

ECTEL Country ICT Assessments

Regional Summary Report

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Abbreviations and Acronyms

C&W	Cable and Wireless
CARICOM	Caribbean Community and Common Market
CIMA	Central Information Management Agency (Government of Grenada/Prime Minister's Office)
CRP	USAID Caribbean Regional Program
CXC	Caribbean Examination Council
EC-ICT	Eastern Caribbean Information Communications Technology Initiative
ECTEL	Eastern Caribbean Telecommunications Regulatory Authority (Dominica, Grenada, St. Kitts/Nevis, St. Lucia, St. Vincent/Grenadines)
EU	European Union
FATF	OECD Financial Action Task Force on Money Laundering
FDI	Foreign Direct Investment
ICT	Information and Communication Technology
IT	Information Technology
ITU	International Telecommunications Union (UN)
Kbps	Kilobits per second
Km	Kilometers
LAN	Local Area Network
Mbps	Megabits per second
MHz	Mega (million) Hertz (cycles/second)
NGO	Non-Government Organization
NTRC	National Telecommunications Regulatory Commission
OECD	Organization for Economic Cooperation and Development
OECS	Organization of Eastern Caribbean States
PC	Personal Computer
SME	Small and Medium-Sized Enterprise

U.S.	United States
USAID	U.S. Agency for International Development
UWI	University of the West Indies
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WB	World Bank
W.I.	West Indies

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Background/Executive Summary of Recommendations

Background

Information & Communication Technology (ICT) Assessments for each of the ECTEL countries (Dominica, Grenada, St. Kitts/Nevis, St. Lucia, and St. Vincent/Grenadines) were conducted by Carana Corporation in February-March 2002 under contract to the U.S. Agency for International Development (USAID). These Assessments were part of a larger initiative being undertaken by USAID/Carana in support of the Organization of Eastern Caribbean States (OECS), specifically to provide technical assistance to the Eastern Caribbean Telecommunications Regulatory Authority (ECTEL) and the five National Telecommunications Regulatory Commissions (NTRCs).

In summary, the technical assistance being provided to OECS, ECTEL, and the NTRCs, is primarily oriented toward telecommunications market liberalization in the region. However, this is in support of an even larger purpose--that of seeking to leverage information and communication technologies (ICTs) for economic growth within the Eastern Caribbean region.

ICT Assessment Structure/Approach

In addition to providing support to OECS/ECTEL, these ICT Assessments were carried out in a manner consistent with USAID's focus on leveraging ICTs in developing and emerging economies. They were structured to provide not only a basic level of consistency among the five ECTEL countries, but also a level of consistency with similar USAID-funded assessments. As such, they relied on a "4-Ps" template in an effort to capture and categorize information from a wide array of sources and to present it to the reader in a readily digestible format. The four "Ps" are as follows:

Public Sector—This part of the Assessments focused primarily on (a) Government ICT policy and the supporting legal/regulatory framework and (b) the actual use of ICTs by the Government. The coverage of telecommunications policy was minimal due to parallel ECTEL/NTRC work in this area.

Pipes—The thrust of the Assessments in this area was on telecommunications infrastructure, access, and price. Analyses were also drawn from a core set of information from the International Telecommunications Union (ITU) Development Indicators reports.

Private Sector—This portion of the Assessments examined the state of development of the ICT industry sector and the use of ICTs by traditional businesses.

People—This section of the Assessments analyzed the education systems relative to producing students and workers with ICT-related skills.

From a methodology perspective, the ICT Assessments were carried out in two parts: (1) research based on a number of prior ICT-related studies and reports produced over the past 2-3 years by various organizational entities, and (2) a one-week on-the-ground assessment during which time a number of interviews were undertaken with individuals from the public, private, and educational sectors. Naturally, with such an abbreviated approach, the ICT Assessment reports do not capture all the details. Rather, the Assessments are country surveys intended to gather sufficient information across a broad array considerations and to support recommendations put forward to OECS and USAID regarding potential areas for future engagement. Their purpose is to be a catalyst, not a catalog.

