**"Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Island Developing States (SIDS) Project"**

*Final Report*
*IDSD Project*
*March 2004*

## *Introduction*

The Information for Decision-making for Sustainable Development Project, or IDSD, as it is often referred to, arose from a joint recognition by the United Nations and the Organization of American States that countries in the Caribbean still require support in creating mechanisms for the effective management of information for sustainable development and environmental management, and in defining ways to harness this information for decision-making purposes. It follows on from an earlier UN/CARICOM Initiative, "Strengthening Capacity in the Compilation and Dissemination of Statistics and Indicators for Conference Follow-up in the Caribbean region," which addressed Environment, Gender and Social Statistics. The latter was completed in 2002.

The project goals were to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii) develop core curriculum and materials for regional training of trainers; and (iii) create a regional electronic site for accessing information on information management systems and techniques. The project was executed from November 2002 – February 2004.

The project implementation methodology is based on a four-pronged approach:

1. An **assessment** of existing activities and capacities in the region based on previous project or on existing or planned activities related to the project focus.
2. The collation of **best practices and tools** which can assist the pilot countries in managing information for and reporting on sustainable development. Training in the use of these tools will also be provided.
3. Facilitating the **sharing of information** on sustainable development through the establishment of a pilot network within the region and the development of a website, through SIDSNET, to address gaps in access to information. The use of SIDSNET as a portal and hub will also be encouraged.
4. The enhancement of existing **technical capacity** through the support of new equipment i.e. hardware and software, as appropriate. This will further enhance the capacity to use the tools, which have been selected as useful and appropriate to the needs of the countries. **Further training** will be provided at the national level to build capacity in the use of the equipment.

This report provides a summary of all activities completed under the project, including outputs and notable achievements. The report also provides a financial summary of all expenditures.

## *Summary of Progress and Accomplishments*

### 1. Assessment and Establishment of Baseline

**Status: All activities Completed.**

Under this task, two main activities were conducted:

- the establishment of a baseline
- and a meeting of regional resource persons

*1.1 Establishment of Baseline*

The Assessment of capacity and capacity-building efforts in information for decision-making was accomplished through a series of Assessment Missions to the region to Barbados, Belize, Jamaica, Saint Lucia and Trinidad and Tobago from December 2002 to April 2003 as well as intense internet research and requests for information from various agencies. During these Missions, the IDSD Field Manager and, at times, the UN Project Manager, met with representatives of government agencies, non-governmental institutions; regional specialized institutions, and project teams.

The output of this four-month effort was the report "Assessment and Establishment of a Baseline on Information for Decision-making in CARICOM Small Island Developing States". In the report, there were critical findings including the confirmation of persistent challenges in making the information collection process relevant for decision-making. Additionally, it was found that though much more technology is available there is still no clear picture of what is the basic minimum that government and agencies should put in place to fulfill their obligations.

The assessment report was well received by the agencies and persons met with during the Missions and by others. It was also seen by the Whitewater to Bluewater Organizing Committee as a useful window to the breadth of activities ongoing in the region. The report has been disseminated to all agencies which provided information and insight into the issues and has been made available on the IDSD website at http://www.oas.org/usde/idsd/pdf/IDSD_PROJECT_ASSESSMENT_REPORT.pdf.

The Assessment has served to set the tone for the rest of the project and has done much to further identify critical activities and the general focus of the project.

Country selection of thematic areas

Given the limited project time frame and a desire to make a contribution to existing activities, it was decided that it would be more realistic for countries to work on one of the thematic areas of the project. As a result of a coordination meeting on Thursday May 29th, 2003 after the Resource Person's Meeting in Saint Lucia, the countries selected the areas they would focus on as follows:

- Barbados – Sustainable Tourism
- Belize - Disaster Management/Climate Change
- Jamaica - Land-use planning

- St. Lucia - Coastal Zone management

The timing was right on many levels for much of the work of the IDSD project. St. Lucia had just completed its Coastal Zone Management Project and is looking to establish a National Coastal Zone Management Unit (CZMU). Looking at this issue as part of the project facilitated the structures put in place and assisted the government in determining monitoring structures for that CZMU. Also, since Barbados has one of the most effective and prominent CZMUs in the region, St. Lucia benefited from their experience in this area. Additionally, the selection of Disaster Management and Climate Change by Belize allowed the country to prepare for and take greater advantage of the imminent commencement of the Mainstreaming Adaptation to Climate Change in the Caribbean (MACC) project and the operation of the Caribbean Community Climate Change Centre (CCCCC) which are both recently based in Belize. Belize was also be able to integrate its present participation in the CIDA- funded Caribbean Hazard Mitigation Capacity-building Programme (CHAMP) project on Hazard mapping.

Formal agreements with the four pilot countries were reached in August 2003.

*1.2 Regional Experts' (Resource Persons)' Meeting*

The meeting of resource persons which was held in the island of Saint Lucia from May 27th-28th, 2003 was quite successful. The objective of the meeting was to bring resource persons from across the region and from varied disciplines to discuss, analyze and recommend actions and steps relating to "Using Information for Decision-making in Sustainable Development". Representation included the United Nations SIDS Unit and the Statistics Division, the Organization of Eastern Caribbean States, the Food and Agricultural Organization, the Caribbean Tourism Organization, the Climate Change Project Unit of CARICOM, the Caribbean Environmental Health Institute and the Caribbean Disaster and Emergency Response Agency.

Thirty-seven (37) participants in total from more than 30 organizations attended, representing a broad cross-section of areas including community involvement, health, tourism, agriculture, and climate change, to name a few. Government agencies, regional specialized agencies, regional political organizations and internal development agencies were represented.

The working group discussions were particularly fruitful in underscoring some key issues to be addressed in the thematic areas selected for the project.

The main highlights/recommendations from the meeting were:

- The need for policy frameworks and structures to address the development, sharing and access to data;
- The need to build on existing networks and not create new ones; and
- Efforts should be made to use and work with existing information management and decision-support systems and contribute to their further development.

One of the key outputs was agreement to form an e-group from within the existing CCA listserv for Information for Decision-making for Sustainable Development.

All workshop documents including the agenda, presentations, and background papers are available on the web at http://www.oas.org/usde/idsd/workshops/workshop1.htm. The final report of the workshop is attached, as *Annex A (we have designated letters to the annexes to this final report to distinguish them from the numbered annexes contained within each annex)*, as a separate file to this report, and was made available for review and discussion. The workshop report is available at the IDSD website at: http://www.oas.org/usde/idsd/pdf/Report1rev1.pdf.

## 2. Development of Methodology Tools, and Training Materials and Course

The main areas of activity under this task were:

- Establishment of Pilot Network
- Methodologies, Best Practices and Tools
- Implementation of Training Course
- Review of Training Materials and Finalization
- Translation of materials for website

### *2.1 Preparation of Training Materials*

#### 2.1.1 *Design and Establishment of Pilot Network (Ongoing)**

One of the critical outputs for the project was the creation of a pilot network on Information for Decision-making. To assist the OAS and the UN in determining the best framework and approach to such a development, the OAS contracted a consultant from the region with wide experience in this area and who had been involved in the field of information management as well as in the development of networks.

Clearly, there are many networks available worldwide and several at the regional level. Amongst the concerns which shaped the development of the network was to build on existing activities as well as to ensure its sustainability. The review covered SIDSNET, the Sustainable Development Networking Programme (SDNP) (in particular pilots in Jamaica and Guyana), and the UNEP CEPNET project. The consultant developed a draft report, which provided clear and important guidance related to the development of the networks and provided recommendations for the creation of a network for IDSD.

As a step towards this, during the Resource Persons' Meeting held in Saint Lucia, the issue of the development of an IDSD network was discussed and it was recommended that it be created within an existing network or added to such a network. Consideration is being given to linking the proposed IDSD network with the CCA's Regional Environmental Information Network. Already, OAS and CCA joined forces in building a network of partnership and ideas in the creation of an e-group, facilitated by the CCA, on IDSD matters. The proposed network would build on this relationship. The final report, containing the findings and recommendations of the consultant is available on the web at http://www.oas.org/usde/idsd/pdf/pilotnetwork.pdf , and is attached to this report as *Annex B*.
As of June 12th, 2003, a temporary e-group had been established on the issue of "Information for Decision-making for Sustainable Development" accessible through *CCAOASIDSD@yahoogroups.com.*

*Note: The emphasis of the project in the last months of execution turned towards training and procurement and installation of equipment, which were seen as essential by the participating countries. Therefore, this activity had to be relegated as a lesser priority. It is expected that it will be pursued in a follow-up activity.

2.1.2. *Identification of priority training needs*

In conjunction with the Establishment of the Pilot Network, the project contracted Mr. Moustafa Toure as a consultant, in order to prepare a report which identified priority training needs for promoting the use of information technology tools and the management of information technology. Mrs. Maritza Hoo-Huong, who worked on the design of the pilot network, also contributed to this effort, and vice-versa.

The report included findings of discussions with a number of institutions in Jamaica, amongst them the University of the West Indies Mona, The Caribbean Energy Information System, the United Nations Environment Programme – Regional Coordinating Unit, and the University of the West Indies Centre for Environment and Development, all of which are involved in capacity-building and in efforts relating to information management. The final report is attached as *Annex C* and is also available at http://www.oas.org/usde/idsd/pdf/training_needs.pdf

Informing both of these reports were missions to the pilot countries. During the Resource Persons' Meeting in Saint Lucia, a brief questionnaire was distributed to also obtain the opinions and input from the participants on areas of need with regard to capacity-building and training as well as generally in the area of IDSD.

This activity was completed in early July 2003; the outcome from the missions and the consultant's reports was a preliminary list of training needs, constraints, and technologies which greatly informed the design of the training manual and the course as well as the selection of technologies and equipment in the latter part of the project.

2.2 *Design of Training Manual and Course*

One of the main objectives of the IDSD project was to train a cadre of resource persons in methodologies, techniques, and tools related to general information management and as it related to the four thematic areas of the project – Land use planning, Coastal Zone Management, Sustainable Tourism, and Disaster Management/Climate Change. This capacity-building effort was based on a number of inputs, including the identification of priority issues and the identification of training needs, the identification of appropriate methodologies and tools, and the design of a training course to be implemented during the project.

The training course was performed during a workshop convened in Trinidad and Tobago in October 2003. Twenty-three participants from six countries – Barbados, Belize, Jamaica, St. Lucia, St. Kitts & Nevis, and Trinidad & Tobago – attended, amongst them representatives from national government; national and regional NGOs such as the Caribbean Network for Integrated Rural Development (CNIRD), the Caribbean Conservation Association (CCA) and the Belize Audubon Society; and specialized institutes such as the Caribbean Community Secretariat (CARICOM), the Caribbean

Environmental Health Institute (CEHI), and the Organization of Eastern Caribbean States (OECS). Training was provided by representatives of Departments, Units or Centres from the three campuses of the University of the West Indies (UWI), as well as the University of Costa Rica. The development of the training materials was coordinated by the Caribbean Center for Administration for Administration and Development (CARICAD) – a regional agency. The Division for Sustainable Development of the UN Department of Economic and Social Affairs also participated as a trainer.

The training course addressed the three main pillars of sustainable development: economic, social, and environment, as well as the specific issues of development in the context of Small Island Developing States. The training materials also covered the thematic areas of the project and provided specific training in those areas that related to tools, techniques, methodologies, and approaches. Participants were introduced to basic concepts in information for economic, social, environment/natural resources and development, as well as to the basics in statistics and indicators for sustainable development, and were exposed to the applications of GIS in information management.

The final report on the workshop is included here as *Annex D*, and can be downloaded at: http://www.oas.org/usde/idsd/pdf/workshop_report_final.pdf. The report includes summaries of the presentations and course materials, and a summary of participant's evaluations of the workshop.

Following the workshop, the training course materials were uploaded to the IDSD website, and a revised CD containing the course materials was distributed amongst the participants, constituting a training manual.

Country representatives were asked to discuss amongst themselves and to identify in a very preliminary way where they felt technological support through hardware and software could facilitate their present and future efforts in information for decision-making. Following up on these discussions, equipment to be procured to the pilot countries was identified, along with short courses geared towards coinciding with the installation of the equipment.

## 3. Establishment of Regional Electronic Information Centre

### *3.1 Development of IDSD Website*

A website on information for decision-making, including the general issues, thematic issues, discussions on issues such as metadata, networks, and which made guidance documents and training materials available was seen as key. One of the main objectives of the website was to make information more accessible to persons in the region.

The website was developed in consultation with a small group of colleagues from the region, amongst them the CARICOM Regional Project Implementation Project Unit for Climate Change (in Barbados), the Ministry of Environment of Barbados, and regional consultants, who were invited to review and comment on the website and its contents.

The IDSD website was officially launched during the Resource Persons' Meeting in St. Lucia in May 2003 and later via email on June 02, 2003 and was located at http://www.oas.org/usde/idsd/. From

March 2004 onwards, UNDESA will host the IDSD website, and will be in charge of additions or revisions to the website.

The website was developed in two parts – (i) project – specific: dealing specifically with the project – overview, progress, and outputs and activities and (ii) as an ongoing gateway/forum for information access and exchange: addressing general issues and also providing links to institutions, activities, databases, papers and reports, and links; it was felt that the website should have a life outside of the project and could be a forum for addressing the issue long after the completion of the project.

(I) Project-specific: Information on all activities related to the project are provided here, including materials generated from the Resource Person's Meeting held in St. Lucia in May and the Training Workshop in Methodologies, Tools, and Best Practices held in Trinidad and Tobago in October 2003. Included here are presentations, final reports, and documents generated for the workshops.

(II) Informational gateway/forum: The website is linked to other activities and websites of regional and international institutions active in the region. The IDSD website has also been officially linked to other relevant electronic networks in the region such as SIDSNET and the Island Vulnerability website. The website also contains links to relevant upcoming meetings.

The website offers various approaches to addressing Information for Sustainable Development including overviews, references, materials, training and guidance on:

- Methodological Approaches
- Networks, Gateways, and Portals
- Data Storage, Inventories, and Metadata
- Geographic Information Systems
- Information and Communication Technologies
- Development of Indicators,
- Methodologies in multi-criteria dimensions in decision-making, and
- Statistics

Further to the launching of the website and the execution of the Resource Persons' Meeting, an update of the IDSD website was completed, including the following additions:

- Information on a IDSD Pilot network
- A listing of links to sustainable development projects in the region categorized by subject area.
- Information on agreements, reports, and publications available online relevant to sustainable development activities in the Caribbean SIDS.
- Information on discussion groups.
- A list on UNDP-GEF projects in SIDS countries.
- Further training materials and guidance documents on metadata development and use, ecological modeling, and capacity development.

- Databases providing content on climate, disaster management, economics, health and social, natural resources management, science, and sustainable development.

Positive comments on the website have been received since its launching. One key challenge is the regular updating of the information. With the provision of equipment and with the development of technical and institutional capacity, it is anticipated that countries will be able to maintain the use of this mechanism for their own needs and for information-sharing amongst themselves.

*3.2 Procurement of equipment and training*

Once the initial training course was completed, the project sought to coordinate the purchasing and delivery of hardware and software, based on the findings of the workshop and the priority training needs assessment, as well as the needs to further key information management systems already in place. The equipment was provided to the participating countries, with the purpose of supporting the continuation of the informational link and enabling the training of personnel at the national level across the region.

This training was conducted at the national level and accompanied the installation of the equipment provided. The exercise was facilitated by personnel trained in the initial course, supported by a consultant with the aim of widening the impact and improving the availability of the tools whose accessibility would have been facilitated by the project.

Procurement of equipment

In the final quarter of the IDSD project, US$7,000 was made available per pilot country for the procurement of equipment to support capacity building and the use of the methodologies and best practices identified in IDSD trainings. The countries determined their equipment needs as initially identified during the IDSD Training Workshop in Trinidad, and the purchase was made by the IDSD Project, following OAS procurement procedures. The following equipment was purchased and distributed to the pilot countries:

Barbados: Laptop computer, Camera, Desktop computer
Belize: ArcGis Technology and Desktop Computers, Design Jet Plotter, and Handheld GPS
Jamaica: ArcGIS Technology
Saint Lucia: Data Storage and Back-up System

Training at the National Level

In the final quarter of the project, national level training was conducted in three of the pilot countries, in concordance with the delivery of the equipment pertinent to the subject areas of the training

efforts.[1] The countries identified their training needs and organized the training, with assistance from the IDSD Project. The training topics were:

Belize – Disasters and Climate Change
Jamaica – National Training Workshop on Information Management Methodologies, Tools and Best Practices
Saint Lucia – National Environmental Statistics Information System

Documentation on these trainings is attached as *Annexes E1-3*.

### *3.3 Preparation of Final Report*

The project evaluation is a critical aspect of the finalization of project activities and the preparation of the final report. It is an opportunity to review the project and its execution and ascertain the project's success in meeting its goals and objectives and to attempt to evaluate any level of impact of the project on the beneficiaries, particularly in terms of capacity building. The IDSD Project Evaluation was conducted by Dr. Carol James, after all of the major activities had been initiated and/or completed. The evaluation was conducted in all four pilot countries, with in-depth studies in Barbados and Saint Lucia. The report included an introduction to the assignment; an outline of the methodology utilized; findings of the interviews and contact with respondents; identification of both successes and constraints; lessons learnt; and recommendations for the way forward on this issue generally. The methodology for the evaluation consisted of a review of project documentation, design of question sets and electronic questionnaires. The Evaluation Report is attached as *Annex F*. Comments from the GS/OAS staff member that served as IDSD Project Manager throughout most of the project are attached immediately following the evaluation.

## *Sustaining the effort - Next Steps*

Quite a few people have noted their appreciation for the approach taken by the project and its overall methodology. In particular, recognition is being given for using and furthering the work carried out by other institutions and the efforts dedicated to building partnerships.

[1] The fourth pilot country, Barbados, was not able to complete the training prior to the conclusion of the project. The only dates that the Government of Barbados was able to hold a workshop was following the end of the project, so unfortunately, it was not able to take place.

Table 1. Activity Matrix (as of March 30th, 2004)

| Project Task | Sub-activity | Inputs | Outputs Realized | Status |
|---|---|---|---|---|
| Assessment and Establishment of Baseline | • Assessment Missions | • Travel to Barbados to meet with donors<br>• Meeting with donors, agencies, governments, experts | • Direction for project activities<br>• Identification of resource persons<br>• Identification of efforts and activities that IDSD could link with; | Completed |
| | • Assessment Report | • Reports from Assessment Missions<br>• Research | • Broad picture of activities and direction in information for sustainable development<br>• Identification of systems which warrant further investment | Completed |
| | • Resource Persons' Meeting | • Travel and conference costs<br>• Presentations by agencies, governments etc | • Establishment of a working group/network of persons interested in the area;<br>• Commitment to collaboration on related efforts<br>• Establishment of an e-group<br>• Discussion papers and examples of effective mechanisms to address decision-making on SD | Completed |
| Development of Methodology, Tools and Development and Implementation of Training Course | • Establishment of Pilot Network | • Consultant expertise<br>• Meetings with regional agencies<br>• Assessment of existing and previous networks | • Review and assessment of fundamentals for network creation<br>• Identification of potential areas to be covered by network and framework<br>• Identification of activities to be included in the network | Completed |

| Project Task | Sub-activity | Inputs | Outputs Realized | Status |
|---|---|---|---|---|
| | • Design and Implementation of Training Course | • Consultant expertise<br>• Collaboration with regional agencies<br>• Assessment of priority training needs<br>• Results from questionnaire | • Training Materials<br>• Trained regional resource persons (30) | - Completed<br>- Completed |
| | • Review of Materials | • Consultant expertise – independent review<br>• Responses from trainees at workshop to questionnaire | • Assessment of effectiveness<br>• Information for review | Completed |
| | • Uploading of materials on website | • Consultant expertise | • Materials available on web and accessible to all including countries | Completed |
| Increased Access to Information on SD and Electronic website | • Development of website | • Consultant expertise<br>• Research<br>• Information and guidance from countries and agencies on what is needed | • First iteration of website<br>• Links with SIDSNET and regional agencies website | Completed |
| | • Update of website and increased access to information on SD | • Consultant expertise<br>• Comments from users<br>• Suggestions and recommendations from resource persons' meeting | • Revised and updated website<br>• Specific links and pages on tools, methodologies and applications | Completed |

| Project Task | Sub-activity | Inputs | Outputs Realized | Status |
|---|---|---|---|---|
| | • Finalization of website | • Consultant expertise<br>• Review of website and user needs | • Finalized website<br>• Website ready for transfer to UNDESA<br>• Sustainable website, easy to manage and maintain | Completed |
| Technical Capacity, Equipment and further training | • Equipment | • Financial Resources<br>• Assessment of country needs and priority training areas | • Countries provided with critical resources<br>• Increased technical and technological capacity<br>• Capacity-building maintained | Completed |
| | • Further Training | • Consultant expertise<br>• Training Materials available in accessible media<br>• Participants – time | • Increased number of trained personnel<br>• Greater redundancy at the national level | Completed (except for Barbados) – The fourth pilot country, Barbados, was not able to complete the training prior to the conclusion of the project. The only dates that the Government of Barbados was able to hold a workshop was following the end of the project, so unfortunately, it was not able to take place. |

## Financial Report

The attached financial report includes all expenditures made by the project (December 2002-February 2004). The project has been provided with advances of US$261,000.00 and has expended US$260,972.57. A US$10,000.00 disbursement was scheduled to be made upon project completion, but will not be needed. The remaining US$26.43 will be returned to UNDESA.

The Financial Reports have been developed in Excel and are attached separately.

**Annex A**

# REPORT ON THE RESOURCE PERSONS' MEETING ON:

# "USING INFORMATION IN DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT IN SMALL-ISLAND DEVELOPING STATES (SIDS)"

**May 27-28th, 2003**

**Rex St. Lucian, Saint Lucia**

**Organization of American States /**

**United Nations Department of Economic and Social Affairs**

**"USING INFORMATION IN DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT IN SMALL-ISLAND DEVELOPING STATES"**
***Report on the Resource Person's Meeting***
***hosted by UNDESA and OAS, in collaboration with the Government of St. Lucia, May 27th to 28th, at the Rex St. Lucian Resort, Rodney Bay, St. Lucia***

Thirty-six persons from 30 organizations, including NGOs, Governmental Agencies, Consultants, and Universities, all of them involved in information production, managing, processing, and use for sustainable development in the Caribbean region, attended the meeting.

The meeting was based on presentations of experiences and was organized in ten sessions, as can be seen in the meeting agenda (*Annex I*).

All presentations highlighted in this report are available on the IDSD website under "Recent Events" at http://www.oas.org/usde/idsd/workshops/workshop1.htm.

The Information for Decision-making for Sustainable Development (IDSD) Project arose from a joint recognition by the United Nations and the Organization of American States that countries in the Caribbean still require support in creating mechanisms for the effective management of information for sustainable development and environmental management, and in defining ways to harness this information for decision-making purposes. It follows on from an earlier UN/CARICOM Initiative, which addressed the needs for Environment, Gender and Social Statistics.

The project aims to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii) develop core curriculum and materials for regional training of trainers; and (iii) create a regional electronic site for accessing information on information management systems and techniques. The project will be executed from November 2002 - October 2003.

**OPENING CEREMONY** - *Chaired by Mr. Bishnu Tulsie, Ministry of Physical Development, Environment, and Housing of Saint Lucia*

During the Opening Ceremony, remarks were made by the Director of the National Office of the Organization of American States (OAS) in St. Lucia; the Honorable Ignatius Jean, the Minister of Physical Development, Environment and Housing of St. Lucia; Mrs. Birgitte Alvarez-Rivero of UNDESA; and Mr. Bishnu Tulsie of the Ministry of Physical Development, Environment and Housing.

Mr. Bishnu Tulsie welcomed participants to St. Lucia and reflected on the need for SIDS to address the issue of management of information as part of the challenge in achieving sustainable development.

Mr. Antoine, the Representative of the OAS in St. Lucia, also welcomed participants to St. Lucia. He noted the importance of the workshop in bringing together experts from across the region and beyond and across various fields. He reiterated the OAS's continuing commitment to assisting the region in meeting the challenges that affect SIDS and in supporting the efforts towards sustainable development.

The Honorable Minister, in the Feature Address, reflected on the usefulness of the Barbados Program of Action as a starting point, but warned that the real challenge was not environmental protection alone, but the integration of environmental, social, and economic agendas into a long-term integrated development plan involving all sectors. As part of this challenge, he identified the availability of useful, timely information for appropriate decision-making as a key issue.

During the Opening Ceremony, the need to promote and build partnerships for collaboration in the production, use, and sharing of information was stressed, as collaboration is the only course to sustainable development. The vulnerability of small islands to climate change, population growth, natural disaster, biodiversity loss, and other threats and the critical need for information for sound decision-making were also underscored.

## BRIEF OUTLINE OF THE "INFORMATION FOR DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT" (IDSD) PROJECT

The IDSD Project Coordinator, Ms. Leisa Perch, OAS, began with a brief outline of the IDSD project: its objectives and some of the issues to be considered in information management for sustainable development.

- It was recognized that information will underpin all efforts towards achieving the overarching goal for sustainable development.
- The timeliness and significance of the project was stressed as it relates to the goals, targets, objectives of the Millennium Development Goals, the Johannesburg Plan of Implementation and the upcoming 10-year review of the Barbados POA+10.
- Fulfillment of such goals and targets will require mechanisms and instruments that measure and track progress, the need for data, statistics, indicators and information systems to illustrate our efforts towards sustainable development and make these readily available and accessible to decision-makers.

## *SESSION 1: OVERVIEW OF INFORMATION CHALLENGES FACING THE CARIBBEAN*

### *1.1. OVERVIEW AND FINDINGS OF IDSD ASSESSMENT REPORT* – **Leisa Perch, Organization of American States**

The presentation outlined a number of general issues and challenges, including technological gaps in SIDS, data compatibility and standardization, lack of a central strategy for managing information for producers and users, and thus the challenge of how this can be resolved in four pilot countries.

KEY ISSUES:

- Discussions focused on trying to meet the overwhelming reporting requirements of international agencies and the need for a harmonization of information needs, which will meet both national needs and international reporting requirements. Also, the need to incorporate a structure which will allow for civil society to be part of a decision-making framework through greater use of information.
- An attempt has been made to limit reporting requirements of countries in BPOA+10 framework into a more concise form for information gathering.
- Efforts must be made to ensure that reporting requirements are SIDS-friendly, taking into account the special circumstances of SIDS.
- There are a significant number of ongoing efforts in the region relating to information management.
- A number of systems have been developed to address issues in critical sectors such as land use planning, coastal resource management, sustainable tourism and disaster/management and climate change.
- Despite fundamental challenges, the region has made progress – demonstrated through the number of indicators' programmes in place or being developed, new institutional structures which embrace sustainable development, efforts towards integrated development planning as an overall development strategy, and the establishment of regional program to look at environment, social and gender statistics.
- Project Outputs should be made available to all CARICOM SIDS.
- Information-sharing amongst the countries participating in the project will also be critical.

### 1.2 GENERAL DATA CHALLENGES FACING CARIBBEAN SIDS - ***Lance Busby, Economic Commission for Latin America and the Caribbean***

The challenges identified by this presenter include the need to identify data sets. It was suggested that a major obstacle confronting the identification of data sets is a closed attitude toward the sharing of information. This is attributed variously to fear of loss of confidentiality, the notion of maintaining power by keeping information within the institution, and general administrative non-strategic thinking. Developing awareness of the power of sharing information becomes essential in ensuring an attitude change.

Other challenges identified included:

- The lack of an institutionalized and integrated approach to data collection, which will ultimately avoid duplication of resources and thus reduce financial burdens on SIDS.
- The issue of governance and how to address making data available while also ensuring that confidentiality of some data is maintained.
- The need for a greater emphasis on metadata in ensuring that the user can better understand the data and the data set.
- The limitations of existing systems, which are often not hierarchical in nature and do not allow for targeted analysis of data from local level to broad national level.

**KEY ISSUES/RECOMMENDATIONS**

Based on the discussions following the two presentations, some key issues and recommendations were:

- Any structure, which is recommended, should have local and national relevance.
- Within the UN system, mechanisms should be established to facilitate and further cooperation with all relevant internal and external agencies in an interactive forum, which would also allow for input from national counterparts.
- Consideration should be given to the establishment of a SIDS-specific program through inter-regional cooperation for an indicator database.
- Data collection should be primarily based on national interests but should consider the reporting frameworks so that the systems created can also provide information for that purpose.
- There should be an agreement on common programs for collection and storage between agencies thereby improving the capacity to compare across data-sets and to share information more easily.

**SESSION 2: DATA/STATISTICS/STANDARDIZATION -** *Moderated by Edwin St. Catherine, Director of Statistics, Saint Lucia*

**2.1 ENVIRONMENT, GENDER AND SOCIAL STATISTICS - LESSONS LEARNED FROM THE UNSD/CARICOM PROJECT-** *Reena Shah, United Nations Statistics Division*

The presentation focused on the UNSD and CARICOM initiative on social/gender and environment statistics in the region aimed at strengthening capacity in data compilation and analysis, and the establishment of a network of regional experts.

Key lessons learnt from project included:

- the need to strengthen institutional capacity,
- the need to take a bottom-up approach to implementation,

- the need for continued communication and collaboration with regional and international institutions and the need to put in place sound structures, which will ensure sustainability.

In reference to the collection of environmental and social/gender statistics, the presenter recommended as next steps:

- The role of the national statistical offices as focal points for social/gender and environment statistics needs to be strengthened
- More methodological guidance needs to be instituted in Member States
- A regional core set of environmental statistics and indicators should be determined
- National social/gender and environment statistics compendia should continue to be published on a regular basis;
- Support should also be provided for development of social/gender and environment statistics units at the CARICOM Secretariat, which can act as repositories for these statistics once compiled at the national level.

**DISCUSSION**

This focused on the problems generated by trying to meet the overwhelming reporting requirements of multiple international agencies and the need for a harmonization of international needs, which must meet national ones. Reporting must be a sub-product of information production for decision-making in the countries of the region and not its mere cause; so, national systems must be designed to fulfill national needs. Furthermore, reporting requirements must be SIDS-friendly, taking into account the special circumstances of SIDS.

2.2 GENERATING ENVIRONMENTAL STATISTICS/DATA - ***Peter Murray, Environment and Sustainable Development Unit of the Organization of Eastern Caribbean States (OECS/ESDU)***

OECS/ESDU has been given a mandate to facilitate the St. George's Declaration (SGD), adopted as a broad statement of policy to guide and inform environmental management in the OECS region. The St. George's Declaration highlights the need for monitoring and reporting to track progress in achieving desired results. Progress is monitored through the use of indicators and actions to be taken by the responsible national institutions. Major challenges to the fulfillment of the mandate were identified as follows:

- Lack of human capacities in data collection
- Inadequate financial resources due to high resource requirement of the data collection
- Data collection is not recognized as significant by political directorate or the general public

**DISCUSSION**

The main points emerging from the discussion were:

- A number of challenges persist in the collection of accurate, timely and specific data in the region and in the fulfillment of national needs and international imperatives – in many cases relating to the lack of a standardized or well-defined methodology.
- International Agencies need to strengthen classification and coding systems, which are compatible at the local, national, and regional, as well as at the international level.
- More emphasis is required on dissemination systems which are timely and accessible to all users based on their individual needs and which are adaptable to other programs such as Geographic Information Systems (GIS).
- Countries should capitalize on the advances in technology such as the use of open-source software to resolve some of these challenges.
- A potential solution to some of these key issues would be the sensitization of groups on the importance of data collection, both at the political and at grassroots levels, by linking it to their everyday concerns.

**SESSION 3: THE DECISION-MAKING PROCESS – RELEVANT ISSUES AND CHALLENGES** - ***Moderated by Ms. Angela Skeete, Caribbean Center for Administration and Development (CARICAD)***

Three presentations were made by representatives from the Caribbean Network for Integrated Rural Development (CNIRD), the Soufriere Marine Management Authority (SMMA) and the Organization of American States (OAS) focussing on participatory processes to decision-making. Regrettably, CANARI was unable to participate due to an emergency.

- Natasha Nunez, CNIRD, cited a number of key challenges in community involvement including illiteracy, non user-friendly information, exclusion from data collection, lack of proper conflict or strategic management, and lack of access to appropriate technology. A number of best practices were identified which could be replicated in local and national circumstances to overcome these challenges, including training in conflict management resolution and data collection and management techniques, establishment of community networks for consultation, community involvement in data collection, and volunteerism.

- Kai Wulf, SMMA, presented a comprehensive report on participatory decision-making in action within his organization. Initially established to mediate conflicts and ensure the proper use of marine resources by ensuring stakeholder participation in decision-making, the organization encountered a few initial difficulties. These were due to a lack of a binding agreement, a lack of focus in the pursued objectives, and a loose, dispersed, and large management group. The lessons learned include ensuring a continuous stakeholder assessment, a need to establish a focused agenda, a need to balance dominance of certain groups, and the need for a strong legal basis to guarantee members' rights and to establish responsibilities clearly. Essential conditions for conflict management emerged:

- Direct participation of resource users, because community institutions do not always provide adequate representation and because stakes/interests often vary from individual to individual.
- Direct communication among stakeholder groups, for example, by allowing fishers to directly address conflicting interests to others, such as divers, or yachts people.
- Effective communication between stakeholders, community groups and other involved parties remains critical.

- Claudia de Windt, OAS, looked at the legal aspects of Participation and cited a number of declarations and principles of the rights of citizens to participate in decision-making, from Rio 1992 to Quebec in 2001. In general, it was noted that the legal foundations for participation have been established, and that the implementation of mechanisms for participation should be seen both as a right and as a reasonable course of action for democratic governments. The challenge was identified as being the implementation of these agreements at the grassroots level.

***KEY RECOMMENDATIONS***

- Replicating the lessons learned from the SMMA to other local groups in St. Lucia and the rest of the region.
- Illiteracy should not be seen as a hindrance to participation. Instead the response and recommendation is consultation (as opposed to information dissemination). Open discussion with marginalized groups can clarify issues and also allows for more participatory decision-making.
- Innovative approaches should be undertaken to foster and achieve meaningful participation by all aspects of civil society.
- Legal frameworks can only be effective if they integrate and promote advocacy and reflect an understanding of the power and the role of civil society.

**DISCUSSION**

During the discussion session it arose that not all SIDS are well prepared to create formal participation mechanisms and that, although it is necessary, there is not a single formula to achieve effective public consultation.

**SESSION 4: GENERATING INFORMATION FOR SUSTAINABLE DEVELOPMENT – NATIONAL AND INTERNATIONAL APPLICATIONS** -
*Moderated by Mr. Espen Ronneberg, SIDS Unit, UNDESA*

4.1 NATIONAL EXPERIENCES

Presentations were made by representatives of the Governments of Barbados, Belize, Jamaica and St. Lucia on challenges and experiences in information management in sustainable development.

All country representatives noted some fundamental challenges in developing and using information for sustainable development, namely:

- Lack of human, technical and financial resources,
- Low level of importance assigned to information development and management,
- Lack of awareness/attitudes to information use,
- Challenges in integrating various data sets together due to differing formats, periodicity and accuracy, and
- Lack of continuity of efforts and of personnel

At least two of the countries have established indicators programmes – Barbados and Jamaica – and these two countries were also able to contribute to the Environmental Vulnerability Index for SIDS piloted by South Pacific Applied Geoscience Commission (SOPAC). Both countries found the UN methodology useful and used many of the indicators in the UNCSD list.

*KEY ISSUES*

- Relationships of government agencies with environmental NGOs and the need to share information. Most of the relationships are not legally binding.
- There is a need for such information to be presented in a digital format.
- Both Barbados and Jamaica are looking at over 150 indicators. Questions were raised at the manageability and feasibility of monitoring so many.
- The acknowledgement has been made that, in many cases, indicators should be aggregated to avoid working with too many at any one time. Countries are encouraged to establish a core set of indicators and then within those note the other factors, which will contribute to the aggregated indicator.
- The lack of policy at the national level for the sharing, distribution and access to information has been a significant constraint on advances in this area.
- Partnerships with other government agencies and NGOs have proved useful in maintaining useful datasets.

*4.2. EXPERIENCE OF COSTA RICA - Edgar Gutierrez-Espleta, Development Observatory of Costa Rica, University of Costa Rica (UCR)*

- Dr. Gutierrez-Espleta presented on ten (10) years of experience in the systematization of indicators for the sustainability of development in Costa Rica.
- A chronological overview of the Costa Rican experience was presented beginning in 1993. Amongst the achievements noted was the establishment of a Technical Advisory Commission for Sustainable Development in 1997. One of the most significant outputs of a UNDP and University of Costa Rica (UCR) initiative was a new research unit that was created named the Development Observatory (OdD). This research unit has developed information on a user-friendly database on Costa Rican development trends, which focuses on a number of key variables, and allows users to disaggregate a number of them.

Included in the database are definitions and methodologies; the database also generates graphical representations, reports and other vital statistics.

- With the support of UNDESA, Costa Rica was able to develop and test a new core set of fifty-seven (57) indicators in environment, economic, institutional, and social areas; additionally, a book with this information was published.
- As a collaboratoring center for UNEP-ROLAC, OdD/UCR contributed to the elaboration of GEO Costa Rica book and other GEO reports in the region. It has been maintaining an environmental database for LAC and produced a CD-ROM to present it.
- UNEP-ROLAC and OdD/UCR are in the testing phase of new software aimed to help countries to establish a model system of environmental statistics. It is available in English and Spanish, will be free and accessible, and will be made available to those interested.
- Based on this effort there is keen interest by the OdD/UCR and UNEP in the development of an environmental data hub.

*4.3 UNCSD SUSTAINABLE DEVELOPMENT INDICATORS PROGRAMMES -Birgitte Alvarez-Rivero, United Nations Department of Economic and Social Affairs*

The presentation focused on guidelines to the development of sustainability indicators. Guidelines include the establishment of a National Coordinating Mechanism and Focal Point. There was emphasis placed on the need to use gap analysis, which would include baseline assessment and priority selection through a consultative process. This consultative process would assist countries in determining capacity-building needs from which will emerge an action plan. Using the UK as an example, the presenter proposed a selection of indicators that were relatively dynamic for reporting purposes. The suggestion was made for periodic evaluation and reassessment of needs due to the changing nature of the political and national priorities.

- A number of action areas were identified, including support for regional indicator networks, a regional network for sustainable information specifically aimed at SIDS, and the use of disaster-reduction indicators based on SIDS' unique vulnerabilities.
- There is a need for a sub-regional training programme in the development and implementation of national strategies for sustainable development.

GENERAL COMMENTS

The concept of development seems to be skewed towards environmental and economic aspects of development. For development to be truly sustainable, it must have a more holistic, integrated approach. It was recommended that more focus be placed on social aspects of the environment such as population, health, education and violence which all impact on development.

As a result of this concern, a presentation was developed by the representative of CAREC, and circulated to all participants.

