank first and third respectively in net tourism profit per capita in the world.[105] Jamaica ranks 14 and Trinidad and Tobago 33, while the rest of the group per capita performance is near the world median. With the increased role of global providers, a significant portion of tourism related revenue does not make it into the region, the countries or the areas visited by tourists, in particular in the case of travel and accommodations booking through the Internet.

TABLE 5.2
TOURISM AND TRADE BALANCE

Countries	Tourism Sector[1]			
	Visitors (thou.)	Revenue (US$ mill.)	Revenue as % of Exports	Revenue per Capita
Barbados	498	648	50.1	2409
Grenada	132	91	52.0	892
Jamaica	1,266	1,209	37.4	456
Saint Lucia	253	210	64.0	1,304
Suriname	582	162	3.32	35
Trinidad and Tobago	379	224	5.0	171
Guyana	104	49	7.3	65

Source: Commonwealth Secretariat: Small States Economic Review and Basic Statistics, Vol. 10, 2005. Data is from 2003, except where indicated.
[1] Data is from 2002. 2 Data is from 2000. Data for 2003 is significantly lower (around 75% lower).

1.2 Call Centers

In recent years, the Caribbean has become an attractive place for outsourcing customer care and service, telemarketing and even bill collection activities, thanks to lower communication costs after the liberalization of local telecommunication markets and the availability of modern technologies and services. Proximity to the USA, English and Spanish as native languages, close time zones, less cultural differences than with other regions and cost savings of some 30-40%, have attracted USA companies to establish a growing number of call centers in the Caribbean to serve both their Hispanic and English speaking customers. With their governments offering

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[101] Source: http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=575354

[102] http://www.smexchange.com.

[103] Business Development Company Limited (http://www.bdc.co.tt) and Digital Business (http://www.digital.co.tt).

[104] Source: http://www.smexchange.com.

[105] World Mapper: Tourism Profit. (http://www.sasi.group.shef.ac.uk/worldmapper/display.php?selected=25)

facilities in free zones and tax incentives, countries like the Dominican Republic, Puerto Rico and Jamaica have more than ten call centers each, employ thousands of local people.

Many of the companies currently operating in the Caribbean also have facilities in other regions, including well established markets like India, Philippines, Ireland and Mexico. Given the limited investment required to establish call centers and reduced social responsibility from the operators, even minor economic, politic or market changes can trigger a migration of these businesses to outside the region.

Telecommunication costs and wages are the two main financial aspects considered by Call Center businesses. But the availability of skilled labor and local support and technical service also play an important role and these issues are still scarce in most of the smaller Caribbean States with reduced population. Vulnerability of the Telecommunications infrastructure is a major concern, particularly with most Caribbean nations geographically located in the Tropical Hurricane zone. In addition, according to a 2005 study,[106] the total operation cost for Call Centers in the Caribbean, while still some 30-40% cheaper than in the USA, remains higher than similar operations in India, Mexico and the Philippines.

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BOX 5.1

EXISTING COLLABORATION INITIATIVES WITH INDIA IN THE CARIBBEAN

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India has been a historically and friend of the Caribbean nations hosting a significant number of East India descendents, providing lines of credits, technical assistance and hundreds of scholarships that support the development of local technological skills in the region. On February 2005, a CARICOM/India Joint Commission was established to coordinate and promote the development and implementation of cooperation projects, in particular, but not exclusively in the areas of health, disaster management, Information and Communications Technology (ICT).[107] Some current and recent cases of Indo-Caribbean cooperation are:

Grenada
The Government of India provides technical assistance to Grenada Public ICT program by assigning and covering the expenses of a full time ICT expert to coordinate and lead the country's government ICT projects.

Guyana
Through its Indian Technical and Economic Cooperation (ITEC) program, India offers some 45 scholarships a year to Guyana's nationals in several disciplines.

Suriname
India offers Suriname a number of ICT scholarships every year by India. As of the time of writing, Suriname and India were looking at possibilities for technical cooperation in developing an ICT Master Plan for Suriname.