Executive Summary of Recommendations

Recommendations were derived from the Assessment findings and are intended for regional application.

Public Sector recommendations include legal/regulatory technical assistance (TA) to develop regional model laws to accommodate ICTs and online transactions. Transparency of proposed laws and regulations is also encouraged, as well as making laws, regulations, orders, and indices available online. Workshops are suggested to help governments organize and effectively plan for and use ICTs and manage their ICT assets. Technical assistance should be provided to help countries develop national ICT plans and to assist ECTEL and OECS in developing a regional ICT plan. Economic planning is also needed to better understand the “post-preference” era and the role ICTs can play in rebuilding the island economies. Government National Development Corporations and NTRCs need to be strengthened to assist SMEs and advance the liberalization process, respectively. Governments need assistance to prioritize, develop, and launch e-government initiatives. The public health care and judicial system are in particular need of ICTs.

Recommendations for Pipes focus on bridging the digital divide in rural and underserved areas through the establishment of telecenters that could provide ICT training, access, and SME support. A seminar on effective network engineering and security considerations for government networks is suggested. Regional uplink capabilities are needed to promote regional news, collaboration, participation, and to provide distance education. PCs in schools need to be upgraded and labs need to be networked and wired for Internet access.

The Private Sector recommendations are a mix of seminars, training, and projects. The private sector could be advanced through a seminar on effective public/private interaction, including relating workforce needs to education professionals. The local banking community would benefit from a training program on considerations pertaining to financing and investing in

ICT firms and differences in foreign and domestic investors. Island companies need business development services and competitiveness support, including upstream business services and Caribbean “branding” assistance. This could be advanced through an international portal to enable companies to collectively market their products/services on the Internet. A seminar on how to leverage ICTs in core business processes would also be helpful. Technical assistance could help countries further define the ICT industry sector that would most benefit their nations. The ECTEL countries should also engage their Diaspora in their national ICT plans.

Recommendations for the People section of the Assessments pertain to revamping the educational system to fit a knowledge economy, developing video distance learning capabilities to enable a four-year computer science degree and other university and certified ICT courses to be available across the islands, and training technical support staff for school PCs and labs.

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Assessment Category Summaries

The ICT Assessments were conducted by country, keeping in mind the current USAID/Caribbean Regional Program for FY 2002 and possible linkages for ICT initiatives with USAID's current/planned engagement in the region.

USAID/Caribbean Regional Program for FY 2002

538-003	Hurricane Georges Recovery and Reconstruction in the Eastern Caribbean
538-004	Increased Employment and Diversification in Select Non-traditional Activities
538-005	Improved Environmental Management by Public and Private Entities
538-006	Increased Effectiveness and Efficiency of Legal Systems in the Caribbean
538-007	Hurricane Lenny Recovery in the Eastern Caribbean
538-008	Enhanced Caribbean Response to the HIV/AIDS Crisis in Target Countries

The following summarizes the findings of the ECTEL country ICT Assessments for each of the "4 P" categories. Overall, the findings in each country were quite similar, opening up several regional opportunities that could have considerable impact. In each country, however, there were individual strengths that were not present in the other countries that would enable that country to take a regional leadership/model role in these specific areas. This section notes similarities in situations among the countries as well as identifies any distinctive country differences or areas where a country shows leadership in a specific area that would be valuable on a regional basis.

Public Sector Summary of Findings

There are many common themes that emerged in the ICT Assessments' analyses of the public sector. However, this was also the area in which Grenada, St. Lucia, Dominica, St. Kitts/Nevis, and St. Vincent/Grenadines each exhibited leadership that, when channeled in regional initiatives, could help propel the widespread deployment and utilization of ICTs in the ECTEL countries. Public sector findings that were consistent in each of the ICT Assessments are:

- **Lack of Government leadership and organization in a form that would promote ICTs.** Most often this involved a lack of direct involvement by the Prime Minister and senior government officials. Countries that have proven, successful models in advancing ICTs almost always have a vision and direction set by the President or Prime Minister, with government activities coordinated through his/her office that facilitates inter-ministerial action, maximizes ICT expenditures, and minimizes redundant efforts. St. Kitts/Nevis's Prime Minister has shown the personal interest and leadership necessary to advance ICTs in his country and, if willing to take additional measures, could provide regional leadership for other Prime Ministers in the region.