**SESSION 5: INFORMATION NETWORKING AT NATIONAL AND REGIONAL LEVELS - LESSONS LEARNED -** *Moderated by Harold Gepaul, Caribbean Environmental Health Institute*

**5.1 THE JAMAICA SUSTAINABLE DEVELOPMENT NETWORK PROGRAMME - NETWORKING AT THE NATIONAL LEVEL -** *Valerie Gordon, Jamaica Sustainable Development Network Program*

Ms. Valerie Gordon talked about the power of Information and Communications Technologies (ICT) to facilitate cost-effective access to and dissemination of sustainable development information, as well as to promote non-discriminatory dialogue and to establish communities of interest across borders. In this vein, she spoke about the Jamaica Sustainable Development Network Program (JSDNP) and its activities in promoting the development of ICT in Jamaica, by providing connectivity and developing networking capacity at the local level at relatively low cost.

The JSDNP has thus been active in the establishment of community focal points as rural telecenters involving local partners and stakeholders, has aided in the development and hosting of community websites, and has developed and made available an information management database and a website. The JSDNP provides training and equipment to community centers that have an information dissemination mandate, and that serve a wide constituency of community interests. The JSDNP ensures that the community websites developed are kept community owned and maintained, that communities make use of Geographic Information System (GIS) as a community sustainable development information tool, and that the websites contain issues, projects, and events of interest to the community.

Among the important lessons learned by JSDNP from its efforts are:

- CBOs, NGOs and others have a role to play in the sustainable development process
- CBOs at the community level are well placed to introduce the technology
- ICTs are a valuable support system for sustainable development
- Capacity-building is an ongoing process
- Empowerment of civil society for sustainable development decisions is a time-consuming process and should not be sacrificed for short term gains

**5.2 CEPNET - SUCCESES, CONSTRAINTS, AND LESSONS LEARNED -** *Luc St-Pierre, United Nations Environmental Programme/Regional Coordinating Unit*

Mr. Luc St.-Pierre discussed the role of the Caribbean Environmental Programme Network (CEPNET) as a facilitator for the better management of environmental information for the Caribbean Environmental Programme (CEP). The CEP is an action plan, in force since 1986, signed by more than twenty (20) countries in the Caribbean to work in the implementation of the Cartagena Convention and its three (3) protocols on: oil spills, wildlife and protected areas, and pollution from land-based sources.

CEPNET has contributed to improving the management and availability of information for sustainable development in the Caribbean by:

- Establishing an internet-based environmental information system
- Strengthening coastal marine resources management
- Creating a CEP website at www.cep.unep.org
- Creating a pilot network programme that included internet and GIS training

Among the lessons learned in its efforts, procuring funding bridges early on in the development of an information project and establishing a committee that ensures the maintenance of the information networks stand out. Other lessons learned:

- Ensure the support of decision-makers
- GIS and internet technologies are readily available, therefore do not justify big investment
- CAR/RCU must emphasize its role as facilitator and be less involved in implementation
- Train webmaster to coordinate and maintain website, database development at SIDS level
- Establish small scale and short time goals
- Build on experiences and replicability
- Use existing human resources
- Try to develop synergies to develop other programs
- Implement activities to increase access to information
- Build a network of networks with the most complete information, in the most efficient way possible

### 5.3 NETWORKS: EFFECTIVENESS IN IMPROVING ACCESS TO INFORMATION

**-** *Mrs. Maritza Hee-Houng, IDSD consultant*

Mrs. Maritza Hee-Houng gave an overview of past and current activities and strategies in the region to improve access to information in sustainable development. As a background, the presenter discussed the role of the United Nations' Agenda 21 in establishing a framework to satisfy information demand through bridging the data gap and improving information availability, and how Agenda 21 has been implemented in the Caribbean SIDS.

Ms. Hee-Houng discussed the development of several information initiatives and networks in the region, including SIDSNET. She mentioned the fact that, although these may not address all needs, some of these are still ongoing and collecting data, and they should be part of any new network.

One issue that has arisen with these initial networks is that technology caught up with them; since anyone can have their own information online, institutions stopped participating in them. CARISPLAN best responded to this new challenge, as it has its own online search-engine for finding Caribbean-relevant material from other institutions, and requests institutions to put their documents in their network. Also discussed was the need for

assessing the impact of networks on improving access to information for decision-making. At the operational level, this is very costly, limiting the ability of institutions to perform evaluations.

General recommendations coming out of this presentation were to:

- Define the problem areas to be addressed
- Determine the type of information needed
- Determine who will participate: researcher, policy maker, NGO
- Establish a consultation process
- Take full advantage of information technology
- Ensure that information is shared
- Train users in new technologies.

**SESSION 6: THE MANAGEMENT OF INFORMATION - THE POTENTIAL FOR MULTI-DIMENSIONAL SYSTEMS. -** *Moderated by Mr. Bishnu Tulsie, Saint Lucia.*

***Current regional efforts in designing and developing integrated information systems - issues and challenges***

**6.1 MANAGEMENT INFORMATION SYSTEM FOR TOURISM (MIST) -** *Ms. Gail Clarke, Caribbean Tourism Organization (CTO)*

Ms. Gail Clarke discussed the challenge of translating information into practical-oriented solutions within the context of the tourism industry in the Caribbean. The CTO has adopted a number of regional technology strategies to address the issue. These include a consumer Internet system with information on resorts supporting official websites from member countries, and CTOnet Caribbean, a regional intranet system that shares regional tourism statistics and reports and provides market research and metadata.

The presenter then turned to a discussion of the Management Information System for Tourism (MIST), developed to provide an integrated strategy for collecting, analyzing, and disseminating information on tourism. MIST allows for managing tourism data at the national or regional levels, operating through a network. Although MIST is accessible to the general public, levels of access vary according to the user, with organizations having higher degrees of access than private individuals.

MIST has had an impact on, among other things, the standardization of methods for data collection, the centralization of data collection activities, and the introduction of information technology to the least developed countries.

MIST started in 1998-99, and is now actively being used by Saint Lucia, Turks & Caicos, Trinidad & Tobago, Grenada, Dominica, Montserrat, St. Vincent & The Grenadines, St. Kitts & Nevis; it has recently been installed in Antigua and Barbuda, and Suriname; Barbados presently only uses the inventory system, and different CTO-written systems are in place in Guyana and Belize.

CTO has looked at the possibility of creating a system to work with sustainable tourism information, but had to think in terms of consumer demands. MIST's modular design makes it a flexible instrument, which might enable it to handle indicators of sustainable development, for example, through the development of a new module or modules. At the time, however, it is geared toward satisfying consumer demand for localization of tourist destinations, and providing marketing and planning information for the hotel industry.

**NEXT STEPS**

- 2003-2004 – Upgrade of MIST: new technologies of internet and intranet systems will enhance CTOs ability to maintain the system
- Training: increase in in-house capability within CTO and National Tourism Offices to manage the system
- Regional MIST: establish the CTO system as the database for tourism information in the Caribbean

## 6.2 THE COASTAL RESOURCES INVENTORY SYSTEM (CRIS): AN APPROACH TO THE DEVELOPMENT OF A DECISION SUPPORT SYSTEM - *Ian King, CARICOM/ACCC*

The presenter discussed the development and use of the Coastal Resources Inventory System (CRIS) and its potential as a decision-support system. The CRIS was designed and implemented as a component of the CPACC project, which had as an objective "to support Caribbean countries in preparing to cope with the adverse effects of global climate change (GCC), particularly sea level rise, in coastal and marine areas, through vulnerability assessment, adaptation planning, and capacity building linked to adaptation planning. "

The CPACC Component 3 goals included the development of a facility to enable wide access to spatial and monitoring data for the purpose of decision-making in a format that the users could understand and utilize, and the development of the capacity within local institutions to apply and adapt the facility – CRIS – to meet institutional and national needs.

The CRIS was designed for the storage, retrieval, updating, analysis, manipulation, and sharing of coastal and marine data. It includes and links together a spatial database and an attribute database that handles non-spatial data.

As part of its capacity-building strategy, CPACC also facilitated the implementation of CRIS and training in its use in the participating countries, by identifying and involving key agencies for participation in the process; complementary activities to CRIS, such as supporting the development of labs with GIS, were also included as activities, to facilitate and enhance its impact.

Varying capacities amongst countries to absorb technology transfer and participate in the process, an almost universal lack of national data access policy, and uncertainty about existence and/or status of data, which is generally limited, have proved to be important challenges to overcome. However, CRIS has succeeded in establishing a community of GIS practitioners in the Caribbean, has developed capacity at the regional/national levels to manage coastal and climate data, and has created a foundation upon which countries can develop their own environmental resource decision support systems

Mr. King concluded that CRIS has had a very positive improvement on the access to management of information for coastal and climate resources for decision-making. For this to further improve, he noted a need for the establishment of a national policy on data and information management, as *ad hoc*, institution-specific approaches create tremendous challenges. As an example, the creation of metadata and data dictionaries could vastly improve the usefulness of existing data and data yet to be collected.

### 6.3 LAND-USE PLANNING IN THE OECS USING THE AUTOMATED LAND EVALUATION SYSTEM (ALES) - *Dr. Lystra Fletcher-Paul, Food and Agricultural Organization, Subregional Office for the Caribbean*

Dr. Lystra Fletcher-Paul presented an overview of the information needs for land use planning and the use of the Automated Land Evaluation System as an approach to sustainable land use.

In her presentation, she discussed the needs for information on biophysical and socio-economic factors that interact to determine and influence a land production system. The challenges in the Caribbean to the collection of data on these factors were examined, including time gaps in records, incompleteness in the range of attributes, inconsistencies in data categories between countries, and a lack of resources to measure and monitor environmental data. In addition to these, existing challenges to data management included: lack of basic information on environmental requirements for non-traditional crops, lack of practical descriptions of land use and productivity, lack of georeferenced data, lack of mechanisms for updating existing, time-sensitive databases on biophysical and economic data, dispersion of data amongst different agencies, and inadequate communications means for data sharing.

Following this, the development and use of ALES and its capacity as a multidimensional, multi-use system was discussed. ALES is a computer program that allows land evaluators to build expert systems to evaluate land according to the method presented in the FAO "Framework on Land Evaluation." ALES works in two stages:

1. Physical evaluation: matching soil, climate, and land use with crop requirements
2. Socioeconomic evaluation next derives the suitability of the land unit for specific land utilization types: e.g. rain-fed agriculture with low inputs or commercial agriculture with high inputs, etc.

Dr. Fletcher-Paul concluded by presenting suggestions for basic principles to be considered to measure sustainable land use:

- Information needs should drive data collection; only collect data that would be used
- Build on existing systems
- Develop awareness among users of utility of the system
- Support institutional strengthening and capacity building
- Support networking and information-sharing efforts
- Develop common data exchange formats and protocols
- Establish common land classification systems to allow comparison amongst countries
- Update soil and land use information
- Research to develop methodologies and validate models so that they are relevant to the region
- Develop metadatabases and skills banks

**EFFORTS AT CREATING DECISION-SUPPORT SYSTEMS FOR DISASTER MANAGEMENT -** *Sheldon de Four, Caribbean Disaster Emergency Response Agency*

An intervention by Mr. de Four was made regarding efforts at creating decision-support systems for Disaster Management. CDERA has, in collaboration with SouthCom, pioneered an Integrated Decision Support System (IDSS). It is anticipated that the IDSS would assist decision-makers in the Disaster management cycle in its entirety and reflects a need to ensure a participatory course of action in planning and in response. A brochure on IDSS is available.

**DISCUSSIONS/RECOMMENDATIONS**

- The ALES system clearly seems to have moved the issue of land evaluation significantly forward - it is key that systems be developed that can facilitate decision-support in such a manner.
- In the development of systems with an approach such as this, the involvement of the research community, particularly the University of the West Indies, is critical.
- For decision-support systems to be effective, common data exchanges will be critical
- Common land classification systems which presently does not exist across the region will improve the effectiveness of systems for decision-making and land use.
- Research is necessary to validate models and to ensure that models effect changes
- Next steps could include the development of holistic scenarios so we can look at decision-making based on future possibilities.

- Continued links with UWI will be useful for the further development and enhancement of ALES, MIST, & CRIS.

## SESSION 7: TECHNOLOGY AS A BRIDGE TO THE INFORMATION GAP

### 7.1 ICT FOR DEVELOPMENT- OVERVIEW OF THE SCHOOL-WIDE AREA NETWORK (SWAN) PROGRAM IN BELIZE AND POTENTIAL FOR EXPANSION

*Mustafa Toure, IDSD Consultant*

Mr. Toure discussed information technology (IT) and telecommunications as the center of a new technological revolution. According to the World Bank, the range and impact of telecommunications reform and the introduction of a sound IT sector are intrinsically linked to enhancing economic efficiency, as a prerequisite toward increasing national welfare.

The presenter presented the policy and development uses of IT, including:

- As an instrument to make existing productive sectors more efficient
- As an area of economic activity in its own right
- As a tool of training and education

Mr. Toure then discussed the School Wide-Area Network (SWAN) project as an example of IT implementation, designed to provide computers and internet access to schools and at all levels in Belize, and by establishing wireless and fiber optic wide area network (WAN) connecting schools, libraries, hospitals, and governments.

The expected benefits from SWAN included:

- High speed internet access for schools and distance-learning centers country-wide
- Country-wide computer network links to all major population areas
- Complementing of existing IT initiatives in education: schools will get hardware and unlimited internet access at no cost
- NGOs and civil society will receive hardware plus unlimited Internet access at low monthly per unit user fees.

The presenter concluded by stating that IT should be embraced by using it to promote sustainable development, and to upgrade the education sector, and as such should be marketed to entrepreneurs, investors, students, etc.

Mr. Toure then presented an overview of the UNCSD Resolution on ICT, noting that:

- Countries should report on mechanisms to update and implement strategy - all sectors must be involved
- The idea of a global information infrastructure must be developed and implemented
- Government and stakeholders must be called upon to develop new roles for integration of IT, each country must develop strategies and have task forces and commissions - some guidelines came a little too late.

**SESSION 8. PRIORITY NEEDS FOR TRAINING AND CAPACITY BUILDING IN INFORMATION MANAGEMENT -** *Mustafa Toure, IDSD Consultant.*

The consultant presented on the preliminary conclusions of his work based on discussions with regional contractors, institutions, and agencies. Amongst the recommendations presented:

- Information Management/Information Technology (IM/IT) education and training certification in priority areas: web development and network technical operations and management.
- Incorporation of IT training into increasingly lower levels of national school systems.
- Establishment of functional IM/IT linkages between regional CARICOM and related SD agencies that are responsible for SIDS-POA, including IDSD Project
- Development of Caribbean regional SD-related content software and linkages
- Development of national information infrastructures/books on digital libraries/portals, databases
- Provision of IM/IT training in the use and application of remote sensing and geographic information systems (GIS) in coastal zone management
- Harmonization of national priorities/contacts with regional priorities/contacts at CEP meetings and fora
- SD/SIDS-POA website content, including IDSD Project thematic areas, development
- Increased revenue generation for programme sustainability
- Provision of greater public access to relevant SD/SIDS-POA data
- More community reporting activities
- Provision of IM/IT training in software development, certified Linux open-source software development courses and courses in "e"-Commerce software development & use
- Continuous updating of regional SD websites' content, including IDSD Project thematic areas
- Streamlining of regional SD websites
- Provision of greater data storage & conversion services to relevant SD/SIDS-POA data nodes
- IM/IT training in Security/vulnerability issues

The consultant also distributed a brief questionnaire on existing gaps and training needs to the participants of the workshop, asking for their insights and recommendations in these areas. The results of these responses would be included in his final report.

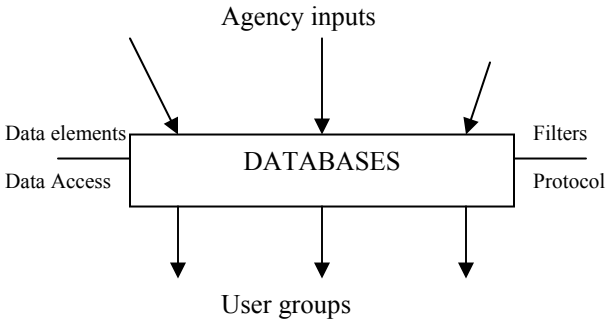
**SESSION 9. WORKING GROUP CONCLUSIONS AND THEIR FINDINGS**

After the presentation sessions were concluded, the participants were assigned to three groups in order to discuss the final recommendations of the meeting. To guide and focus the discussion, a list of guidance questions with relevant topics to be considered were distributed; these questions are included in the report as Annex II. The working groups had a limited time for their deliberations.

The following preliminary recommendations resulted from their discussions:

Group 1: Basic Principles: Strategies for Improving Information for Sustainable Development in the IDSD thematic areas

- Sustainable Development Information should be regarded as a national asset
- Information must be open and inter-sectoral
- Hence, SIDS must establish national information for sustainable development policies
- Besides, appropriate forums must be developed to enable stakeholder participation
- Information should be built through the application of linkages and filters
- Consequently, protocols must be developed to assure compatibility of sources and databases
- Quality control should be covered by protocols
- SIDS must develop sets of sustainable development goals and targets in order to assess effectiveness of development according to the set of indicators being monitored
- Information should be used for decision making, so ways must be found to make information useful for this purpose; make use of graphic and cartographic presentations as much as possible
- Accordingly, strategies should be developed making clear who the target groups are
- Information systems must be sustainable in the long-term
- A general model for the information system could be the one shown in the following figure:




- Systems should also enhance\enrich user skills
- Systems should use a multiplicity of sources
- Information should be generated for decision-making support and not only for reporting
- Use best-and-worse case scenarios

Strategies for improvement

- Recognition of the values of the data collection process and of the data itself
- Need to inform government executives
- Only agree to collect data that reflects sustainable development goals
- Strategies for sustainability of the information systems must be developed (fees, user contributions, budgetary lines, project surcharges)

Recommendations coming out of the ten (10) year review of the Barbados Plan of Action

- Raise awareness of importance of knowledge societies
- Establish virtual data centers
- Establish national focal points
- Establish mechanisms for information sharing at the national, regional and inter-regional levels
- Use a bottom-up approach to gather and build information, supported by regional agencies
- Support SIDS training program for:
    - Analysis, case studies
    - Dissemination
    - Presentation
    - Communication
- Disseminate information for decision-making at all levels
- Establish comprehensive yet accessible training facilities

*Group 2: National Information Strategy Policy Issues*

- National policies should be based on best practices: ISP, stats. legislation, UNESCO
- Access initiative: www.wri.org
- Some information should be free, e.g. environmental impact assessment; some could have nominal cost based on users (structured)
- Introduce information issues into school curricula
- To build consensus: consultation, transparency
- National structures must have the mandate (e.g. Barbados) or the capacity to review/revisit existing frameworks
- Remember to manage technology
- Principles for National Information Strategies must be developed
- Services provided should include training and ideas for standards
- Networks are useful for:
    - Dissemination of information
    - Consensus-building
    - Creating awareness

**Group 3: Priority Training Needs for IDSD in addressing Sustainable Tourism, Land use Planning, Coastal Zone Management and Disaster Management/Climate Change**

| | Sustainable tourism | Land use planning | Coastal zone management | Disaster Management |
|---|---|---|---|---|
| **Gaps** | • **Lack of indicators to measure sustainable tourism**<br>• Lack of consensus about indicators<br>• Inadequate knowledge of MIST by end users | • No linking of decision making with data<br>• Absence of systems with applications to Land Use Planning<br>• Inadequate participation of stakeholders in planning process<br>• Outdated maps | • Lack of adequate biophysical data/info<br>• Lack of integrated policies to guide CZM<br>• Unclear, poorly defined institutional frameworks | • Inadequate vulnerability assessment systems |
| **Constraints** | • No integrated applications to information management<br>• Lack of standardized formats<br>• Short term planning horizon for political benefits<br>• Lack of common understanding of meaning of data<br>• Narrow focus of tourism managers | • No integrated applications to information management<br>• Lack of standardized formats<br>• Short term planning horizon for political benefits<br>• **Inadequately designed data systems to support decisions**<br>• Inadequate participatory approaches | • No integrated applications to information management<br>• Lack of standardized formats<br>• **Lack of human resources to monitor and manage coastal zone**<br>• Short term planning horizon for political benefits | • No integrated applications to information management<br>• **Lack of standardized formats**<br>• Short term planning horizon for political benefits<br>• Lack of scenario development in applications |
| **Training needs** | • Environmental-awareness building of end users of eco-tourism products<br>• Assessing sustainability of tourism<br>• Policy formulation<br>• Link Resource Management to product promotion and use to generate financial support | • Participatory approaches to planning<br>• Networking to share experiences | • Awareness building among decision-makers and planners<br>• Use of CZM guidelines e.g. EIAs | |
| **Building sustainable capacity** | • Investment in regional approaches<br>• Inter country collaboration and capacity training<br>• Database of resource persons | • Investment in regional approaches<br>• Inter country collaboration and capacity training<br>• Database of resource persons | • Investment in regional approaches<br>• Inter country collaboration and capacity training<br>• Database of resource persons | • Investment in regional approaches<br>• Inter country collaboration and capacity training<br>• Database of resource persons |
| **Functional capacity to support Decision-making** | • Certification | | | |
| **Priority Technical training** | | | | |

**GENERAL CONCLUSIONS AND RECOMMENDATIONS EMANATING FROM THE MEETING -** *All*

There were a number of conclusions and recommendations, which can be identified from the presentations, discussions and the findings of the working group that will serve as the basis for further discussion amongst participants:

***Conclusions***

- The determination of who should collect data should be done by national assessments rather than by an organization.
- Information collection should serve national needs but structures put in place should also reflect the need for information for reporting at the regional and international level.
- In assessing the needs for information management, use and generation, definitions can often differ, even within sectors. Often this is as a result of the lack of clarity in parameters to be used in defining the problem.
- Presently, there is a proliferation of technology and databases to manage and store data and information. However, not all of these are of equal quality or are compatible with each other. Appropriate database management and design will allow offices to use information more efficiently and effectively.
- The development of websites is useful in meeting the objective of information dissemination but needs to be recognized as one of a number of options. Since many communities do not have the necessary technology or infrastructure to support websites, other methods and approaches should also be considered.
- The development of networks for dissemination of information, building of consensus, creation of awareness, training, and establishment of standards is critical in improving our information management and generation capacity.
- Appropriate time is required if programs are to achieve their full potential - quick and easy solutions often are not sustainable or effective in the long-term.
- National Councils for sustainable development may be effective forums for dialogue and should be established.
- Political will for maintaining sustainable structures is key for information management programs to succeed.
- In any discussion on information and decision-making, it is critical that civil society be involved from the conceptual stage.
- In the context of the discussion on information for decision-making, one needs to identify the real and critical issues, particularly those affecting local and civil society.
- Innovative mechanisms and approaches to information management will assist Caribbean SIDS in building flexible systems.

***Recommendations***

- Caribbean SIDS should develop sets of sustainable development goals and targets in order to assess effectiveness of development according to the set of indicators being monitored.

- While countries may be at different levels of informational development, they often face similar issues. Inasmuch as this is so, countries should, where possible, seek to coordinate the development of information strategies through horizontal cooperation.
- Countries must also contribute to the discussions at the international level on the harmonization of reporting formats if these systems are to improve.
- The users and producers of information must work together if systems are to be relevant, effective, efficient and sustainable.
- A set of principles for National Information Strategies should be developed to guide the countries during the development of their own strategies.
- Data and Computer Systems that can communicate to, and are compatible, with each other should be the focus of information technology, which is put in place to support information management.
- A common environmental hub, at the national and regional level, should be established.
- A clearinghouse that compiles databases should be developed and the structure and policy that supports that mechanism must be part of a common framework.
- Technicians should be encouraged to design ways to enhance existing programs, infrastructure and technology in order to serve the widest possible needs for information management.
- Metadata should be integrated as part of information management strategic approaches.

**SESSION 10: WAY FORWARD**

Clearly, there is a need for continued efforts in the field of IDSD and for promoting the greater use of databases, metadata, and applications that support decision-making.

Among the next steps highlighted for the project were:

- *The development of training materials*. Based on the priority training needs identified by the questionnaire and the interviews with agencies, efforts would be made to make available relevant opportunities, materials and media over the web. Further, the results of the assessment would inform the development of specific training materials on information for decision-making, particularly on the generation and use of economic, social and environmental data/information as well as on the four IDSD thematic areas.

- *Dissemination of methodological approaches and best practices.* Clearly, there have been a number of relevant efforts to develop and promote methodological approaches to information for decision-making to varying levels of success. It is also possible to extract lessons learnt from these efforts, particularly those of relevance to the Caribbean. As part of the IDSD project, a team of consultants will undertake an assessment of relevant approaches and best practices to the issues and challenges of Caribbean SIDS. These results will be made available on the web and, where possible, integrated into the training materials developed and utilized as the basis for training under the IDSD project.

- *Broad participation in the training course to be held in October 2003.* The training workshop to be held in October 2003 will be made available to the widest possible group and combination of persons, mainly from the four participation countries. Nominated persons are expected to be representative of government, the NGO community and regional specialized institutions. The course and training will be presented in the form of "train the trainers", expecting to create a cadre o f persons capable of furthering capacity building at the national level.

- *The provision of equipment (hardware and software) to support the training provided.* It is clear that information and communication technologies must play a key role in information management and decision-making for sustainable development. The IDSD project will seek to provide support to countries, in their chosen thematic area and on a general basis, by supplying software and hardware, as necessary. In particular, the project will support equipment which can further access to information and to information dissemination and which can also widen the user base of critical information management and decision-support systems. Technologies and mechanisms that can facilitate capacity building in key methodological approaches and best practices will also be supported, where possible.

- *Further training at the national level*. Further to the cadre of persons trained at the regional level, additional training will be made available at the national level as part of the installation of desired software and hardware to support the IDSD activities at the national level. This will allow for the participation and the exposure of other ministries, agencies, NGOs and potentially civil society to approaches and practices relating to information management.

Although there was not enough time to fully review the recommendations in order to identify key principles, there was general commitment to the process by participants. In this vein, it was suggested that an e-group be set up to further discuss these issues and to facilitate a continued exchange between practitioners, producers, and users. The representative of the Caribbean Conservation Association (CCA) proposed that the existing CCA list server and the newly established Regional Environmental Information Network could provide a home/operational basis for the e-group forum.

**CLOSING REMARKS**

The project manager for IDSD thanked all participants for their contributions and noted that efforts such as these would be supported, where possible, by the project.

Thanks and appreciation were also extended to the Government of Saint Lucia for their gracious hospitality and visible support for the process.

The representative of UNDESA also thanked the IDSD coordinator for the organization of the successful meeting.

ANNEX I. AGENDA FOR RESOURCE PERSONS' MEETING

| **Day One – May 27th , 2003** | **Information Challenges for Sustainable Development** | |
|---|---|---|
| 8:30a.m – 9:00a.m | *Opening Ceremony* | Chaired by, Ministry of Physical Development, Environment and Housing of St. Lucia |
| 9:00 a.m. – 9:15 a.m. | *Opening of Meeting*<br>1.1 Introduction of Participants<br>1.2 IDSD Project and Workshop Objectives | Ms. Leisa Perch, OAS/USDE |
| 9:15 a.m – 10:15 a.m. | *Session 1: Overview of Information Challenges for Caribbean SIDS*<br>- 10 minute overview from IDSD Assessment Report<br>- General Data Challenges facing the Caribbean<br>** Plenary discussion* | Ms. Leisa Perch, OAS<br>Mr. Lance Busby, UN/ECLAC |
| 10:15 a.m. –10:40 a.m. | Coffee/Tea Break | |
| 10:40 a.m. – 12:00 p.m. | *Session 2: Data/Statistics/Standardization*<br>- Environment, Gender and Social Statistics - Lessons Learned from the UNSD/CARICOM Project<br>- Generating and Using Social and Environmental Data<br>* Plenary Discussion Addressing Data Quality, Quantity and Standardization | Moderated by Mr. Edwin St. Catherine, Dir. Of Stats (St.Lucia)<br>Ms. Reena Shah, United Nations Statistics Division<br>Mr. Peter A. Murray, OECS/ESDU |
| 12:15 p.m. – 12:45 p.m. | Session 3: *The Decision-making Process – Relevant Issues and Challenges (Part 1)*<br>- Participatory Approaches and Mechanisms for Decision-making – Panel Discussion:<br>• community involvement;<br>• bottom up vs. top-down approaches;<br>• community-based management and consensus-building | Moderated by Ms. Angela Skeete, CARICAD<br>Ms. Natasha Nunez, CNIRD<br>Mr. Allan Smith, CANARI<br>Mr. Kai Wulf, SMMA<br>Ms. Claudia de Windt, OAS/USDE |
| 12:45 p.m. – 14:00 p.m. | Lunch Break | |
| 14:00 p.m. – 14:40p.m. | Session 3 (cont'd): *The Decision-making Process – Issues and Challenges*<br>- Panel Discussion cont'd | CNIRD,CANARI, SMMA, OAS |

| **Day One – May 27th , 2003** | **Information Challenges for Sustainable Development** | |
|---|---|---|
| 14:40 p.m. – 15:40 p.m. | *Session 4 – Generating Information for Sustainable Development – National and International Applications*<br>- Country perspectives on issues and challenges in generating and using information for decision-making – land use planning, sustainable tourism, disaster management and coastal zone management<br>- UNCSD Sustainable Development Indicators Programme – Outputs and Guidelines | Moderated by Mr. Espen Ronneberg, SIDS Unit, UNDESA<br>Representatives of IDSD Participating Countries – Barbados, Belize, Jamaica and St. Lucia<br>Mrs. Birgitte Alvarez-Rivero, UN Division for Sustainable Development |
| 15:40 p.m. – 15:55 p.m. | Coffee/Tea Break | |
| 15:55 p.m. – 17:15 p.m. | *Session 4 (cont'd) – Generating Information for Sustainable Development – National and International Applications*<br>- Information for decision-making – Experience of Costa Rica<br>- Summary of Present Reporting for Major UN Conference and Follow-up and Outcomes of the UNCSD Discussion on Reporting<br>*followed Plenary Discussion | Dr. Edgar Gutierrez-Espeleta, Sustainable Development Observatory<br>Mrs. Birgitte Alvarez-Rivero |
| 17:15 p.m. –17:30 p.m. | Summary of the Day's Discussions | Leisa Perch, OAS |

**End of Day One**

| **Day Two – May 28th, 2002** | **"Responding to the Challenges of Information Generation and Management"** | |
|---|---|---|
| 8.30 a.m. – 10.00 a.m. | *Session 5: Information Networking at National and Regional Levels – Lessons Learned*<br><br>- The Jamaica Sustainable Development Network Programme – Networking at the National Level<br>- CEPNET – successes, constraints and lessons learnt<br>- Networks: effectiveness in improving access to information | Moderated by Mr. Herold Gopaul, CEHI<br><br>Ms. Valerie Gordon, Jamaica Sustainable Development Network Program<br>Mr. Luc St. Pierre, UNEP/RCU<br>Mrs. Maritza Hee-Houng, IDSD Consultant |
| 10:00 a.m. – 10:30 a.m. | *Session 6: Management of Information – The Potential for Multi-dimensional systems*<br><br>- Current regional efforts in designing and developing Integrated information systems –issues and challenges<br>• Management Information System for Tourism<br>• Automated Land Evaluation System (ALES)<br>• Coastal Resource Inventory System (CRIS) | Moderated by Mr. Bishnu Tulsie, Ministry of Physical Development, Environment and Housing<br><br>Ms. Gail Clarke, CTO<br>Dr. Lystra Fletcher-Paul, FAO<br>Mr. Ian King, CARICOM/ACCC |
| 10:30 a.m. –10:50 a.m. | Coffee/Tea Break | |
| 10:50 a.m. – 11:45 a.m. | *Session 6 (cont'd): Management of Information – The Potential for Multi-dimensional systems* | CPACC, CTO, FAO and CDERA |
| 11:45 a.m. – 12:30 p.m. | *Session 7: Technology as a Bridge to the Information Gap*<br><br>- ICT for Development – overview of the SWAN Project in Belize and the potential for expansion/Overview of UN Resolution | Mr. Mustafa Toure, Consultant |
| 12:30 p.m. – 13:35 p.m. | Lunch Break | |
| 13:35 p.m. – 14:00 p.m. | *Session 8: Training and Capability – Critical Needs*<br>- Indicative Priority Needs for training and capacity-building in information management | Presentation and Discussion led by Mr. Mustafa Toure, Consultant |

| **Day Two – May 28th, 2002** | **"Responding to the Challenges of Information Generation and Management"** | |
|---|---|---|
| 14:00 p.m. – 16:00 p.m. | *Session 9: Recommendations and Way Forward*<br><br>(1) Break Out Groups:<br>- Strategies for Improving Information-sharing on Sustainable Development<br>- Development of National Information Policies<br>- Priority Training Needs for IDSD to address in key thematic areas | All |
| 16:00 p.m. – 16:15 p.m. | Coffee/Tea Break | |
| 16:15 p.m. – 17:00 p.m. | *Session 9 cont'd*<br><br>(2) Report from Breakout Groups | |
| 17:00 p.m. – 17:20 p.m. | *Session 10: Conclusions, Recommendations and Next Steps* | Leisa Perch, OAS |
| 17:20 p.m. – 17:30 p.m. | *Closure of the Meeting* | Government of St. Lucia and OAS/UNDESA |

***** End of Meeting *****

## ANNEX II. GUIDING QUESTIONS/COMMENTS FOR THE WORKING GROUPS

**Working Groups/Break-out Sessions**

Group 1: Topic – Strategies for Improving Information for Sustainable Development – in the IDSD thematic areas

- Identify mechanisms to address key challenges in information generation.
- What are some basic principles that countries can follow/should consider in developing information for sustainable development?
- Propose Key strategies for improving information for sustainable development for Caribbean SIDS.
- What some key considerations that should be raised at SIDS +10 in the area of information for decision-making?
- How can information be improved so that it is useful for decision-making?
- Identify approaches to data gathering.
- How should issues of design be addressed in terms of information gathering and storage so that extraction can be simplified?
- How should issues of quality and quantity be addressed in data generation and use?
- Identify the potential roles of technology, policy and strategic planning in the context of information management.

**Group 2: Topic - Development of National Information Policies including issues such as access, information-sharing, reporting and participation.**

- Identify/Propose Best Practices/Ideas for address critical information management issues at the policy level and how these could be integrated into policy.
- Are policies required for any specific areas of sustainable development?
- How can the issue of access to information be addressed sustainably?
- Define potential structures and policy frameworks in which these issues can be accommodated.
- Identify approaches to building consensus on information needs.
- Role of Sustainable Development Councils and Committees.
- Strengthening of existing structures and mechanisms for collaboration.
- Effective function cooperation
- Identify approaches and mechanisms for effective networking – Is there a larger role for networks in addressing some of these issues?

**Group 3: - Priority Training Needs for IDSD in addressing Sustainable Tourism, Land use Planning, Coastal Zone Management and Disaster Management/Climate Change**

- Identify major gaps in existing capacity.
- What are the key constraints to the effective use of existing data? What other prohibitive factors limit decision-making?
- Training Needs – in what areas and at what levels. Suggestions should reflect steps that are not already being taken in other projects and activities.
- How can Caribbean SIDS build sustainable capacity?
- How can we build functional competencies in areas to support information for decision-making in these areas?
- What types of technical training should be given priority?

**ANNEX III.**

# ADDRESS BY THE HONOURABLE IGNATIUS JEAN
MINISTER OF PHYSICAL DEVELOPMENT, ENVIRONMENT AND HOUSING
OF SAINT LUCIA
TO THE OPENING OF THE REGIONAL WORKSHOP ON
INFORMATION FOR DECISION MAKING
27 – 28 MAY, 2003
REX ST LUCIAN HOTEL

Salutation

On behalf of the Government of Saint Lucia and the Ministry of Physical Development, Environment and Housing, it gives me great pleasure to share some thoughts with you at the opening of your workshop on Information for Decision-Making.

The concept of sustainable development, though not new, took center stage on the global development agenda during the United Nations Conference on Environment and Development in Rio in 1992. Since that time, countries around the world, and in particular developing countries have invested much energies in coming to terms with modalities for operationalizing sustainable development. Now, by definition, sustainable development is about pursuing our development goals without compromising the ability of future generations to do the same. The concept recognizes that its achievement requires the integration of social, economic, and environmental considerations in development planning. At first these may seem to the uninformed to be uncomplicated issues, but it is when you try to put the theory and concepts into practice that the difficulties raise their ugly heads.

These difficulties are both institutional and cultural. We have a history of thinking and acting along narrow, sectoral or portfolio paths. This modus operandi has led over the years to the creation of structures that are sector focused, designed to address either a single, or tight cluster of related issues on the development agenda. This, in turn, nurtured the evolution of a mind set, particularly in the public sector, that does not lend itself readily to the integration of the many non-sectoral issues that are integral to the attainment of sustainable development goals. The challenge, therefore, is to fashion, or indeed re-fashion, governments in ways that will break down the compartmentalization that characterizes the way the public sector functions – a task easier articulated than achieved.

Notwithstanding what I have just said, national efforts are further complicated by global issues. The end of the cold war brought a false, but short-lived sense of relief to the world. It was quickly replaced by the greater threat of global instability, which, in a very real sense, calls into question the ability of governments to govern. We have lost the ability, or indeed the right to define our own political, social and economic agendas. And lest I be mistaken, I am not referring only to global terrorism, but also to globalization, the World Trade Organization (WTO) processes, the influence of powerful states on the policies and freedoms of the lesser, the power of the Bretton Woods institutions and a myriad of other international structures and processes over which we have little control, but which bring to bear considerable influences on how we pursue our development agendas.

These are indeed difficult times, but rolling over and letting events dictate our future is not an option. Developing countries, and indeed small island developing states must fashion responses that go beyond being reactionary - we must transcend the status quo and fashion our own approaches, within the context of the global environment, but unique to our own circumstances, strengths and abilities. We have a good blue print in the Barbados Programme of Action, but this, I suggest focused too heavily on environmental issues. The Programme itself needs to better reflect the sustainable development paradigm and we should use the upcoming review next year to address this. Notwithstanding, as I said earlier, it does provide a useful starting point – what we need to do is to start to seriously making it the centerpiece of our development agendas.

In addition to the Barbados Programme of Action, SIDS have joined a number of multilateral environmental agreements – perhaps too many for us to deal with all of them effectively – as part of a strategy to achieve sustainable development. But remember that sustainable development is not about environmental protection – it is about integrating environmental, social and economic agendas in a mix that will allow us to achieve our development goals without compromising the ability of future generations to do the same.

In responding to this challenge, my Ministry has decided that the way forward is to change the way national development planning takes place and the way development is pursued. We are of the view that we must start with a long-term vision for our development. This vision, we feel, must then be deliberately translated into non-sectoral development principles, developed on a platform of social, economic and environmental considerations, as a means of forcing the integration of sectoral efforts in the achievement of wider national development goals. The output of this process we will call our sustainable development strategy, from which we will extract our medium term development strategies.

What I just described is bold, challenging and novel, but we feel that we must build sustainable development principles into our development planning processes and that this is the best approach to doing so. One of the challenges we will face in this exercise will be the availability of appropriate, timely information to inform the decisions we must make along the way. To this end we have compiled our first compendium of environmental statistics and will soon produce our first State of the Environment Report. We also have annual publications of our Economic and Social review and have recently completed a poverty assessment for the country. There is much information out there for us to draw upon as we pursue our integrated approach to national development planning. The problem is that the information is not all in one place and often difficult to pull together as and when needed. In addition, the presentation is generally for reporting purposes and not for decision-making. We will therefore have a major challenge on our hands to redesign our information collection, storage, analysis and reporting procedures to ensure that we can get what we want, when we want it and in a form that will suit our purposes.