Co-operation between Caribbean Association of Industry and Commerce (CAIC) and the Export Import Bank of India
Aims to promote the regular exchange of information, publications on trade, business and investment opportunities to facilitate increased co-operation between firms in India and the Caribbean.

Co-operation between National Small Industries Corporation of India and Caribbean Association of Industry and Commerce (CAIC)
Carry out feasibility studies and entrepreneurship development programmes in the Caribbean to identify business opportunities, link entrepreneurs, facilitate enterprise to enterprise contacts, technology transfer and investment from India in specific industrial sectors.

Source: http://www.nalis.gov.tt

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[106] Caribbean Call Center Report: A Customer Care Market. Zagada Institute, 2005.
[107] Press release available at: http://www.caricom.org/jsp/pressreleases/pres38_05.htm

1.3 Emerging On-line Business to Consumers (B2C) e-Commerce

In the countries with local e-commerce capacity, there is an incipient e-commerce industry and market that has been evolving timidly in the last few years. A low Internet penetration rate, the short distance to "real" providers, lack of awareness and distrust on on-line business transactions are factors that affect negatively the development of a local on-line business-to-consumers (B2C) market. There is however a significant market opportunity for catering the interest of nationals living abroad on local products. In any case, policy makers have to keep in mind that e-commerce in the region must and will respond to the needs, conditions and demands of its local markets and may very well evolve to be different from the nature of e-commerce in developed countries or other regions. On-line purchase of flight tickets, payment of services, remittances from abroad, purchase of foreign good by locals and local goods by people abroad, purchase of groceries and payment of local services for their relatives by the diaspora are some of the areas where B2C e-commerce is more likely to expand and grow in the Caribbean.

Properly motivated, enabled and channeled, the adoption of ICT in business can become a source of increasing wealth and growing revenue for the Caribbean governments, the business sector and the people of the region and their constantly constrained budgets. Many countries in the region already have a tradition of hosting offshore operations. This is a competitive advantage for the development of a new sector hosting e-commerce operations, once the proper legislation, telecommunications infrastructure and security capacity are in place. Among the most vibrant activities are Offshore Banking and on-line Gambling.

Six (6) Caribbean territories are already members of the Offshore Group of Banking Supervisors (Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Netherlands Antilles) with the British Virgin Islands and the Eastern Caribbean Central Bank participating as observers.

Although the imminent passing of legislation by the USA prohibiting the use of US issued credit cards or engaging in any kind of electronic funds transfer to pay for on-line gambling will definitely affect the Caribbean on-line gambling industry (it is estimated that 40% of the revenue comes from the USA), the gambling providers are already starting to look at Europe and other regions to expand their business. The potential revenue of hosting on-line gambling sites can be significant for small economies like those of most Caribbean island states. Gambling is already legal in many Caribbean countries, which host luxurious casinos as part of their tourism offer and hotel infrastructure. Adjusting legislation and enabling proper supervision and regulation provisions for the proper operation of on-line casinos and gambling websites is affordable and attainable in the short term for most Caribbean states, in particular considering the potential revenue.

TABLE 5.3
CARIBBEAN ON-LINE GAMBLING INDUSTRY

Country	No. of On-line Gambling Sites	License fee - US$/yr
Antigua and Barbuda	382	75,000
Belize	57	10,000
Dominica	2	75,000
Netherlands Antilles	328	N/A
Saint Kitts & Nevis	28	80,000 reg. - 40,000 /yr

Source:Author's compilation.

VI. Content and Culture

1. Content Governance

Caribbean culture and identity are often better expressed and served through images, sounds, motion, colors and live sensations, rather than plain words. The Caribbean is known for its lively music and vibrant spirit, colorful crafts and magical stories. However, the region has yet to crossover to the digital world and build a significant presence for its cultural identity on-line. Paradoxically, the Caribbean is working hard extending and providing access to a network that runs content mostly alien to its culture and its people.

While newspapers in most countries covered in this study have on-line presence, their content is limited in most cases to a summary limited edition of their actual paper version.

The reduced presence of Caribbean culture and content on-line is a combined result of weak intellectual property awareness and enforcement, lack of local funding and limited support for digital content creation or digitalization of existing content). Fear of plagiarism and piracy, the limited availability of e-commerce and the unavailability of alternative compensation methods keep able content creators from putting their content on-line. While there are some isolated cultural initiatives on-line, there are no formal policies in the region for promoting the creation and availability of local content, either by regional organizations or national authorities.