- Lack of understanding by senior government officials of the value of ICTs.
Although several mid- to lower-level government managers and personnel seemed to understand the value of ICTs in improving the efficiency of their operations and delivering information and services to citizens, every country revealed a serious lack of understanding of the value of ICTs at the senior levels of government. This has resulted in a lack of support for increased usage of ICTs in government agency and department operations.
- Lack of a National ICT Plan.
With the exception of Grenada, all the other ECTEL countries lacked a National ICT Plan that provided a multi-year vision and strategy for leveraging ICTs. This has resulted in “scatter-shot” initiatives that have not built momentum or created synergy.
- Lack of a Regional ICT Plan.
Although regional telecommunications liberalization is well underway through ECTEL and the OECS, there is no regional plan for advancing ICTs in CARICOM, OECS, or ECTEL. This is largely due to the absence of national ICT plans that could be integrated into a larger, regional strategy.
- Inadequate legal/regulatory frameworks to support ICTs.
None of the ECTEL countries’ legal frameworks will support ICTs and online transactions. They have no laws to support e-transactions, e-signatures, or e-payments. They do not have laws covering data protection and privacy or provisions for consumer protection. In addition, their legal frameworks do not address cybercrime. Opportunities for offshore operations will be limited until this has been addressed. Likewise, growth of ICTS in the country will also be stunted without these legal reforms.
- Lack of “post-preference economic planning” and definition of ICT sector.
All of the countries are facing economic downturns due to diminishing banana subsidies and a slump in tourism. Yet, with the exception of Dominica, none of the countries have an effective plan for economic recovery that involves detailed analysis. They all indicate they want to use ICTs as a vehicle for economic growth, but none of the countries have gone through the necessary analysis of factors to define what kind of ICT sector their country could support and develop, how ICTs could boost traditional industry sectors, and what steps would be needed to achieve defined goals. Most developing countries want to become Bangalore, yet, for most, that is an unrealistic goal.
- Little usage of ICTs in government operations, especially in courts and health.
Few e-government initiatives exist in the ECTEL countries, and government utilization of ICTs is generally limited to word processing and e-mail. Although many government entities plan to use ICTs to get information and services to citizens, the supporting government enterprise architecture is missing. Many of the PCs in government offices are either outdated or broken and few are networked. All the countries desperately need court administration and case management systems and initiatives to automate the court

registries need to be advanced. None of the public health systems are utilizing ICTS for effective health surveillance, patient record management, and accounting.

- Lack of enterprise management of ICT resources.
With the exception of Grenada's Central Information Management Agency, there is no government entity responsible for overall government architecture or management of ICT resources. Most Ministries in all countries lack a chief information officer or director of ICTs.
- Need to strengthen National Telecommunications Regulatory Commissions.
The country NTRCs are struggling to get launched and need additional training for their staffs, instruction on administrative procedures for licensing, domain names, etc., and assistance in strengthening their relations with the private sectors, OECS, and ECTEL.
- Lack of ICT investment incentives and facilities.
In all of the countries, there is a lack of ICT investment incentives. Most of the countries' incentives are still targeted at manufacturing or traditional industry sectors and do not apply to ICT companies. In addition, tariffs on computer equipment work to deter the importation of ICT equipment. Most government-sponsored industrial facilities are not suitable for ICT companies.
- Inadequate support for small and medium-sized enterprises and business development.
All countries lack adequate support for SMEs. Overall, their business development services are lacking, especially as it pertains to either the usage of ICTs within traditional industry sectors or the development of ICT companies. Business development initiatives linked with competitiveness assistance are sorely needed.
- Efforts to "brand" the Caribbean as a desirable business venue are weak or non-existent.
All the countries expressed a desire to work on a regional basis, yet efforts to "brand" the Caribbean as an attractive business venue are very weak, if they exist at all. St. Kitts/Nevis and St. Lucia are the only ECTEL countries that have been removed from the OECD FATF blacklist. The attraction to the Caribbean of offshore activities that are either illegal or considered unsavory in other jurisdictions work against a favorable "branding" of the region.
- Interaction between the public and private sectors is lacking.
With the exception of St. Lucia, interaction between the public and private sectors is lacking, hindering the advancement of ICTs in the ECTEL countries. Even the NTRCs do not effectively communicate with the private sector industries they regulate and their citizens.
- Lack of transparency and access to legislation, laws, and regulations.
Statutes and regulations are not available online and there is no requirement for public access to and comment on pending legislation and regulations. Annual indices of laws and amendments are published in hard copy form through the University of West Indies Law School, but these are not available online. The inability to efficiently refer to the