It is against this background that I welcome this initiative you are launching here today. Information for decision-making will be a key ingredient in the work that lies ahead for us here in Saint Lucia. In the final analysis, the quality and relevance of the decisions we will be called upon to make will depend on the quality of the information available to inform them. But lest I appear to be selfish, let me quickly add that this is not true for us in Saint Lucia alone. All countries will need access to quality information for decision making. This workshop is therefore important, not only because it highlights the significance of information in decision-making, but also because it helps consolidate, and even reassert our commitment to sustainable development, which has been a recurring theme for good governance for at least the last decade. This workshop will therefore serve as the beginning of the action that we need to take to improve the quality of, and access to the information needed by citizens, the private sector and governments to make better decisions and to take action to support our sustainable development aspirations.

It is against this background that I welcome you to this workshop. I especially welcome participants from our neighboring islands and trust that you will leave this experience better informed on the subject of your discussions over the next two days. I also extend a warm welcome to the representatives of the OAS, the SIDS office in New York, the UN Department for Economic and Social Affairs, the UN Statistics Division, CARICOM and UNEP/ROLAC. Your support for this initiative underscores the commitment of your organizations to the sustainable development of Small Island Developing States. Obviously we have good friends in our corner and we will continue to call upon you for support as we pursue our sustainable development goals.

It now gives me great pleasure in declaring your workshop open, and wish you an enlightening experience.

Thank you.

## ANNEX IV. LIST OF PARTICIPANTS

| Name | Title | Institution | Address | Telephone | Fax | Email |
|---|---|---|---|---|---|---|
| Barbara Tillet Abdulhadi | Physical Planner | Land & Surveys Dept | Min. of Natural Resources & Environment & Industry, Market Square, Belmopan Belize | (501) 822-2598/22249 | (501) 822-22333/1526 | lincenbze@btl.net |
| Birgitte Alvarez-Rivero | Sustainable Development Officer | United Nations Division for Sustainable Development | 2 UN Plaza, DC2-2262 New York, NY 10017 USA | (212) 963-8400 | (212) 963-1267 | alvarez_riverob@un.org |
| Beverly Andrews | Bio-statistician | Caribbean EPID Centre | 16-18 Jamaica Blvd Federation Park St. Clair | (868) 622-4261 ext 345 | (868) 622-1008 | Andrewbe @carec.paho.org |
| Natalie Boodram | Information Officer | Caribbean Environmental Health Institute ( CEHI) | P.O.Box 1111 The Morne, Castries, St. Lucia | (758) 452-2501 | (758) 453-2721 | cehi@candw.lc |
| Lancelot Busby | Economic Affairs Officer | United Nations ECLAC | P.O. Box 1113, Port of Spain, Trinidad | (868) 623-5595 | (868) 623-8485 | lbusby@eclacpos.org |
| Fiona Christopher | Research Officer | Ministry of Physical Development Environment & Housing | Greaham Louisy Administrative Building P.O. Box 709 | (758) 468-4490 | (758) 458-2330 | Fchristopher @planning.gov.lc |
| Gail Clarke | Marketing Research Specialist | Caribbean Tourism Organization | 1 Financial Place, Collymore Rock, St. Michael, Barbados | (246) 427 5242 | (246) 4293065 | gclarke@caribtourism.com |
| Shelton DeFour | Programme Officer | CDERA | The Garrison , St. Michael, Barbados, W.I. | (246) 436-9650/1 | (246) 437 7369 | cdera@caribsurf.com |
| Cornelius Fevrier | Environment & Sustainable Dev. Officer | Ministry of Physical Development Env. & Housing | P. O. Box 709 | (758) 468-4463 | (758) 468-4522 | fevrierc@planning.gov.lc |
| Dr. Lystra Fletcher-Paul | Integrated Natural Resources Management Office | Food & Agriculture Organization of the U.N. | United Nations House, Marine Gardens Christ Church, Barbados | (246) 426-7110 | (246) 427-6075 | lystra.fletcherpaul @fao.org |

## ANNEX IV. LIST OF PARTICIPANTS

| Name | Title | Institution | Address | Telephone | Fax | Email |
|---|---|---|---|---|---|---|
| Jacinta Francis | Tourism Officer | Ministry of Tourism | 3rd Floor, Sir Stanilaus James Bldg. Waterfront, Castries | (758) 468-4619/1/0 | (758) 451-7414 | aurejfrancis@hotmail.com |
| Jose L. Gerhartz | SIDS Net Information Officer | SIDSNET/UWICED | c/o UWICED , UWI Mona Campus, Jamaica | (537) 202-7970 | (537) 204-0798 | gerhartz@ama.cu |
| Herold Gopaul | Director of Information Services | Caribbean Environmental Health Institute ( CEHI) | P.O. Box 111, The Morne Castries | (758) 452-2501 | (758) 453-2721 | hgopaul.cehi@candw.lc |
| Valerie Gordon | Coordinator | Jamaica Sustainable Dev. Network | c/o Liquanea Cybercentre 891/2 Half Way Tree Rd, Kingston Jamaica | (876) 968-0323 | (876) 968-1125 | vgordon@jsdnp.org.jm |
| Dr. Edgar E. Gutierrez-Espeleta | Director | Development Observatory | University of Costa Rica | (506) 207-4878 | (506) 207-4854 | egutierr@ucr.ac.cr. |
| Maritza Hee-Houng | Information Specialist | Consultant to OAS | 3, Hillside Ave. Cascade, Trinidad & Tobago | (868) 624-8280 | N/A | heehoung@tstt.net.tt |
| Sharon Hutchinson | Lecturer | University of the West Indies | SEDU (Sustainable Economic Development Unit), UWI-St.Augustine,Trinidad | (868) 662-2002/2444 | - | shutchinson@fans.uwi.tt |
| Ian C. King | Project Officer | Caricom RPIU for the ACCC Project | Lazaretto Complex, Black Rock, St. Michael Barbados | (246) 417-4579/80 | (246) 417-0461 | kingcpacc@sunbeach.net |
| Vidyaratha Kissoon | Co-ordinator | SDNP | c/o UNDP, 42 Brickdam, 2 UN Place, Georgetown | (592) 227-6198 | (592) 226-2942 | co-ordinator@sdnp.org.gy |
| Peter A. Murray | Programme Officer | OECS, ESDU | Morne Fortune, P. O. Box 1383 Castries, St. Lucia | (758) 453-6208 ext. 29 | (758) 452-2194 | pamurray@oecsnrmu.org |
| Jeanne Majella Louis | Statistician | Gov't Statistics Dept. | Chreiki Bldg. 55 Micoud Street, Castries, St.Lucia | (758) 452-3716/24410 | (758) 451-8254 | majellalouis@hotmail.com |
| Anthony McKenzie | Manager Strategic Planning & Policy | NEPA | 10 Calidonia Ave. KGN 10 Jamaica | (876) 906-5787 | (876) 754-7594 | amckenzie@nepa.gov.jm |

## ANNEX IV. LIST OF PARTICIPANTS

| Name | Title | Institution | Address | Telephone | Fax | Email |
|---|---|---|---|---|---|---|
| Kakuko Nagatani-Yoshida | Junior Professional Officer | UNEP- Regional Office for Latin American and the Caribbean | Blvd. de los Virreyes, No. 155 Lomas de Virreyes, Mexico, D.F. Mexico | (525) 55202-4841 | (525) 55202-0950 | kakuko.nagatani@pnuma.org |
| Natasha Nunez | Programmes Associate | Caribbean Network For Integrated Rural Development (CNIRD) | 40 Eastern Main Road, St. Augustine, Trinidad | (868) 662-6473 | (868) 645-5963 | cnird@carib-link.net |
| Kemraj Parsram | Technical Officer | Caribbean Conservation Association | Chelford, Bush Hill, The Garrison St. Michael, Barbados | (246) 426-5373 | (246) 429-8483 | ccatechofficer@ccanet.net |
| Leisa Perch | Project Manager/Environ-mental Specialist | Organization of American States | 1889 F Street NW. Rm 622-A Washington DC 20006 | (202) 458 3228 | 202 4583560 | lperch@oas.org |
| Martina Regis | Economist | Ministry of Physical Dev. Env. & Housing | Greaham Louisy Administrative Building P.O. Box 709 | (758) 468-4463 | (758) 452-2506 | mkregis@planning.gov.lc |
| Espen Ronneberg | Inter-Regional Advisor for SIDS | SIDS Unit, DESA, United Nations | 2 UN Plaza, DC2-2082 New York, NY 10017 | (212) 963 -2043 | (212) 963-4340 | ronneberg@un.org |
| Susanna Scott | Fisheries Biologist/Coastal Zone MGT. Project Coordinator | Ministry of Agriculture & Fisheries | Point Seraphine, Castries | (758) 468-4138 | (758) 452-3853 | deptfish@slumaffe.org |
| Reena Shah | Statistician | United Nations Statistics Division | DC2-1412, 2 UN Plaza, New York, NY 10017, USA | (212) 963-4586 | (212) 963-0623 | shahr@un.org |
| Amrikha D. Singh | Environmental Officer | Ministry of Housing, Lands and Environment, Barbados | First Floor, S.P. Musson Building, Hincks Street, Bridgetown, Barbados | (246) 467-5705 | (246) 437-8859 | technical@meenr.gov.bb |
| Angela R. Skeete | Regional Programme Coordinator | CARICAD | Weymouth Corporate Centre Roebuck Street St. | (246) 427-8535 | (246) 436-1709 | askeete@caricad.org |

## ANNEX IV. LIST OF PARTICIPANTS

| Name | Title | Institution | Address | Telephone | Fax | Email |
|---|---|---|---|---|---|---|
| | | | Michael Barbados | | | |
| Cletus I. Springer | Principal Consultant | Impact Consulting Services Incorporation | P.O. Box 1410 Castries | (758) 4521007 | (758) 452-1007 | springer@candw.lc |
| Edwin St. Catherine | Director | Statistics Dept | Chreiki Bldg, Castries | (758) 453-7670 | (758) 451-8254 | edwin_St._Catherine @msn.com |
| Luc St.Pierre | CEPNET Programme Office | UNEP - Caribbean Regional Coordinating Unit (UNEP-CR/RCU) | 14-20 Port Royal Street, Kingston, Jamaica | (876) 922-9267 | (876) 922-9292 | lsp.uneprcuja @cwjamaica.com |
| K. Mustafa Toure | Consultant | IDSD Project | P.O. Box 984 Belize City, Belize | (501) 610-2197 | (501) 223-1762 | mustafa@belizeiit.bz |
| Bishnu Tulsie | Chief Sustainable Development & Env. Officer | Ministry of Physical Development, Environment & Housing | Graheam Louisy Administrative Building, P.O. Box 709. Waterfront Castries | (758) 451-8746 | (758)4516958 | btulsie@planning.gov.lc |
| Claudia S. de Windt | Proj. Attorney Inter-American Forum on Env. Law | Organization of American States | 1889 F Street NW. Rm 623 Washington DC 20006 | (202) 458-6914 | (202) 458-3560 | cdewindt@oas.org |

**Annex B**

# Proposal for a Pilot Network for Decision-making for Sustainable Development

**A Preliminary Report for the**
**"Information for Decision-making on Sustainable Development (IDSD) Project"**

**by**
**Maritza Hee Houng**

**Information Consultant**

**for the**
**Unit for Sustainable Development and Environment**
**Organization of American States**

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*LIST OF ACRONYMS*

| | | |
|---|---|---|
| CAGRIS | - | Caribbean Agricultural research Information System |
| CANARI | - | Caribbean Natural Resources Institute |
| CARICOM | - | Caribbean Community |
| CEIS | - | Caribbean Energy Information System |
| CEPNET | - | Caribbean Environment Programme Network |
| CCA | - | Caribbean Conservation Association |
| CFRAMP | - | Caribbean Fisheries Resources and Assessment Programme |
| CPACC | - | Caribbean Planning for Adaptation to Climate Change |
| GIS | - | Geographic Information Systems |
| IDB | - | Inter-American Development Bank |
| ICT | - | Information and Communications Technology |
| IDSD | - | Information for Decision Making for Sustainable Development |
| INASP | - | International Network for the Availability of Scientific Publications |
| ISP | - | Internet Service Provider |
| NGO | - | Non-Governmental Organization |
| OAS | - | Organization of American States |
| ODINCARSA | - | Ocean and Data Information Network for the Caribbean and South America |
| POA | - | Programme of Action |
| SDNP | - | Sustainable Development Networking Programme |
| SIDS | - | Small Island Developing States |
| UNCED | - | United Nations Conference on Environment and Development |
| UNDP | - | United Nations Development Programme |
| UNECLAC | - | United Nations Economic Commission for Latin America and the Caribbean |
| UNEP | - | United Nations Environment Programme |
| UNSD | - | United Nations Statistics Division |
| UWICED | - | University of the West Indies Centre for Environment and Development |

1. Background to the Project

1.1 The Caribbean Community (CARICOM) and its member states require support in creating mechanisms for the long-term management of sustainable development and environment information and particularly in defining ways to harness this information for decision-making purposes. In order to assist in meeting this demand, the Organisation of American States (OAS) has teamed up with the United Nations Division on Social and Economic Affairs (UNDESA) to implement a small regional project entitled **" Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Island Developing States (SIDS)"**. The OAS has been given the task of managing this important initiative, which is better known as the **Information for Decision-making for Sustainable Development (IDSD) Project**.[2]

1.2 The IDSD project aims to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii) develop a training manual and materials for training of personnel at the national and regional level; and (iii) create a regional electronic site for accessing information on information management systems and techniques. The project will be executed from November 2002 - October 2003.

1.3 It is envisioned that the following outputs will be achieved:

- A pilot network of national, regional, and possibly local institutions involved in information management in the Caribbean region;
- Resource persons trained as information managers within the region that will have the capacity to train information managers themselves at the regional and national levels;
- Training materials on information management systems for training of human resources accessible through SIDSNET connected to regional networks and UN-system sites;
- A forum of exchange for experiences among regional and national information systems' managers; &
- A final report on implementation, including an assessment and evaluation of the projects.

1.4 IDSD builds on previous work carried out by the United Nations Statistics Division (UNSD) in collaboration with the CARICOM Secretariat/Member States on *"Strengthening Capacity in the Compilation and Dissemination of Statistics and Indicators for Conference Follow-up in the Caribbean region"* and work by the United Nations Environment Programme (UNEP) in the field of environmental information management. The work programme envisions

- A regional experts meeting to assess and agree on priority training needs,
- The identification of best practices and appropriate information management tools,
- The implementation of a training course, and
- The establishment of a website to address information management for sustainable development.

1.5 Four pilot countries (Barbados, Belize, Jamaica & St. Lucia) have been selected for the first phase of the project, which is to focus on four thematic areas: Sustainable Tourism, Land use planning, Coastal Zone Management and Disaster Management including Climate Change.

2. Terms of Reference of the Assignment

2.1 The Terms of reference of the assignment are as follows:

The consultant will assist the OAS in proposing a framework for a pilot network to support information sharing and discussion amongst actors at the regional level involved in sustainable development. The network will also, of necessity, be a medium for the sharing of information. As such, the pilot network will be designed to facilitate the practice of sharing information amongst all actors in the region over

ongoing activities and function as a readily accessible portal where critical information and data can be located by all. The network will supplement the information provided in the website.

2.2 The Consultant will have the following responsibilities:

1. Evaluate the effectiveness of existing information and information-sharing networks in the region and outside the region which have been set up to increase access to and on information for sustainable development by:

(a) assessing their success in (i) reaching their audience, (ii) meeting the needs of practitioners, and (iii) their sustainability. Particularly, the consultant should include the following networks in her review: SIDSNET (United Nations Department of Economic and Social Affairs), the Sustainable Development Networking Programme (United Nations Development Programme); CEPNET (United Nations Environment Programme/Caribbean Regional Coordinating Unit – Jamaica) and Landnet Americas (OAS/USAID), formerly www. PropertyRegistration.org.

(b) evaluate these networks, assess the successes and constraints and identify lessons learnt from the execution of these programmes. The consultant should employ efforts to interview both institutions and stakeholders and users involved in completing this review.

2. Develop and propose a framework for a pilot network based on the findings of the evaluation and on needs of the IDSD project. In the design of the proposed framework, the consultant should address in detail: (i) ease of access, (ii) maintenance and updating, (iii) mechanisms for monitoring and evaluation of the effectiveness of the network; and (iv) long term sustainability.

3. Introduction and Context of the Assignment

3.1 This Report is in response to the above stated initiative by the Organization of American States (OAS) with respect to the Terms of Reference to:

(a) evaluate the effectiveness of existing information-sharing networks in the region and outside the region which have been set up to increase access to and on information for sustainable development

(b) propose an appropriate framework for a pilot network based on the findings of the evaluation.

4. Background

The Report of the Earth Summit[3] identifies the need for information to support sustainable development, and in Chapter 40 entitled *"Information for Decision Making*", (in the context of sustainable development) the Report, while recognizing that "considerable data already exist," recommends the implementation of two broad programme areas which are critical to the decision making process. These were identified as

- Bridging the Data Gap
- Improving Information Availability

The objectives which were listed as important in defining these programme areas are as follows:

5. Bridging the Data Gap: Objectives

- To achieve more cost-effective and relevant data collection and assessment by better identification of users, … and of their information needs at local, national and international levels;

- To strengthen local, provincial, national and international capacity to collect and use multi-sectoral information in decision-making processes;

- To develop and strengthen local, provincial, national and international means of ensuring that planning for sustainable development in all sectors ????capacity???? the means is based on timely, reliable and usable information;

- To make relevant information accessible in the form and at the time required to facilitate its use.

6. Improving Information Availability: Objectives

- To strengthen existing national and international mechanisms of information processing and exchange, and of related technical assistance to ensure effective and equitable availability of a generation at the local, provincial, national and international levels, subject to national sovereignty and relevant intellectual property rights.

- To strengthen national capacities within Governments, NGOS, and the private sector in information handling and communications, particularly within developing countries.

- To ensure full participation of, in particular, developing countries in any international scheme under the organs of the United Nations for the collection, analysis and use of data and information.

[3] Agenda 21: Programme of action for sustainable development; Rio declaration on environment and development; the final text of agreements negotiated by Governments on the United Nations Conference on Environment and Development, 3-14 June 1992, Rio de Janeiro, Brazil. NY, UN, 1993.

7. Other Developments

7.1 The follow-up meeting to UNCED, held in Barbados in 1994, the Global Conference on the Sustainable Development of Small Island Developing States, in its Programme of Action,[4] highlighted and requested follow up action on the part of the United Nations in undertaking the development of an Information Network For Small Island Developing States, (SIDSNET), which would address the objectives so clearly stated in Agenda 21.

7.2 In addition, the regional level follow up activity in the form of the Caribbean Meeting of Experts on the Implementation of the SIDS Programme of Action held in May 1995, again focused on the priority areas of action. The recommendations of the Experts Meeting include some recommendations which are specific to information. These are as follows:

(1) A survey of information resources and needs should be undertaken for the designated priority areas of the SIDS-POA. Based on the results of the survey, a proposal should be prepared for implementation of national and regional information management programmes, for sustainable development which would include data collection and analysis, repackaging and dissemination of information for decision-makers at all levels and utilizing new information technologies, where appropriate. The proposal should be prepared with inputs from multi-disciplinary teams at national and regional levels.

(2) Information management and training should be promoted since this is crucial for the full and effective utilization of information technologies in the region.

7.3 UNECLAC which convened the Ministerial Meeting of Experts responded to the recommendations and commissioned a study to do a number of things, including, identify priority needs of different categories of users for environmental information, identify and detail ongoing and planned environmental information initiatives in the region being implemented by a range of actors, identify mechanisms for national and regional institutions to respond to these needs, and formulate a concept proposal for a regional strategy to strengthen the capability of Caribbean governments and regional institutions for environmental data and information management.

7.4 The resulting study[5] provides an extensive listing of data and information needs grouped under priority areas outlined in the POA. The study recommends as the priority step in its strategy, the execution of institutional audits of environmental data and information. Other strategic initiatives proposed are broad based and general in nature and include the development of metadatabases, the establishment of coordinating bodies for information management, the provision of infrastructures to facilitate information flows, (i.e., telecommunications technologies), and capacity building in human resources in information management.

7.5 It cannot be determined (for the purpose of this study) how much of the institutional data audits at national and regional level took place, but certainly there were several layers of activities on going at a practical level which sought to collect, analyze, repackage and disseminate data and information geared towards more sustainable practices for a varied group of users.

[4] United Nations 1994. Earth Summit. Programme of Action for Small Island States. Global Conference on the Sustainable Development of Small Island Developing states. Bridgetown, Barbados, 26 April – 6 May, 1994. NY, UN.

[5] ECLAC-CDCC/IDRC/UNEP. 1997. The way forward: environmental information mangement in the Caribbean. Caribbean Ministerial Meeting on the Implementation of Programme of Action for the Sustainable Development of Small Island Developing States, Barbados, 10-14 November, 1997. (SIDS97/INF.9)

7.6 These were to some extent demand-driven in response to an increasing awareness at both governmental and civil society levels of the threats of some development agendas on natural and human resources. Information for decision-making on these issues was not seen as the prerogative of governmental agencies, and the result was a mushrooming of non-governmental organizations and community based organizations at both regional and national level, seeking a role in decision-making with the governments. Add to this scenario the role of international agencies, in particular with respect to the reporting and other requirements of international conventions, (Convention on Biological Diversity, The Ramsar Convention, the Cartagena Convention and its related Protocols, etc.) and the result is a complex mix. The multi-disciplinary nature of the issues involved in sustainable development and the range of potential actors only serves to increase the complexity.

7.7 The dynamic and complex situation has spawned a range of projects, programmes and initiatives. Some were focused specifically on information management , others on a combination of research and information dissemination, and yet others on advocacy and conservation efforts and which therefore had a component of information management.

7.7 These initiatives include SIDSNET, Sustainable Development Networking Programme of the United Nations Development Programme, (SDNP), the United Nations Environment Programme's (UNEP) INFOTERRA Programme, the Ocean and Data Information Network for the Caribbean and South America (ODINCARSA), Caribbean Planning for Adaptation to Climate Change (CPACC), Coastal Zone Management Programme of Barbados, CARICOM Fisheries Resources and Management Programme (CFRAMP), the Gulf of Paria Database Project funded by Food and Agriculture Organization and the United Nations Development Programme (UNDP). The role of information technology as a tool was a major factor in these initiatives. This list is not exhaustive.

7.8 Library networks and databases relevant to sustainable development were also in progress, e.g., the Caribbean Agricultural Research Information System, (CAGRIS) of the University of the West Indies, and CARISPLAN, a Caribbean Socio-economic Information System, funded by UNECLAC.

7.9 Programmes within NGOs and other institutions aimed at information dissemination included the CCA Information Management Programme, the extensive investment in all aspects of information collection, publication and dissemination by the Island Resources Foundation and the work in research and documentation on specific themes, for example, participatory planning in natural resources management done by CANARI. This list is also not exhaustive.

7.10 It is within this context that the attempt at determining the effectiveness of networks has been approached.

7.11 The extent to which SIDSNET and other networks have effectively "bridged the data gap" and "increased the availability of information" in Caribbean SIDS and the effectiveness of the input of the information in decision-making for sustainable development, is the focus of this meeting and project.

7.12 The network concept as used here refers to a group of organizations and institutions which participate in a defined activity and which use information and communications technologies (ICTs) as the method of linkage and information sharing.

7.13 There are several different types of these networks, including those which use the technology as the major tool for linkage, and others such as wide area networks and Intranets, but the discussion here is not limited to these technological networks. Information is assumed to include both 'data' and information.

8. The Information Networks
8.1 The time frame of this assignment and the scope of work did not permit a full and detailed evaluation of the selected networks. It did permit an overview and an assessment which can lead to some conclusions and provide some pointers for other network development. Much of this assessment is based on the comments of participants in the network, on my own observations and interaction with the SIDSNET and other developments.

9. SIDSNET.
9.1 SIDSNET had as a major objective, the provision of ICTs as a tool to enable SIDS to share information, expertise, experiences and other resources and to use these in decision making for sustainable development.

9.2 Certainly, SIDSNET did provide the ICT tools to a wide range of stakeholders, and initiated through training and other initiatives increased participation by SIDS in Internet based activities. SIDSNET spawned new web sites, increased the availability of information at national level through national web sites and by mirroring some sites expanded the horizons of information usage. In addition, SIDSNET also provided the tools for virtual discussion forums, chat conferences, document storage, events calendars, and discussion lists. In my own experience the discussion lists were particularly useful.

9.3 Some of the drawbacks were the wide range of topics and the number SIDS intended for coverage, and the difficulties faced by the receiving organizations in maintaining the activities when the support and training were completed. The reality of this is evident on the SIDSNET web page today, where the linkages to relevant Caribbean sites and sources are quite limited. The proposal to establish a SIDSNET presence in each of the key island regions did not materialize for the Caribbean and may account for the low level of coverage on the Caribbean on the web page. In the process of this assignment, it was learnt that the SIDSNET Regional Focal Point will shortly be established in Jamaica under the aegis of University of the West Indies Centre for Environment and Development (UWICED).

9.4 Comments by users in the region stressed the absence of specific areas for example, trade and the environment issues which are critical for SIDS and the focus on rather broad areas. Content was seen as a concept but not delivered as a working tool. Responsiveness to user needs was also felt to be ineffective, and the absence of a regional contact point was also a weakness. The establishment of Caribbean Focal point referred to above, is likely to address some of these concerns.

10. Sustainable Development Networking Programme (SDNP)
10.1 The Sustainable Development Networking Programme (SDNP) of the UNDP was another initiative which sought to introduce ICTs within developing countries as a means of enhancing information flows within and between sectors and thus contributing towards the achievement of sustainable development. The SDNP focus was focused on human development, giving a wider scope to SDNP activities than its sub-programme, SIDSNET. In addition, its coverage is developing countries while SIDSNET's coverage is restricted to small island developing states.

10.2 In the Caribbean there are two SDNP projects, Jamaica and Guyana. Both have achieved significant success in the broad based objective of supporting sustainable development through the delivery of information by the increase in connectivity, but the process has been markedly different.

10.3 The Jamaican model has established seven telecentres in rural communities, trained more than 500 persons in Internet use and basic computer applications, assisted in developing content and hosting it for a number of NGOs and other agencies.

10.4 Now operating as an established NGO, entitled the Jamaica Sustainable Development Network Ltd., the project has clearly established its growth and success by adopting developments which met the demands of its user group. These appear to have been the need for training and access to computers and the Internet, and on a lesser scale the development of web pages and hosting services.

10.5 The Guyana model has taken a different route. In a country with a lower level of ICT development, the objective of facilitating information flows towards contributing to sustainable development, was interpreted as more directly providing connectivity and building skills for access. In Guyana, the SDNP acts as an ISP and offers dial up access under different plans as well as hosts web pages (both for the Government and NGOs), and trains users and web developers.

10.6 The SDNP is also very involved in ICT policy development in the country and collaborates with governmental and other agencies in potential ICT project development in Guyana.

10.7 In both the Jamaica and Guyana models, therefore, it seems the demands of the situation have directed the path of the networks and been contributory factors to their success and further development. This seems to be a useful lesson in the design of new networks.

10.8 It is therefore recommended that in the development of the IDSD network some flexibility in operations be accommodated within each thematic network, and that the guidelines to be developed for operations clearly state this.

10.9 With respect to sustainability this has remained a problem, and both have continued to receive support beyond the original completion date. Both have used the opportunities available for income generation to their advantage, but have continued to seek support funding to maintain the networks.

11. CEPNET

11.1 The CEPNET project was approved by the Inter-American Development Bank (IDB) as a regional Technical Cooperation Project. Its objectives were to "strengthen the coastal and marine resource management capabilities of the IDB member countries in the UN Caribbean Environment Programme." Operational between 1996 – 1999, (approved in 1994) the Pilot Network involved six countries, Barbados, Jamaica, Trinidad and Tobago, Dominican Republic, Nicaragua and Venezuela. There are extensive progress and evaluation reports which document the process of the project implementation.

11.2 In brief, the project achieved significant success in strengthening the marine and coastal marine resources capabilities in participating countries. This involved the provision of hardware and software to enable information management, training in web page design and management of web sites, training in specialized software such as GIS and metadata standards and application for network partners. Network participants in turn were expected to generate 'State of the Coasts' reports for sharing on the network. For the Regional Coordinating Centre at UNEP in Jamaica, the project did 'strengthen the central role of the Caribbean Regional Coordinating Unit,' which developed an Intranet and a web site during the project, and facilitated the hosting of the databases and other products developed by participating countries. The strength of the internal infrastructure left at the RCU is a major benefit of the project. Its further development and ongoing management remain an issue of concern.

11.3 For the participating countries training and information sharing of available resources have been the major benefits. Metadata on available information resources has encouraged cooperation and eliminated some duplication. This also highlighted issues related to the need for policies on data dissemination, opened avenues for cost recovery of data collection in some instances or at least policies on this, and provided a virtual space for environmental reporting on the 'State of the Coasts.'

11.4 The Progress Reports on the Project indicate achievements beyond the creation and sharing of information and skills in the model and framework which can be applied in other areas, and in the catalytic role it has played in bringing information and Internet policy issues to the fore. Users of the network sites have also expressed satisfaction with its very focused approach and see this as a major advantage to the broader framework attempted by SIDSNET.

11.5 There is concern however with respect to sustainability at both the RCU and the pilot network sites, given that ongoing efforts at maintaining the services and information products now have to be done without additional staff and other inputs provided at start up. In addition, the rate of information technology development, particularly with respect to specialized tools (e.g., GIS, metadata databases, etc.,) requires an ongoing commitment to training and updating for participants. The difficulty of resolving this need, coupled with the routine loss of trained personnel, continue to be concerns for network planning.

12. Other Networks

12.1 It is useful at this point to indicate that in addition to the networks actually listed for review there are an increasing number of networks of different types which are also relevant in the field of sustainable development.

13. Library and Bibliographic Networks

13.1 Library networks precede thematic networks and were focused on the development of bibliographic (i.e., catalogues of documents on a particular field from several participating libraries), databases between several institutions and made the information available to all network members. Caribbean Socio-Economic Information System (CARISPLAN), Caribbean Agricultural Research information system (CAGRIS), Caribbean Energy information System (CEIS), are good examples of these networks. The development of ICTs and the growth of the Internet has forced changes on these networks, but their role and input in information delivery and use remain very relevant.

13.2 While there is less need for collaborative building of bibliographic databases now that participating members can provide their specific databases on the Internet, the additional possibility of making the full text of citations possible has led to the growth of digital libraries. These can be a major supporting infrastructure to thematic networks and should form part of any new network development. UNECLAC for instance has made this transition from CARISPLAN, a bibliographic network, to a digital library, and provides access not only to its own documents but to other full text links of relevant Caribbean documents.

14. Commodity and Thematic Networks

14.1 There is also an increasing number of commodity and thematic networks in the Caribbean and the structure and operations of some of these should be both supportive and useful in the design of new networks.

14.2 The networks operated under the Program for Cooperation of Institutes of Agricultural Science and Technology in the Caribbean (PROCICARIBE) jointly by IICA and CARDI are recommended as models. The networks cover the following:

- CARIFRUIT Fruits
- CRIDNET Rice
- CIPMNET Integrated Pest Management
- CAPGERNET Plant Genetic Resources
- CLAWRENET Land and Water Resources

- CABANET Banana and Plantain
- CARINET Biosystematics

14.3 The National Network engages both private, public sector and civil society representation in the generation, validation and transfer of technology and information related to the specific issues nationally and regionally. National networks join together at the regional level under the leadership of a Regional Coordinator who works closely with the PROCICARIBE Secretariat and a Technical Advisory Committee which ensures the technical integrity of the networks' activities and products. The Secretariat facilitates and coordinates the operations of the networks and assists in mobilizing resources.

14.4 Funding for the networks is generated through membership fees and from project funds. As is the case with other regional bodies membership fees are often late or unpaid. The dynamism and success of regional coordinators in attracting project funds becomes critical.

14.5 The experience of the CARINET network seems relevant for planning purposes.
CARINET is mandated by the Caribbean region's urgent need to conserve and utilize sustainably its biological resources. While the Caribbean is renowned for its species diversity and endemism, the problems of small size, isolation and fragility threaten the very resources on which the region is dependent. This applies to its marine, coastal and terrestrial resources.

14.6 CARINET therefore seeks to

- Provide biosystematic services to the Caribbean sub-region and to develop and maintain sustainable systems in the agricultural and environmental sectors;
- Offer species identification services at minimal cost to member countries;
- Support the initiative of self-reliance in biosystematics through continued training, upgrade of reference collections, information services and the development and adaptation of user-friendly technologies;
- Provide support to national programmes in areas related to plant quarantine, wise use of the environment, biodiversity, and eco-tourism; and
- Establish North-South, South-South linkages to facilitate the implementation of the programme of work.

14.7 CARINET's work is targeted at the agricultural, environmental and public health sectors in the Caribbean, and its services are directed to biological scientists, research scientists, and the extension and farming community in the CARIFORUM countries. CARINET's activities are mainly in the taxonomic field and are focused on information and communication services, training, rehabilitation of resources, development and application of new technologies. CARINET has developed databases which include biosystematics and directories of experts and technical centres and has facilitated training in biosystematic methods. While there are no built in mechanisms for assessment of its effectiveness there has been clear validation by the responses to its success in identification and management of the Pink Mealy Bug and whiteflies which have been major pests in the region. This type of validation has done more for the continued support to CARINET than formal evaluation mechanisms.

14.8 CARINET's scientific data on taxonomy feeds its specialist clients, but by extension the generation of data can also be utilized in respect of the region's input to requirements for the Convention on Biological Diversity as well as for developments in areas related to the planned networks of this workshop, for example, sustainable tourism and coastal zone management.

14.9 It is suggested that in the planning of new networks extensive research be conducted to identify existing networks, institutions and work programmes with which the networks should collaborate, as well as explore the development of joint information products.

15. Caribbean Energy Information System (CEIS)
15.1 The CEIS is also presented as an interesting model. A cooperative network of fifteen (15) CARICOM governmental members the network is engaged in the sharing and pooling of energy information. CEIS generates a number of information products covering energy production and use, directories of research and expertise as well as news on energy themes. Its products have been developed based on user needs and sale of the products generate some funds for the network. The dynamism and commitment of the regional coordinator of this network have contributed to its continuity, in spite of problems related to ongoing funding.

16. NGO Networks – Caribbean Conservation Association Network
16.1 In addition to information networks there are also NGO networks which have as a major focus, the management and dissemination of information. The experience of the Commonwealth Secretariat funded project developing the information system at the Caribbean Conservation Association, a network of governmental and other NGO members, is also relevant and is drawn on here as an input to the discussion.

16.2 The focus of the Information Management assignment was the building of a library and databases to ensure improved access to CCA's considerable information resources. The project met this objective but also accelerated the development into adopting new technology, developing a web presence, offering information directories on the web, and initiating email information services. The scope of work needed and the available financial and human resources could not meet the demand that was created. However, the process also created a focus on the need for regional environmental information management and focused CCA's strategic thinking towards new projects such as its current Regional Environmental Information Network (REIN). That process has influenced the ideas presented here.

17.Virtual Networks
17.1 The International Network for the Availability of Scientific Publication (INASP) operates a successful health information network. INASP-Health is a cooperative network of more than 1000 organizations worldwide working to improve access to relevant, reliable information for health professionals in developing countries. The services include an information forum (workshops), advisory services which draw on the expertise of network participants, email discussion lists, provision of directories on organizations working to improve access to information for health professionals, and a portal to health related information on the web. Supported by INASP, WHO and other organizations the role of the Coordinator appears to be pivotal in the development of the network.

17.2 With respect to evaluation of networks INASP-Health recently requested participants to indicate their observations on value of the network on their email discussion list. The responses which provide details of practical examples of usage are the best evaluation seen to date on information networks. Practical approaches may be the best solution.

18. Sustainable Development Initiatives in Barbados
18.1 Given that Barbados is a pilot country in the IDSD project, a review of current sustainable development initiatives was undertaken and discussions were held with the following agencies:

- Caribbean Conservation Association (CCA)
- Caribbean Disaster and Emergency Response Agency (CDERA)
- Caribbean Environmental Reporters Network (CERN)

- Caribbean Planning for Adaptation to Climate Change (CPACC)
- Caribbean Tourism Organization (CTO)
- Ministry of Housing, Lands and Environment

18.2 The range of ongoing activities which are being done by these agencies and which are generating varied information and datasets is extensive, and have been reported on in the baseline study[6] which forms the background study for the IDSD project.

18.3 The information scenario seen includes the generation of information from several sectors, the sharing and dissemination by various methods, (CERN and CCA in particular), the analysis of data collected (CPACC), the development of indicators, (CTO), as well as attempts at building systems for information management (CCA and its Regional Environmental Information Network).

18.4 In brief, Barbados appears to present an ideal scenario for a pilot network focusing on a specific theme, and it is suggested that tourism should be the theme selected. In addition, the management structure in existence in Barbados is recommended as a possible model for the other pilots to be developed. Barbados' National Commission on Sustainable Development is supported by a multi-sectoral Steeering Committee on Indicators for Sustainable Development, which advises on information and datasets which are needed. The work done by this Steering Committee can in turn be further disseminated and shared through the facilities offered by the CERN and CCA's REIN, with linkages to the OAS IDSD project.

18.5 The Pilot Network for Sustainable Tourism can be initiated in Barbados by linking the several agencies already involved in aspects of sustainable tourism. The common shared goal of ensuring an effective economic tourism sector is supported by sub-goals which meet the specific objectives of the participating institutions. The role of the network will best be met by supporting the specific objectives of each agency but at the same time addressing the broader issue of achieving an effective economic tourism sector

.

18.6 The CTO's MIST requires the input from other agencies and can best be advanced by offering them a win-win situation which involves them in providing data to MIST but at the same time, provides some support for their own activities. In addition, the interaction between the agencies will result in a more widespread knowledge of the development of MIST, and shared information on the concerns of the participating agencies is likely to lead to new processes in information collection and to more committed and motivated membership.

18.7 It should be noted that there was limited knowledge among agencies met during the survey in Barbados for this project, of the development of MIST and of its intention to provide information in the region.

18.8 A critical component of this project and of the information management approach being developed should be the initial creation of a portal/directory on the range of activities and initiatives for each thematic area which are generating and producing relevant information. This will assist in the development of plans for the effective management of the information and for ideas and methods which allow for improved access and better outputs.

18.9 CERN's potential for making information available to the general public through a range of media services including radio, print, email news lists, should be brought into the project mix. Information

[6] Marco Alcaraz and Leisa Perch. Assessment and establishment of a baseline on information for decision-making in CARICOM Small Island Developing States (SIDS). Washington, OAS, 2003.

outputs targeted at the general public but drawn from the datasets generated by the specialist systems will make a significant impact on the design of information systems.

18.10 Ongoing assessments should be done within the life of the project to provide for adjustments that may be needed. The assessments should be straightforward and simple and should not involve additional funding.