The Caribbean culture can benefit from the establishment of digital archives and initiatives for the digitalization, preservation and facilitation of access to the region's wealth of cultural content and traditions. Some early pilots in this direction have been conducted, in particular by the National Library and Information System (NALIS)[108] of Trinidad and Tobago.

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[108] http://www.nalis.gov.tt

1.1 Creation of Local Digital Content

The void of local digital content, historical and current, written and multimedia, should be addressed by allocation of additional resources and policies that provide incentives for digital content generation initiatives.

Some argue that alternative compensation mechanisms should be explored to motivate content creators to crossover to the digital world and facilities such as cultural portals should be encourage to allow them to present, distribute and even sell their music directly to consumers around the world.

Given the technical expertise and to some extent specialized hardware required for the creation of digital content, community centers can play an important role in facilitating these processes as UNESCO's Community Multimedia Centers (CMC's) have demonstrated.

Digital Newsroom and Radio Saint Lucia[109]

Part of UNESCO's International Programme for the Development of Communication, this project introduced Radio Saint Lucia to the world of digital news editing by providing ICT tools and training. A foundation is laid for future media convergence and multiple platform support by building local capacity in digital news gathering, production and dissemination. The next phase of the program includes training in ICT usage for journalists and news correspondents in coordination with the University of West Indies Caribbean Institute of Media and Communication (CARIMAC).[110]

Just as well, the introduction of ICT in schools is an important opportunity for developing content creation skills and stimulating creativity at an early age and as part of the new generations' capacities.

1.2 Intellectual Property, Fair Use and Open Content

In recent years, legislation has advanced to increase the protection of intellectual property in the region. Compliance with World Trade Organization (WTO) and World Intellectual Property Organizations guidelines is common at least at formal level. Local non-governmental intellectual property agencies are also becoming more active and articulated, as the dynamic presence and openness to discuss and address the concerns of content creators, consumers and merchants of the Copyright Music Organization of Trinidad and Tobago (COTT)[111] clearly illustrates.

However, most of the current discussion on copyright and content revolves around the music and software industries. Increased awareness and discussion on content ownership, reproduction, distribution and use as a whole and in other industries seems adequate.

Given the limited size of Caribbean markets and the increasing influx of foreign content and influences, conventional distribution and remuneration schemes may not be enough to support a vibrant local cultural content industry. In addition to exploring alternative compensation methods as mentioned before, attention should be drawn to the promotion of a culture of Caribbean commons where contents are made accessible to the public with varying degrees of use, reproduction and distribution permissions, retaining ownership of content and safeguarding the potential for remunerating authorship.

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[109] http://www.rslonline.com

[110] Source: http://www.cott.org.tt

[111] http://www.cott.org.tt

1.3 Multimedia Content and Broadband Content

Broadband users benefit from global rich and multimedia on-line content and services and the advantages of permanent and fast connections that can improve communication, information, exchange and access to better work, education and business opportunities.

But the lack of Caribbean on-line multimedia content and applications that take advantage of broadband creates an inherent danger of diminishing awareness and appreciation of local and regional culture and identity.

Other than the free global on-line mapping services (such as Google Earth and Microsoft Windows Live Local) that provide detailed local satellite images, a few radio stations broadcasting on-line and improved communications of individuals and institutions through voice over IP and videoconferencing, there are not many uses of broadband specific to the Caribbean.

As these services are integrated with other applications and on-line content, and media convergence becomes more ubiquitous, the benefits of broadband will increase and so will the incentives for its use.

Many of the interviewed claimed that national and Regional policies should be set in place to promote and facilitate the generation and distribution of local digital content for broadband in the region, so that the Caribbean is not just a passive recipient of content, but also an active contributor of content in the global Information Society.

This would support continuous growth and evolution of regional culture as it coexists with global knowledge and culture without being at disadvantage.