laws and regulations in the Caribbean countries makes doing business difficult, increases legal fees, and deters foreign investment.

- Lack of coordination by donor organizations and lack of initiative by countries.
Although there is a general lack of coordination by donor organizations regarding activities in the OECS/ECTEL region, there is also a lack of initiative by countries to chart their own destiny. Thus, donor projects are undertaken that overlap, synergies are lost, and countries are getting donor projects that are not desired as part of an overall country or regional plan.

Pipes Summary of Findings

The ICT Assessments did not analyze the telecommunications legal/regulatory environment, as the liberalization process is well underway in ECTEL. The findings in the Pipes section were fairly consistent across the region, with Dominica showing leadership in the development of rural telecenters for youth training. A summary of the Pipes findings follows:

- Frustration by Governments and business with the high cost of telecommunications.
As the ECTEL countries become more aware of how the high price of telecommunications is costing them foreign direct investment and growth, the Governments, their citizens, and businesses are becoming more resentful of Cable & Wireless, the monopoly provider. In both Dominica and Grenada, this has fueled a dangerous trend of talks and plans for new Government networks to offer lower-cost telecommunications.
- Lack of access in rural, underserved areas, need for telecenters.
There is a general lack of access in rural and underserved areas of the islands. The digital divide between those living in the larger cities and those in rural and underserved areas is critical. Telecenters or access points in these areas are badly needed. Dominica has partially addressed this problem by allowing competitor providers to service these populations. Dominica also has an exceptionally well organized rural telecenter project for training youths in ICT skills and in educating trainees in traditional fields how to use technology for increased job performance and efficiency.
- Government infrastructures are weak, with few Intranets.
As the nations' largest employer, the island Governments have poorly developed infrastructures, with little networking. Grenada shows the most promise in thinking through a Government infrastructure and Intranet that will facilitate e-government applications as well as intra-governmental communications and file sharing.
- Poor network security.
Network security is lacking in all the islands, and, in part, this is understandable due to the lack of government networks and infrastructure. It is simply a topic that has not been on the agendas of government leaders. However, confidence in the use of ICTs and e-government applications will require the Governments to take the lead in this area and ensure their networks and data are secure.

- Need for regional uplink/videoconferencing capability.
The countries in the OECS region have a hard time communicating among themselves outside of telephone and person-to-person meetings. There is no capability on the islands for them to uplink local content, coordinate regional efforts, share information, and participate in events via videoconferencing. In addition to uplink capabilities, a shared public/private video conferencing facility would greatly facilitate inter-island communications, information exchanges, and trade.
- Need for shared video distance education facilities.
There is a need for two-way video distance learning capabilities across the region. The University of West Indies (UWI) currently uses two-way audio to deliver courses to the islands, but has no video capability. All educational institutions (public and private) in the ECTEL countries clearly indicated their desire for distance learning. Not only would shared video distance education capabilities enable UWI's four-year degreed computer science program to reach all the islands, it would enable educational institutions to tap into North American and European university and ICT course content.
- PCs in schools need to be upgraded, repaired, and provided with Internet access.
All the schools in the ECTEL islands suffer from outdated PCs, lack of technical support, lack of or incomplete networking of PCs, and inadequate access to the Internet.