## 19. Networks: Effectiveness in Improving Access to Information

### 19.1 Defining the Concepts

In planning networks that will be effective a preliminary step is the identification of the information gap/s which the network seeks to address and the process by which that gap was identified. There are likely to be many problem areas requiring information support, and consultation on the most critical of those problem areas is needed.

19.2 Deciding on the audience for the information needs is also a necessary process in ensuring a relevant and effective network. The stance that information is needed for decision-makers should also address the levels of decision-makers a network is intended to serve. The current views on participatory decision-making particularly with respect to sustainable development, mandates a network that seeks to inform and involve all levels of stakeholders in the decision-making process.

19.3 A very focused planning process should therefore address specific problems, rather than broad issues, for e.g., biodiversity, and should be participatory involving all possible stakeholders.

### 19.4 Ensuring Effectiveness at the Operational and Technical level

In measuring the effectiveness of networks in improving access to information one can employ both identifiable qualitative and quantitative indicators, but these must be identified in advance and data generated against these indicators. In a study done by Margot Bellamy[7] on the assessment of impact of information management in the field of agriculture, five types of indicators are identified:

- Performance indicators: relating inputs to outputs
- Effectiveness indicators – relating outputs to use
- Cost-effectiveness indicators – relating inputs to use
- Cost-benefit indicators – relating inputs to outcomes
- Impact indicators – relating use to outcomes.

19.5 This type of theoretical approach is both costly and time consuming, and according to one source provides inconclusive results. The International Development Research Centre (IDRC) funded a CARICOM project entitled ‘Information for Decision-Making’ (1993 – 1994), which sought to assess the impact of regional information services on decision-making, research and action. While the project did provide information providers with some lessons on the approach to assessment, it was inconclusive with respect to the actual input of information services to decisions taken.

19.6 In the absence of a monitoring system geared towards the data collection and analysis suggested by Bellamy, one has to depend on a more generalised and practical approach and this is what has been employed in this study, and it is suggested as an effective means determining the value of networks.

[7] Margot Bellamy. Approaches to impact evaluation (assessment) in agricultural information management. CTA, 2000.

19.7 In effect, the study has depended on observation of the major outputs of the networks, e.g., the Internet presence and programmes, on experience in interaction with the networks, and on the observations, comments and of stakeholders, institutions and users. The number of these approached while minimal, were of a quality that the information provided can be ranked as the best available.

19.8 Some suggested useful approaches to determining effectiveness at operational level are the following series of questions:

20. Assessment of Effectiveness of Networks
Has the network been effective in collecting relevant information?
In making the information available (processing – cataloguing, indexing)?
In disseminating the information (traditional means or new technology)?
Has the network been able to generate new information?
Have information networks made any significant impact on sustainable development practices?
Does the structure of the network facilitate the increased availability of information from members? Do members have the tools and resources for creating a web presence, for loading their information on network sites?
Is there a national network structure which builds and shares information at national level?
Are there effective methods for dissemination of information from all partners in the network? For e.g., discussion lists, newsletters, newswire, radio programmes
Do users have the tools to access and use the information?
Can you identify problems faced by information networks, e.g.,
Have information providers in the specialist areas been identified?
Do existing networks adequately cover the special fields of the study?
Are the areas of coverage well defined in networks?
Are there a proliferation of new knowledge networks? Are there linkages?
Do information providers have the capacity to make information available?
Is there any linkage between information generators and users which ensures application of the information?

21. Success in Reaching the Audience
Has the network been effective in sharing the information with all levels of users?
Is there any indication that information provided has made an in-put in decision-making?
Is there any evidence of changes in behaviour among recipients?
Have the methods of information dissemination met the particular needs of users? TV, radio, Internet, print, etc.
Have the networks specifically addressed the needs of users/practitioners in the following fields – Sustainable Tourism, Land Use Planning, Coastal Zone Management, Disaster Management?
Have information activities changed the way you work in the field?
Are you aware of increased capacity in any relevant institutions as a result of information availability?
Has information strengthened the capacity of individuals working in the fields listed?
Has the network generated new information from users/practitioners?

22. Sustainability Issues
What changes have you noticed in information handling for sustainable development in the last 5 years?
Are you aware of any significant improvement in information management for sustainable development?
Would networks be sustainable without grant funding?
Can networks generate funds on their information services?
What products can assist in making the networks sustainable?

23. General Recommendations Design for a Pilot Network
This assignment has generated some thoughts on the network development process as follows:

(i) A clear definition of problem areas to be addressed and the types of information needed to address those problems should be made. Generalised themes are not useful.

(ii) The levels of information needed must be clear, with participatory decision-making as an objective, information generation must meet the needs of the researcher, the policy maker and the local NGO.

(iii) Preliminary research should be done to identify all potential stakeholders, other networks, institutions and programmes (including information sources) which should be involved in the consultation and development process.

(iv) Full consultation with all stakeholders is needed to ensure priorities are determined and that cooperation is agreed.

(v) Negotiation on linking and sharing of available complementary and relevant information sources which combined can make a valuable whole should precede the development of new product development.

(vi) Willingness on the part of users to meet the costs of information generation should be explored. This is a crucial factor as it affects the sustainability of the network and its products.

(vii) The network structure must clearly define the information generating roles of all members, and facilitate the coordination and output. Responsibility for the data sets should be clear and rights re usage and sharing should be stated.

(viii) Full advantage should be taken of the information technology developments, in particular tools such as online discussions, users lists, video and radio linkages and associated use of e-commerce and other features which can support the financial stability of participants in the networks.

(ix) The process of network development should include capacity building within participating institutions, enabling continuing training particularly with respect to the rapidly changing information technology applications in information management.

(x) The network should also allow for the training of users in the information outputs, particularly in the use of specialized products such as GIS.

(xi) Information dissemination should however also address the needs of users without the capacity to use specialized tools.

(xii) Consideration should be given to exploring new type networks which are virtual rather than physical and which operate under a very open structure. An example of such a network is the INASP Health Network. (see www.inasp.info/health). Admittedly, the life- or-death need for health information may account for the active participation in this network.

(xiii) Human resources for the network are vital to its success. In this context, the role of the coordinator of the network is critical, and requires a full time dedicated dynamic and committed individual. The network should provide for this.

(xiv) Agreements should be sought early in the development for methods to maintain trained personnel post the start-up of the network. The networks reviewed all indicated the difficulty of maintaining the system when project funds ended.

(xv) An overview external group for example, a Technical Advisory Group should form part of the planning and ongoing review work of the network.

(xvi) The experience of regional networks represented here should be useful in providing additional guidance in a design of a pilot that truly delivers information, helps in its application and uses the experience to build further knowledge for users.

24. Priority Action

25.1 Sections 19 – 24 provide recommendations for the development of the network and guidance questions which can be used both for planning and monitoring the network. Urgent attention must also address the following priority issues:

- Seed funding to initiate the network, and allow for the start up processes, (e.g., meetings, guidelines preparation, sample output);

- Selection of the coordinating agency and the coordinator to guide the process; and

- Training of network participants in data inputs and outputs and development of training materials to support the network (use of technology, application of multi-sectoral approaches to indicators for sustainable development, etc.)

25. Proposed Framework

The design of the Ttourism Pilot Network which has been proposed for Barbados should first of all address the institutional infrastructure of the network. The development of the institutional framework will require the identification of all the agencies involved in the thematic area and the determination of be based o the objectives on which the several collaborating agencies are focused. It is suggested that this step should be the next step in the implementation stage of this project.

25.2 While all the selected agencies may have the development of tourism sector as a common theme, each has more specific aims. CTO may, for example, be concerned with the potential of the economic growth of the sector, a number of other national agencies in Barbados may be focused on beach and water quality, participation of small entrepreneurs in the tourism sector, development of heritage tourism for example, and others at a more regional level (for example CCA) may have an interest in involvement in the development of tourism policies and in their application and dissemination across the region.

25.3 An initial step in the structure of the framework therefore is the identification of all the relevant agencies which should be brought together in the setup of the pilot network. In addition, each agencies' focus on the tourism sector should be clearly identified and the resources which are available for meeting the stated objectives. The contribution of the individual agencies towards meeting the common overall objective should also be identified. A critical input at this stage of development of the network is the identification of those activities which can contribute to **decision-making for sustainable tourism.**

26. Structure and Potential Operations

26.1 A Coordinating agency should be agreed on by all the agencies participating in the network. The Coordinating Agency will have a major role in guiding the development of the network and in ensuring

that the major objective of the network (i.e., information for decision-making in tourism) remains the priority focus, while permitting the individual agencies to maintain their special interests in related areas.

26.2 While the Coordinating Agency is critical to the network development, the real responsibility lies with the individual who leads the network. Dynamism and commitment, initiative, strong team and leadership qualities, ability to motivate others are all qualities that will be needed.

26.3 Other operational activities include the preparation of guidelines under which the network will function, the pooling of data and information generated by participating and other agencies, the definition of new information necessary to meet the objectives, the agreement on tasks for each agency, the design of new information activities, the building of the information tools, the effective dissemination and promotion of the new tools, the analysis of their application and use and review towards changes and additions.

26.4 With respect to the Pilot Tourism Network proposed for Barbados it is suggested that the following options be explored. At the recent UNDESA/OAS IDSD meeting 'Using Information for Decision-making on Sustainable Development – Issues and Challenges for Caribbean SIDS' in St. Lucia, the CCA offered to act as coordinator for the development stage of the project, and it is suggested that this offer can be extended to provide an option for the CCA to act as coordinator of the Barbados based Tourism Pilot Network. There are several good reasons for this. CCA's current focus on the development of a REIN allows for the incorporation at a practical level of the policies, guidelines, inputs and outputs being developed for the REIN, within the Pilot Network. It also offers the opportunity for linkages with other networks in which CCA is participating or building, and provides the win-win situation noted earlier in this report.

26.5 The Ministry of Housing, Lands and Environment is also a possible option for the development of the Pilot Tourism Network. This Ministry has responsibility for the operations of the National Commission on Sustainable Development which is supported by a multi-sectoral Steering Committee on Indicators for Sustainable Development. The development of the Pilot Network could be exploited by this Ministry to generate the data needed for the creation of indicators of sustainable tourism development. Barbados' priority focus on the tourism sector in its economic development and the critical need for ensuring the sustainability of the tourism product are factors that cab be brought together effectively in a Pilot Network managed by the Ministry of Housing, Lands and Tourism. Managing the Pilot Network within the Ministry also provides a more direct national focus, and could assist in guiding the development of national networks in other Caribbean countries.

26.6 The CTO is another possible option for the location of the Pilot Network on Sustainable Tourism. CTO is the most important and stakeholder in the Caribbean in the tourism sector, and its very existence justifies its inclusion as a possible operator. Additionally, its thrust on information dissemination and awareness as a specific programme and strategy for sustainable tourism development can be the pillar on which the Pilot Network is developed. CTO's resources and its regional strengths are significant advantages for this option. The range of its activities, and the demands of its more direct clients in the tourism business, who need to generate profits rather than indicators may be disadvantages.

26.7 The OAS itself is also a major contender for the role of network coordinator. Its role in the conceptual development of the IDSD Project and its position in the joint UNDESA/OAS Project as Field Managing Institution, together with the various assessment and extensive data collection on the status of regional information management activities for sustainable development, prepared as a precursor to the IDSD project, are significant factors in the OAS retaining its role as coordinator of all the networks to be developed within the IDSD project. It can be argued that the clarity of its vision in defining and developing the IDSD Project require its continued involvement in the coordination to ensure its

successful implementation. In addition, the need for accessing funding and for collaboration with other international agencies can best be achieved with the OAS as leading partner. The disadvantage of a non-regional host for the network has been noted earlier in this Report, but given the awareness of this possible limitation, efforts can be made to ensure that regional institutions are made collaborative partners in the networks.

27. Linkages with Existing Networks and Sharing of Lessons Learnt

27.1 This report and the Regional Meeting held as part of the Project on Information for Decision-Making for Sustainable Development, have identified a wide range of existing networks in the region. These networks can contribute data in some instances and the value of the experience in network development to the IDSD Project.

27.2 It has been determined that initial operational processes will include the identification and pooling of data generated by other agencies. This process should allow for the establishment of linkages (formal or non-formal) with relevant networks and this can best be facilitated through the coordinator, who can seek to use the strength of his/her organization and the new network to forge the links. Maintaining the linkages and gaining from the experience of other networks requires the building of relationships and ability in developing a perspective on issues as they develop. Tools such as Internet access, participation in meetings, newsletters, email discussion lists all contribute to the process, but the coordinator provides the stimulus and the balance.

28. The Role of Networks in Information Dissemination

28.1 The review of the networks cited in this Report has pointed to the increase in the availability of information to network members, and the potential for sharing by means of ICTs to non-members. Network participation increases the potential for the development of new and specialist information resources and the application of ICTs enhances the tools that can be developed, for example databases, webpages, portals, etc. ICTs also facilitate more extensive sharing of the information being generated. Networking both in the sense of collaborative building and sharing and in the context of technological networking (i.e., Intranets, WANS, etc.,) offer enormous potential for the increased dissemination of information.

28.2 The geographic make-up of a dispersed island chain in the Caribbean limits the interchange between islands. This further exacerbates the already limited information flows at the local level. Several studies have noted the tendency for organizations in the region to operate in a uni-dimensional way. Participants at the workshop and the survey conducted for this project confirmed in a practical way the lack of information and knowledge sharing between institutions. Effective networking has the potential to open up channels of information exchange at national and regional levels, and consequently to improve decision-making, as well as lead to the generation of better sources of information. across the region

28.3 In addition to the priority role of information generation and dissemination the network can also use its information resources in assuming a more activist role in defining strategies, in providing advisory services to policy makers, in influencing public opinion and reaction, and in effecting the necessary changes in the area of its operation.

28.4 It is particularly in the context of the network assuming a more activist role that the participation of CCA's REIN has been suggested. CCA has long sought and given the composition of its membership of Governmental and NGO members should play a major role in policy determination in the area of sustainable development in the region. CCA's involvement at the level of the REIN should facilitate the additional value of setting policies for sustainable tourism which can be shared and eventually adopted in the region.

*BASELINE COSTS AND BENEFITS OF ESTABLISHING A NEW NETWORK*

| *COSTS* | *BENEFITS* |
|---|---|
| **Network Coordination including:** | Creation of linkages among participating members |
| • Preparation of guidelines | Increased sharing of information |
| • Consultation with stakeholders | Coordination of information activities between agencies leading to improvements in availability |
| • Research and analysis | Generation of new information products drawing on larger information resource base |
| • Provision of equipment and network tools | Capacity building in human resources via training of network members |
| • Support funds to initiate network | Access to updated technology for members |
| • Development of network products, email lists, multi-media products, web pages, etc., | Capacity building in IT management via requirements of network to maintain pace with IT developments |
| • Training of network members | Development of focused website and portals |
| • Training of trainers | Establishment of linkages with other related networks and potential coordination of information activities, e.g., CSD, SIDSNET, IIED, IISD, INFOTERRA, CARINET, ACS Sustainable Tourism Zone for the Caribbean |
| • Cost of Dissemination of information | Ongoing assessment of impact of network – and resulting adaptations |
| • Network Coordinator | Identification of information producers and users in the specialist area/s |
| • Meeting costs | Input to building national information polices, strategies and structure |
| | Increased credibility in work of regional coordinator |
| | Possibility of generating funds from sale of information products |
| | Increased sustainability of network through sale of products |
| | Increase in public awareness through outputs |

| | |
|---|---|
| | to various groups |
| | Increased civil society participation in issues |
| | Development and improvement in IT skills nationally and regionally (capacity building) (training of users) |
| | Documentation of qualitative aspects of network experience in lessons learnt |
| | Increased visibility of network (and members) in sector leading to greater input in policy-making levels, e.g., CARICOM meetings, ACS Convention on Sus. Tourism Zone of the Caribbean |

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Annex C

# CARICOM Small Island Developing States (SIDS) Information Technology Training & Capacity-Building: Priorities for Sustainable Development Decision-Making


## Final Report For The "Information for Decision-making on Sustainable Development (IDSD) Project"

**By**
**K. Mustafa Touré, Priority Training Needs Consultant, for the**
**Unit for Sustainable Development and Environment**
**Organization of American States**

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# *EXECUTIVE SUMMARY*

**1. PROJECT OVERVIEW**

The overall IDSD project aims are to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii develop a training manual and materials for training of personnel at the national and regional level; and (iii) create a regional electronic site for accessing information on information management systems and techniques.

**The Consultant's Terms of Reference call for the identification of priority training needs for the region in generation and using information for sustainable development. In particular, training needs for promoting the use of information technology tools and the management of information technology. The outputs will inform the development of training materials and the design of a training course scheduled for September 2003. The consultant's tasks ultimately relate to the project's aim of developing methodology tools and approaches. This document is the finalised Training Needs Assessment Report and includes recommendations for the way forward and strategies for addressing existing gaps by the IDSD Project. A separate draft outline of a proposed methodology for defining indicators and baselines for measuring progress in using information for decision-making has also been produced.**

**2. REGIONAL IT MANAGEMENT INFRASTRUCTURE ASSESSMENT**

**2.1. Information Management Review**

**In carrying out the assessment of Regional Sustainable Development Information Management & Infrastructure, a conceptual overview of Information Management was carried out with background provided on: Information, Statistics, Indicators, Information Management Systems, New Tools and Sustainable Development Decision-Making. The report finds that the increasing 'digitisation' or computerisation of data-gathering and dissemination has led to new, increasingly cheaper and more efficient systems of information sharing and management. In the 21st Century, the Internet has become the pre-eminent 'communicator' and has triggered the development of the 'knowledge' or 'information' society movement to widely employ ICT/IT systems for advancing socio-economic development. Given its multi-disciplinary global scope, when utilising these systems for the measurement or management of Sustainable Development, effective decision-making relies on the establishment of appropriate requirements, goals and tools (such as statistical indicators). However, in order for these technological tools to be utilised effectively, organisational and technological frameworks must exist to carry out the associated activities required to establish and maintain these systems.**

**2.2. Information Infrastructure Review**

**Similarly an overview was made of the conceptual basis of the term Information Infrastructure with the emphasis being: National Information Infrastructure (NII), Global Information Infrastructure (GII), 'Informatisation' and the INEXSK technique of measuring IT use for economic development. The review found that the evaluation of where a country or region stands in terms of information infrastructure can be accomplished by: (1) Investigating the status of existing IT physical infrastructure for connectivity [in terms of Landline & Cellular Telephone Connections, Personal Computers (PCs), Servers and Internet Service Providers (ISPs)] and the economic activities that underpin them; (2) Assessing IT Scientific and Technological infrastructure, including Training & Research institutions, to understand strengths and weaknesses in terms of human resources capacity; and (3) Considering the expertise and experiences of a broad array of International, Government, Private and Non-Government actors in the area of IT and Information Management.**

**2.3. Global Sustainable Development Information Management Review**

The report found that the United Nations System since 1992 has spawned a number of key Global information management policies, mechanisms and initiatives that have been endorsed by the world community. A review is made of their outputs in terms of: Agenda 21 Chapters 35 & 40; the Barbados SIDS Programme of Action (SIDS-POA); the Millennium Declaration Goals (MDGs), the World Summit on Sustainable Development (WSSD) and the World Summit on the Information Society (WSIS).

***Agenda 21 and the Sustainable Development Networking Programme (SDNP)***

Agenda 21 contains two chapters (35, Science for Sustainable Development and 40, Information for Decision-Making) that have made a substantial impact on global Sustainable Development Information Management. Two institutional capacity indicators are used by the UN's Commission on Sustainable Development (CSD) to monitor progress in implementing Chapter 40: (1) Under the Information Access sub-theme, Number of Internet Subscribers per 1000 Inhabitants and (2) Under the Communication Infrastructure sub-theme, Main Telephone Lines per 1000 Inhabitants. The one used for Chapter 35 falls under the sub-theme of Science and Technology; it is Expenditure on Research and Development as a Percent of GDP.

Chapter 40 Information for Decision-Making, in particular, is especially noted for: (1) its two sub-programmes of global, regional and local actions required to ***bridge the data gap*** while also ***improving availability of information***; and (2) For laying the basis for the UNDP's Sustainable Development Networking Programme (SDNP) as an early intervention to close the digital divide and provide more information resources for disadvantaged regions and populations. The report identifies two Caribbean SDNPs in the CARICOM Member States of Guyana & Jamaica, a profile of the Jamaica SDNP was provided. The Jamaica SDNP has a well-defined set of goals and objectives that includes: I*ntroducing and connecting public, private non-government and community sector agencies and interests to local and international sources of information on sustainable development utilising the Internet and other tools; Establishing community Telecentres as focal points in marginalised communities; & Establishing community information networks"*

Chapter 35 Science for Sustainable Development is not as well known as Chapter 40, but has come to be seen as increasingly important for utilising IT to enhance decision-making. The multi-disciplinary nature of environmental management makes the development of national Scientific and Technological (S&T) capacity a critically important corollary to Information Management Infrastructures for Sustainable Development Decision-Making.

***Barbados SIDS-POA and the Small Island Developing States' Network (SIDSNet)***

A review is made of the 1994 UN Conference on the Sustainable Development of Small Island Developing States-SIDS held in Barbados that produced a fifteen point Programme of Action (the Barbados SIDS-POA). It is shown to be the policy foundation for Sustainable Development policies in SIDS worldwide. The 15 SIDS-POA issues or thematic areas, containing the core content of integrated regional environmental & natural resources management strategies, are presented with a review of IT related sections recommending actions that gave birth to the Small Island Developing States Network (SIDSNet). The report notes that SIDSNet is accessible to the region, but that it presently has no institutional link in the Caribbean. However, information findings from missions supporting the consultancy note that, in collaboration with the University of the West Indies' Centre for Environment & Development (UWICED), the launch of a Caribbean SIDSNet node is planned for the near future.

***The Millennium Declaration Goals (MDGs), the World Summit on Sustainable Development (WSSD) and the World Summit on the Information Society (WSIS)***

MDGs

Stating the origins of the MDGs as the UN's Millennium Declaration by most Heads of State and Government worldwide in the year 2000, it is explained that the declaration has 8 Goals and 18 Targets called the Millennium Development Goals (MDGs); progress towards meeting them is measured by 48 inter-related Indicators. The report identifies the indicators related to Sustainable Development Decision-Making Information as being: 6-Net enrolment ratio in primary education, 7-Proportion of pupils starting grade 1 who reach grade 5 and 8-Literacy rate of 15 – 24 year olds, 47-Telephone Lines per 1000 people and 48-Personal Computers per 1000 people.

WSSD

**A list of key outcomes and commitments arising from the 2002 Johannesburg World Summit on Sustainable Development (WSSD) Plan of Implementation was described by the report, along with decisions and statements produced by a related meeting of Latina American & Caribbean (LAC) Ministers of the Environment. The report states that the LAC Initiative endorsed a range of Objectives, Operational Guidelines and Action Priorities that stressed the importance of S&T and IT capacity-building, including human resources development and sustainability/vulnerability indicators, in promoting Sustainable Development and effective participatory decision-making.**

WSIS

The World Summit on the Information Society (WSIS) is described as the most recent major UN initiative of relevance to Caribbean Sustainable Development decision-making. A brief history and the UN Resolutions supporting the WSIS process were cited and the organisational arrangements which include the process leading to the Summit being coordinated by a high-level Summit organising committee, chaired by the ITU Secretary-General and consisting of the heads of United Nations bodies and other interested international organizations. Further, it recounts that the UN's Economic and Social Council adopted the idea at the high-level segment of its substantive session of 2000 via a ministerial declaration concerning information and communication technologies. Another important decision is described in which this Council decided to assist WSIS by, among other activities, creation of the Information and Communication Technologies Task Force (ICT-TF) as a successor to the UNCSTD Working Group on IT and Development.

The report acknowledges that the WSIS process has helped to considerably advance the region's awareness of IM/IT issues through a series of preparatory meetings in the Caribbean and abroad. One example given was the WSIS Eastern Caribbean Briefing held in 2002 that recommended important and timely steps to advance the regions IM/IT agenda through the WSIS as : (1) Establish a Caribbean sub-regional WSIS Task Force; (2) Regional agencies engaged in ICT activities (i.e. CDB, ITU, UWI, CARICOM, CTO, UN/ECLAC, OECS, CARICAD, UNESCO, etc.) should collaborate in the work of the sub-regional Task Force; (3) Seek visionary leaders and champions from the Heads of Government and or CEOs of the private sector to lead and direct the Task Force, and (4) The Task Force should identify an issue of crucial importance for the Caribbean and develop proposals around that issue for presentation at the World Summit.

**2.4. Regional Sustainable Development Information Management Review**

***Overview of Caribbean Regional Information Systems***

Using a thorough overview of Caribbean Regional Information Systems and/or Networks (Hee-Houng, 2001), a summary description of the major entities in the region is reported in a table format. These pioneering IM/IT mechanisms attempted to address regional and inter-governmental management and decision-making as well as a number of key sectoral interests such as Medicine, Trade, Energy and Agriculture. Overall, the systems and/or networks described may be considered as uni-dimensional single-sector mechanisms that focused more on 'data' and 'information systems' as opposed to multi-disciplinary Sustainable Development 'decision-making'. A selected number of the initiatives studied by Hee-Houng identified, along with relevant mechanisms identified during this consultancy that are more oriented to SD decision-making, are summarised in terms of their history/background and purpose/services; annexes with added information for several agencies are attached separately.

***Caribbean Regional Sustainable Development Information Management Mechanisms***

An analysis of the resulting Sustainable Development-oriented mechanisms/initiatives is made in the report, revealing that they are generally active in the functional use of IM/IT for decision-making in the following ways: (1) Information-Sharing & Networking (via List-servs and Email); (2) Human Resources Development (through Training, Workshops and Meetings); Institutional Capacity-Building (through the provision of IT Software/Hardware Infrastructure); & Public Awareness & Advocacy (using Websites, List-servs and Email). 4 SIDS-POA thematic decision-making uses are identified: (1) Information-Sharing and Monitoring of various global and regional Multilateral Environmental Agreements-MEAs by CARINFO, CEPNET, UN-ECLAC & REIN; (2) Coastal & Marine Resources Management by CEPNET; (3) Bio-diversity Resources by CCA/CREP/REIN; and Natural and Environmental Disasters by CARDIN. Three of the mechanisms identified are addressing the issue of Information for Decision-Making (CARICOM/UNSD, CARINFO & the newly formed CIVIC). It was noted that some aspects of IM/IT networking for decision-making in several of the other SIDS-POA thematic areas are presently being addressed by regional agencies such as: CPACC (Climate Change & Sea Level Rise via the Coastal Resource Information System); CTO (Tourism Resources via MIST); CARICAD (National Institutions & Administrative Capacity via E-Government Strategy Development); CEIS (Energy Resources); CARDI (Land Resources/Agriculture

via CAIS); CRFM (Coastal Marine Resources/Fisheries); CARICOM (Regional Institutions & Technical Cooperation); UWIDLIS (Human Resource Development); and CEHI (Freshwater Resources).

**2.5. The Use of Information for Regional Sustainable Development Decision-Making**

The presentation and analysis of five case studies of current uses of IT for Regional Sustainable Development decision-making covered the Mesoamerican Barrier Reef System (MBRS) Project Regional Network, the Government of Jamaica National Environmental Planning Agency (NEPA) Database, the Government of Belize Schools-Computers Wide Area Network (SWAN) Project, the Government of Barbados EduTech Programme, and the Jamaica TechSchool Initiative. The reviews are far from being an exhaustive examination of all existing mechanisms but were limited to a select number known to the consultant or discovered via project missions or web-research, given the time and scope of this consultancy. Preliminary analysis indicates, however, that there are significant opportunities for enhancing the application of IM/IT for decision-making in the region for all the identified SIDS-POA sustainable development issues or themes. While natural resources and environmental management (MBRS) has traditionally been seen as the main strategic use of IM/IT for Sustainable Development decision-making, human resources development (SWAN, EduTech & TechSchool) and other social sector applications (UNSD/CARICOM) should be considered as critical tactical capacity-building areas of interest. Overall, the region's IM/IT management infrastructure could be assessed as having a diverse and growing number of stakeholder organisations and agencies that could benefit from greater collaboration and rationalisation of their noteworthy efforts. Given the global basis for much of our national and regional activities in the field of IT for Sustainable Development, the region would do well to strengthen and better coordinate national and regional participation in the WSIS process.

***The Mesoamerican Barrier Reef System (MBRS) Project Regional Network***

This case study is an excellent example of IM/IT utilisation for Sustainable Development decision-making, in the context of a regional environmental management project involving Belize and her mainland neighbours: the GEF-funded MBRS Project's Regional Data Communications Network (RDCN). The goal of the MBRS is to enhance protection of the project area's unique and vulnerable marine ecosystems and to assist the participating countries (Belize, Guatemala, Honduras & Mexico) to strengthen and coordinate national policies, regulations and institutional arrangements for their conservation and sustainable use. One of the project's regional objectives is to: "*Develop and Implement a Standardised Data Management System of Ecosystem Monitoring and Facilitate the Dissemination of its Outputs throughout the Region*" The main goal of the RDCN project component is to develop a reliable base of data for the MBRS eco-region and an information system that can be used to support more informed management decisions. The establishment of a regional environment information system (REIS) is considered an essential tool for organising and managing data in support of improved decision-making. From an IM/IT point of view, the REIS mechanism provides the basic framework to guide Bio-Physical & Socio-Economic Data Collection, Processing, Distribution and Utilisation. The REIS will be fed by a regional and issue-specific long-term (synoptic) monitoring programme that will generate information on the region's oceanographic current regime and on the status and processes of MBRS reefs and other critical ecosystems. Data is to be collected on reproduction, larval dispersal & recruitment of corals, fish and other important reef components to further the understanding of ecological linkages between reefs and other marine environments, and processes that influence reef integrity. The specific outputs are: (1) Design and Implementation of a Synoptic Monitoring Programme; (2) Establishment of a bi-lingual (English and Spanish) Project Website; (3) Establishment of a Web-based Regional Environmental Information System, a GIS-capable database; and (4) Provision of Computing & Networking Equipment & Infrastructure to the 4 National RDCN Nodes. The report acknowledged that some useful insights for similar regional networking initiatives and mechanisms, including the IDSD Project, may be gleaned from a review of MBRS' approach to designing and implementing its RDCN. The MBRS network design process is summarised and graphic representation are provided of the end results of these two principal tasks: (1) Design and Implementation of an Electronic Information (or Communication) System, which would manage and make accessible to the project's clients information considered as relevant to management of the MBRS and related ecosystems & to the human communities that depend on it for their livelihood; and (2) Design and Installation of a Computer Network, the platform on which this information system would run.

***The Government of Jamaica National Environmental Planning Agency (NEPA) Database***

The SIDS-POA Country Report Compact Disc produced by the Government of Jamaica's National Environmental Planning Agency (NEPA) case is also another good example of current IM/IT usage for Sustainable Development decision-making. Using their State of the Environment reports for 1995, 1998 & 2001, NEPA prepared a compact disc (CD) for public dissemination that is structured along the lines of the 15 SIDS-POA thematic areas. Using their large integrated local area network (LAN), NEPA has included a large number of related reports, policy documents and papers into and integrated database with text and graphics. This tool is described as quite useful for briefing policy-makers, assessing progress in the management of national Sustainable Development policy, as well as for meeting a number of MEA reporting requirements.

***The Government of Belize Schools-Computers Wide Area Network (SWAN) Project***

In the important Human Resource Development area, this case presents how the Government of Belize has begun implementation of a Schools-Computers Wide Area Network (SWAN) project through its Ministry of Education, Youth & Sports (MoEYS). The project addresses the IM/IT issue of access to computers and the Internet at all levels of the education establishment for teaching, learning and educational administration purposes. In order to implement this innovative project in cooperation with Intelco (Belize's first new service provider under its recently liberalised telecommunications regime), a multi-disciplinary SWAN Task Force composed of representative staff from key units was formally set up in 2001 via a MoEYS directive and charged with: (1) Ensuring Timely and Effective SWAN School/NGO Sites Preparation, Hardware Installation, Maintenance & Monitoring; (2) Managing User-related Curriculum, Training & Instructional Software/Internet Administration/Operational Management Issues; & (3) Facilitating Stakeholder Participation & Public Awareness through Continuous Liaison with Intelco & Private Sector Contractors, National & District Education Councils (NEC/DEC), MoEYS Service Areas and School/NGO Sites Managing Authorities. Employing operational arrangements with Intelco and local equipment suppliers developed by the Task Force, the Installation Phase of the project has focused mainly on Information Technology (IT) Infrastructure Development. Technical staff support for network installation & maintenance came from the Employment Training and Education Services (ETES) unit, while administrative support for carrying out the required inter-related activities was coordinated through the Planning, Projects & Performance Measurement (PPPM) unit. PPPM assisted with the preparation and payment of contracts, and with the management of funds according to GOB procedures. District Education Centre (DEC) Officers assisted with the readiness of sites as they were prepared for installations.

The Quality Assurance & Development Services (QADS) unit worked in collaboration with the Central American Health Sciences University (CAHSU) to develop a Science Education website that is housed on the CAHSU server. This collaboration is expected to continue as a part of the MoEYS' goal of digitising the National Curriculum in order to support distance education via the Internet. The major achievements of the SWAN Project & Task Force in 2002, according to three main areas, are summarised and included. Further, the political manifesto of the present Belize Government (2003-08) envisages a significant role for Information Technology and the Internet in promoting sustainable economic development. Besides a far-reaching twelve-point proposal for developing a "High Tech Belize", one of its specific goals is to establish "Computer Education Centres" in all districts. The SWAN Project/Task Force is presently being re-tooled as a ministry-wide service area focusing on IT & Internet Services in order to assist MoEYS and Government to meet this challenge.

***The Government of Barbados EduTech Programme***

**This additional HRD case study comes from the UN Information and Communications Technologies Task Force (UNICT-TF), the UN Development Programme (UNDP) and the UN Fund for International Partnerships (UNFIP) co-sponsored a gathering called *Meeting on Bridging the Digital Divide for the Caribbean* held as part of the preparatory process for the WSIS at the United Nations in January of this year 2003. It covers the presentation made by Ms. Lolita Applewhaite (Director of the Centre for International Services, Cave Hill Campus of the University of the West Indies in Barbados) on the Government of Barbados' EduTech (Education Sector Enhancement Programme. EduTech is another practical example of IM/IT use in the Education sector that is similar to the Belize SWAN project, but of an order of magnitude larger in terms of financing and scale. In summary, as the first project of its kind and scope among CARICOM member state, EduTech is an innovative and multifaceted initiative to provide the Barbados education sector with the skills, tools and infrastructure to 'leapfrog' into the knowledge-based future.**

***Jamaica TechSchool Initiative***

The final case study presents one of the most unique Caribbean presentations at the UN *Meeting on Bridging the Digital Divide for the Caribbean* that was made by Makonnen Blake, Youth Technology Consultant to the Jamaican Minister of Commerce and Technology. Mr. Blake is a youth IT prodigy who was tapped by the Government of Jamaica to advance the involvement of youth in this vital arena. It covers his activities since his appointment in 1998 in pioneering a creative initiative to open the doors of IT opportunity for young Jamaicans by casting "Youth as IT Teachers" and engaging in a wide range of partnerships with other youth from the region and the developed world.

Overall, the report considers SWAN in Belize, EduTech in Barbados and TechSchool in Jamaica are harbingers of 21st Century Caribbean Knowledge Societies. They, along with the MBRS' Regional Environmental Information System, Jamaica's SDNP & NEPA State of the Environment/SIDS-POA compact disc, also offer proof from the limited assessment done that the Caribbean can successfully deploy IT tools for Sustainable Development Decision-Making that Bridges the Data Gap (Digital Divide) and Increases the Availability of Information.

## 3. REGIONAL IT TRAINING & CAPACITY BUILDING PRIORITIES

### 3.1 IM/IT Training and Capacity-Building Conceptual Review

***Education, Lifelong Learning and Institutional Change***

This section of the report sought to determine regional IT Training & Capacity-Building priorities and began by returning to Mansell & When's 'source book' for a review of the conceptual base for both a 'lifelong learning & institutional change' approach to and specific recommendations for IT skills requirements.

***Enhancing the Skills Base for Participation, Facilitation and Control***

Three types of skills are described: (1) Participatory Skills necessary for involvement in networked communication and information-sharing. These incorporate computer literacy and fluency in the English language for the use of the Internet, databases and most software until more content is provided in local languages; (2) Facilitating Skills for the design, implementation and maintenance of networks involve a number of essential skills for installation, user training and maintenance. In addition, software and computer systems engineering skills are desirable. Even more emphasis needs to be placed on vocational training to provide a large number of people with the ability to ensure the functionality of networks; and (3) Control Skills that enable the allocation of funds for the acquisition of appropriate ICT equipment in order to manage access to networks in some countries to achieve public or private control.

### 3.2 Caribbean Sustainable Development IT Training & Capacity-Building Needs

Here the report concludes that the path to appropriate and sustainable IT training for capacity-building lies along the Education sector highway, but, given the changes wrought by the emerging 'global information order', existing educational infrastructures and philosophical dogmas must be revamped. The new 'global information order' requires an 'informatisation' of the educational establishment, with an emphasis on criteria that will enable life-long skills that enable peoples and societies to Participate in, Facilitate operation of & acquire Control over this new 'global information order'. A useful view from India is covered that presents a 4-Level IT skills training framework to be considered by the region as it attempts to find a Caribbean vehicle to carry us along a high-tech Education path. The report surmises that our IT training transport must not only be globally marketable and multi-disciplinary, but it must also be able to navigate our distinct socio-cultural roadways and allow us to both contribute as well as receive goods. In summary, Caribbean IT training for Sustainable Development should become a part of all the region's many educational programmes. Beginning with 'e-Literacy; IT training has to enable operational use and eventual mastery of the applications, sciences and technologies involved for the benefit of the whole Caribbean Society., Our ultimate success in this endeavour will be judged by our ability to generate new content, products and services that are globally marketable **and** locally beneficial.

***Jamaica & Belize Missions and St. Lucia Survey Findings***

The input of stakeholders throughout the region is considered essential in the determination of specific Caribbean IT training and capacity-building priorities. This section covers how, as a critical part of the consultancy, brief missions were mounted to Jamaica and Belize where helpful discussions were held with a number of agencies and organisations that have an interest in the IDSD project and Information for Sustainable Development Decision-Making. Similarly, the project-sponsored St. Lucia Resource

Persons Meeting was designed to incorporate the views and opinions of a wider Caribbean audience into the IDSD project's determination of Priority IT Training & Capacity-Building Needs in the region. Using findings from the missions and a survey at the meeting, a needs assessment in the context of identifying perceived constraints as well as any new IT tools that should be recognised, was carried out . The complete findings from the missions to Jamaica and Belize; and the recorded St. Lucia Resource Persons' Survey responses were attached as appendices and the results were examined in the report to establish priority categories of needs, constraints or New IT Tools; the summaries were presented in tables within the document and through the use of three dimensional (3-D) charts to graphically the outcomes.