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Regional Databases

UN ECLAC Caribbean Digital Library: http://www.eclacpos.org/cdl/cdl_statistics.asp

CARISNET: http://www.carisnet.org

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Red GEALC - Network of E-Government Leaders in Latin America and the Caribbean: http://www. redgealc.net

CARICOM Statistics: http://www.caricomstats.org

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The Caribbean Association of National Telecommunication Organizations (CANTO): http://www. canto.org

Caribbean Telecommunications Union: http://www.c-t-u.org

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Annex
Excerpts from Treaties and Legislation

1. Chaguaramas Treaty[112]

Article 64: Research and Development

1. COTED[113] shall promote market-led research, technological development and adaptation of technology in the Community in order to support the production, on a sustainable basis, of goods and services in the Member States with a view to diversifying such production and enhancing its international competitiveness.

2. In the discharge of its mandate set out in paragraph 1 of this Article, COTED shall adopt measures to encourage, inter alia, inventions and innovation, and acquisition, transfer, assimilation, adaptation and diffusion of technologies in the Community. Without prejudice to the generality of the foregoing, COTED shall:

    a. encourage public and private sector agencies, research establishments and tertiary institutions in their research and technological development activities and assist in identifying sources of funding for such activities;

    b. promote co-operation in research and technological development among the Member States and with third States and competent international organizations;

    a. facilitate co-operation:

        i.   in training;

        ii. in the exchange of scientific and technical information among competent institutions;

        iii. in the free movement of researchers in the Community;

        iv. among private sector enterprises to integrate the results of research and development in the production process;

        v.   develop and implement technological policies and strategies, having due regard for the importance of technology management and protection of intellectual property rights;

        vi. facilitate access by Community nationals to technological and research facilities of Member States; and promote the development of technology extension services.

3. In particular, COTED shall promote and encourage research and development, and the adaptation, diffusion and transfer of appropriate technologies in order to achieve increased agricultural production and productivity, bearing in mind the need to protect the independence and human rights of the farming community.

4. COTED shall, in collaboration with competent public and private sector research and development institutions, encourage and assist Member States:

    a. to facilitate access to and use of new and appropriate technologies in the agricultural sector;

    b. to develop:

        i.   efficient systems for the generation and transfer of appropriate technologies; and

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[112] Revised Treaty of Chaguaramas establishing the Caribbean Community, including the CARICOM Single Market Economy. CARICOM, 2001. http://www.caricom.org/jsp/community/revised_treaty-text.pdf

[113] COTED is the Council for Trade and Economic Development, defined on Article 15 of the Treaty, and shall consist of Ministers designated by the Member States.

    ii.   technological and institutional capabilities in the public and private sectors, compatible with competitive and sustainable agricultural production.

5.   In the pursuit of its functions under this Article, COTED shall encourage the private sector to play a vital role in:

    a.   the development, adaptation and transfer of appropriate technologies in the agricultural sector; and

    b.   the development of producer associations as a basis for autonomous action and intra-regional transfer of technologies and research findings.

6.   COTED shall co-operate with the Member States and competent organizations to devise means of protecting, developing and commercializing local knowledge about the value and use of the Region's biodiversity for the benefit of their populations, especially their indigenous peoples.

Article 66: Protection of Intellectual Property Rights

COTED shall promote the protection of intellectual property rights within the Community by, inter alia:

    a.   the strengthening of regimes for the protection of intellectual property rights and the simplification of registration procedures in the Member States;

    b.   the establishment of a regional administration for intellectual property rights except copyright;

    c.   the identification and establishment, by the Member States of mechanisms to ensure:

        i.   the use of protected works for the enhanced benefit of the Member States;

        ii.   the preservation of indigenous Caribbean culture; and

        iii.   the legal protection of the expressions of folklore, other traditional knowledge and national heritage, particularly of indigenous populations in the Community;

    d.   increased dissemination and use of patent documentation as a source of technological information;

    e.   public education;

    f.   measures to prevent the abuse of intellectual property rights by rightsholders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology; and

    g.   participation by the Member States in international regimes for the protection of intellectual property rights.

Article 67: Standards and Technical Regulations

1.   COTED shall, in collaboration with competent agencies, develop a standardization programme in furtherance of the objectives of this Chapter and consistent with the international obligations of the Member States.