Private Sector Summary of Findings

The ICT Assessments revealed similar problems among the private sector in all of the islands. The Assessment interviews also uncovered a clear desire on the part of island businesses to work on a regional basis to advance the competitiveness of their companies and their national economies. The opportunities for USAID regional activities are great and could serve as a model for other regional donor initiatives around the globe. Private sector findings that were consistent in each of the ICT Assessments include:

- Little coordination or involvement between governments and private sector.
Only St. Lucia seemed well positioned to work effectively with the private sector. The Office of Private Sector Relations is housed in the Prime Minister's office and is headed by a former executive director of the St. Lucia Chamber of Commerce. Other ECTEL countries have not effectively organized or sought private sector input on ICT issues and business problems.
- No definition of ICT industry and workforce needs.
Beyond the general idea that each island should develop an ICT industry sector, little analysis has gone into what types of businesses are feasible for the countries, their infrastructure, intellectual capital and workforce skills, and facilities. St Vincent/Grenadines has shown regional leadership in this area, however, through its investment in a call center and its eagerness to promote ICT job creation through a National Institute of Technology. More analysis, however, needs to be done to advance both of these goals and further define what types of ICT skills are needed. St. Kitts has

also shown leadership, as it is the only ECTEL country to recognize the dire shortage of network engineers and high-end technical workers and is promoting a training program for these types of workers.

- General lack of understanding by business community how to use ICTs in core processes.
Overall, businesses are using ICTs for word processing, email, and limited back room functions. They need to gain a better understanding of how to leverage ICTs in their core business processes to improve efficiency, cut costs, and become more competitive.
- Need to expand ICT-enabled industries.
So far, the islands tend to think of ICT industries in terms of either call centers or high-end software programming. There is a need to expand the ICT-enabled industries in the region, building on the strengths and capabilities of each country. Examples of some of the more advanced industries that could be pursued include data storage centers, remote systems administration, data bank development, and “back room” processing functions.
- Lack of dialogue between the private sector and education professionals.
There is little interaction between the business community and education professionals regarding the skills businesses need and the inadequacies they are experiencing with the workforce.
- Lack of venture and equity capital for ICT companies.
Across the islands, the local banking community does not understand the nature of ICT companies and how to evaluate their potential for loans and investment. Technical assistance in this area would be welcomed.
- Perceived favoritism of foreign investment over domestic investment.
Many business people on all the islands resent the emphasis placed on attracting foreign direct investment and perceive a favoritism that works to discriminate against the local entrepreneur.
- Business development and competitiveness support is inadequate.
There is a consistent need across the islands to assist businesses in understanding their markets and how to grow and become more competitive. There is the need to improve the quality and consistency of products, packaging, labels, etc. Businesses need to enhance their business management and marketing skills, as well as develop business expansion plans covering advertising, distribution, payments, etc.
- Need for shared upstream business services.
Businesses need collective distribution, warehousing, shipping, and foreign market business development capabilities. At present, each of these areas presents a formidable – and expensive – barrier to conducting business outside their own islands and region.
- There is a need and desire for regional “branding” of Caribbean goods and services.
Each of the ECTEL countries recognizes that they can do more as a whole than independently. Therefore, they expressed a strong desire to build an international portal

to enable them to develop a regional brand and sell their goods and services through collective advertisement, hosting, development and e-payment services. The islands do not, however, understand how to combine their national interests and develop such a regional portal and brand.

- Inadequate SME support.
SMEs are important generators of jobs, innovation, and flexibility in the market, yet they receive little support.
- Inadequate legal protections for consumers and businesses.
The legal/regulatory frameworks of all the ECTEL countries do not provide adequate credit card liability protections for consumers and businesses. Thus, both sides are reluctant to engage in online commerce.
- Lack of effective use of Diaspora.
Only Dominica seems to have effectively engaged a group of Diaspora. Each country could advance its ICT interests if it engaged its Diaspora in the U.S. and Europe to help them reach foreign markets, expand ICT opportunities, attract FDI, and develop their national and regional ICT plans.