***Analysis of Needs, Constraints & New Tools***

According to the results, the most important need identified is Education & Training (including certification) in the following key areas with examples:

- **Databases**, including
  - Creation, development, distribution & management (especially for administrative staff);
  - Regional database development & maintenance training ('train the trainers' programme);
  - Review of administrative forms & systems to facilitate data gathering & recording;
  - Metadata development & management.
- **Networks**, including
  - Satellite networking;
  - Management & design.
- **Web/Internet**, including
  - Development;
  - Management.
- **Computer Operations & Maintenance**, including
  - Basic computer hardware concepts (e.g. RAM, ROM, etc.);
  - Essential office software (e.g. spreadsheets, word processing & database programmes);
  - PC File Management, Data formatting and Presentation programmes such as PowerPoint.
- **Remote Sensing and Geographic Information Systems (GIS)**, including
  - GIS technology for CSOs or clearinghouses;
  - GIS for Environmental (Coastal Zone) management.
- **Software Development and Use**, especially
  - Open-source (Linux) for "e"-Commerce.
- **Management of Changing and Evolving IT Systems & Infrastructure**, including
  - Security/vulnerability issues;
  - Training for negotiators;
  - Technical analysis training;
  - CTO MIST system operations (esp. in manipulation of 'back-end' data for national demands).
- **Statistics & Indicators**, including
  - Energy Balance & Energy Statistics;
  - Statistical coding methodologies, e.g. Costa Rica University Development Observatory;
  - Development of impact indicators.

In the determination of regional IT and capacity-building priorities, the report uses a synopsis of the categories from the findings to indicate that Education and Training is perceived as the single most important need; Infrastructure Capacity, Web & Software Development and National/Regional Collaborative Linkages are also significant needs. Several constraints were identified; the most critical being the lack of Human Resources Capacity, followed by inadequate Financial Resources, weak National/Regional Collaborative Linkages and insufficient Infrastructure Capacity. Web and Software Development was overwhelmingly assessed as the most momentous in terms of New IT Tools, although some notable implements were recognised from the Education & Training and Infrastructure Capacity areas. The overall ranking demonstrates that both Education & Training and Web & Software Development would be crucial components of any effective regional IT Training and Capacity-Building initiative. And, along with Infrastructure Capacity, Human Capacity and National/Regional Collaborative Linkages; they can form the strategic elements of present and future IDSD Project activities. The securing of appropriate Financial Resources must not be overlooked either, as it is viewed as essential to the sustainability of any proposed programme.

***Lessons from an Indian View on Human Resources Development to Meet IT Challenges***

The case from India shows that it is world known for the phenomenal advances made by its IT industry, especially in the field of software development and export. Assessing what the Caribbean can learn from India's experience, the report summed up a very useful paper in this respect written by R. Narasimhan of India's National Centre for Software Technology (NCST). Debunking what he calls the "*hype*" and "*mystique*" that "*software is peculiarly matched to the Indian genius*", Narasimhan analyses the HRD problem from a broader perspective and proposes a 4-level expertise generation framework, included as a table in the document, based on what he calls "*desired ideal*" criteria.

**3.3 Caribbean Sustainable Development IT Training & Capacity-Building Actions**

***Requirements for Sustainable Caribbean IT Training & Infrastructure Capacity-Building***

*Globally Relevant but Locally Available Education and Training*

The report concludes in terms of IT that, if the region is to assume and or maintain its control of this rapidly evolving, science & technology-driven instrument, appropriate training of a youthful populace as well as stakeholder IT staff is critical. A recommended template for providing the fundamental skills (Participatory and Facilitating) required, including advanced and basic courses is included:

- High level staff technical training for IT/IM/MIS Department Managers in: Networking, Security & Microsoft SQL (for Database Administrators) leading to the Microsoft Certified Systems Engineer (MCSE) credential;

- Mid level staff technical training for IT/IM/MIS Technicians in hardware and software installation/operation/maintenance (A+ Certificate); and
- Administrative level support staff training in full functionality of combination software packages (e.g. Microsoft Office or Coral Suites).

An example is given of Miami-Dade Community College's establishment of an Emerging Technologies Centre of the Americas (ETCOTA) to cater to hemispheric IT training and workforce needs in recognition of the value of the so-called 'high-end' technology training as a prerequisite for life-long learning IT careers; MDCC was also cognizant of the growing demand for such courses in the wider Latin American & Caribbean region.

The report maintains that, for fundamental manoeuvrability, and as the language of the new 'Global Information Order, these types of vendor-certified training courses are essential in the professional IT world and are increasingly needed by all stakeholder institutions involved in Caribbean Sustainable Development Decision-Making. In determining the types of IT education and training that the IDSD Workplan envisages, eight inter-related areas are suggested coming from the findings of section 3.2. The proposed curriculum would target key IM/IT managers and officials for instruction in:

- Database & Information Systems Development and Management;
- Networking (Local Area Networks-LANs & Wide Area Networks-WANs) Technologies;
- Email/Web/Internet Management;
- Computer Operations & Maintenance;
- Remote Sensing and Geographic Information Systems (GIS);
- Open Source Software Development and Use;
- Management of Changing and Evolving IT Systems & Infrastructure; &
- Sustainable Development Statistics, Indicators & Decision-Making

*Knowledge Management and Portals*

Knowledge Management

The document states that if the IDSD and other IT Education and Training initiatives for the region are to address critical regional problems and remain abreast of industry and societal trends, they must assess and deploy locally the latest tools available for the benefit of the Caribbean. Two recommended cutting edge mechanisms are 'Knowledge Management' and Portals. Knowledge Management, according to a strategic planning report for an Indian IT firm:

"*…is first and foremost a management discipline…that promotes a collaborative and integrated approach to the Creation, Capture, Organisation, Access and Use of an enterprise's information assets. This includes Databases, Documents and most importantly, uncaptured tacit expertise and experience of individual workers..*"

"*…helps prepare…for an environment of constantly shifting demographics, industries, economies and customer needs by ensuring that people have the expertise and information they need in order to properly assess business problems and opportunities...*"

Portals

Databases and portals are described as two key elements of IT with the potential to provide appropriate access to the vast amounts of online data existent in an organisation today in a dynamic and organized manner and UNESCO's "Webworld" Gateway is presented as an example of a portal-type website designed to advance that organisation's capacity for sharing the accomplishments of its own Information Society initiative. A more useful example for the IDSD project is considered to be the OAS Education for the Americas Portal. Carlos Paldao, of the OAS' Inter-American Agency for Cooperation & Development (IACD) that sponsors this mechanism, is quoted as describing the EPA in this manner:

*"The Education Portal of the Americas is a clearinghouse of information for students, teachers, researchers, government officials and others who would like to access quality information regarding the Hemisphere's best distance learning programmes and scholarship opportunities from one central location. It is a tool to help all individuals interested in improving their personal and/or professional development."*

*Towards Establishing Proactive National and Regional IT Policy Frameworks*

One of the first policy frameworks for the formulation of National Information Infrastructures (NII) that could then allow for the formation of a Caribbean Regional Information Infrastructure (RII), proposed by the UNSTD's Report of the Working Group on Information Technology and Development, is discussed and included in an annex. The Working Group's report concluded that governments and other stakeholders must be called upon to design new roles for the public and business sectors to enable ICTs to be harassed to economic, social, and environmental development goals. A summary of its recommendations is that:

*Each developing country and country in transition establishes a national ICT strategy. Where such strategies already exist, they should be reviewed to ensure that they take note of the guidelines proposed by the UNCSTD Working Group;*

*Immediate action be taken by national governments to establish a task force or commission or to ensure that another entity is charged with establishing the guidelines for national ICT strategies. Reviews should be undertaken over a six-month period and a report should be prepared by each government outlining the priorities of its national ICT strategy, the mechanisms for continuous updating, and the procedures for implementation of the components of the strategy. Progress on the implementation of this recommendation should be reported to the next session of the Commission in 1999;*

*Each agency of the United Nations system reviews the financing, production, and use of ICTs for social and economic development in their area of responsibility. This review should monitor the effectiveness of new forms of partnerships in the ICT area, and address the capability of each agency to provide technical assistance in that area. This needs to happen so that the United Nations System can be in the forefront in helping developing countries and countries in transition to implement their national ICT strategies.*

Case studies of the Caribbean's IT sector & policies are presented from the Caribbean Digital Diaspora Network Conference on the status of the region's IT use, its policy infrastructure and proposals for its advancement. The report offers brief summaries of these presentations, which enable the reader to get a sense of where the region is at present, where we would like to go in the future and some insights on steps we must take to get there. The interventions described are: Caribbean ICT

Development: Critical Issues and Challenges, by Roderick Sanatan (Manager of Research and Development at UWI's Centre for International Services in Barbados); Caribbean Community (CARICOM) ICT Strategy /Agenda 2003, Ms. Jennifer Britton (Senior Project Officer for Integrated Information Systems at the CARICOM Secretariat); and ICT Development in the CARICOM Countries Discussion Paper, by Dr. L.A. Nurse.

**The review of IT policy frameworks in the context of Caribbean IT Training & Capacity-Building indicated that after connectivity, the issue of education and training may be considered the next highest regional priority. However, the report states it is important to recognise that in order for the Caribbean to move effectively to address this almost universal cry, the requisite national legislative and institutional arrangements must be in place and in harmony with the regional administrative framework. The recommendations and guidelines from the UNSTD Working Group on IT and Development are still relevant and could form a template for a course on National ICT Policy formulation. CARICOM is described as having elaborated a coherent strategy agenda that was detailed by Britton and endorsed by Nurse in his DDN-C paper. With the development of a Caribbean ICT policy framework in process, the report suggests that the IDSD project could undertake to specifically support its advancement through training interventions. And, in the context of building regional environmental information management capacity, indicates it may wish to explore the sponsorship of a GEF project as a longer term partnership with the region.**

***Suggested Stakeholder Principles for Sustainable IT Training & Capacity Building Policies***

The concept of e-Governance is recognised in the report as the new emerging paradigm that is meant to encompass steps and procedures for administering the Knowledge Society and making decisions in a participatory and transparent manner using IT. Several instructive sets of guiding principles or processes for establishing rational decision-making for e-Governance are reviewed, including experiences from UNESCO, the Commonwealth Network of Information Technology for Development and a Workshop for the Exchange of Experience on Social Appropriation of New Information and Communication Technologies for Development in Latin America and the Caribbean. Finally, based on data gather during this consultancy, a matrix is offered for evaluating whether a proposed investment in capacity is needed and cost-effective for certain desired IT applications.

***Matrix for the Qualitative Determination of Appropriate Institutional Capacity for Desired IT Service and Application (* = Low; ** = Medium; *** = High)***

| ***SERVICE*** | ***INSTITUTIONAL CAPACITY NEEDED*** | | | ***APPLICATIONS*** |
|---|---|---|---|---|
| ***Functional Use of Technology*** | ***Human Resources*** | ***Infrastructure*** | ***Finance*** | ***SD Decision-Making Areas*** |
| **Email** | * | * | * | **Information sharing, Coordination** |
| **Website** | ** | * | * | **Information sharing, Public Awareness** |
| **Database** | *** | ** | ** | **SIDS-POA & MEAs Monitoring, Other Regional & Local Indicators; GIS; Training; R&D, Knowledge Management** |
| **Networking** | ** | *** | *** | **GIS, Training, R&D, Knowledge Management, Coordination** |
| **Portal** | ** | *** | *** | **Training, R&D, GIS, Knowledge Management** |
| **E-Learning** | *** | ** | ** | **Training, R&D, GIS** |
| **Video-conferencing** | ** | *** | *** | **Training, Information Management, Coordination** |
| **E-Commerce** | ** | *** | ** | **Training, Financing, Distribution** |

This matrix could also assist decision-makers and other stakeholders in assessing the implications of acquiring a particular technology to implement a Sustainable Development IT programme.

***The Immediate Way Forward: A Proposed IDSD Project Action Strategy***

**Recommended IT Training Packages**

In order to promote the effective use of information technology tools and the efficient management of information technology in the Caribbean, two training packages are recommended. The first training package (see IT Training Package text box) is oriented towards promoting the effective use of IT tools and begins with basic computer literacy and goes up to technical mastery

## IT Operations Training Package

- **Level 1. Basic Computer Literacy for Administrative & Support Staff**

**Training in full functionality of combination software packages for proficiency in operating Word-Processing, Spreadsheet, Database & Presentation programmes.**

- **Level 2. Network/PC Literacy for Technical Operations & Maintenance Staff**

**Training for IT and MIS Technicians in networking hardware and software installation, operation & maintenance (A+ Certificate); and**

- **Level 3. Network Operator for IT Unit/Department Managers or Database Administrators**

**Training for Network Managers in: Networking (i-Net +, Network +, Security & Microsoft SQL. Minimum: i-Net+ Certificate; Recommended: Network+ & Linux+ Certificates. Advanced: Microsoft Certified Systems Engineer (MCSE)**

The second package is a smorgasbord of courses, some representing training needs identified earlier. They are suggested for the strengthening of regional management capacity to enable the efficient administration of databases, networks and the Internet.

## IT Management Training Package

- **E-Government Principles & Practice**
- **Knowledge Management for Knowledge Societies**
- **Development of Portals & Digital Libraries**
- **National ICT Policy Development & Management**
- **Using Sustainable Development Indicators & Statistics for Decision-Making**
- **Geographic Information Systems (GIS) for Environmental Decision-Making**
- **Managing Local Area Networks-LANs & Wide Area Networks-WANs**
- **Managing Email, the Web & the Internet**
- **Open Source & Proprietary Software Management for Networking**
- **Security Management for IT Systems & Infrastructure**
- **Wireless Fidelity (WIFI) Networking Technology & Management**

**Short to Medium Term Action Strategy**

The proposed Short, Medium & Long term elements of an IDSD Project strategy was presented as a table

***IDSD Project Action Strategy: Focusing on Key Regional IT Training & Capacity-Building Needs***

| *Timeframe* | *Project Activity* | *Key Regional Training Area* | *Key Regional Capacity-Building Area* |
|---|---|---|---|
| **On-going since May 2003** | **Website Focus** | **SIDS-POA Pilot Issues & Themes Education, Sustainable Development (SD) Education, Information Science & Technology Education** | **Information Dissemination & Public Awareness, Connectivity Advocacy, Civil Society/NGO Participation** |
| **Developed at May 2003 meeting** | **List-serv** | **Project Communication & Coordination** | **Project Partnerships, Information Sharing** |
| **Immediate, July-September 2003** | **Establish Collaborative Partnerships** | **National Ministries of Education, Natural Resources & Environment, Information or IT and Planning/Development Cooperation; UWI-DLIS; Private Sector (National, Regional & Global); OAS Education Portal (www.educoas.org); UNESCO Communication & Information in the Knowledge Society Gateway (www.unesco.org/webworld); UNU IAS (www.ias.unu.edu); Commonwealth Network of Information Technology for Development (COMNET-IT)** | **Regional**<br>**CARICOM Secretariat, OECS Secretariat, CCA/CREP-REIN, CARINFO, CIVIC, UWI-DLIS, CARICAD**<br>**International**<br>**OAS/IACD, ITU-Caribbean, UNECLAC-POS, UNEP-CAR/RCU, UNDP SDNP & SIDSNet, UN-WSIS/ITU,**<br>**Private Sector**<br>**Caribbean Tourism Organisation**<br>**Caribbean Association of Industry & Commerce** |
| **Immediate July-September 2003** | **Training Workshop Planning** | **E-Government Principles & Practice**<br>**Development of Portals & Digital Libraries**<br>**National ICT Policy Development & Management**<br>**Development and Management of Databases**<br>**Managing Local Area Networks-LANs & Wide Area Networks-WANs**<br>**Managing Email, the Web & the Internet**<br>**Geographic Information Systems (GIS) for Decision-Making**<br>**Open Source & Proprietary Software** | **IT Research & Development**<br>**National Policies & Institutional Capacity Arrangements**<br>**Regional & Global Resources Coordination**<br>**Science & Technology Transfer**<br>**SD Statistics & Indicators** |

| ***Timeframe*** | ***Project Activity*** | ***Key Regional Training Area*** | ***Key Regional Capacity-Building Area*** |
|---|---|---|---|
| | | **Management for Networking**<br>**Security Management for IT Systems & Infrastructure**<br>**Using Sustainable Development Indicators & Statistics for Decision-Making**<br>**Wireless Fidelity (WIFI) Networking Technology & Management**<br>**Knowledge Management for Knowledge Societies** | |
| **Short to Medium term, 2003-2005** | **Caribbean IT Knowledge Portal** | **E-Literacy, E-Learning, E-Commerce, MEAs Monitoring (National, Regional & Global), Regional SD Digital Library, Caribbean IT Skills Virtual Registry & Exchange** | **Human Resources Development, Financing, Partnerships, SIDS-POA Collaboration, Caribbean SIDSNet Guidance & Oversight** |
| **Medium to Long term, 2004-2009** | **CARICOM/OAS/UNDESA/UN-ICT GEF Information for Sustainable Development project formulation, assessment & development** | **MEAs Monitoring (National, Regional & Global), Regional SD Digital Library, Caribbean IT Skills Virtual Registry & Exchange** | **National Policies & Institutional Capacity; Regional & Global Resources Coordination; Science & Technology Transfer**<br>**SD Statistics & Indicators** |

Collaborative Partnerships

The report suggests several collaborative partnerships for immediate exploration.

September 2003 Training Workshop

An approach to implementing the planned September 2003 workshop is offered.

Caribbean IT Training Portal

A description of the action strategy recommendation for development of a Caribbean IT Training & Capacity-Building Portal is given.

Long-term GEF Project Proposal

In support of the developing Caribbean ICT policy framework, the report proposes that the IDSD project undertake sponsorship of a GEF project as a longer term partnership with the region.

UNESCO Digital Divide Strategy

The document ends with a presentation of the recently published UNESCO Digital Divide strategy, which is described as reflecting the paradigm shift taking place at the global level that could assist the proposed IDSD Action Strategy.

# *1. The IDSD Project*

## 1.1 Project Overview

1. The Caribbean Community (CARICOM) and its member states require support in creating mechanisms for the long-term management of sustainable development and environment information and particularly in defining ways to harness this information for decision-making purposes. In order to assist in meeting this demand, the Organisation of American States (OAS) has teamed up with the United Nations Division on Social and Economic Affairs (UNDESA) to implement a small regional project entitled **" Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Island Developing States (SIDS)"**. The OAS has been given the task of managing this important initiative, which is better known as the **Information for Decision-making for Sustainable Development (IDSD) Project**.[8]

2. The IDSD project aims to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii develop a training manual and materials for training of personnel at the national and regional level; and (iii) create a regional electronic site for accessing information on information management systems and techniques. The project will be executed from November 2002 - October 2003.

It is envisioned that the following outputs will be achieved:

- A pilot network of national, regional, and possibly local institutions involved in information management in the Caribbean region;
- Resource persons trained as information managers within the region that will have the capacity to train information managers themselves at the regional and national levels;
- Training materials on information management systems for training of human resources accessible through SIDSNET connected to regional networks and UN-system sites;
- A forum of exchange for experiences among regional and national information systems' managers; &
- A final report on implementation, including an assessment and evaluation of the projects.

3. IDSD builds on previous work carried out by the United Nations Statistics Division (UNSD) in collaboration with the CARICOM Secretariat/Member States on *"Strengthening Capacity in the Compilation and Dissemination of Statistics and Indicators for Conference Follow-up in the Caribbean region"* and work by the United Nations Environment Programme (UNEP) in the field of environmental information management. The work programme envisions

- A regional experts meeting to assess and agree on priority training needs,
- The identification of best practices and appropriate information management tools,
- The implementation of a training course, and
- The establishment of a website to address information management for sustainable development.

Four pilot countries (Barbados, Belize, Jamaica & St. Lucia) have been selected for the first phase of the project, which is to focus on four thematic areas: Sustainable Tourism, Land use planning, Coastal Zone Management and Disaster Management including Climate Change.

## 1.2 Consultant's Terms of Reference

4. A short-term Priority Training Needs consultant has been contracted to assist the OAS in identifying priority training and capacity-building needs for the region in generating and using information for sustainable development, particularly in promoting the use and management of this information for enhanced decision-making (see Annex 1). The outputs from this assignment will also inform the development of training materials and the design of a training course to be held in September 2003.

8 OAS 2003. Information for Decision-making for Sustainable Development (IDSD) Project Briefing Note. Unit for Sustainable Development and Environment, Organization of American States; Washington, DC.

# *2. Assessment of Regional Sustainable Development Information Management & Infrastructure*

The assessment of Sustainable Development information training and capacity-building needs in the region begins with a conceptual review of both the use of Information & Communication Technology (ICT or IT, I use both interchangeably) for Sustainable Development or Information Management; and the notion of capacity for effective IT utilization or Information Infrastructure.

## 2.1 Information Management Conceptual Overview

5. In preparing for the IDSD project, a comprehensive assessment report[9] on Information Management (IM) included background on the concepts Information, IM Systems, New IT Tools and Sustainable Development Decision-Making (quoted in italics below, see Appendix 1 for complete text):

- *Information/Statistics/Indicators*

6. *"Information is commonly defined as either knowledge about something, or as a collection of facts and data. Data are usually described by statistics, numbers that summarize the characteristics of the data collected. Statistical aggregates of processed and raw data can be used as indicators. Indicators try to capture in a simple fashion complex events. The search for indicators for sustainable development has gained in importance, as such indicators are seen as an effective input in the decision making process"*.

- *Information Management Systems*

7. "*The practice of collecting, organizing, and communicating knowledge so that it can be used in the most effective way possible by as many users as possible is known as information management. A collection of tools and techniques that facilitate information management is known as an information management system. Traditional information management systems have included paper files and documents, but more recently the advent of computer networks have introduced the use of electronic systems"*.

- *New IT Tools*

8. The current 21st Century paradigm in information management systems has, however, gone 'digital' in the words of Nicholas Negroponte[10] by spawning a vast array of new IT tools or applications, constantly evolving[11]according to the laws of Moore and Metcalf[12] such as:

***"... Interlinked websites forming an information network, digital clearinghouses of information, electronic databases, search engines, etc. The power and versatility of these tools have enabled users to access and analyze ever-increasing amounts of information in much shorter time frames than has been the case in the past. The Internet has become the favoured tool of use for instant access to and dissemination of information, and once the infrastructure for a network has been put into place, it also represents a relatively low-cost medium for communicating information. Websites, with their potential for both displaying information and providing links to related topics of interest, can serve both as portals and communication forums for sustainable development issues. Other useful electronic tools include e-groups and distribution lists (List-servs), which provide users with periodic postings and updates of events and news in an area of specialty.***

9 Alcaraz, M. and Perch, L. 2003. Assessment and Establishment of a Baseline on Information for Decision-Making in CARICOM Small Island Developing States (SIDS); A Report for the "Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Island Developing States (SIDS) Project"; Unit for Sustainable Development and Environment, Organization of American States; Washington, DC.

10 Negroponte, N. 1995. Being Digital. Vantage, New York.

11 Downes, L and Mui, C. 1998. Unleashing the Killer App: Digital Strategies for Market Dominance. Harvard Business School Press, Boston.

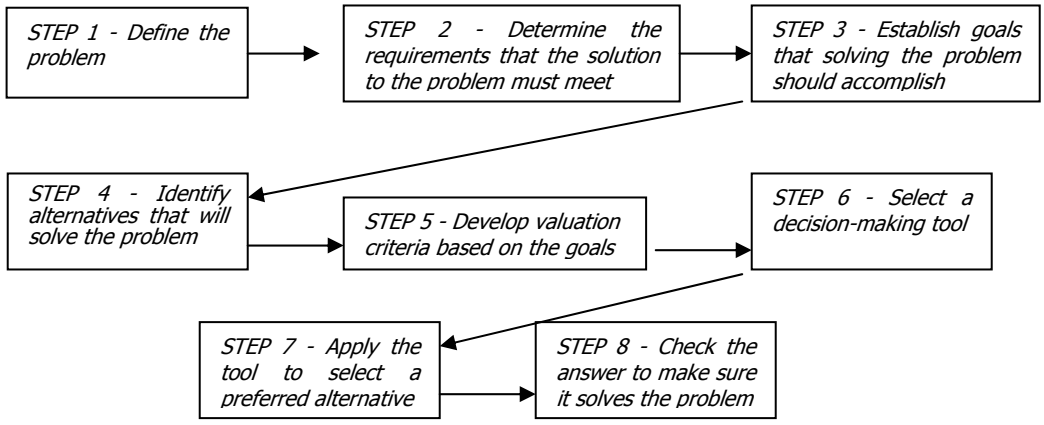
12 Moore's Law: A prediction by Intel founder Gordon Moore that every eighteen months, for the foreseeable future, [micro] chip density (and hence computing power) would double while cost remained constant, creating ever more powerful computing devices without raising their price...The bottom line is simple but potent: ***faster, cheaper, smaller***.
Metcalfe's Law: The observation made by Robert Metcalf, founder of 3Com Corporation, that networks (whether of telephones, computers or people) dramatically increase in value with each additional node or user. Metcalfe's Law values the utility of a network as the square of the number of users, and can be easily appreciated by considering the impact of standard railroad gauges, Morse code and standardized electrical outlets in the last century and telephones, fax machines, and the Ethernet & Internet protocols today. Once a standard has achieved critical mass, its value to everyone multiplies exponentially.

➢ *Sustainable Development Decision-Making*

9. In the area of sustainable development decision-making, the IDSD Assessment notes that for the process to be efficient, a series of steps are involved that require appropriate information inputs at different stages, as well as stakeholder feedback (see below):

- ***"Step 1, the definition of the problem, and step 2, determining the requirements that the solution must meet, require baseline information on the needs of the stakeholders. Evidently, this requires either input from the stakeholders themselves (ideally) or from their representatives. Step 3, establishing goals that the problem should accomplish, and step 4, identifying alternative solutions to the problem; require information on not only the ideal outcomes to the problem, but also information on the capacity of the region to respond. This means that in many cases, the solution will not necessarily be ideal, but will need to be adapted to the region's realities. For this, priorities need to be established, and this involves step 5, developing valuation criteria for the goals. Once the approach has been established, the decision-making tools appropriate to the approach have to be decided upon, step 6. Having information on the availability and characteristics of different decision-making tools is critical at this stage. Step 7 involves possessing the knowledge of how to use the decision-making tool in applying it to the problem; here, information on past experiences using the tool comes in very handy. Finally, step 8, checking the answer to make sure it fits the problem, may involve consultation with other agencies or individuals who have worked on similar problems and approaches, in order to confirm the expected results. At each step, the quality and availability of information is in direct correlation with the effectiveness of the approach".***

*Decision-Making Process Figure*




10. In short, the increasing 'digitisation' or computerisation of data-gathering and dissemination has led to new, increasingly cheaper and more efficient systems of information sharing and management. In the 21st Century, the Internet has become the pre-eminent 'communicator' and has triggered the development of a burgeoning movement to widely employ ICT/IT systems for advancing socio-economic development, the 'knowledge' or 'information' society. Given its multi-disciplinary global scope, when utilising these systems for the measurement or management of Sustainable Development, effective decision-making relies on the establishment of appropriate requirements, goals and tools (such as statistical indicators). However, in order for these technological tools to be utilised effectively, organisational and technological frameworks must exist to carry out the associated activities required to establish and maintain these systems.

## 2.2 Information Infrastructure Conceptual Overview

11. A useful 'source book' that has an overview of the conceptual basis of 'Information Infrastructure' is the seminal, much-referenced 1997 report (*Knowledge Societies[13]: Information Technology for*

[13] 'Knowledge Society' is a recently coined term that reflects a shift in the perceived role of ICTs/IT, in terms of the major social & economic transformations attributed to them, from '**drivers**' of change to a perspective where these technologies are regarded as tools that may provide a new industrial paradigm by combining computerized information systems with the creative potential and knowledge that resides in human beings. These technologies do not create transformations in society by themselves; they are designed and implemented by people in their [respective] social, economic and technological contexts. Some observers mark the

*Sustainable Development*) to the United Nations Commission on Science & Technology for Development-UNCSTD by its Working Group on IT and Development, edited by Robin Mansell & Uta When (quoted in italics below):

- *National Information Infrastructure (NII) & Global Information Infrastructure (GII)*

12. The physical capacity to actually access and use IT depends on the availability of a combination of goods and services, on the one hand, and skilled personnel, on the other hand:

- ***"The technologies, organisations and capabilities within a country that facilitate production and use of IT are called National Information Infrastructure (NII); the combination of these factors worldwide is called the Global Information Infrastructure (GII). Before the arrival of microelectronics and digital technologies, ICTs were accounted for statistically as separate industries – computer hardware & software, microelectronics, telecommunications, broadcasting, etc. Today, convergence[14], real or forecast, characterises all aspects of IT Infrastructure at least at the technical level[15]."***

- *'Informatisation'*

13. Another core concept in IM/IT management, 'Informatisation', focuses on the scientific, technological and engineering disciplines and the management techniques used in information handling and processing. The increasing interchange between science and management is thought to be as important as the applications, hardware & software in the way they are transforming the interaction between people and machines in social, economic and cultural relationships:

- ***"Another distinctive feature of ICTs is that they are centrally about "Informatisation" – the progressive application of IT to the input, storage, processing, distribution and presentation of information. This term was used as early as the 1960s by the Japanese and it refers to a social as well as technological process. It requires changes in management processes, organisation, and skills as well as in the tools used in the production of goods and services. This idea links technical, organisational, managerial and institutional aspects of IT. All these aspects must be considered if the social and economic implications of ICTs are to be understood. An 'informatisation' approach is consistent with an emphasis on the importance of technological knowledge and social capabilities as well as on the hardware and software itself ... The recombination of these components (input, storage, processing, distribution and presentation of information) is giving meaning to the NII and GII concepts. The time dimension is important in terms of assessing the implications of further technological innovations for all the segments of the ICT industry. In addition, the process of 'informatisation' is resulting in changes in industry boundaries and providing opportunities for new entry by firms from within, and outside, the traditional ICT industry. This is creating turbulence in the competitive environment. Market instability has major implications for developing countries as uncertainty increases about which countries can develop the capabilities to produce the components of different segments of the industry."***

- *The INEXSK Technique of Measuring IT Use for Economic Development*

14. The INEXSK (INfrastructure, EXperience, Skills, and Knowledge) approach outlined by Mansell & When (1997), as a measurement technique, aims to provide insight from a telecommunications' industry perspective into the roles that infrastructure, experience and skills play in contributing to knowledge-based economic growth & development:

- ***"Analysing the possibilities for ICTs to contribute to knowledge-based social and economic development requires a systematic method for graphing indicators and making international comparisons. The task of assembling the appropriate indicators is hindered by the enormous variety of IT applications. These range from expensive capital goods such as machine tools to the simplest portable calculators and watches. Similar problems exist in attempting to assess the comparative development of IT-based services. Existing data for the industrialized countries do not provide a complete picture of the full size and nature of the ICT use. Data for the developing countries provide an even less complete picture. For many of the least developed countries, useful indicators are virtually non-existent. The absence of adequate statistics is particularly troublesome because of the impacts of these new technologies on investment demands, application opportunities and production possibilities. One approach to these data problems is to use some of the available indicators to create a coherent conceptual framework. If it is properly constructed, such a framework will suggest some of the key***

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production in 1969 of the first 'computer on a chip' and the declining cost of semiconductor technologies & microelectronic as the beginning of the IT 'revolution'.

[14] Technological convergence means that there are few clear boundaries between the supply-side sub-sectors: ICTs are used, and often produced or modified in the case of software, in virtually every segment of the manufacturing, services and natural resources industries.

15 Mansell, R. and When, U.; Editors. 1998. Knowledge Societies: Information Technology for Sustainable Development. UN Commission on Science and Technology for Development, United Nations. Oxford University Press Inc. New York.

***features by which ICTs; combined with the requisite human skills and organisational changes, may make significant contributions to economic development."***

The three main indicators seen as underpinning 'knowledge-based' development are briefly summarised as:

- ***"For Infrastructure, the traditional measure is the size and growth of the telecommunication network. Telephone networks provide a broad base for building other types of infrastructure, such as data communication networks, but cannot serve as the only indicator of development. Unfortunately, few other indicators are as comprehensive as those associated with telecommunications. Where more detailed information is available, telecommunication indicators can be shown to be reasonably good proxies for other variables. For example, where it can be examined, the extent of data networking appears to be consistent with high levels of telephone access. More research is needed to explain variances in the rate and direction of other forms of infrastructure development with the telecommunication indicators.***
- ***To understand the contribution of Experience, electronics industry production and demand can be examined. These (levels and trends in production, consumption and trade in electronic products) are indicators of the production capacities of various countries, and the domestic use and export or import of electronic products. Although production and use of electronic products are only partial measures of the ICT revolution, they do provide insight into the vigour of the social and economic changes that are associated with the process of moving toward greater knowledge use in societies throughout the world.***
- ***In examining Skills, it is vital to develop measures that indicate the state of readiness to enlarge the use of information to develop knowledge. A principal indicator of such readiness is the literacy level. It is also important to develop measures of the skills that may be harnessed in producing or adapting ICTs. The stock of graduates with technical degrees in engineering, mathematics and computer science is relevant here."***

15. In summary, the evaluation of where a country or region stands in terms of information infrastructure can be accomplished by:

- Investigating the status of existing IT physical infrastructure for connectivity [in terms of Landline & Cellular Telephone Connections, Personal Computers (PCs), Servers and Internet Service Providers (ISPs)] and the economic activities that underpin them;
- Assessing IT Scientific and Technological infrastructure, including Training & Research institutions, to understand strengths and weaknesses in terms of human resources capacity; and
- Considering the expertise and experiences of a broad array of International, Government. Private and Non-Government actors in the area of IT and Information Management.

## 2.3 Global Sustainable Development Information Management Review

16. Internationally, the United Nations System since 1992 has spawned a number of key Global information management policies, mechanisms and initiatives that have been endorsed by the world community. In this section, a review is presented of the related outputs of: Agenda 21 Chapters 35 & 40; the Barbados SIDS Programme of Action; the Millennium Declaration, the World Summit on Sustainable Development and the emerging World Summit on the Information Society.

### ➢ *Agenda 21 and the Sustainable Development Networking Programme (SDNP)*

17. Beginning with the 1992 UN Conference on Environment and Development-UNCED in Brazil, Agenda 21 contains two chapters (35, Science for Sustainable Development and 40, Information for Decision-Making) that have made a substantial impact on global Sustainable Development Information Management (see Annex 2 for SD Indicators table). Chapter 40, in particular, laid the basis for the UNDP's Sustainable Development Networking programme, an early intervention aimed at both bridging the digital divide and increasing the availability of information for disadvantaged regions and populations.

Agenda 21, Chapter 35-Science for Sustainable Development: Although not as well known as Chapter 40, Chapter 35's (www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter35.htm) weight has come to be seen as increasingly apparent in the context of utilising IT for enhanced decision-making. As indicated by the following quote, the multi-disciplinary nature of environmental management makes the development of national Scientific and Technological (S&T) capacity a critically important corollary to IM/IT for Sustainable Development Decision-Making:

- ***"Science for sustainable development is the focus of Chapter 35 of Agenda 21. It calls for: a) strengthening the scientific basis for sustainable management; b) enhancing scientific understanding; c) improving long-term scientific assessment; and d) building up scientific capacity and capability. Decisions relating to science have subsequently been taken by the Commission on Sustainable Development at its third (1995), fifth (1997) and sixth (1998) sessions, by the United Nations General Assembly at its Special Session to review the implementation of Agenda 21 (1997). The special session of the General Assembly held in June 1997 to review progress five years after UNCED stressed the need for authoritative scientific evidence for assessing***

***environmental conditions and changes, which would facilitate international consensus-building. Scientific cooperation was to be promoted across disciplines for that purpose, and building scientific and technological capacity in developing countries was extremely important in that regard."***

18. Agenda 21, Chapter 40-Information for Decision-Making: Chapter 40, see Appendix 2 for complete text (www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter40.htm) is especially noted for its prescient description of global, regional and local actions required to ***bridge the data gap*** while also ***improving availability of information***; it also clearly crystallised the global consensus that underlies establishment of the global Sustainable Development Networking Programme (SDNP), the oldest global initiative to facilitate the chapter's implementation with a special focus on the participation of disadvantaged groups and communities. There are currently two Caribbean SDNPs in the CARICOM Member States of Guyana & Jamaica (a profile of the Jamaica SDNP is attached as Annex 3). The Jamaica SDNP has a well-defined set of goals and objectives that includes:

- *"TO INTRODUCE AND CONECT PUBLIC, PRIVATE NON-GOVERNMENT AND COMMUNITY SECTOR AGENCIES AND INTERESTS TO LOCAL AND INTERNATIONAL SOURCES OF INFORMATION ON SUSTAINABLE DEVELOPMENTUTILISING THE INTERNET AND OTHER TOOLS...;*
- *ESTABLISHMENT OF COMMUNITY TELECENTRES (FOCAL POINTS) IN MARGINALISED COMMUNITIES; &*
- *ESTABLISHMENT OF COMMUNITY INFORMATION NETWORKS"*[46]

A list of the relevant IM/IT policy initiatives and mechanisms offered by the two programmes suggested by Agenda 21/Chapter 40, emphasising Sustainable Development Indicators, Data Management & Information Networking, Science & Technology, Human Resources Development or Training & Institutional Capacity-Building is as follows (my emphasis in bold text):

*PROGRAMME A-BRIDGING THE DATA GAP/ACTIVITIES*

- *DEVELOPMENT OF INDICATORS OF SUSTAINABLE DEVELOPMENT:* ***Countries at the national level and international governmental and non-governmental organizations at the international level should develop the concept of indicators of sustainable development****.*
- *PROMOTION OF GLOBAL USE OF INDICATORS OF SUSTAINABLE DEVELOPMENT* ***Relevant organs and organizations of the United Nations system, in cooperation with other international governmental, intergovernmental and non-governmental organizations, should use a suitable set of sustainable development indicators****; …****harmonized development of indicators at the national, regional and global levels ... and ... incorporation of a suitable set of these indicators in common, regularly updated, and widely accessible reports and databases****.*
- *IMPROVEMENT OF DATA COLLECTION AND USE …* ***carry out inventories of environmental, resource and developmental data, based on national/global priorities for the management of sustainable development****. …* ***data-collection activities*** *…* ***need to be strengthened*** *and …* ***make use of new techniques of data collection, including satellite-based remote sensing****.*

*PROGRAMME A-BRIDGING THE DATA GAP/MEANS OF IMPLEMENTATION*

- *SCIENTIFIC & TECHNOLOGICAL MEANS …* ***with the rapid evolution of data-collection and information technologies it is necessary to develop guidelines and mechanisms for the rapid and continuous transfer of those technologies*** *…* ***and for the training of personnel in their utilization****.*
- *HUMAN RESOURCE DEVELOPMENT …* ***technical training of those involved in data collection, assessment and transformation, as well as assistance to decision makers concerning how to use such information****.*
- *CAPACITY-BUILDING …* ***strengthen their capacity to collect, store, organize, assess and use data in decision-making more effectively****.*

*PROGRAMME B-IMPROVING AVAILABILITY OF INFORMATION/ACTIVITIES*

- *DEVELOPMENT OF DOCUMENTATION ABOUT INFORMATION …* ***Networking and coordinating mechanisms should be encouraged between the wide variety of other actors, including arrangements with non-governmental organizations for information sharing and donor activities for sharing information on sustainable development****.*
- *ESTABLISHMENT AND STRENGTHENING OF ELECTRONIC NETWORKING CAPABILITIES …* ***exploit various initiatives for electronic links to support information sharing, to provide access to databases and other information sources, to facilitate communication for meeting broader objectives, such as the implementation of Agenda 21, to facilitate intergovernmental negotiations, to monitor conventions and efforts for sustainable development to transmit environmental alerts, and to transfer technical data*** *…* ***facilitate the linkage of different electronic networks and the use of appropriate standards and communication protocols for the transparent interchange of electronic communications. Where necessary, new technology should be developed and its use encouraged permitting participation of those not served at present by existing infrastructure and methods. Mechanisms should also be established to carry out the necessary transfer of information to and from non-electronic systems to ensure the involvement of those not able to participate****.*

*PROGRAMME B-IMPROVING AVAILABILITY OF INFORMATION/ MEANS OF IMPLEMENTATION*

- *CAPACITY-BUILDING …* ***expand their capacity to receive, store and retrieve, contribute, disseminate, use and provide appropriate public access to relevant environmental and developmental information, by providing technology and training to establish local information services and by supporting partnership and cooperative arrangements****.*

16 Jamaica Sustainable Development Network Ltd. 2003. Business Plan 2002-2005. Draft, for discussion only, document.

- *SCIENTIFIC AND TECHNOLOGICAL MEANS …* ***research and development in hardware, software and other aspects of information technology, in particular in developing countries****.*

➢ *Barbados SIDS-POA and the Small Island Developing States' Network (SIDSNet)*

19. Next, the 1994 UN Conference on the Sustainable Development of Small Island Developing States-SIDS in Barbados produced a fifteen point Programme of Action (the Barbados SIDS-POA) www.un.org/esa/sustdev/sids; see Appendix 3 for relevant SIDSNet and IM/IT related sections. The Barbados SIDS-POA explicitly laid the policy foundation for Sustainable Development in SIDS worldwide. Covering 15 issues or thematic areas (see text box) with recommended actions at the National, Regional and Global levels, the SIDS-POA contains the core content of an integrated regional environmental & natural resources management strategy.