2.   In implementing the programme, the Member States shall not use standards, technical regulations and conformity assessment procedures as barriers to trade.

3.   The programme shall have the following objectives:

    a.   trade facilitation;

    b.   enhanced efficiency in the production and delivery of goods and services;

     c.   improved quality of goods and services traded within the Community and with third States; and

     d.   consumer and environmental protection.

4.   The programme shall include the following elements:

     a.   harmonization of standards and technical regulations, and transparency in the development and promulgation of standards and technical regulations;

     b.   recognition of conformity assessment procedures through mutual recognition agreements or other means;

     c.   facilitation of standards infrastructure development at the national and regional levels;

     d.   facilitation of metrology infrastructure development; and

     e.   arrangements for the exchange of information with respect to development and implementation of standards and technical regulations among the parties to this Treaty.

5.   The Community shall promote the establishment of a regional standards body which shall, inter alia:

     a.   facilitate implementation of the standardization programme;

     b.   assist the Member States in understanding and fulfilling their obligations under this Treaty and other international agreements;

     c.   promote the development of national standards bodies in the Member States; and

     d.   facilitate access to technical assistance available in the Member States and in third States.

6.   For the purposes of this Article, the following definitions apply:

     a.   "technical regulations" means regulations which lay down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory. The term may also include or deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method.

     b.   "standard" means a guideline approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory. The term may also include or deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method.

     c.   "conformity assessment procedures" includes any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled.

Article 147: Promotion of Investment

COFAP[114] shall promote investment in disadvantaged countries by, inter alia, facilitating:

     a.   the establishment of joint ventures among nationals of disadvantaged countries as well as between nationals of disadvantaged countries and nationals of other Member States;

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[114] COFAP is the Council for Finance and Planning, defined on Article 14 of the Treaty, and shall consist of Ministers designated by the Member States.

b. the establishment of joint ventures between nationals of disadvantaged countries and nationals of third countries;

c. investment for economic diversification including diversification of the agricultural sector;

d. research, development and the transfer of technology in the development of disadvantaged countries; and

e. capital flows from other Member States to disadvantaged countries through the conclusion of double taxation agreements and appropriate policy instruments.

Use of Technological and Research Facilities

Article 153: Use of Technological and Research Facilities in Member States

1. The Member States undertake to provide opportunities for access to their technological and research facilities by nationals of disadvantaged countries.

2. COTED shall encourage close collaboration between research institutions and facilities located in disadvantaged countries with others located in other Member States.

Article 166: Use of Technological and Research Facilities

The more developed countries undertake to provide opportunities for the use of their technological and research facilities by the less developed countries.

Article 239: Undertaking of Protocols for e-Commerce, government procurement and consumer protection

a. The Member States undertake to elaborate a Protocol relating, inter alia, to:

b. electronic commerce;

c. government procurement;

d. treatment of goods produced in free zones and similar jurisdictions;

e. free circulation of goods in the CSME; and

f. rights contingent on establishment, provision of services and movement of capital in the Community.

2. Barbados Program of Action and Mauritius Implementation Strategy

Chapters in the Barbados Programme of Action[115]

Climate change and sea level rise	Biodiversity resources.
Natural and environmental disasters	National institutions and administrative capacity.
Management of wastes	Regional institutions and technical cooperation.
Coastal and marine resources	Transport and communication.
Freshwater resources	Science and technology.
Land resources	Human resource development.
Energy resources	Implementation, monitoring and review.
Tourism resources	

Mauritius Strategy[116]

List of Chapters

Climate change	Science & technology
Natural disasters	Graduation from LDC status
Waste Management	Trade
Coastal & marine resources	Capacity building & ESD
Freshwater resources	Production & consumption
Land resources	Enabling environments
Energy resources	Health
Tourism resources	Knowledge management
Biodiversity resources	Culture
Transport & communication	Implementation

Chapter X: Transport and Communication (X)

58.   Small island developing States are committed, with the necessary support of the international community, to taking initiatives in such areas as access to and the use of information and communication technology (ICT); the development of community multimedia centres; ICT literacy; skills development; local content and applications in building knowledge-based societies; and bridging the digital divide, particularly in rural communities. There is also a continuing need for the maintenance of low-technology communication solutions, such as high-frequency radio for rural and remote locations. The International Telecommunication Union, the United Nations Educational, Scientific and Cultural Organization and other relevant organizations are invited to support these activities in a coordinated manner. In this regard, the World Summit on the Information Society is encouraged to consider small island developing States concerns and their participation in the Summit process.