People Summary of Findings

As in the other areas examined in the ICT Assessments, there were common themes in the factors considered in the “People” section of the Assessments. St. Kitts/Nevis and St. Vincent/Grenadines have at least targeted higher-end ICT training, but have not addressed many of the problems that are pervasive in the educational systems across the islands. The key findings of the “People” area are:

- Need to keep all students in school beyond age 12.
All of the islands still administer the Common Criteria examination to 12 year-old students and will not advance those students who do not pass the test. This practice may have been acceptable for agricultural economies, but cannot be sustained in knowledge economies. It puts workers into the workforce who cannot compete with the demands of modern businesses and operations and diminishes each country’s chance to advance.
- The Caribbean Examination Council test needs to be updated.
The Caribbean Examination Council (CXC) test given to secondary students is out of step with modern business needs, especially regarding proficiency with ICTs. The CXC and OECS are addressing this problem, however, the matter is urgent.
- Need to upgrade local education content.
The curricula and course content for both primary and secondary schools needs to be upgraded to integrate ICTs into the course work and to develop ICT-specific courses that meet the market needs.
- Lack of four-year degreed computer science program and certified ICT skills.

Although UWI offers a four-year computer science degree, it is not offered, even via distance learning, in any of the ECTEL countries. Likewise, none of the countries have internationally recognized ICT schools that provide vendor certified programs. Cisco has expressed an interest in establishing a Cisco Academy in Dominica, however, this has been held up due to government bureaucracy. Additionally, the islands do not have the capability to reach North American and European university and educational content, which would help prevent brain drain from students who leave to study and do not return.

- IT support for PCs in schools needs to be improved.

The favored approach in all the ECTEL countries is to train teachers to troubleshoot and fix PCs and to function as the system administrator. This is an unworkable situation that leads to burned out staff, broken PCs, and dysfunctional networks. Adequate support for ICTs must be provided if the notion of an ICT industry sector is to succeed.

- Need to expand use of school labs.

There is the need to expand the use of the school labs during school “off hours” to enable them to be used as telecenters and provide community access, ICT basic courses to adults, SME support, etc.

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Assessment Recommendations

The following recommendations were derived from the Assessment findings and are valuable to each of the ECTEL countries. As such, they are intended for regional application to promote synergies and a regional thrust, with individual countries taking a leadership role in areas where they have demonstrated strengths. They are designed to create buy-in from all stakeholders, including government officials and to link together to create a development plan that will foster the widespread deployment and utilization of ICTs as well as economic growth and advanced competitiveness.

They are also intended to provide a shopping list for USAID, other donor organizations, and country leaders to enable them to select projects that fit with their current initiatives and plans, thereby giving them additional momentum. The Assessment teams strongly urge the donor community to improve their own coordination and increase efforts to build off each other's work. The ICT Assessments provided a good model for this: the USAID-funded Carana teams interacted before and after their work with the World Bank-funded GOPA team and even participated in GOPA's final conference.

Public Sector Recommendations

1. Legal/regulatory technical assistance (TA) to draft model regional laws to accommodate ICTs, including e-transactions, e-signatures, e-payments, privacy and data protection, consumer protection, and security and cybercrime. This should include protections for consumers and businesses for credit card payments. The development of these laws and regulations needs to be in harmony with the global developing legal framework concerning ICTs.
2. TA to instill transparency in the legislative/regulatory process and provide online access to laws and indices. The ECTEL countries have very little internal legal support for drafting legislation, ensuring review/comment, and in making available to the public draft legislation and regulations. There are no statutes online. Annual indices of laws and amendments are prepared by the University of West Indies Law School in hard copy only. Draft legislation, orders, and regulations are prepared using word processing and submitted to UWI electronically. These services could be expanded via a regional Web site with full-search capabilities.
3. Regional workshop on (a) organizing governments effectively to leverage ICTs, (b) establishing public/private forums, (c) helping senior government personnel understand the value of ICTs, and (d) establishing investment incentives for foreign direct investment (FDI). Inter-ministerial task forces and public-private forums organized by the Prime Minister serve as critical focal points in addressing ICT-related topics. Likewise, senior government officials need to understand the value of ICTs and how they

can be leveraged to advance their agency goals and national interests. Investment incentives in the Caribbean are still geared toward manufacturing and traditional industries. Government officials need to understand how to revamp their incentive programs to attract ICT industries and FDI.