**SIDS-POA Issues or Thematic Areas Text Box**

**BARBADOS SIDS-POA**

**(Sustainable Development of Small Island Developing States Programme of Action)**

**ISSUES or THEMATIC AREAS**

**Including Sectoral, Multi-Disciplinary & Cross-Cutting Issues**

| | |
|---|---|
| **I.** | **CLIMATE CHANGE AND SEALEVEL RISE** |
| **II.** | **NATURAL AND ENVIRONMENTAL DISASTERS** |
| **III.** | **MANAGEMENT OF WASTES** |
| **IV.** | **COASTAL AND MARINE RESOURCES** |
| **V.** | **FRESHWATER RESOURCES** |
| **VI.** | **LAND RESOURCES** |
| **VII.** | **ENERGY RESOURCES** |
| **VIII.** | **TOURISM RESOURCES** |
| **IX.** | **BIODIVERSITY RESOURCES** |
| **X.** | **NATIONAL INSTITUTIONS AND ADMINISTRATIVE CAPACITY** |
| **XI.** | **REGIONAL INSTITUTIONS AND TECHNICAL COOPERATION** |
| **XII.** | **TRANSPORT AND COMMUNICATION** |
| **XIII.** | **SCIENCE AND TECHNOLOGY** |
| **XIV.** | **HUMAN RESOURCE DEVELOPMENT** |
| **XV.** | **IMPLEMENTATION, MONITORING AND REVIEW** |

20. An appraisal of IM/IT Sustainable Development decision-making aspects of the SIDS-POA shows that its most profound contribution are the references to the Small Island Developing States' Network-SIDSNet. Although SIDSNet is accessible to the region, there is presently no institutional link in the Caribbean to this important facility. However, mission meetings during the consultancy revealed that, in collaboration with the University of the West Indies' Centre for Environment & Development (UWICED), the launch of a Caribbean SIDSNET node is planned for the near future. The last five chapters of the SIDS-POA (Chapters X- National Institutions And Administrative Capacity, XI- Regional Institutions And Technical Cooperation, XII- Transport And Communication, XIII- Science And Technology, XIV- Human Resource Development & XV- Implementation, Monitoring And Review) are cross-cutting in general and contain a significant number of references to both SIDSNET and the conceptual and global consensus that underpins it as a key IM/IT tool for Sustainable Development decision-making in SIDS; the selected references are contained in Annex 4, but those mentioning SIDNET are presented below :

*X- NATIONAL INSTITUTIONS AND ADMINISTRATIVE CAPACITY*

- ***…Establish national information nodes…in order to encourage, at the international level, the development of a Small Islands' Sustainable Development Information Network****…*

*XIII- SCIENCE AND TECHNOLOGY*

- ***…Assist Small Island developing States in assessing technology, developing databases on environmentally sound technologies, conducting relevant research and development and training, and developing appropriate information systems****…*

*XV- IMPLEMENTATION, MONITORING AND REVIEW*

- ***…UNDP should be invited to coordinate a feasibility study in collaboration with the small island developing States and relevant subregional organizations for the implementation of a Small Island Developing States Information Network (SIDS/NET)…***

➢ *The MDGs, the WSSD and the WSIS*

21. Since the turn of the century, the UN System has produced the Millennium Development Goals (MDGs), the 'Rio + 10' Johannesburg World Summit on Sustainable Development (WSSD) Plan of Implementation and the emerging World Summit on the Information Society (WSIS) process.

**MDGs**

22. The UN's Millennium Declaration was signed by most Heads of State and Government worldwide in the year 2000. Progress towards meeting the eight (8) Goals and eighteen (18) Targets or Millennium Development Goals[17] (MDGs), is measured by some forty-eight (48) Indicators. Besides Goal 2 (*Achieve Universal Primary Education*), with its Target 3 (*Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling*) and Indicators 6 – 8 (*Net enrolment ration in primary education; Proportion of pupils starting grade 1 who reach grade 5; and Literacy rate of 15 – 24 year olds*) only two other Goals ( *# 7-Ensure Environmental Sustainability and # 8–Develop a Global Partnership for Development*) define targets and two indicators, 47-48 (*Telephone Lines per 1000 people & Personal Computers per 1000 people*) related to SD Decision-Making Information; they are reproduced in Table 1 below.

Table 1 MDGs' Sustainable Development Decision-Making Targets and Indicators

| MDG GOAL | MDG TARGET | MDG INDICATOR |
|---|---|---|
| **7. Ensure Environmental Sustainability** | **9. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.** | **25. Proportion of land area covered by forest.**<br>**26. Land area protected to maintain biological diversity.**<br>**GDP per unit of energy use (as proxy for energy efficiency).**<br>**28. Carbon dioxide emissions (per capita) [Plus two figures of global atmospheric pollution: ozone depletion and the accumulation of global warming gases]** |
| | **10. Halve, by 2015, the proportion of people without sustainable access to safe drinking water.** | **29. Proportion of population with sustainable access to an improved water source.** |
| | **11. By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.** | **30. Proportion of people with access to improved sanitation.**<br>**31. Proportion of people with access to secure tenure [Urban/rural disaggregation of several of the above indicators may be relevant for monitoring improvement in the lives of slum dwellers]** |
| **8. Develop a Global Partnership for Development** | **14. Address the Special Needs of Land-locked Countries and Small Island Developing States-SIDS (through the Barbados POA and 22nd UN General Assembly provisions)** | **Official Development Assistance (ODA)**<br>**35. Proportion of ODA for environment in SIDS** |
| | **18. In cooperation with the private sector, make available the befits of new technologies, especially Information and Communications.** | **47. Telephone Lines per 1000 people.**<br>**48. Personal Computers per 1000 people.** |

**WSSD**

24. The 2002 Johannesburg World Summit on Sustainable Development (WSSD)[18], see Appendix 4 for a list of Key Outcomes & Commitments, and its related fora made a number of decisions relating to S&T as well as IM/IT capacity-building mechanisms that are highlighted in its Plan of Implementation (sections in bold print are my emphasis):

17 UNDP 2000. Millennium Development Goals (MDGs). Based on the UN Millennium Declaration that was approved by the UN General Assembly. UNDP worked with other UN departments, funds and programmes, the World Bank, the International Monetary Fund and the Organisation for Economic Cooperation and Development to identify over 40 quantifiable indicators.

18 UN 2002. Johannesburg Summit 2002 Key Outcomes of the Summit and Implementation Plan. UN/DESA, United Nations; NY, NY.

*"THE WSSD PLAN OF IMPLEMENTATION*

- *underlined the* ***importance of science-based decision-making, inter alia, by: integrating scientists' advice into decision-making bodies; partnerships between scientific, public and private institutions****; improved collaboration between natural and social scientists, and* ***establishing regular channels for requesting and receiving advice between scientists and policy makers; making greater use of integrated scientific assessments, risk assessments and interdisciplinary and intersectoral approaches****; increasing the beneficial use of local and indigenous knowledge.* ***Strengthening and creating centres for sustainable development in developing countries were encouraged, as well as networking with and between centres of scientific excellence and between science and education for sustainable development. Tools for science-based decision-making and sharing of knowledge and experiences to be promoted include: information and communication technologies, ground-based observations, satellite technologies, and national statistical services capable of providing sound data, assessment models, accurate databases and integrated information systems****. The Plan also urged* ***support for publicly funded research and development entities to engage in strategic alliances for the purpose of enhancing research and development****."*

25. On the margins of the WSSD, the United Nations Environment Programme (UNEP) Forum of Ministers of Environment of Latin America & the Caribbean held its First Special Meeting and put forward its own Latin American and Caribbean Initiative for Sustainable Development[19]. The LAC Initiative endorsed a range of Objectives, Operational Guidelines and Action Priorities that stressed the importance of S&T and IT capacity-building, including human resources development and sustainability/vulnerability indicators, in promoting Sustainable Development and effective participatory decision-making. Some of the most relevant to Caribbean SIDS are presented below (the bold text is my emphasis):

*"LAC SD INITIATIVE, OBJECTIVE C:*

- ***...Implementation of competitive sustainable development models backed by public policies designed to develop science and technology, financing sources, human resources capacity-building, institutional development, the evaluation of environmental goods and services as well as sustainability indicators adapted to each country's social, economic, environmental and political conditions, or the needs of sub-regional groups of countries****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Urge the developed countries to fulfil these commitments to give priority to the Small Island Developing States in the region, especially in financing the implementation of the Barbados SIDS-POA****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Increase participation by non-governmental agents and improve transparency in decision-making processes by strengthening initiatives such as the establishment of National Councils on Sustainable Development and the preparation of national and local Agendas 21****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Initiating or continuing environmental or natural resources evaluation processes to make better use of the region's comparative advantages, incorporating indicators relating to environmental liabilities and assets to permit their inclusion in national accounting systems****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Formulating strategies to incorporate; transfer and develop technologies to be supported by mobilising and expanding existing financial institutions' resources****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Enhancing or adjusting existing systems of sustainability indicators that respond to the region's social, economic and political characteristics, or building such systems****.*

*LAC SD INITIATIVE, OPERATIONAL GUIDELINE*

- ***Promoting capacity building through the strengthening of national, sub-regional and regional institutions and the development of human resources****.*

*LAC SD INITIATIVE, ACTION PRIORITY.*

- ***...Introducing an environmental dimension in economic and social processes; strengthening technical and vocational training institutions; promoting human resources development, particularly in information and communication technology; the need for qualitative and analytical work on vulnerability indices to define the economic, social and environmental vulnerability of countries concerned; sustainable management of water resources; sustainable generation of energy and increasing the use of renewable sources; managing protected areas for the sustainable use of biodiversity; adapting to impacts caused by climate change and sustainable management of urban and rural areas, with special emphasis ... on minimising risks and vulnerability to natural disasters. Actions to promote scientific and technological innovation, strengthening research and development institutions and increasing existing sources of financing... centres of excellence in research and development should promote the building of a solid scientific alliance through, among others, scientific exchanges, establishing interdisciplinary information networks and formulating joint research projects; &***

*LAC SD INITIATIVE GUIDING GOALS AND INDICATIVE PURPOSES*

- ***Institutional Arrangements – Evaluation and indicators. i) Develop and implement an assessment process to follow up the progress made towards attaining sustainable development objectives, including the results of the***

19 UNEP 2002. First Special Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean. UNEP/LAC-SMIG.I/2

***Johannesburg Plan [of Implementation], adopting national and regional sustainability indicators that respond to the region's unique social, economic and political features."***

**WSIS**

27. The World Summit on the Information Society (WSIS) is the last of the major UN IM/IT mechanisms that have great relevance to Caribbean Sustainable Development decision-making, as the next section reveals. The WSIS process began with an action plan presented by the Secretary-General of the International Telecommunication Union (ITU) to the UN and was formally endorsed by the UN General Assembly at its 56th Session in 2001[20] (see Annex 5 for the resolution's full text). The process leading to the Summit is coordinated by a high-level Summit organising committee, chaired by the ITU Secretary-General and consisting of the heads of United Nations bodies and other interested international organizations. Further, the Summit is to be convened under the patronage of the United Nations Secretary-General, and although the ITU is taking the lead role in its preparation, the UN's Economic and Social Council previously adopted the idea at the high-level segment of its substantive session of 2000 via a ministerial declaration concerning information and communication technologies. Subsequently the Council provided institutional assistance to WSIS through related work done in this area, including the creation of the Information and Communication Technologies Task Force (ICT-TF) as a successor to the UNCSTD Working Group on IT and Development. The General Assembly's justification for its WSIS endorsement includes:

- ***"The urgent need to harness the potential of knowledge and technology for promoting the goals of the United Nations Millennium Declaration and to find effective and innovative ways to put this potential at the service of development for all,***
- ***The pivotal role of the United Nations system in promoting development, in particular with respect to access to and transfer of technology, especially information and communication technologies and services, inter alia, through partnerships with all relevant stakeholders,***
- ***The need to harness synergies and to create cooperation among the various information and communication technologies initiatives, at the regional and global levels, currently being undertaken or planned to promote and foster the potential of information and communication technologies for development by other international organizations and civil society, and***
- ***The need, at the highest political level, to marshal the global consensus and commitment required to promote the urgently needed access of all countries to information, knowledge and communication technologies for development so as to reap the full benefits of the information and communication technologies revolution, and to address the whole range of relevant issues related to the information society, through the development of a common vision and understanding of the information society and the adoption of a declaration and plan of action for implementation by Governments, international institutions and all sectors of civil society."***

In summary, the 21 December 2001 resolution:

- ***Welcomed the resolution adopted by the ITU Council at its 2001 session, in which the Council endorsed the proposal of its Secretary-General to hold the World Summit on the Information Society at the highest possible level in two phases, the first in Geneva from 10 to 12 December 2003 and the second in Tunis in 2005, pursuant to resolution 73 adopted by the ITU's Plenipotentiary Conference at its 1998 session, held in Minneapolis, United States of America;***
- ***Recommended that the preparations for the Summit take place through an open-ended intergovernmental preparatory committee, which would define the agenda of the Summit, finalize both the draft declaration and the draft plan of action, and decide on the modalities of the participation of other stakeholders in the Summit;***
- ***Invited the ITU to assume the leading managerial role in the executive secretariat of the Summit and its preparatory process;***
- ***Invited Governments to participate actively in the preparatory process of the Summit and to be represented in the Summit at the highest possible level;***
- ***Encouraged effective contributions from and the active participation of all relevant United Nations bodies, in particular the ICT-TF, and encouraged other intergovernmental organizations, including international and regional institutions, non-governmental organizations, civil society and the private sector to contribute to, and actively participate in, the intergovernmental preparatory process of the Summit and the Summit itself;***
- ***Invited the international community to make voluntary contributions to the special trust fund established by the International Telecommunication Union to support the preparations for and the holding of the Summit, as well as to facilitate the effective participation of representatives of developing countries, in particular the least developed countries, in the regional meetings to be held in the second half of 2002, in the preparatory meetings to be held in the first half of 2002 and in 2003, and in the Summit itself;***
- ***Invited the UN Secretary-General to inform all heads of State and Government of the resolution's adoption; and***

20 UNGA (United Nations General Assembly) 2002. A/RES/56/183, adopted 21 December 2001, the first Resolution on WSIS adopted by the General Assembly. Distr.: General; United Nations, NY, NY.

- ***Invited the ITU Secretary-General to submit to the General Assembly, at its fifty-seventh and fifty-eighth sessions, through the Economic and Social Council, for information, a report on the preparations for the Summit.***

A second WSIS resolution by the UNGA was made in December 2002[21]. As we shall see in subsequent sections below, the WSIS process has helped to considerably advance the region's awareness of IM/IT issues through a series of preparatory meetings in the Caribbean and abroad. One example is the WSIS Eastern Caribbean Briefing held in 2002, http://www.caribank.org/Secre.nsf/WSISReport/$File/CarifoWSISrep1.pdf?, attached at Annex 6. The meeting recommended some important and timely steps to advance the regions IM/IT agenda through the WSIS: Establish a Caribbean sub-regional WSIS Task Force; Regional agencies engaged in ICT activities (i.e. CDB, ITU, UWI, CARICOM, CTO, UN/ECLAC, OECS, CARICAD, UNESCO, etc.) should collaborate in the work of the sub-regional Task Force; Seek visionary leaders and champions from the Heads of Government and or CEOs of the private sector to lead and direct the Task Force.; & The Task Force should identify an issue of crucial importance for the Caribbean and develop proposals around that issue for presentation at the World Summit.

## 2.4 Regional Sustainable Development Information Management Review

### ➢ *Overview of Caribbean Regional Information Systems*

28. A well-known Caribbean Information Specialist, Mrs. Maritza Hee-Houng of Trinidad & Tobago, completed a quite thorough overview of Caribbean Regional Information Systems and/or Networks two years ago (Hee-Houng, 2001)[22], see Appendix 5. A brief description of the major entities reviewed is reported in Annex 7. Table 2 below summarises these pioneering regional IM/IT mechanisms that attempted to address regional and inter-governmental management and decision-making as well as a number of key sectoral interests such as Medicine, Trade, Energy and Agriculture.

Table 2 Overview of Caribbean Regional Information Systems from Hee-Houng (2001)

| System/Network | Description |
|---|---|
| CARISPLAN – Caribbean Information Systems Planning Network | Established by UNECLAC in 1979 with IDRC funding, the CARISPLAN network aimed at the collection, processing and dissemination of information relevant to socio-economic planning in the region. With ECLAC as coordinating centre, supported by national documentation centres in the CARICOM counties, CARISPLAN built one regional and several national bibliographic databases, and provided a range of services, including current awareness, selective dissemination, abstracting and indexing, and document delivery. UNECLAC, had the leadership role, and moving with the technology and the times, in 1998 mounted its CARISPLAN database on the Internet; in addition it now offers users a virtual library, the Caribbean Digital Library (CDL), more in keeping with current user expectations. |
| CCCRIS - Consultative Committee on Caribbean Regional Information Systems | Mandated by the CARICOM Conference of Heads of Government in 1987, CCCRIS' functions were defined as : 1.Ensuring appropriate regional information systems activities or criteria; 2. Ensuring systematic evaluation of regional information systems; 3. Rendering required assistance in the establishment of regional information systems; 4. Coordinating overall regional information systems management; & 5. Linking with bodies or institutions involved in information systems establishment. |
| RIITF – CARICOM Regional Information Infrastructure Task Force | Mandated by the CARICOM Ministers of Information at the 1995 1st Meeting of the Standing Committee of Ministers Responsible for Information, this was chaired by Senator Phillip Goddard then Barbados Minister of Telecommunications. |
| MEDCARIB - Coordinated by BIREME, a PAHO specialist centre in Brazil | Founded as the Caribbean component of the Latin American and Caribbean Health Information Network, the network's development was initiated by that Latin American-oriented network. It has been operational for several years and has made a significant contribution to the management and delivery of Caribbean health information. |
| CARTIS – Caribbean Trade Information System | CARTIS was established under the CARICOM Secretariat in 1990 and aimed at improving inter-regional trade, through the collection and dissemination of trade information. Operating as a network with the usual components of national nodes, both company, bibliographical and statistical data were originally collected by the regional centre, the CARICOM Export Development Project (CEDP), in Barbados, that was subsumed into a new independent regional agency Caribbean Export Development Agency (CE). |
| CEIS - Caribbean Energy Information System | CEIS was adopted in the Regional Energy Action Plan approved at the CARICOM Heads of Government Conference in 1983. It became operational in 1987, as a cooperative network among |

21 UNGA (United Nations General Assembly) 2003. A/RES/57/238 adopted 20 December 2002, the second Resolution on WSIS adopted by the General Assembly. Distr.: General; United Nations, NY, NY.

22 Hee Houng, M.2001. Status Report on the Regional Information Systems . 8th Biennial Meeting of Caribbean Information Action Group (CARINFO) Caribbean Development Bank Conference Centre, Barbados.

| System/Network | Description |
|---|---|
| | Caribbean countries committed to the pooling and sharing of energy information. |
| INFONET – OECS Information Network | INFONET was established as a sub regional component of the CARISPLAN network, incorporating the information of the countries which make up the Organisation of Eastern Caribbean States (OECS). The system aimed to collect and disseminate information in the priority areas for development in the OECS, and in addition to facilitate the participation of the OECS as a group in the CARISPLAN and other regional networks. |
| CAGRIS – Caribbean Agricultural Information System | CAGRIS was established in the late 1980's with support from the UN Food and Agriculture Organization's (FAO) international system, AGRIS. In related sectoral IT/IM developments, the Inter-American Institute for Cooperation in Agriculture (IICA) has initiated an Agricultural Information and Documentation System for Latin America and the Caribbean (SIDALC). CARDI, the Caribbean Agricultural Research Development Institute is also developing CAIS (www.caisnet.org), its Caribbean Agricultural Information System and SIDALC and CAIS have agreed to cooperate on these systems. |

- *Caribbean Regional Sustainable Development Information Management Mechanisms*

29. Overall, the regional IM/IT systems and/or networks described above may be considered as uni-dimensional single-sector mechanisms that focus more on 'data' and 'information systems' as opposed to multi-disciplinary Sustainable Development 'decision-making'. Along with other relevant mechanisms identified during this consultancy, a selected number of the initiatives identified by Hee-Houng that are more oriented to SD decision-making have been briefly summarised in Table 3 below in terms of their history/background and purpose/services; summary annexes with added information for several agencies were prepared and attached separately:

Table 3 Selected Caribbean Regional Sustainable Development Information Management Mechanisms

| Mechanism/Project | History/Background | Purpose/Services |
|---|---|---|
| CEPNET[23]&[24] ; Information Systems for the Management of Marine and Coastal Resources<br><br>Web: www.cep.unep.org<br>Email: uneprcuja@cwjamaica.com | The United Nations Environment Programme's Caribbean Regional Coordinating Unit (UNEP-CAR/RCU) oversees the Caribbean Environment Programme's CEPNET; a CEP subprogramme that provides overall support to all its activities by promoting effective information management. A focus is given to the development of mechanisms that can facilitate the dissemination of environmental information relevant to CEP's priorities. These include access to data, information and networks of expertise & knowledge. The development of tools for geographic analysis to support environmental decision-making has become a primary activity for CEPNET. It has the capacity to implement projects and/or support training programmes in GIS, remote sensing, Internet-based applications such as Web-GIS, on-line training & clearinghouse mechanisms.<br>CEPNET collaborates with UNEP and other global environmental reporting agencies as well as with CPACC's Coastal Resources Information System (CRIS), UWICED, IOCARIBE, CREP/CCA | The primary objectives of CEPNET are:<br>a) To strengthen capabilities for coastal & marine resources information management in the Wider Caribbean Region and the CEP countries;<br>b) To increase access to marine & coastal resources information through strengthening of networking mechanisms and database development;<br>c) To disseminate information resulting from the projects and activities of CEP;<br>d) To assist the regional subprogrammes of CEP in matters related to information management.<br>CEPNET is responsible for the development and maintenance of the CEP website, which has now integrated the CEPNews bulletin into the CEPNews Centre. The CEP site also offers the CEP Technical Report series, thematic databases, environmental links relevant to the Wider Caribbean Region and other CEP publications. |
| CARICOM/UNSD Statistics & Indicators Capacity-Building Project (see Annex 8)<br>Web: www.un.org/esa/devaccount/progress98-99Hiii.htm or http://unstats.un.org/unsd/environment<br>Email: | UNSD has been assisting the CARICOM region since 2000 in the development of environment statistics through the Project "Strengthening Capacity in the Compilation of Statistics and Indicators for Conference Follow-up in the CARICOM Region". The Project jointly carried out by UNSD and CARICOM, covers the areas of social/gender and environment statistics, with a supporting component of information technology. | Its overall objectives have been to strengthen the capacity of national and regional statistical offices to collect and analyse statistical information, and establish a network of experts to improve intra-regional cooperation. The main outputs will include two regional publications, one on social/gender statistics and the other on environment statistics, and increased capabilities in information technology. |

23 UNEP. 2002. UNEP-CAR/RCU Secretariat's 2002-2003 Biennial Workplan & Budget; UNEP(DEC)/CAR IG.22/6; Presented to the 10th Intergovernmental Meeting on the CEP Action Plan & the 7th Meeting of the Contracting Parties to the Cartegena Convention, 11 May 2002. Montego Bay, Jamaica.

24 UNEP. 2002. Executive Director's 2000-2001 CEP Implementation Report; UNEP(DEC)/CAR IG.22/INF.5; Presented to the 10th Intergovernmental Meeting on the CEP Action Plan & the 7th Meeting of the Contracting Parties to the Cartegena Convention

| Mechanism/Project | History/Background | Purpose/Services |
|---|---|---|
| shahr@un.org | | |
| UNECLAC-CDCC/ Caribbean SIDS Support Web: www.eclacpos.org Email: uneprcuja@cwjamaica.com | The mission and mandate of ECLAC/CDCC are to undertake activities which are functionally linked to the realities of Caribbean life, to prepare the region to better deal with a changing world environment, to provide strategic thinking and information to Governments to provide the basis for policy formulation and to provide hands-on expertise when needed. | Arising from the 1997 Caribbean Ministerial Meeting on Implementation of the Barbados SIDS-POA, ECLAC/CDCC and the CARICOM Secretariats also act jointly as the 'executive agency' for the Caribbean Small Island Developing States. The unit is also responsible for developing Caribbean Sustainable Development databases as a repository of knowledge and information for Caribbean SIDS environmental policy development & issue analyses that are to be hosted and mirrored on SIDSNet and other locations, and the online searchable SIDS Related Projects and Programmes Database. |
| CRFM<br>Website: www.caricom-fisheries.com<br>Documents Received:<br>○ CRFM Draft Strategic Plan 2003-2008<br>○ Description of Programmes & Projects | Programmes/Projects:<br>○ Member States' fisheries IT capacity-building activities took place during the earlier CFRAMP period and provided computers, web & email service and related software<br>○ CARIFIS Regional database development<br>○ Strategic & Medium Term Plan includes "Research & Data Analysis for Policy Formulation and Decision-Making" programme<br>○ CARIFIS Database IT Training for Member States' Data Manager, Trainers and CRFM Staff<br>Services:<br>○ CRFM Website | Needs:<br>○ Website Development & Maintenance capacity-building and training for CFRM Member States<br>○ Institutionalisation of IT knowledge & skills in Member States<br>○ Management of changing and evolving information technology infrastructure<br>○ More intra-country linkages at the national level between the fisheries sector, planning authorities and other relevant sectors<br>○ Fisheries Economics training for improved national decision-making<br>Constraints:<br>○ Lack of integrated national planning framework<br>○ Insufficient national surveillance capacity<br>○ Lack of common Regional & National approach to IM<br>New Tools:<br>○ Satellite-based Remote Sensing IT tools for Fisheries Management |
| REIN – Caribbean Conservation Association / Caribbean Regional Environment Programme Regional Environmental Information Network (see Annex 9) Web: **www.caribbeanconservation.org** **Email:** crepadministrative@caribsurf.com or ccatechofficer@ccanet.net | Presently under development, REIN is a "niche" or specialised network which will specifically address one the CREP project's objectives of promoting better environmental quality at selected Amenity Area demonstration sites throughout the region. Its primary aim is the promotion of Integrated Protected Area Management Systems. | The REIN vision envisages "strengthened regional, national and local community information and communication systems committed to continuously enhancing access and use of environmental information within the Caribbean through an effective structure, and to demonstrate the benefits of integrating protected areas management with the promotion of sustainable livelihoods." |
| CARDIN – Caribbean Disaster Information Network Web: wwwcardin.uwimona.edu.jm:1104 | The Caribbean Disaster Information Network (CARDIN) was established in June 1999 to provide linkages with Caribbean disaster organizations, to widen the scope of the collection of disaster related information and to ensure improved access to such material. The project is funded by the European Community Humanitarian Office (ECHO) . The Library of the University of the West Indies at Mona, has been selected as the focal point for disaster information in the Caribbean. | To strengthen the capacity within the Caribbean community, for the collection, indexing, dissemination and use of disaster related information; serves as a sub-regional disaster information centre. This is a network of institutions across the Caribbean using ICTs to archive and retrieve data which is vital to their disaster preparedness planning. IT has enhanced the overall planning of this disparate network. |
| **CARINFO – Caribbean Information Action Group (see Annex 10)** Web: www.caribank.org/Secre.nsf/welcomepage?OpenPag | CARINFO is the successor body for the Consultative Committee of Caribbean Regional Information Systems (CCCRIS) which was established in 1988 following mandates received from both the Conference of Heads of Government of the Caribbean Community (CARICOM) and the Caribbean Development Cooperation Committee (CDCC). CARINFO is thus a regional grouping of | Enhancing the development process through insightful and informed advocacy and consultation:<br>-Advising people and governments of the Caribbean Community on the preparation and actions required for sustainable development in the information age;<br>-Identification, initiation and support of viable |

| Mechanism/Project | History/Background | Purpose/Services |
|---|---|---|
| e or www.caribank.org<br>Email:<br>sealyw@caribank.org | Caribbean institutions and bodies committed to regional efforts to promote collaborative knowledge networking in support of a true knowledge society through activities related to access, technology, content and continuing education. | products that would demonstrate the feasibility of providing access to information to the citizens of the region;<br>-Addressing copyright and intellectual property rights issues; and<br>-Making interventions, at the policy level, regarding Internet and ICT-related issues viz., mechanisms to ensure quality control of indigenous material to be placed on the international network; and universal access to essential services at a reasonable cost. |
| CIVIC - Caribbean ICT Stakeholders Virtual Community<br>Web:<br>http://www.icamericas.net/workshops/caribbean/<br>Email: carib-ict-consutlation@icamericas.net | Caribbean ICT Virtual Community (CIVIC) is a permanent virtual forum of Caribbean ICT stakeholders. It is a venue for sharing information, holding discussions, networking and linking ideas, actors, projects or initiatives on ICTs and development in the Caribbean, which is Caribbean managed. It was initiated by the participants of the WSIS-sponsored Caribbean ICT Roundtable at Barbados on October 28-30 2002, but it is open to all active Caribbean ICT stakeholders. | CIVIC aims to provide an up to date perspective on the status of development of ICT in the Caribbean and recommendations on how WSIS and the processes to follow can be used to accelerate integration of ICT applications for human development in this region of the world. . It aims also to contribute to build a common vision/perspective on ICTs, and to promote a Caribbean strategy and Caribbean wide actions. |

## 2.5. The Use of Information for Regional Sustainable Development Decision-Making

30. Our analysis of the mechanisms/initiatives reviewed above reveals that they are generally active in the functional use of IM/IT for decision-making in the following ways:

- Information-Sharing & Networking (via List-servs and Email);
- Human Resources Development (through Training, Workshops and Meetings)
- Institutional Capacity-Building (through the provision of IT Software/Hardware Infrastructure); &
- Public Awareness & Advocacy (using Websites, List-servs and Email).

Besides Information-sharing and Monitoring of various global and regional Multilateral Environmental Agreements-MEAs (CARINFO, CEPNET, UN-ECLAC & REIN), three other important SIDS-POA thematic or subject Sustainable Development decision-making uses identified are Coastal & Marine Resources Management (CEPNET/CARIFIS), Bio-diversity Resources (CCA/CREP/REIN) and Natural and Environmental Disasters (CARDIN). Three mechanisms identified are addressing the Agenda 21/Chapter 40 issue of Information for Decision-Making (CARICOM/UNSD-see text box below, CARINFO & the newly formed CIVIC) It should be noted that some aspects of IM/IT networking for decision-making in several other SIDS-POA thematic areas are presently being addressed by regional agencies such as:

- CPACC Project (Climate Change & Sea Level Rise via CRIS, www.cpacc.org);
- Caribbean Tourism Organisation-CTO (Tourism Resources via MIST, www.doitcaribbean.com);
- Caribbean Centre for Development Administration-CARICAD (National Institutions & Administrative Capacity via E-Government Strategy Development, caricad@caribsurf.com);
- Caribbean Energy Information System-CEIS (Energy Resources, www.comnet.mt/ceis/);
- Caribbean Agricultural Research Development Institute-CARDI (Land Resources/Agriculture via CAIS, www.caisnet.org);
- CARICOM Regional Fisheries Mechanism-CRFM (Coastal Marine Resources/Fisheries, www.caricom-fisheries.com);
- CARICOM Secretariat-CARICOM (Regional Institutions & Technical Cooperation, www.caricom.org);
- UWI Department of Library & Information Studies-UWIDLIS (Human Resource Development, www.dls.uwimona.edu.jm); and
- The Caribbean Environmental Health Institute-CEHI (Freshwater Resources, www.cehi.org.lc).

**CARICOM/UNSD Statistics & Indicators Project Text Box**

**CARICOM/UNSD Statistics & Indicators Capacity-Building Project Summary**

**Objectives:**

- To reinforce existing South-South networks and to create opportunities for experts to learn from rapid substantive and technological changes in the field of statistics, and to improve the ability of national institutions to produce relevant statistics. This sub-project addresses the specific needs of CARICOM countries.

**Effects and impact:**

- Two reports on the CARICOM region were prepared for publication in 2002: one on environment statistics (actually released at the IDSD Resource Persons' May 2003 meeting in St. Lucia); the other on social and gender statistics. The reports were both reviewed by expert groups in Grenada in October 2001 and suggested changes in both structure and content are now being made and incorporated into the final text and tables. The reports, as modified, have been endorsed by the Standing Committee of Caribbean Statistics (SCCS). It is intended that these reports will become biennial publications and produced from within the region.
- An Advisory Group has been established, comprising the seven heads of Caribbean national statistics offices in the CARICOM region, representatives of the CARICOM Secretariat, and the Statistics Division of the United Nations. The main task of the Group is to review the achievements of the project and to discuss ways to further capacity building beyond the life of the project. The SCCS has endorsed the setting up of the Advisory Group.
- The project has led to other initiatives in social and environment statistics. Grenada has produced its first set of national statistical publications on gender statistics and environment statistics. Jamaica has produced an environment statistics publication. St Lucia has produced a draft gender statistics publication to be posted on its website.
- The CARICOM Secretariat has assumed increasing responsibility in the social and gender related statistics activities of the project. Working jointly with the Statistics Division, CARICOM is preparing a report for the region on social and gender statistics. It is expected that the impact of the project will be sustained; using the capacity developed and build on some of the initiatives established by the project, such as the organization of national workshops and the publication of national compendia in these two fields.

➢ *The Mesoamerican Barrier Reef System (MBRS) Project Regional Network*[25]

31. This consultancy revealed an excellent example of IM/IT utilisation for Sustainable Development decision-making, in the context of a regional environmental management project involving Belize and her mainland neighbours: the GEF-funded Meso-american Barrier Reef System (MBRS) ; website: www.mbrs.org.bz) Project's Regional Data Communications Network (RDCN). The goal of the MBRS is to enhance protection of the project area's unique and vulnerable marine ecosystems and to assist the participating countries (Belize, Guatemala, Honduras & Mexico) to strengthen and coordinate national policies, regulations and institutional arrangements for their conservation and sustainable use. One of the project's regional objectives is to: "*Develop and Implement a Standardised Data Management System of Ecosystem Monitoring and Facilitate the Dissemination of its Outputs throughout the Region*" The main goal of the RDCN project component is to develop a reliable base of data for the MBRS eco-region and an information system that can be used to support more informed management decisions. The establishment of a regional environment information system (REIS) is considered an essential tool for organising and managing data in support of improved decision-making. From an IM/IT point of view, the REIS mechanism provides the basic framework to guide Bio-Physical & Socio-Economic Data Collection, Processing, Distribution and Utilisation. The REIS will be fed by a regional and issue-specific long-term (synoptic) monitoring programme that will generate information on the region's oceanographic current regime and on the status and processes of MBRS reefs and other critical ecosystems. Data is to be collected on reproduction, larval dispersal & recruitment of corals, fish and other important reef

25 MBRS Project. 2003. Design of the Regional Data Communications Network for the Mesoamerican Barrier Reef Systems Project; MBRS Technical Document Number 8. Project Coordinating Unit; Belize City.

components to further the understanding of ecological linkages between reefs and other marine environments, and processes that influence reef integrity. The specific outputs of this project component are:

- Design and Implementation of a Synoptic Monitoring Programme
- Establishment of a bi-lingual (English and Spanish) Project Website
- Establishment of a Web-based Regional Environmental Information System, a GIS-capable database
- Provision of Computing & Networking Equipment & Infrastructure to the 4 National RDCN Nodes

MBRS Network Design & Implementation Process

32. Some useful insights for similar regional networking initiatives and mechanisms, including the IDSD Project, may be gleaned from a review of MBRS' approach to designing and implementing its RDCN. The MBRS network design process was built on two principal tasks:

1) Design and Implementation of an Electronic Information (or Communication) System, which would manage and make accessible to the project's clients information considered as relevant to management of the MBRS and related ecosystems & to the human communities that depend on it for their livelihood; and
2) Design and Installation of a Computer Network, the platform on which this information system would run.

It was determined that two consulting firms would be employed to assist the project team: the Canadian firm of ESG International was chosen to execute the Network Design & Implementation job, while the American firm of Research Planning Inc. (RPI) was given the Information System Design & Implementation consultancy. Because the design of the environmental monitoring methodology had to be closely interlinked with the design of the data communications network, close liaison was required among the project's components and among the consultants in order to ensure that the infrastructure or physical design could support the information management needs. The design process involved the following sub-tasks:

- Requirements Analysis-The project hosted an Expert Meeting with 15 regional & international experts to discuss the REIS and the RDCN that resulted in specific recommendations for hardware, software and network technologies; long-term sustainability; as well as information regarding resources and levels of telecommunication services available in the four MBRS countries.
- Node Agency Selection-The project had to select agencies in each MBRS country to host network nodes in order to implement the regional network; National Barrier Reef Committees in the participating countries participated in choosing agencies that best met a set of criteria for site selection (see textbox below).
- Proposed Node Agencies' Physical Site Verifications-Visits were made to candidate agencies to conduct physical site verifications and meet with local Internet Service Providers (ISPs); the results of these visits were: 1) To obtain first-hand information about the proposed facilities for use in network design, 2) To ascertain quality and prices of telecommunication services & 3) To strengthen relations between the project and the agencies.
- Data Communications/Telecommunications Infrastructure Research-Investigations were done by electronic correspondence and personal interviews to identify available technologies and connectivity.
- Preparation of a Network Design Specification-This involved the synthesis of prior information, evaluation of various network topologies & significant current hardware/software research; this resulted in design recommendations, comparison of various network configuration options along with their respective diagrams, analysis of their respective advantages/disadvantages and detailed equipment purchase requirements statements.
- Preparation of Comprehensive Statements of Requirements-For hardware (computers, input/output peripherals, networking components), electrical wiring and software (both operating system & networking).
- Equipment Procurement-Carried out through a transparent bidding process according to World Bank guidelines, based on the detailed requirements statements.