Chapter XIII: Knowledge management and information for decision-making

79.   Small island developing States recognize that there are new opportunities afforded by the rapid new developments in ICT to overcome the limitations of isolation and remoteness and build their resilience. These new opportunities include such areas as e-commerce, improved early warning, tele-medicine and distance learning.

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[115] http://www.sidsnet.org/docshare/other/BPOA.pdf
[116] http://www.sidsnet.org/docshare/other/20050222171050_Mauritius_Strategy_latest_version.pdf

80.   Further action is required by small island developing States, with the necessary support of the international community, for:

   a.   The identification and addressing of gaps in data and the characterization of information related to economic, social, environmental and cultural areas;

   b.   Developing databases, vulnerability indexes, geographic information systems and other information systems;

   c.   Establishing national and regional information and database centres, including the collection, quality control and use of metadata, analysis of data, accessibility and sharing of data and information;

   d.   The expansion and extension of the Partnership in Statistics for Development in the Twenty-first Century initiative to address the concerns of small island developing States;

   e.   Addressing issues relating to cyber-security in small island developing States;

   f.   Establishing land use databases, inter alia, through training in and access to the use of geographic information systems and remote-sensing;

   g.   Strengthening and establishing, where necessary, relevant research and postgraduate programmes at regional tertiary-level institutions in small island developing States.

Chapter XX: Implementation

84.   To adequately address their most urgent sustainable development challenges, small island developing States, with the necessary support of the international community, including through the facilitation and improvement of access to existing resources and, where appropriate, through allocation of dedicated financial resources, will take action in the following key areas:

   c.   Intellectual property rights and development: take action to protect intellectual property in small island developing States, including traditional knowledge and folklore, and recognize their value;

   e.   Culture and development: take action to promote the development of cultural industries in small island developing States, including through cultural exchanges among small island developing States and other countries;

   l.   Information and communication technology: take action to enhance ICT development, including connectivity and access to affordable hardware and software.

Round Table 2 - The way forward: building capacity

10 b.   Establish and build institutional capacities for regional and subregional early warning and information systems. Early warning systems are linked to the availability of ICTs, so capacity-building efforts for these two areas should be linked. This could also help to eliminate the digital divide;

11 b.   Diversify the economic base of small island developing States to improve competitive advantage through capacity-building at the regional and international levels, inter alia, in ICT, science and technology, and development of cultural industries;

11 g.   Support capacity-building initiatives aimed at strengthening ICT literacy and skills development;

11 h.   Create subregional hubs for ICT among small island developing States. For example, India is building a cyber city to create a hub for ICT in Mauritius through South-South

cooperation, and has cooperative ICT programmes with 30 small island developing States;

11 i.   Support ICT networks, early warning systems, remote sensing, computer based systems for mapping and wireless technologies. A number of countries highlighted new initiatives and ongoing efforts to advance capacity-building in these areas;

11 j.   Support and promote centres of excellence to build capacities in science and technology that also draw on traditional knowledge. It was noted that the Millennium Development Goals cannot be achieved without capacity-building in science and technology, in particular renewable energy applications and ocean sciences;

12 e.   Support the proposed establishment of a consortium of tertiary institutions for capacity development and education in small island developing States, including regional centres of excellence, technical development facilities for traditional knowledge and virtual universities;

12 f.   Invest in education, particularly for women and girls, as the best means of alleviating poverty and achieving sustainable development;

12 g.   Support education in small island developing States in which the supply of teachers and educational materials is limited, and access to ICT is almost nonexistent;

12 h.   Promote distance learning, including at the secondary and tertiary levels of education through ICT, in order to build needed capacity and as a means of combating brain drain.