4. TA to help countries develop national ICT plans and to assist OECS in developing a regional ICT plan that includes regional “branding.” National plans would include a definition of the ICT sector for each country and set out a strategic and tactical plan for advancing ICTs in each country. Both national and regional plans would be developed with the involvement of the private sector, NGOs, educational representatives, and citizens. Grenada’s leadership in this area should be leveraged.
5. Regional workshop on effective enterprise management of ICT resources. The ECTEL country governments need to understand how to develop system architectures that will accommodate various Ministry needs, provide security and privacy, manage ICT resources, support e-government and internal system applications, and allow growth. This content of this workshop could be modeled after the U.S. Chief Information Officers’ Council and their business case approach to management of ICT assets.
6. TA to develop national post-preference economic plans, including analysis of competitiveness of existing industry sectors and how ICTs can boost their productivity, efficiency, and competitiveness. Guidance and assistance can be offered on a regional basis, with individual assistance to each country. This approach will help advance regional solidarity and will enable each country to draw upon the expertise and ideas of the others.
7. Program to develop support services for SMEs to enable them to have better front-end counseling, financing, regulatory exemptions, and shared ICT services, including software packages that can increase their business potential and handle administrative functions. This will necessarily involve enhancing the National Development Corporations and strengthening their knowledge/skill set and capacity in ICT business strategies.
8. Continue efforts to support and strengthen the National Telecommunications Regulatory Commissions. The NTRCs will need to be able to address increasingly complex telecommunications issues and handle administrative matters efficiently, lest telecom liberalization efforts be delayed due to learning curves and inefficiencies at the NTRC level. The continued liberalization initiative is crucial to the deployment of ICTs in the region.
9. Technical assistance to help governments in prioritizing, planning, and launching e-government initiatives, especially those that have a broad impact or pertain to public health. ICT needs in public health systems are both administrative and patient-related. Specific areas needing attention include hospital accounting/financial systems, patient records, and health “surveillance” or disease incident collection/reporting. Government forms and commonly required filings are e-government applications that can have wide

impact but are relatively easy to implement. Further analysis to determine what systems would have major impact in the ECTEL countries is needed. Each country could select one application to pilot in its country, with the result being five different e-government applications tested almost simultaneously. Access to e-government information and services can be via cyber cafes, postal shops, rural telecenters, community centers, and kiosks in public locations.

10. Advance initiatives to automate court registries and analyze court administration and case management systems. Considerable efficiencies could be realized through automated processes for recording births, land deeds, business/commercial registrations, and other court filings.

Pipes Recommendations

1. Project to promote telecenters in rural/underserved areas to help bridge the “digital divide” and provide ICT training, access, and SME support. This would include expanding the use of school labs. In remote, low-density, and low-income areas of the islands, even a liberalized market may not be adequate. Dominica’s leadership with its Youth Enterprise Centers that are equipped with PCs and provide training to out-of-school youths should be leveraged.
2. Seminar on effective government networks and security considerations. Network engineering design considerations, including bandwidth, must be understood before networks are built. Likewise, security considerations must be factored in from the beginning. This includes intrusion detection and response, retention of data, disaster recovery and contingency planning, and international cooperation between industry, governments, and law enforcement.
3. Development of regional uplink capability that could also be used for shared video distance education. In small island broadcast markets, it is virtually impossible for local cable and broadcast operators to justify purchasing uplink hardware to broadcast periodic political, sporting or musical, or international events out of the country. The joint acquisition of a transportable “Fly Away” video uplink capability could serve all the islands (public and private sectors) on an on-demand basis. It would (a) enable more participants to virtually participate in conferences and events, (b) facilitate the exchange of information, and (c) improve private sector business capabilities. Additionally, if this uplink capability were expanded to two-way, it could be used to expand ICT and traditional course offerings.
4. Upgrade PCs in schools, network labs, and wire for Internet access. Many schools are not fully wired; PCs are outdated or broken; many labs are not networked; and Internet access is limited. If the ECTEL countries are to even hope to utilize ICTs as an economic driver and avenue for higher skilled jobs, students must be trained on and proficient with current systems that enable them to access the Internet and understand a modern, interconnected world. Wireless networking capabilities greatly simplify the process of wiring a lab and also provide greater flexibility.