**MBRS National Node Agency Selection Criteria Text Box**

**MBRS National Node Agency IM/IT Selection Criteria**

**I. NETWORK MANAGEMENT INFRASTRUCTURE**
- **Provision of a secure and environmentally appropriate location for network equipment**
- **Provision of Internet connectivity for network operation**
- **Ability to take administrative responsibility for equipment maintenance, both physical & operational, on the agency's premises**

**II. WEB MANAGEMENT CAPACITY**
- **Ability to update clearinghouse with current information on node country MBRS-related topics**
- **Data management experience with anticipated volume MBRS-related information**
- **Able to collect existing node country data & maintain country-specific website within MBRS website**

**III. BIO-PHYSICAL MONITORING SUPPORT CAPACITY**
- **Ability to support local 'thematic' (sectoral or technical) area node agencies with physical access or connectivity to the regional network**

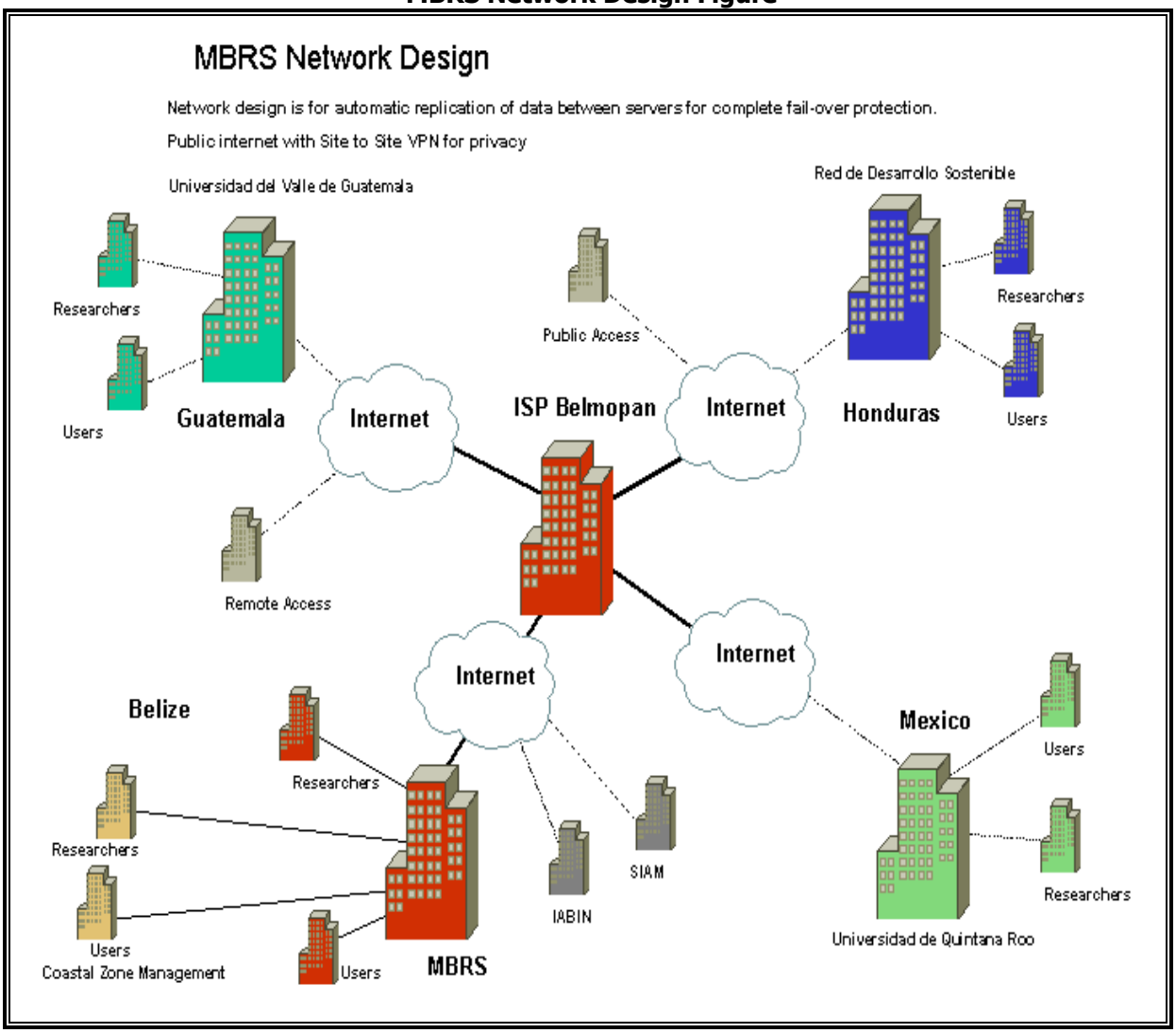
**IV. DATA-SHARING**
- **Selected node agencies must be willing to share some of its information with the MBRS project for either internal use or public dissemination**
- **Selected node agencies would enter into signed data-sharing agreements between the MBRS project and the node agency**

Several additional IT design considerations were:
- Shared Resources,
- Scalability,
- Reliability,
- Maintainability,
- Modularity,
- Security,
- Web server software,
- Affordability & long-term sustainability,
- Back-end/front-end application & systems software, and
- Interoperability with SIAM (the Mesoamerican Environmental Information System) and IABIN (the Inter-American Biodiversity Information Network).

## Final MBRS Network Design & Infrastructure

33. The final network design chosen (see design figure below) was a wide area network (WAN), within which node servers in the MBRS countries are permanently connected to a central server at the project's Belize City headquarters via a Virtual Private Network (VPN) established over the Internet to provide data-sharing, collaboration and file replication. Remote users and specially designated organisations such as CONANP (the Mexican National Protected Areas Commission), SIAM & IABIN would have access to the REIS database from the central server via the Internet; while government agencies, research institutions, NGOs and the public would connect to the project website via the Internet.

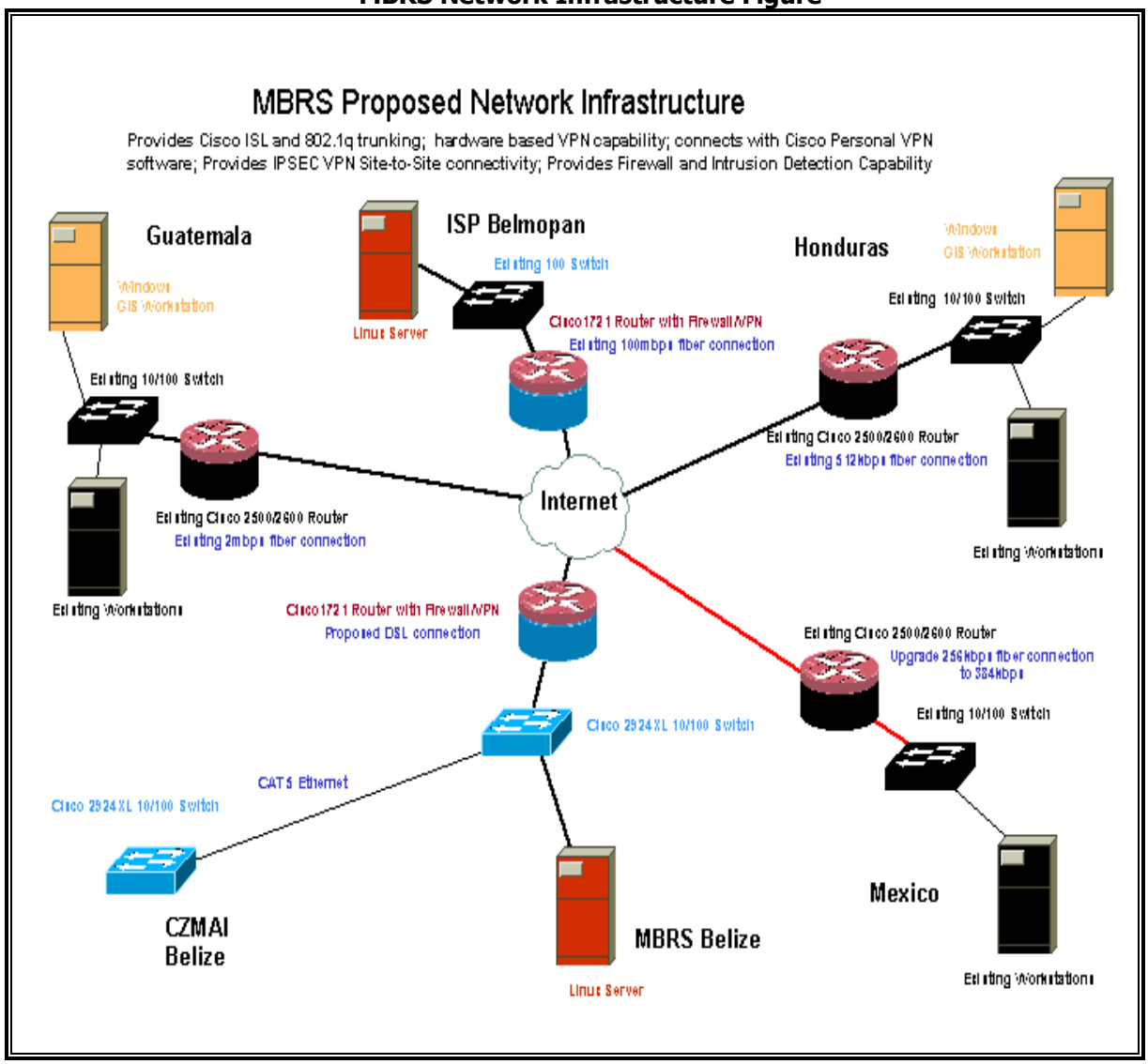
**MBRS Network Design Figure**




**The network infrastructure configuration finally selected (see infrastructure figure below) was the partially distributed option that is centred on two redundant servers in Belize. New servers are to be installed at the MBRS headquarters in Belize City and the ISP so that the co-location facility is hosted in Belmopan as there is a high hurricane/disaster risk for the Belize City facilities. In summary, the MBRS project expects to complete procurement of equipment and telecommunication service by mid 2003. Afterwards, network installation will be carried out and the REIS implemented and made operational. It is further planned that, after the network is installed, maintenance and security plans will be drafted along with the provision of any necessary training in network and/or server management for system administrators who are assigned those tasks. Finally, after the RDCN and REIS are physically implemented, the administrative and operational framework will be finalised and established using Memoranda of Understanding and Data-Sharing Agreements between the country node agencies and the MBRS headquarters; including data collection and data entry arrangements as well as other partners involved. Ultimately, the Synoptic Monitoring Programme will then come on stream and begin collecting system usage and performance statistics that will guide future expansion and address any performance bottlenecks as they**

**arise. The sustainable development decision-making aim of the MBRS IM/IT network is the efficient provision of useful information related to the Mesoamerican Barrier Reef System and related ecosystems to its users. However, for this to be successfully achieved, the cooperation of all its stakeholders and partners in creating, analysing and managing the information housed on the network is essential.**

**MBRS Network Infrastructure Figure**




➢ *The Government of Jamaica National Environmental Planning Agency (NEPA) Database*

34. Another good example of current IM/IT usage for Sustainable Development decision-making is the SIDS-POA Country Report Compact Disc produced by the Government of Jamaica's National Environmental Planning Agency (NEPA). Using their State of the Environment reports for 1995, 1998 & 2001, NEPA prepared a compact disc (CD) for public dissemination that is structured along the lines of the 15 SIDS-POA thematic areas (see Annex 11). Using their large integrated local area network (LAN), NEPA has included a large number of related reports, policy documents and papers into and integrated database with text and graphics. This tool is quite useful for briefing policy-makers, assessing progress in the management of national Sustainable Development policy, as well as for meeting a number of MEA reporting requirements.

➢ *The Government of Belize Schools-Computers Wide Area Network (SWAN) Project*

35. In the important Human Resource Development area, the Government of Belize has begun implementation of a Schools-Computers Wide Area Network (SWAN) project through its Ministry of Education, Youth & Sports (MoEYS). The SWAN project (see text box below) addresses the IM/IT issue of access to computers and the Internet at all levels of the education establishment for teaching, learning and educational administration purposes. In order to implement this innovative project in cooperation with Intelco (Belize's first new service provider under its recently liberalised telecommunications regime), a multi-disciplinary SWAN Task Force composed of representative staff from key units was formally set up in 2001 via a MoEYS directive and charged with:

- **Ensuring Timely and Effective SWAN School/NGO Sites Preparation, Hardware Installation, Maintenance & Monitoring;**
- **Managing User-related Curriculum, Training & Instructional Software/Internet Administration/Operational Management Issues; &**
- **Facilitating Stakeholder Participation & Public Awareness through Continuous Liaison with Intelco & Private Sector Contractors, National & District Education Councils (NEC/DEC), MoEYS Service Areas and School/NGO Sites Managing Authorities.**

**Belize SWAN Project Summary Text Box**

**I. BACKGROUND: The VISION…**

**To Harness Information and Telecommunication Technology for Enhancing Education, Improving National Welfare & Securing Belize's Place in the New Global Economy!**

WHAT?: To provide computers and unlimited internet access for all primary, secondary, and tertiary level schools, all libraries and other educational institutions in Belize.

HOW?: To establish a wireless & fiber-optics based Wide Area Network (WAN) linking all government offices and other governmental institutions, e.g. schools, libraries, hospitals, police stations, etc.

HOW MUCH?: By using the wide area network to provide Government with all the telecommunications services it presently obtains, substantial savings can be achieved.

**II. MEETING NATIONAL IT INFRASTRUCTURE REQUIREMENTS**

- Data Communication Backbone for Government owned Virtual Private Network (VPN)
- Internet Diffusion for Social Sector Reforms (Education, Health)
- Supporting National Poverty Elimination Strategy to Provide IT Access for Poor & Rural communities
- Strengthening of Tourism & Financial sectors
- Development of IT and Services Sector

**III. EXPECTED BENEFITS: NATIONALLY**

- Established links to all major population areas nationally
- Established country-wide Computer networking framework for government
- High-speed internet access supported country-wide for schools and other distance learning programs
- Any locale allowed to be used for IT services, development and products

**IV. EXPECTED BENEFITS: EDUCATION SECTOR**

- Compliments existing IT initiatives in the Education sector
- Schools will get hardware & unlimited internet access at no cost
- NGO's and Civil Society receive hardware plus unlimited Internet access at low monthly per unit user fees.

Employing operational arrangements with Intelco and local equipment suppliers developed by the Task Force, the Installation Phase of the project has focused mainly on Information Technology (IT) Infrastructure Development. Technical staff support for network installation & maintenance came from the Employment Training and Education Services (ETES) unit, while administrative support for carrying out the required inter-related activities was coordinated through the Planning, Projects & Performance Measurement (PPPM) unit. PPPM assisted with the preparation and payment of contracts, and with the management of funds according to GOB procedures. District Education Centre (DEC) Officers assisted with the readiness of sites as they were prepared for installations. The Quality Assurance & Development

Services (QADS) unit worked in collaboration with the Central American Health Sciences University (CAHSU) to develop a Science Education website that is housed on the CAHSU server. This collaboration is expected to continue as a part of the MoEYS' goal of digitising the National Curriculum in order to support distance education via the Internet. The major achievements of the SWAN Project & Task Force in 2002, according to three main areas, are summarised below:

**SITE PREPARATION**

- **Over 60 school/library/NGO sites were prepared & launched (Belize district-52, Cayo district-2 & Toledo district-2).**
- **Improvements have been completed at 40 more sites (Belize district-8, Cayo district/Belmopan-19 & Orange Walk district-13). Final preparations are being made for their launch; all LAN installation work has been completed at the sites in Belmopan and 4 LAN installations have been completed for the Orange Walk sites.**
- **Over 1200 computers with Internet access donated by Intelco and installed by Intelco & SWAN.**
- **Coordinated and directed IT Volunteer Partners and Donors from Peace Corps, Canada and VSO**

**USER SERVICES**

- **MoEYS website linked to all SWAN computers as default browser homepage.**
- **Developed Student's Science webpage in collaboration with Central American Health Sciences University**
- **Sponsored 2 workshops to provide IT/Internet skills training for Lab Supervisors.**
- **Developed a Basic IT Training Manual and provided weekly Introduction to IT classes for over 150 teachers.**

**STAKEHOLDER CONSULTATION**

- **Regular MoEYS/Intelco project management meetings held.**
- **User Agreement with Problem Reporting Procedures annex drafted and sent to Solicitor General.**
- **SWAN Computer Lab Preparation Construction Guidelines drafted and sent to all Managing Authorities.**
- **Regular Meetings held with the National Education Council (NEC), the Belize District Education Council & Principals and the Belize Association of Principals of Secondary Schools (BAPSS).**
- **Regular Briefings given to Chief Education Officer & Chief Executive Officer.**

The political manifesto of the present Belize Government (2003-08) envisages a significant role for Information Technology and the Internet in promoting sustainable economic development. Besides a far-reaching twelve-point proposal for developing a "High Tech Belize", one of its specific goals is to establish "Computer Education Centres" in all districts. The SWAN Project/Task Force is presently being re-tooled as a ministry-wide service area focusing on IT & Internet Services in order to assist MoEYS and Government to meet this challenge.

- *The Government of Barbados EduTech Programme*

36. As a part of the preparatory process for the WSIS, the UN Information and Communications Technologies Task Force (UNICT-TF), the UN Development Programme (UNDP) and the UN Fund for International Partnerships (UNFIP) co-sponsored a gathering called *Meeting on Bridging the Digital Divide for the Caribbean* (see Annex 12) at the United Nations in January of this year 2003. Among the many relevant presentations made by regional representatives and participants, Ms. Lolita Applewhaite (Director of the Centre for International Services, Cave Hill Campus of the University of the West Indies in Barbados) made an intervention on the Government of Barbados' EduTech (Education Sector Enhancement Programme, see Annex 13). EduTech is another practical example of IM/IT use in the Education sector that is similar to the Belize SWAN project, but of an order of magnitude larger in terms of financing and scale (see text box below):

**BACKGROUND**

- **The aim of EduTech is to infuse technology into the education system in Barbados. The programme is funded jointly by loans from the IDB, the CDB and the Barbados government with some aspects funded by the Barbados private sector.**
- **Implementation of EduTech started in 1998 and will be applied in the entire school system in Barbados: Private, Public, Primary and Secondary Schools.**
- **The EduTech objective is not simply to place computers in schools, but to change the culture of the classroom.**

**JUSTIFICATION**

- **Nationally and internationally, there is increasing demand for higher levels of literacy, numeracy, technological skills and competencies such as problem-solving and team-working abilities.**
- **Barbados's excellent education system served it well in the agrarian and industrial eras.**
- **Given the need to respond to demands of technological, knowledge-based society; Barbados's education system has not kept pace with the national and international shifts.**

**GOAL**

- **To bring about an increase in the number of students contributing to the sustainable social and economic development of Barbados; to use technology to improve the quality of education; and to develop students that are highly skilled and readily re-trainable in a technologically rich and rapidly changing environment.**

**STRATEGIES**

- **The transformation of the fundamental philosophy and teaching approach of the education system.**
- **The integration of available technologies as a necessary tool in this new approach to schooling.**

**OUTPUTS**

- **Provide new approaches to teaching and learning,**
- **Integrate the use of available technology within the teaching and learning process, and**
- **Reform the curriculum.**

In summary, as the first project of its kind and scope among CARICOM member state, EduTech is an innovative and multifaceted initiative to provide the Barbados education sector with the skills, tools and infrastructure to 'leapfrog' into the knowledge-based future.

**Barbados EduTech Programme Summary Text Box**

**EDUTECH PROGRAMME COMPONENTS**

- Civil Works
- Training
- Institutional Strengthening
- Technology

**Civil Works**

- Rehabilitation of buildings and installation of cable.

**Training**

- Development of basic computer skills
- Acquisition of pedagogical IT skills, understanding and knowledge
- Development of skills and competencies for educational leadership
- Child-centred learning
- Special needs education
- Integration of technology into the teaching/learning process
- Project management and management of change.
- School IT Leadership Team (SILT) comprising the principal, an Information Technology coordinator and a senior teacher
- Training for parents of children provided with laptops

**Institutional strengthening**

- Programme Unit
- Education Evaluation Centre
- Software Review Centre
- Policy Committee
- Steering and Implementation Committee
- School Implementation Committee

**Technology**

Approaches to the use of technology in the education system:

1. The provision to children of generic skills of computer use
2. The use of subject-based packages focusing on the core curriculum in the primary schools
3. The fostering of creativity in students through project based learning opportunities
4. The use of interactive media and audio-visual technology;
5. The use by teachers of technology for their timetabling and lesson preparation; and
6. The setting up of an Education Management Information System (EMIS)

***Hardware***

Primary school

- one or two computer labs, depending on the school roll
- four to six computers in each classroom

Secondary school

- five subject rooms with 30 computers each, two with 20 each and one with ten computers
- Library or Information Resource Centre equipped with 20 computers with access to the internet

Schools with small classrooms

- Special childproof laptop computers, using infra red or radio technology.

Special needs schools

- Braille keyboards, hearing assisted devices

***Software***

- Criteria set out by the Ministry

***Schools' Intranet***

- Ministry has become its own Internet Service Provider (ISP)

➢ *Jamaica TechSchool Initiative*

37. One of the most unique Caribbean presentations at the recently held UN *Meeting on Bridging the Digital Divide for the Caribbean* was made by Makonnen Blake, Youth Technology Consultant to the

Jamaican Minister of Commerce and Technology. Mr. Blake is a youth IT prodigy who was tapped by the Government of Jamaica to advance the involvement of youth in this vital arena. Since his appointment in 1998, Blake has pioneered a creative initiative to open the doors of IT opportunity for young Jamaicans by casting "Youth as IT Teachers" and engaging in a wide range of partnerships with other youth from the region and the developed world (see text box below and Annex 14).

**Jamaica TechSchool Highlights Text Box**

**TechSchool Overview**

- Since 1998, we have been operating TechSchool Jamaica, a cyberschool where we teach youth tech skills at workshops and by Internet.
- Over the years we have taught many Jamaican students and children from other Caribbean territories such as Trinidad, Mexico and Guyana.

**Digital Peace Corps Proposal**

- All of this leads up to my idea, to create a Digital Peace Corps composed of tech gifted youths like Melissa, Aaron and the international youths of Nation One and send them to schools in the Caribbean to stimulate technology development.

**How It Could Work**

- Link with Nation One/MIT to partner with youth technology resources of the developed world
- Link students through Student Internet Website Design competition to build educational websites across the Caribbean and the world by Internet.
- Link students through this UN Caribbean Digital Diaspora Network.

***"THE SKILL OF USING COMPUTERS COMES MOST EASILY TO US, THE YOUTHS WHO WERE BORN IN THE COMPUTER AGE. WE YOUTHS HAVE VISIONS OF NEW WAYS TO TAP THIS GREAT RESOURCE, VISIONS NOT CLOUDED BY PAST EXPERIENCES, EITHER OUR OWN OR OTHERS. YOUTH CREATE NEW PATHWAYS WITH THIS NEW 'TOY'."***

**Makonnen Blake, Youth Technology Consultant to the Jamaican Minister of Commerce and Technology**

38. The five preceding reviews are far from being an exhaustive presentation, much-less analysis, of current IM/IT case studies covering Caribbean Regional Sustainable Development decision-making. Given the limited time and scope of this consultancy, only a few of the initiatives known to the consultant or discovered via web-research have been selected for inclusion. Preliminary analysis indicates, however, that there are significant opportunities for enhancing the application of IM/IT for decision-making in the region for all the identified SIDS-POA sustainable development issues or themes. While natural resources and environmental management (MBRS) has traditionally been seen as the main strategic use of IM/IT for Sustainable Development decision-making, human resources development (SWAN, EduTech & TechSchool) and other social sector applications (UNSD/CARICOM) should be considered as critical tactical capacity-building areas of interest. Overall, the region's IM/IT management infrastructure could be assessed as having a diverse and growing number of stakeholder organisations and agencies that could benefit from greater collaboration and rationalisation of their noteworthy efforts. Given the global basis for much of our national and regional activities in the field of IT for Sustainable Development, the region would do well to strengthen and better coordinate national and regional participation in the WSIS process.

# *3.0 Caribbean IT Training & Capacity-Building Priorities*

## 3.1 IM/IT Training and Capacity-Building Conceptual Review

32. This section on determining regional IT Training & Capacity-Building priorities begins by returning to Mansell & When's 'source book'[26] for a review of the conceptual base for both a 'lifelong learning & institutional change' approach to and specific recommendations for IT skills requirements; two relevant sections are quoted in italics below:

- *Education, Lifelong Learning and Institutional Change*

***"Major transformations are occurring in the formal education sector and other organisations that play a key role in enabling people to develop new capabilities. These changes are partly the result of the increasing use of ICTs as enabling technologies for education and learning. The possibility of continuous informal education and lifelong learning is growing with the increased availability of IT applications and creativity in their application to address development problems. In developing countries, the potential of the application of IT to these areas is only beginning to be realized. However, this potential can only be exploited if the formal and informal educational processes in developing countries allow people to acquire the skills that are necessary to use new technologies creatively and productively. Major changes in formal education systems and institutions as well as the organisations that contribute to informal learning are needed to build new capabilities. The introduction of lifelong learning strategies requires that the foundations of learning be strengthened and changed. It also implies that there must be flexibility for movement between education, training & work and new roles for public and private sector institutions that contribute to the learning process."*** **(My emphasis)**

- *Enhancing the Skills Base for Participation, Facilitation and Control*

***"The use of IT to support development goals does not need to be considered only in terms of the extension of telephony networks to every household. Alternate modes of access may be preferable in some circumstances and the choice of radio, television or telephony as a means of connection of citizens to networks of information is dependent on each country's circumstances. The skills base that is built up must be compatible with the mix of ICTs available and provide a basis for continuing learning. Three specific skills are particularly important:***

- ***Participatory Skills** are necessary for involvement in networked communication and information-sharing. These incorporate computer literacy and fluency in the English language for the use of the Internet, databases and most software until more content is provided in local languages.*
- ***Facilitating Skills** for the design, implementation and maintenance of networks involve a number of essential skills for installation, user training and maintenance. In addition, software and computer systems engineering skills are desirable. Even more emphasis needs to be placed on vocational training to provide a large number of people with the ability to ensure the functionality of networks.*
- ***Control Skills** imply the allocation of funds for the acquisition of appropriate ICT equipment in order to manage access to networks in some countries to achieve public or private control*

## 3.2 Caribbean Sustainable Development IT Training & Capacity-Building Needs

- *Jamaica & Belize Missions and St. Lucia Survey Findings*

37. The input of stakeholders throughout the region was essential in the determination of specific Caribbean IT training and capacity-building priorities. As a critical part of this consultancy, therefore, brief missions were mounted to Jamaica and Belize in May 2003 where helpful discussions were held with a number of agencies and organisations that have an interest in the IDSD project and Information for Sustainable Development Decision-Making. Similarly, the May 2003 project-sponsored St. Lucia Resource Persons Meeting was designed to incorporate the views and opinions of a wider Caribbean audience into the IDSD project's determination of Priority IT Training & Capacity-Building Needs in the region. Enquiries during the missions and a survey at the meeting were directed towards assessing these needs in the context of identifying perceived constraints as well as any new IT tools that should be recognised. The complete findings from the missions to Jamaica and Belize; and the recorded St. Lucia Resource Persons' Survey responses are attached at Appendix 6 and Appendix 7 respectively. The findings were examined to establish priority categories by tabulating the number of times the replies received from discussions and the survey, generally fit into common groups within the three issues of needs, constraints or New IT Tools; see summaries in Tables 5 & 6 below and grouped responses in Annex 15 & Annex 16. The three dimensional (3-D) charts presented on the following page are used to graphically depict both analyses.

26 IBID, see 5 above.

**Chart 1; Jamaica and Belize Mission Findings Summary**

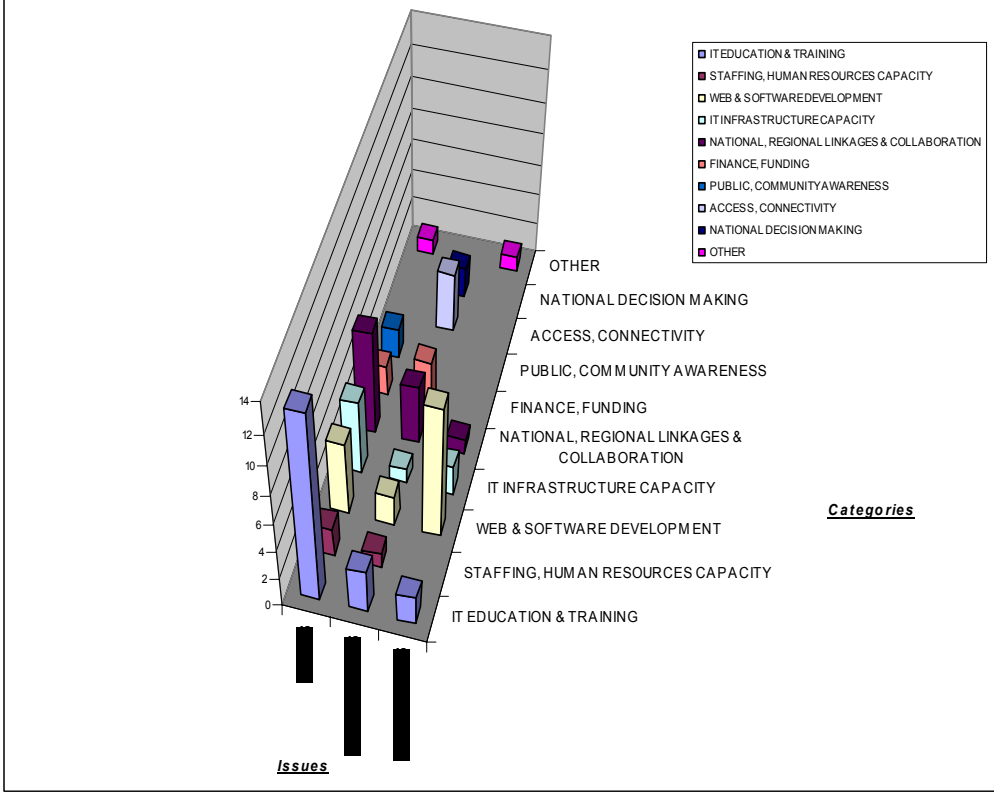



**Chart 2; St. Lucia Meeting Resource Persons Survey Findings Summary**

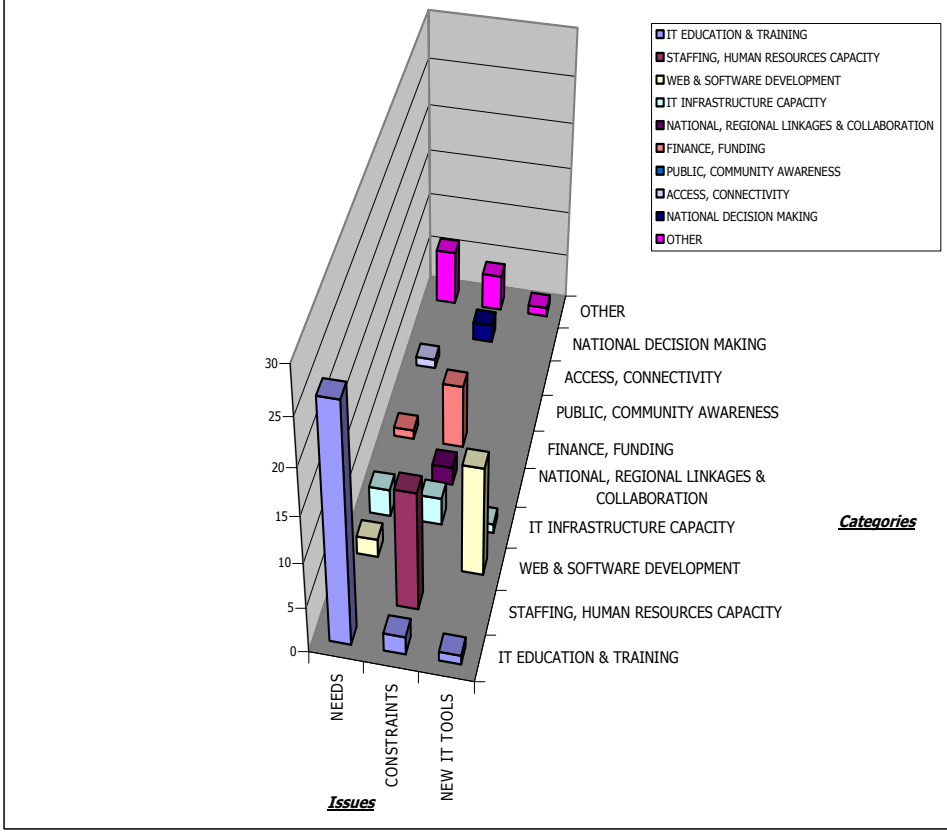


**Table 4; Jamaica and Belize Mission Findings Summary**

| Needs | Constraints | New IT Tools |
|---|---|---|
| IT Education & Training (13)<br>National/Regional Linkages & Collaboration (7)<br>Web & Software Development (5)<br>IT Infrastructure Capacity (5)<br>Finance/Funding (2)<br>Public/Community Awareness (2)<br>Staffing/Human Resources Capacity (2)<br>Other (1) | National/Regional Linkages & Collaboration (4)<br>Access/Connectivity (4)<br>IT Education & Training (3)<br>Finance/Funding (3)<br>Web & Software Development (2)<br>National Decision-Making (2)<br>Staffing/Human Resources Capacity (1)<br>IT Infrastructure Capacity (1)<br>Other (1) | Web & Software Development (9)<br>IT Education & Training (2)<br>IT Infrastructure Capacity (2)<br>National/Regional Linkages & Collaboration (1) |

**Table 5; St. Lucia Meeting Resource Persons Survey Findings Summary**

| Needs | Constraints | New IT Tools |
|---|---|---|
| IT Education & Training (26)<br>IT Infrastructure Capacity (3)<br>Web & Software Development (2)<br>Finance/Funding (1)<br>Access/Connectivity (1)<br>Other (6) | Staffing/Human Resources Capacity (13)<br>Finance/Funding (7)<br>IT Infrastructure Capacity (3)<br>National/Regional Linkages & Collaboration (2)<br>IT Education & Training (2)<br>National Decision-Making (2)<br>Other (4) | Web & Software Development (12)<br>It Education & Training (1)<br>IT Infrastructure Capacity (1)<br>Other (1) |

- *Analysis of Needs, Constraints & New Tools*

36. **Needs**

**I. IT EDUCATION & TRAINING (39)**

According to both findings, the most important need identified is Education & Training (including certification) in the following key areas with examples:

- **Databases**, including
  - Creation, development, distribution & management (especially for administrative staff);
  - Regional database development & maintenance training ('train the trainers' programme);
  - Review of administrative forms & systems to facilitate data gathering & recording;
  - Metadata development & management.
- **Networks**, including
  - Satellite networking;
  - Management & design.
- **Web/Internet**, including
  - Development;
  - Management.
- **Computer Operations & Maintenance**, including
  - Basic computer hardware concepts (e.g. RAM, ROM, etc.);
  - Essential office software (e.g. spreadsheets, word processing & database programmes);
  - PC File Management, Data formatting and Presentation programmes such as PowerPoint.
- **Remote Sensing and Geographic Information Systems (GIS)**, including
  - GIS technology for CSOs or clearinghouses;
  - GIS for Environmental (Coastal Zone) management.
- **Software Development and Use**, especially
  - Open-source (Linux) for "e"-Commerce.
- **Management of Changing and Evolving IT Systems & Infrastructure**, including
  - Security/vulnerability issues;
  - Training for negotiators;
  - Technical analysis training;
  - CTO MIST system operations (esp. in manipulation of 'back-end' data for national demands).
- **Statistics & Indicators**, including
  - Energy Balance & Energy Statistics;
  - Statistical coding methodologies, e.g. Costa Rica University Development Observatory;
  - Development of impact indicators.

**II. IT INFRASTRUCTURE CAPACITY (8)**

The next most important need cited by the two groups, IT Infrastructure Capacity, emphasised:

- **Management of Changing and Evolving IT Systems & Infrastructure**, including
  - Provision of greater data storage & conversion services to relevant SD/SIDS-POA data nodes;
  - Long-term capacity-building projects for National partners;

- Formal on-going capacity-building programmes.

- **Web/Internet**, including
  - Increased emphasis on Internet and Web management capacity-building.
- **Statistics/Indicators**, including
  - Strengthening national environmental statistics capacity of CSOs or clearinghouses.

**III. WEB & SOFTWARE DEVELOPMENT (7)**

The development of software for Internet and Web-based applications could be considered the third category of need most observed overall; the area, with examples is:

- **Web/Internet**, including
  - Development of Caribbean SD-related /SIDS-POA Website & Content Software and Linkages;
  - Internet and Web management capacity-building;
  - Continuous updating of regional SD websites' content, including IDSD Project thematic areas;
  - Streamlining & Continuous updating of regional SD websites;
  - Website Development & Maintenance capacity-building and training.

**IV. NATIONAL/REGIONAL LINKAGES & COLLABORATION (7)**

The establishment or enhancing of functional (collaborative and integrated) national and/or regional IT organisational linkages was noted a relatively large number of times by the Jamaica & Belize mission interviewees, although it was not mentioned as a need by any of the survey respondents at the St. Lucia meeting. This reflects an acknowledged need to strengthen collaboration between stakeholders that are principally responsible for SIDS-POA thematic areas[27] in the Caribbean, on four levels:

- The National level (esp. Intra-national Policy Harmonisation by local & regional representatives);
- The Regional level;
- The Hemispheric level;
- The United Nations & Global level.

**V. OTHER (FINANCE, STAFFING, PUBLIC AWARENESS & ACCESS/CONNECTIVITY) IMPORTANT NEEDS**

Several other important areas mentioned were:

- Increased financial resources and revenue generation for programme sustainability;
- Definition & Institutionalisation of specific IT Knowledge, Skill Levels & Requirements;
- Provision of greater public access to and more community reporting activities about relevant SD/SIDS-POA data;
- Improved computer connectivity & Internet access for selected audiences or groups.