Private Sector Recommendations

1. Seminar on effective public/private interaction, including educational needs of workforce. It is critical that the development of ICT-related curricula in secondary and tertiary schools be shaped by the demands of the private and public sector. Today, graduates are generally not qualified to fill ICT jobs, even at call centers, without supplemental training by employers. St. Vincent/Grenadines' investment in a call center and its commitment to acquire a qualified workforce provides valuable experience that should be leveraged. In addition, St. Vincent/Grenadines plans to establish and finance a National Institute of Technology to train 3,000 to 5,000 employees for ICT jobs. St. Kitts/Nevis has launched a program to train network engineers. The leadership of these two countries could provide valuable input to this seminar.
2. Training program for banking community on financing and investment considerations for ICT firms, and varying considerations for domestic and foreign investors. ICT-related firms are frequently service oriented and without a lot of capital investments, thus, do not have traditional means of securing loans. Awareness training and TA to the local banking sector will help them reach a comfort factor that will enable ICT industries to grow.
3. Project to advance private sector business development services and competitiveness support, including upstream business services and Caribbean "branding." There is a need to help businesses (a) improve the quality and consistency of products, packaging, labels, etc., (b) enhance business management and marketing skills, (c) gain access to venture capital, (d) develop business expansion plans for entering new markets, including advertising, distribution, payments, etc. Additional upstream support is needed in targeted markets to provide collective shipping, warehousing, delivery, and distribution of goods.
4. Project to develop an international portal for regional products/services, such as a virtual "Shop Carib" or "Caribbean Mall" that would enable Caribbean companies to collectively market their products/services on the Internet. Collective advertisement, hosting, development, shopping carts, banking services, etc., would keep costs to the individual company low, while increasing the potential for generating traffic to the Web site.
5. Project to expand ICT-enabled industries. In defining what an ICT sector will encompass, each country will need to explore how ICT-related industries can operate in their countries, whether existing facilities and workers can meet their needs, what incentives will likely be required, and the impact of the businesses on the economy. Analysis in each of these areas is critical to the development of national ICT plans and new curricula. The leadership of St. Vincent/Grenadines and St. Kitts/Nevis should be leveraged in this project.

6. Seminar on helping businesses understand advanced uses of ICTs in core business processes. Awareness training on the use of ICTs to improve core business processes will help companies become more aware of how ICTs can be more effectively leveraged to gain competitive advantages through lower costs, streamlined processes, etc.
7. Development of program to enable each country to better network with their Diaspora and communicate with them through the international portal to ensure regional interests are advanced.

People Recommendations

1. TA to help revamp the Common Criteria and Caribbean Examination Council examinations and educational system and develop guidelines for course content in line with a knowledge economy and workplace requirements.
2. Project to establish a four-year degreed computer science program across ECTEL countries and to explore educational affiliations with internationally-recognized ICT educational programs (public and private). There appears to be a collective demand for video streaming of course content and an opportunity for educational institutions to share in a hub/teleport facility on each island that would allow a shared facility to receive broadband and then connect to the actual delivery point via terrestrial microwave. This would enable a number of educational institutions to expand capacity with limited cost.
3. Project to train system support technical staff for maintenance of school PCs and networks. Possibilities worth exploring include programs modeled after the U.S. Peace Corps and Canada's Global Net Corps (now available through the Digital Opportunity Trust). Under the Canadian program, youths are trained to provide ICT-related support in-country and commit to provide support in the form of community service for 6-9 months. Similar to the U.S. Peace Corps, a small stipend is provided while they are in the program. There may be a linkage between this service and the IT training for out of school youth. Leadership exhibited by Dominica's Youth Division program and St. Kitts/Nevis's training for network engineering should be leveraged.