37. **Constraints**

**I. STAFFING/HUMAN RESOURCES CAPACITY (14)**

The main perceived stumbling block for improved regional IT training & capacity, particularly by the St. Lucia meeting respondents, seems to lie in the area of national authorities and their respective capacities to adequately deploy, maintain & improve local human resources; in particular:

- **Insufficient Time for Substantive Workloads and IT-Related Tasks**, including
  - Time to dedicate to research & training;
  - Time of both providers & receivers of training;
  - Timely data collection;
  - Work loads & priorities of coordinating agencies.
- **Supply of Trained and/or Specialist IT and Related Staff**, including
  - Lack of competent National CSO/sectoral agency staff to receive training;
  - Lack specialist staff for collection, processing sharing of relevant SD/ SIDS-POA information;
  - Staff turnover once trained;
  - Absorptive capacity of institutions to apply training.
- **Inadequate Human Resources Management**, including
  - Lack of 'trickle-down' of skills and knowledge to appropriate end-users;
  - Appropriate personnel selection.
- **Insufficient Number of Permanent IT and Related Staff**, including
  - Lack of human resources or personnel;
  - Lack of designated or permanent IT staff.

**II. FINANCE/FUNDING (10)**

Finance and funding can be considered as the second major inhibiting factor, as defined by remarks that fall into two areas:

[27] Specific references were made to agencies such as the CARICOM Secretariat, the OECS Secretariat, the Caribbean Meteorological Organisation (CMO), the Caribbean Environmental Health Institute (CEHI), the Caribbean Energy Information System (CEIS), The Institute of Marine Affairs (IMA), the Caribbean Planning for Adaptation to Global Climate Change/ Adaptation to Climate Change in the Caribbean/Mainstreaming Adaptation to Climate Change in the Caribbean (CPACC/ACCC/MACC) Projects, the Caribbean Disaster Emergency Response Agency (CDERA), the Caribbean Development Bank (CDB), he Caribbean Regional Fisheries Mechanism (CRFM), the Caribbean Tourism Organisation (CTO) and the University of the West Indies (UWI) DLIS & CED.

- **Inadequate Financial Resources**, including
  - Sustainability of programme services;
  - Lack of financial resources;
  - General lack of resources/funding;
  - Lack of funding for travel.
- **High Costs of Goods & Services**, including
  - High cost of appropriate certified 'high-end' IM/IT training;
  - High cost of proprietary technology;
  - Internet access costs.

**III. NATIONAL/REGIONAL LINKAGES & COLLABORATION (6)**

The third area perceived to hamper regional IT training & capacity-building is that of functional cooperation & links, both at home and abroad locally and in the following areas:

- **Not enough High Level IM/IT Policy & Management Coordination**, including
  - Lack of national/regional policy collaboration & coordination;
  - Lack of common Regional & National approach to IM;
  - Balkanised' approaches among agencies;
  - Lack of voluntary agreement by sectoral agencies to share or release data;
  - Lack of inter-sectoral collaboration.
- **Not enough High Level MEAs Policy & Management Coordination**, including
  - Lack of information and coordination at national (Government/NGO) level regarding hemispheric and regional Multi-lateral Environmental Agreements (MEAs).

**IV. IT EDUCATION & TRAINING (5)**

In addition to being seen as an important need, the lack or inefficient use of IT skills is also seen as another important restraining element in these areas:

- **Computer Operations & Maintenance**, including
  - Low levels of IT or "e" Literacy;
  - Staff underutilisation of the full range of software applications.
- **Remote Sensing and Geographic Information Systems (GIS)** , including
  - Lack of Cartography skills in GIS section.
- **Supply of Trained and/or Specialist IT and Related Staff**, including
  - Lack of flexibility by trainers in meeting specific needs of users.
- **Web/Internet**, including
  - Limited availability of training materials, on-line or otherwise.

**V. IT INFRASTRUCTURE CAPACITY (4)**

Inadequate IT Infrastructure Capacity was cited as negatively affecting the following areas & cases:

- **Management of Changing and Evolving IT Systems & Infrastructure**, including
  - Lack of National Government Standards in software and related hardware functionality (e.g. expensive Oracle vs. cheaper MSSQL for Database operations
  - Digitising older reports
  - Disaggregating of data & distribution over many departments, agencies or ministries
  - Lack of computers at national level offices

**VI. WEB & SOFTWARE DEVELOPMENT (2)**

The lack of an adequate web presence constrains IT training & capacity-building; two examples are:

- **Web/Internet**, including
  - Low quality and technical level of SIDSNET Website
  - Ineffective Website design

**VII. OTHER (NATIONAL DECISION-MAKING, ACCESS/CONNECTIVITY) SIGNIFICANT CONSTRAINTS**

There are two other significant constraint areas:

- **National Decision-Making**, which includes
  - Inadequate decision-making processes by national Governments in terms of attitudes and aptitudes regarding IM/IT information development & use;
  - Lack of integrated national planning framework;
  - Need for increased awareness among policy-makers;
  - Lack of informed decision-making by political directorate.
- **Access/Connectivity**, including
  - Lack of 'Connectivity' and High-speed Internet Access.

38. **New Tools**

**I. WEB & SOFTWARE DEVELOPMENT (21)**

In the arena of new technologies for IT training & capacity-building, the development of Internet and Web-based software applications is clearly considered to be of utmost importance; being overwhelmingly

mentioned by almost all mission interviewees and survey respondents. The web is almost omnipresent in its scope, seemingly related in one way or another to most of the feedback received on new IT tools. Some exemplary observations, by area, are:

- **Web/Internet**, including
  - Web conferencing;
  - Web-based distribution of information, including spatial information;
  - Web-based Internet Video-conferencing software & technology;
  - On-line newsletter;
  - Webpage design;
  - CEPNET, SPAW, CAMPaM List-servs;
  - SIDSNET Energy Issues List-serv.
- **Software Development and Use**, especially
  - Open source software, e.g. Linux, Kykr, DMP & MySql;
  - Website "e"-Commerce software development & use;
  - Scenario modelling software (e.g. Polestar);
  - Development of web-based databases using open source software & open standards for data storage;
  - IDSS Disaster management software (available through US Southern Command);
  - Open source software for database & content management;
  - SQL server & Access software tools, esp. reporting systems such as Crystal Reports and SPSS.
- **Databases**, including
  - Visual Basic software for MS Access Databases;
  - Simplified database software;
  - Flexible National & sectoral databases that allow linkages at national, regional & international levels.
- **Networks**, including
  - Virtual Private Network (VPN) software & technology.
- **Remote Sensing and Geographic Information Systems (GIS)**, including
  - Web-based GIS database software development & use.

**II. IT EDUCATION & TRAINING (3)**

Internet and Web-related education and training are a noteworthy new IT tools; the relevant areas observed and a few examples are listed below:

- **Web/Internet**, including
  - Virtual negotiations training.
- **Software Development and Use**, especially
  - WEB-CT and VIRTUAL-U Course Tools software development & use.
- **Remote Sensing and Geographic Information Systems (GIS)**, including
  - GIS Skills training.

**III. IT INFRASTRUCTURE CAPACITY (3)**

The building of new IT infrastructure capacities was also a noteworthy category suggested by the following areas and instances:

- **Web/Internet**, including
  - Standardised IT platforms and databases.
- **Remote Sensing and Geographic Information Systems (GIS)**, including
  - Satellite-based Remote Sensing IT tools for Fisheries Management.
- **Networks**, including
  - Wireless Fidelity (WIFI) Networking Technology.

**IV. NATIONAL/REGIONAL LINKAGES & COLLABORATION (1)**

Although it was only identified by one of the Jamaica/Belize mission interviewees, the need to employ appropriate statistical indicators in the coordinated monitoring of SD and the SIDS-POA is an acute imperative; the applicable area and illustration is:

- **Statistics/Indicators**, including
  - Technical indicators for SIDS-POA, including IDSD Project, thematic areas, with delegation of responsibility for update/maintenance to relevant hemispheric & regional SD agencies.

**Synopsis**

39. In the determination of regional IT and capacity-building priorities, using a synopsis of the categories from the findings (Table 6 below), the results indicate that Education and Training is perceived as the single most important need; Infrastructure Capacity, Web & Software Development and National/Regional Collaborative Linkages are also significant needs. Several constraints were identified; the most critical being the lack of Human Resources Capacity, followed by inadequate Financial Resources, weak National/Regional Collaborative Linkages and insufficient Infrastructure Capacity. Web

and Software Development was overwhelmingly assessed as the most momentous in terms of New IT Tools, although some notable implements were recognised from the Education & Training and Infrastructure Capacity areas.

**Table 6 Synopsis of Key IT Training & Capacity Building Areas**

| CATEGORY/FREQUENCY | NEED | CONSTRAINT | NEW IT TOOL |
|---|---|---|---|
| **Education & Training/47** | **(39)** | **(05)** | **(03)** |
| **Web & Software Development/30** | **(07)** | **(02)** | **(21)** |
| **Infrastructure Capacity/15** | **(08)** | **(04)** | **(03)** |
| **National/Regional Linkages & Collaboration/14** | **(07)** | **(06)** | **(01)** |
| **Human Resources Capacity/14** | **(01)** | **(14)** | **(0)** |
| **Finance/Funding/10** | **(01)** | **(10)** | **(0)** |
| **Other:**<br>○ **Access/Connectivity (02)**<br>○ **Public Awareness (01)**<br>○ **National Decision-Making (01)** | <br>**(01)**<br>**(01)** | <br>**(01)**<br><br>**(01)** | |

Clearly, the overall ranking demonstrates that both Education & Training and Web & Software Development would be crucial components of any effective regional IT Training and Capacity-Building initiative. And, along with Infrastructure Capacity, Human Capacity and National/Regional Collaborative Linkages; they can form the strategic elements of present and future IDSD Project activities. The securing of appropriate Financial Resources must not be overlooked either, as it is viewed as essential to the sustainability of any proposed programme. Before turning to final section 3.3 below on recommended actions, a brief examination is given on an Indian view on IT Human Resources Development.

- *Lessons from an Indian View on Human Resources Development to Meet IT Challenges*

40. India is world known for the phenomenal advances made by its IT industry, especially in the field of software development and export. What can the Caribbean learn from India's experience? A very useful paper[28] in this respect was written by R. Narasimhan (rn@saathi.ncst.ernet.in) a National Fellow in IT at India's National Centre for Software Technology (NCST). Debunking what he calls the "*hype*" and "*mystique*" that "*software is peculiarly matched to the Indian genius*", Narasimhan analyses the HRD problem from a broader perspective and proposes a 4-level expertise generation framework (see Table 4 below) based on what he calls "*desired ideal*" criteria:

**Indian IT Software Training Challenge**

***"The single most extraordinary development in the Indian industrial scene during the last decade and a half has been the phenomenal growth of the Indian software industry, especially its export performance. It does not seem that in the foreseeable future-say, in the next decade or so-the growth of the software industry in India would slow down. Software exports of US$ 50 billions, from the present level of US$ 2.5 billions, are seriously being targeted in 10 years from now. In this context, both within the government and outside, anxieties have been expressed on the ability of our educational system to meet the challenge of producing enough software specialists. Ad-hoc solutions have been proposed: for example, to increase the intake in Indian Institutes of Technology (IITs) in the software specialisations; to start additional institutes of the calibre of the existing IITs; to upgrade the Regional Engineering Colleges (RECs) to the level of the IITs; and so on."***

**Survival in the Global Village Requires Global Skills**

***"If it is true that technology 'push' is transforming this world into a global village, then, the ultimate requirement for survival is to be able to function as a significant contributing member of this global village. The skills one equips oneself with, and the knowledge one is able to command of this world (near-by and far-away) are determinants of the kinds of roles one can play in this global village. The skills one acquires, whether as part of in-school training, or through individual initiatives at home, must be marketable in this global village. In a world dominated by ICTs, survival demands that one's skills are ICT-friendly, and the products one makes are designed and/or manufactured with ICT-friendly processes."***

**Meeting the Skills Challenge through Multi-Disciplinary Education**

***"This does not imply that everyone should acquire the specialised competencies of a software engineer or a programmer. India's economy needs people specialised in a variety of skills and conversant with the use of modern tools in their own varied specialisations. The needs of domestic computerisation on a large scale, and new challenges such as e-commerce, can only be met by involving every arts, science and commerce college-in addition to the engineering colleges and the institutes of technology-in addressing the relevant educational needs as part of general education... Truly multi-disciplinary education is involved in preparing young people to use modern tools in***

28 Narasimhan, R. 2000. Human Resource Development to Meet the Challenges of Information and Communication Technologies (ICTs). National Centre for Software Technology, Ministry of Information Technology, Government of India

***their own fields of expertise, and to compete with others in the world in a global market. For instance, proper exploitation of the www-technology demands expertise in commerce, design, arts, advertising and marketing. Meaningful work in such technologies can be undertaken only by inter-disciplinary teams."***

**2 Indian ICT Industry Weaknesses: Few Local Benefits & Absence of Domestic Market**

1) ***"The ICT industry in India, for all its creditable global performance, suffers from several weaknesses as is well-known to most major actors in this sector. The Prime Minister, while inaugurating the HiTec City in Hyderabad, identified one such weakness. He is reported to have said, "the benefits of IT could not remain confined to the well-off and the English-educated...I will consider my government's commitment to IT fulfilled only when it improves the life of the poor and the powerless." (Deccan Herald, Bangalore, 23 Nov 1998)"***
2) ***"Secondly, although the power of ICTs stems from the coming together of information and communication technologies, the prevalent tendency in India is to talk exclusively about IT, to identify IT with the software industry, and to stress, exclusively again, in all discussions the export performance of the Indian software industry. In such discussions one tends to forget that ICT is primarily an enabling technology and an infrastructural one – like electric power technology. THE REAL BENEFITS OF ICT WOULD ACCRUE TO A COUNTRY ONLY TO THE EXTENT THAT ICT IS DEPLOYED TO INNOVATE AND IMPROVE THE PERFORMANCE OF OTHER INDUSTRIES AND SERVICES IN GENERAL. The absence of such a realisation is, again the prime reason for the almost total absence of an informed domestic market for ICTs in India."***

**A 4-Level Skills and Knowledge Acquisition Scenario[29]**

**Table 7 Narasimhan's Four "Desired Ideal" Levels of IT Training**

| LEVEL | DESCRIPTION | EMPLOYMENT |
|---|---|---|
| **Level O: Universal Prerequisites** | **With ICT becoming a pervasive technology, to access the full potentials of an ICT-dominated world, every person should become ICT-literate. Minimally this means full familiarity with the use of a personal computer, and basic proficiency in the fundamental tools of personal computing such as email, word-processing, spreadsheets, databases, and of course, the use of the keyboard and the mouse. Students going through formal education should... be proficient in:**<br>▪ ***Communication*: Oral communication, general and technical writing, and listening skills.**<br>▪ ***Quantitative & Qualitative Analysis*: Including discrete mathematics, basic introduction to statistics and calculus.**<br>▪ ***Organisational Functions*: Introduction to economics, accounting, finance, human resources, marketing, production, etc.**<br>**Ideally every student passing out of +2 (6th Form) must have acquired these prerequisite skills and foundational knowledge.** | ○ **Data-entry Operators**<br>○ **Information Systems (IS) Application Assistants** |
| **Level 1: Entry-level Skills & Knowledge in Information Systems (IS)[30]** | ▪ **Thorough familiarity with Level O skills and foundational knowledge.**<br>▪ **Familiarity with and competence in the use of vendor-delivered products intended for general use. This implies working-level knowledge of similarities and differences between products with overlapping functionalities (e.g., different word-processing packages) and the ability to choose the best product to meet given requirements.**<br>▪ **Similar know-how and skills in the use of products incorporating knowledge in domains one is specialising in (e.g., products like MATHLAB, SPSS, SAS, AUTOCAD, SAP, etc.).**<br>▪ **Capability to be trained to use customised** | ○ **Data-entry Operators**<br>○ **Information Systems (IS) Application Assistants** |

***[29] "We must emphasise that we are here concerned only with the ICT-expertise that make-up the knowledge and skills at each level. We are not spelling out here the domain knowledge that relates to student specialisations such as Physics, Chemistry, Mathematics, Commerce, Business Administration, and so on...We are emphasizing the need for integrating training in ICT knowledge and skills with the education system in its entirety..." (R. Narasimhan)***

***[30] "Information systems are engineered systems based on ICT with desired input-output specifications. To create such engineered systems (also called system integration usually) both hardware and software skills and knowledge may be needed."***

| LEVEL | DESCRIPTION | EMPLOYMENT |
|---|---|---|
| | **(and/or home-grown) products.**<br>▪ **Familiarity with presentational graphics and their use in the generation of appropriate visual aids for popular or technical presentations. This implies availability of foundational design know-how: Layout, Lettering, Colour Contrast, Drawing, etc.**<br>**Ideally, all first degree holders from liberal arts, science and commerce colleges must have acquired Level 1 skills and knowledge of IS.** | |
| **Level 2:**<br>**Operating With Available Technologies[31]** | ▪ **Level 1 skills and knowledge are prerequisites**<br>▪ **Knowledge of how IS (both hardware & software) work, rather than mere skills in using them.**<br>▪ **Enough knowledge of programming, data-structures and mathematics to be able to design and implement applications packages in areas in which one has the requisite domain knowledge**<br>▪ **Advanced technical writing skills to be able to write, and/or supervise the production of, "help" manuals at various levels of detail and complexity. ("help" manuals could be technical maintenance manuals or user manuals.)**<br>▪ **Articulating requirement specifications and/or translating requirement specifications into systems specifications and design.**<br>▪ **Enough basic IS expertise to maintain (i.e. debug/rectify) application packages of various levels of complexity.** | ○ **Hardware/ software Maintenance**<br>○ **System Integration Assistants**<br>○ **Product Development Supervisors**<br>○ **Requirement/System Specifications Design** |
| **Level 3:**<br>**Generating New Technologies** | ▪ **Full-fledged IS expertise.**<br>▪ **Knowledge in cutting edge aspects of current technology.**<br>▪ **Ability to add to technology or generate new technology in one's specialisations: e.g., graphics, networks, database techniques, operating systems, etc.**<br>▪ **Enough technical and user understanding of the markets to judge what product innovations would sell.**<br>▪ **Enough production know-how and grasp of marketing details to assess rationally the cost of product/process innovations.** | ○ **Application Development Managers**<br>○ **Project Leaders**<br>○ **Middle Level Managers** |

41. The path to appropriate and sustainable IT training for capacity-building lies along the Education sector highway, but, given the changes wrought by the emerging 'global information order', existing educational infrastructures and philosophical dogmas must be revamped. The new 'global information order' requires an 'informatisation' of the educational establishment, with an emphasis on criteria that will enable life-long skills that enable peoples and societies to Participate in, Facilitate operation of & acquire Control over this new 'global information order'. A useful view comes from India in attempting to find a Caribbean vehicle to carry us along a high-tech Education path: our IT training transport must not only be globally marketable and multi-disciplinary, but it must also be able to navigate our distinct socio-cultural roadways and allow us to both contribute as well as receive goods. In summary, Caribbean IT training for Sustainable Development should become a part of all the region's many educational programmes. Beginning with 'e-Literacy; IT training has to enable operational use and eventual mastery of the applications, sciences and technologies involved for the benefit of the whole Caribbean Society.,

***[31] "Levels 2 and 3 relate primarily to students majoring in engineering. Level 2 roughly corresponds to students working for a first degree in engineering. Level 3 corresponds to students working for higher degrees (Masters, Doctorate) in engineering, and also those engaged in R&D activities in R&D organisations.***

Our ultimate success in this endeavour will be judged by our ability to generate new content, products and services that are globally marketable **and** locally beneficial.

## 3.3 Caribbean Sustainable Development IT Training & Capacity-Building Actions

- *Requirements for Sustainable Caribbean IT Training & Infrastructure Capacity-Building*

***Globally Relevant but Locally Available Education and Training***

42. The SWAN in Belize, EduTech in Barbados and TechSchool in Jamaica are harbingers of 21st Century Caribbean Knowledge Societies. They, along with the MBRS' Regional Environmental Information System, Jamaica's SDNP & NEPA State of the Environment/SIDS-POA compact disc, also offer proof from our limited assessment that the Caribbean can successfully deploy IT tools for Sustainable Development Decision-Making that Bridges the Data Gap (Digital Divide) and Increases the Availability of Information. However, if the region is to assume and or maintain its control of this rapidly evolving, science & technology-driven instrument, appropriate training of a youthful populace as well as stakeholder IT staff is critical. The management of the only private sector training agency interviewed (the Belize Institute for Information Technology) suggested that there are three acknowledged levels of technical training among corporate IT departments. They offer, and I recommend them as, a template for providing the fundamental skills (Participatory and Facilitating) required, including advanced and basic courses:

- High level staff technical training for IT/IM/MIS Department Managers in: Networking, Security & Microsoft SQL (for Database Administrators) leading to the Microsoft Certified Systems Engineer (MCSE) credential;
- Mid level staff technical training for IT/IM/MIS Technicians in hardware and software installation/operation/maintenance (A+ Certificate); and
- Administrative level support staff training in full functionality of combination software packages (e.g. Microsoft Office or Coral Suites).

Recognising the value of the so-called 'high-end' technology training as a prerequisite for life-long learning IT careers, and cognizant of the growing demand for such courses in the wider Latin American & Caribbean region, Miami-Dade Community College has established an Emerging Technologies Centre of the Americas (ETCOTA) to cater to hemispheric IT training and workforce needs (see text box below).

**Miami Dade Community College Emerging Technologies Centre Text Box**

**MIAMI DADE COMMUNITY COLLEGE EMERGING TECHNOLOGIES CENTRE**

**The Emerging Technologies Centre of the Americas (ETCOTA) currently offers a wide variety of programs, certificates and degrees in Telecommunications and Computer Information Systems at five of MDCC's campuses. By early spring 2002, the ETCOTA will also have a 40,000 square foot state-of-the-art education and training facility at the downtown Wolfson Campus. This ETCOTA site, funded by the 2001 Florida Legislature in the amount of $5.2 million, will be located two blocks from the Network Access Point (NAP) of the Americas and within walking distance of the BellSouth Multimedia Internet Exchange (MIX), another NAP. The ETCOTA will serve the education, training and workforce needs of Miami-Dade County, the tri-county Internet Coast, the State of Florida and Central and South America and the Caribbean Basin.**

**The scope of offerings and opportunities for individuals and businesses is among the most extensive in the nation; including:**

- ***CERTIFICATION TRAINING*** **in Microsoft (MCP, MCSE and MOUS); Cisco (CCNA and CCNP); Oracle, Nortel, Novell and IMB (AS-400); and, A+, I-Net+ and Network+.**
- ***COLLEGE CERTIFICATE PROGRAMS*** **in, for example: Digital Communications Technician, Electronics Telecommunications Specialist, Graphic Illustrator, Telecommunications Technician, CAD Operations, Data Processing Equipment Repair, Electronics Semiconductor Processing and Electronics Specialist.**
- ***ASSOCIATE IN SCIENCE DEGREES*** **in, for example: Computer Engineering Technology, Electronics, Micro-Electronics Technology, Computer Information Systems Technology, Internet Communications, Telecommunication Engineering Technology and Multimedia Presentation Technology.**

**The final "build-out" of the ETCOTA will create a state-of-the art facility with a 120-seat auditorium with broadband connectivity, 5 specialized laboratories for instruction, 14 high-tech classrooms and faculty offices. For further information, call William Kornegay, Chairperson of Computer Information Systems and Design Technology, 305-237-3928 or e-mail at wkornega@mdcc.edu.**

43. For fundamental manoeuvrability, and as the language of the new 'Global Information Order, these types of vendor-certified training courses are essential in the professional IT world and are increasingly needed by all stakeholder institutions involved in Caribbean Sustainable Development Decision-Making. In determining the types of IT education and training that the IDSD Workplan envisages, eight inter-related areas are suggested by the findings of section 3.2. The proposed curriculum, based on the previous analysis of inputs from national and regional stakeholders, would target key IM/IT managers and officials for instruction in:

- Database & Information Systems Development and Management;
- Networking (Local Area Networks-LANs & Wide Area Networks-WANs) Technologies;
- Email/Web/Internet Management;
- Computer Operations & Maintenance;
- Remote Sensing and Geographic Information Systems (GIS);
- Open Source Software Development and Use;
- Management of Changing and Evolving IT Systems & Infrastructure; &
- Sustainable Development Statistics, Indicators & Decision-Making

***Knowledge Management and Portals***

44. If the IDSD and other IT Education and Training initiatives for the region are to address critical regional problems and remain abreast of industry and societal trends, they must assess and deploy locally the latest tools available for the benefit of the Caribbean. Two recommended cutting edge mechanisms are 'Knowledge Management' and Portals. Knowledge Management[32], according to a strategic planning report for an Indian IT firm by Jashwant in 2000:

- ***"...is first and foremost a management discipline...that promotes a collaborative and integrated approach to the Creation, Capture, Organisation, Access and Use of an enterprise's information assets. This includes Databases, Documents and most importantly, uncaptured tacit expertise and experience of individual workers.."***

32 Jashwant, Harshada 2000. Report on Knowledge Management by Strategic Planning Team. Global Tele-Systems Ltd. Mumbai, India

- ***"...helps prepare...for an environment of constantly shifting demographics, industries, economies and customer needs by ensuring that people have the expertise and information they need in order to properly assess business problems and opportunities..."***

One of the findings from the previous section is the serious constraint posed by inadequate and insufficient human resources, particularly in the context of haemorrhaging organisation memory due to rapid staff turnover. The justification for Knowledge Management is that it is a tool for dealing with just this kind of problem and related situations such as:

- ***"Too often one part of an organisation repeats work of another part simply because it is impossible to keep track of, make use of knowledge in other parts of an organisation.***
- ***Productivity and opportunity loss [due to] a lack of knowledge where and when it is needed in a useable format.***
- ***Information overload [because of] too much unsorted and non-targeted information.***
- ***'Knowledge is Power' mentality [caused by] misunderstanding that sharing of knowledge will lead to a reduction of personal power.***
- ***Knowledge attrition; according to some estimates, the average organisation loses half its knowledge base through turnover of employees, customers and investors. Due to the intangibility of Knowledge Management, there is no unit to measure the loss...on account of...an employee leaving the organisation."***

As we move rapidly into the 'Knowledge Society' era, Knowledge Management could be recognised as an essential a component of a manager's or a decision-maker's 'tool-kit' as the laptop, cell phone or personal digital assistant is today.

45. Soraya Abad-Mota, from her Databases and Portals for Knowledge Management article in ***Digital Libraries and Virtual Workplaces: Important Initiatives for Latin America in the Information Age***, (Reenen, 2002)[33] recognizes that:

- ***"Databases and portals[34] are two key elements of IT with the potential to provide appropriate access to the vast amounts of online data existent in an organisation today in a dynamic and organized manner."***

UNESCO's "Webworld" Gateway, www.unesco.org/webworld/index.shtml (see Annex 17), is an example of a portal-type website designed to advance that organisation's capacity for sharing the accomplishments of its own Information Society initiative. A more useful example for the IDSD project is best represented by the OAS Education for the Americas Portal (see Annex 18). Carlos Paldao, of the OAS' Inter-American Agency for Cooperation & Development (IACD) that sponsors this mechanism, writes in his An Open Door to Education in the Americas article (Reenen, 2002):

- ***"The Education Portal of the Americas is a clearinghouse of information for students, teachers, researchers, government officials and others who would like to access quality information regarding the Hemisphere's best distance learning programmes and scholarship opportunities from one central location. It is a tool to help all individuals interested in improving their personal and/or professional development."***

The EPA was developed by the IACD as part of the mandate given to the OAS by the Plan of Action stemming from the Third Summit of the Americas and the resulting Connectivity Agenda for the Americas. Portals, when compared to other Internet and web applications for the diffusion of information, may offer the best model for the proposed IDSD project's information dissemination objectives.

***Towards Establishing Proactive National and Regional IT Policy Frameworks***

46. One of the first policy frameworks for the formulation of National Information Infrastructures (NII) that could then allow for the formation of a Caribbean Regional Information Infrastructure (RII) was proposed by the UNSTD's Report of the Working Group on Information Technology and Development, in Mansell & When's 1998 bible of the Knowledge Society 'movement' (see Annex 19). The Working Group's report concluded that governments and other stakeholders must be called upon to design new roles for the public and business sectors to enable ICTs to be harassed to economic, social, and environmental development goals. A summary of its recommendations is that:

33 Reenen, Johann van 2002. Digital Libraries and Virtual Workplaces: Important Initiatives for Latin America in the Information Age . Organisation of American States; Washington, DC.

[34] A portal is an overloaded term used to describe, among other things, a bundle of services provided electronically, through the web, to a set of users.

- ***Each developing country and country in transition establishes a national ICT strategy. Where such strategies already exist, they should be reviewed to ensure that they take note of the guidelines proposed by the UNCSTD Working Group;***
- ***Immediate action be taken by national governments to establish a task force or commission or to ensure that another entity is charged with establishing the guidelines for national ICT strategies. Reviews should be undertaken over a six-month period and a report should be prepared by each government outlining the priorities of its national ICT strategy, the mechanisms for continuous updating, and the procedures for implementation of the components of the strategy. Progress on the implementation of this recommendation should be reported to the next session of the Commission in 1999;***
- ***Each agency of the United Nations system reviews the financing, production, and use of ICTs for social and economic development in their area of responsibility. This review should monitor the effectiveness of new forms of partnerships in the ICT area, and address the capability of each agency to provide technical assistance in that area. This needs to happen so that the United Nations System can be in the forefront in helping developing countries and countries in transition to implement their national ICT strategies.***

47. Along with enabling presentations on Barbados' EduTech and Jamaica's TechSchool, as part of the WSIS preparatory process, the January 2003 Digital Diaspora Network-Caribbean (DDN-C) Conference allowed the CARICOM Secretariat and other Caribbean stakeholders to present informative papers on the status of the region's IT use, its policy infrastructure and proposals for its advancement. The remainder of this section offers brief summaries of these presentations, which enable the reader to get a sense of where the region is at present, where we would like to go in the future and some insights on steps we must take to get there.

**Caribbean ICT Development: Critical Issues and Challenges**, see Annex 20; this presentation by Roderick Sanatan (Manager of Research and Development at UWI's Centre for International Services in Barbados) covered the following topics:

- Definition and Measurement Issues
  - *1. DEFINING ICTs:*
    - *Traditional definition concerns Voice communication technology linked to the telecommunication network*
    - *Today, reference is to the delivery of a worldwide broadcasting capability, a mechanism for information dissemination and a medium for interaction between individuals and their marketplace for goods and services*
    - *ICTs are not a panacea for development or a replacement for real world processes*
  - *2. MEASURING ICTs*
    - *Connectivity - physical capacity, infrastructure, pricing, etc.*
    - *Access - wider determinants*
    - *Policy Environment - systems and applications*
    - *Usage - content, absorption, human capacity, investment*
- Priority Areas for Caribbean Development
  - *3. PRIORITY AREAS FOR CARIBBEAN DEVELOPMENT*
    - *Strategic competitiveness of the region using ICT*
    - *Technology diffusion challenge – Investment and human capacity*
    - *External Trade for Services and Manufacturing, ICT efficiency*
    - *Domestic Systems - Regulation & policy, human capacity/education, production - entrepreneurship, business applications*
- Selected Issues and Challenges
  - Technology Shifts
    - *Internet usage, Mobile shift*
  - Electronic Commerce
    - *Legislation and administration, Entrepreneurship, Settlement issues, E-Government systems*
  - The Digital Divide
    - *The information society, Vulnerability, Social cohesion, Diaspora linkages*

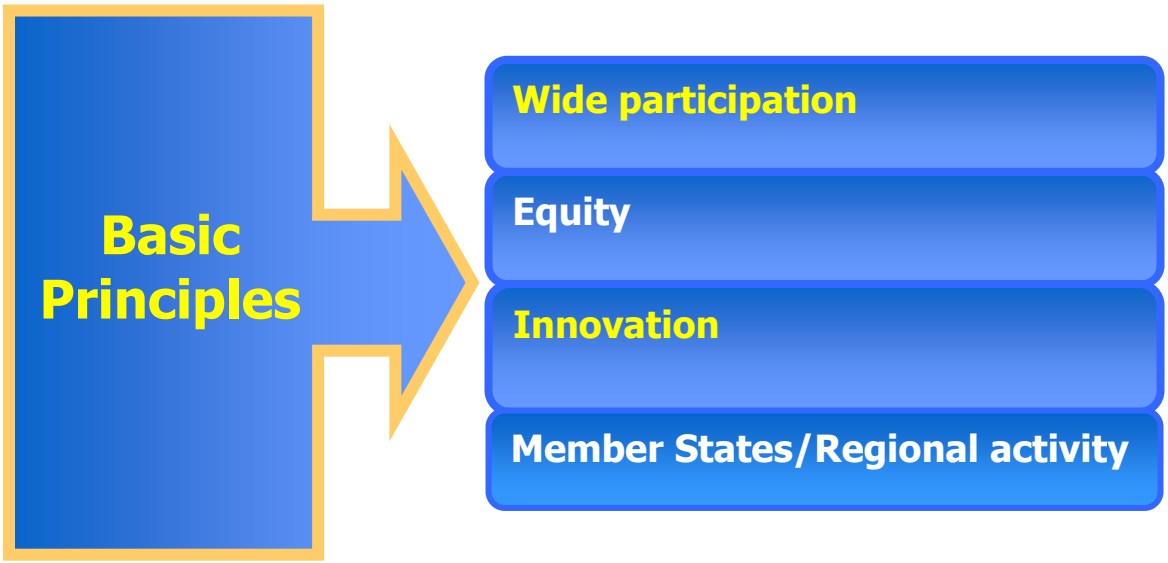
Sanatan concluded by recommending to regional stakeholders the *judicious* use of indices for ICT measurement, while focusing on *applications* to real development. He also reminded the meeting that ICT offers tremendous opportunities for business *exploitation* and Civil Society *advocacy*. His emphasis on human capacity-building as one of the major suggested priorities for the region concurs with this consultancy's findings.

**Caribbean Community (CARICOM) ICT Strategy /Agenda 2003**, see Annex 21; this presentation by Ms. Jennifer Britton (Senior Project Officer for Integrated Information Systems at the CARICOM Secretariat) began with her discussion of a "*CARICOM ICT Sector Index*" that described

Telecommunications sector liberalisation in the region as being carried out through de-monopolisation within and outside the World Trade Organisation (WTO) context. She also described current legal & regulatory frameworks among CARICOM member states. In reviewing 'connectivity', she stated that penetration in the region is between 20% to 50% of the population for fixed lines; less than 8% for the Internet and under 13% for mobile phones. Major IT use and applications were said to occur in the education, health, energy, tourism, and agriculture sectors; international business & manufacturing; and E-Commerce & e-government. After an overview of the ICT sector in CARICOM's newest member state, Haiti (1 national telecom company; 2 mobile phone operators, Haitians use mobile more than fixed lines; 10 ISPs; 200 private cyber cafés and a rate of Internet penetration that is more than recorded), she gave these highlights of CARICOM's 2003 IT Strategy & Agenda:

- Rationale
  - *Quebec City summit – promotion of an Agenda for Connectivity in the Americas.*
  - *CARICOM HOG agreed that the Secretariat through a specialised small working group would promote & advance community guidelines, principles and action with respect to ICT and the CARICOM Agenda for connectivity.*
  - *CARICOM's Secretariat was mandated to present a CARICOM ICT strategy for ratification at the next meeting scheduled for early 2003 and a commitment was made to "… further pursue meaningful participation in hemispheric and other policy-making fora on the global information society."*
- Elements of CARICOM Agenda for Connectivity
  - Definition of connectivity
  - *A society's internal capacity for communication with its global environment through the use of telecommunications, information technologies and the products of its content industries.*
  - Definition of Agenda for Connectivity
  - *Individually & collectively move towards expanding access to global knowledge & full integration with the knowledge society*
  - *Promote the modernization of the telecommunications sector*
  - *Establish conditions taking into account national legal frameworks that promote and strengthen free and fair competition in telecommunications services*
  - *Seek out innovative ways of facilitating access to and usage of computers and software in our learning environments*
  - Participation
    - *CARICOM Member States, CARICOM Secretariat, CARICOM Agencies, Institutions & Funding partners*
  - CARICOM Policy Approach Components
    - *Infrastructure, Utilisation* (Applications Software)*& Content*
    - *A regulatory framework to support & sustain the development of the Agenda*
      - *Financing options, Importance reflected in macro-economic policies & allocation of public expenditures*
    - *Performance Measurement should be shared by Government, Private Sector & Civil society*
  - Principles

  See graphic below:




***Caribbean Community (CARICOM) ICT Strategy /Agenda Principles***

- Vision
  - *Must be conceived & executed with 3 sectors of society*
  - *Must be guided by principles of equity and universality*
  - *Promotion of infrastructure use & content development that reflects countries cultural identities.*

See graphic below:


- **Infrastructure expansion**
- **Research & Development**
- **Investment in human resources**
- **Entrepreneurial development**
- **Enabling Business sector environment and investment regime**
- **Developing statistical support**
- **Connectivity in CARICOM, the Americas and globally**

***CARICOM ICT Vision***

- Strategies
  - *Integration & Harmonisation of existing CARICOM efforts*
  - *Analysis & adoption of the best National and international practices*
  - *Creation & reinforcement of alliances*
  - *Establishment of a small working group / Oversight Agency*
  - *Focus groups establishment for collaborative action-Infrastructure, Application & Content*
- Action Platform

*Assessment*
  - *Designated Entity to oversee*
  - *Inventory of national efforts*
  - *Infrastructure (indicators –e.g. Civil society)*
  - *Utilisation (sectors – health, education)*
  - *E- readiness (esp. Legal & regulatory framework)*

*Planning*
  - *Establish a forum for discussion & agreement*
    - *Define policies/priorities/plans of action*
  - *Nominate a high-level Gov't entity to co-ordinate activities*
  - *Establish short/medium & long-term plans*

*Execution*
  - *Action will be undertaken simultaneously on five (5) fronts:*
    - *Infrastructure, Utilisation, Content, Regulatory framework & Financing*

*Evaluation*
  - *Definition of a performance measurement framework that specifically checks:*
    - *Number of/percent of (specific behaviour/response)*

        - *Relevance & validity*
        - *Key performance indicators*
        - *Performance of key processes (activities & outputs)*
    - *Define collection method*
    - *Detail/define who needs to be involved*
    - *Analysis of relationships between categories*

The CARICOM Secretariat has a well-defined agenda that could become one of a number of 'smart' partnerships entered into by the IDSD Project. Besides supporting investment in human resources capacity, there are a number of synergies that could be made to occur, and in particular, the IDSD Project might join with CARICOM to focus on Internet or web applications and content oriented towards the SIDS-POA thematic areas. This would require a close working relationship between the OAS and the CARICOM Secretariat, as already envisaged in the IDSD project design; previous OAS/CARICOM collaborative efforts have led to CPACC/MACC/CCCCC that regional Climate Change programming. There is also an opportunity to collaborate with CARICOM on infrastructure and networking through the Pilot Network component of the IDSD Project.

**ICT Development in the CARICOM Countries Discussion Paper**, see Appendix 8; this informative discussion paper By Dr. L.A. Nurse[35] outlines first the purpose, background and mission of the Caribbean Digital Diaspora Network:

Purpose/Background

- *Convinced of the positive potential of ICT to accelerate economic growth and social development, the UN ICT Task Force, in collaboration with United Nations Development Programme and United Nations Fund for International Partnerships, is embarking on an initiative to contribute to the development process in the Caribbean. The initiative is known as the Digital Diaspora Network for the Caribbean (DDN-C). To achieve its objectives, the initiative seeks to use networking and partnering strategies to build and mobilize a competent community of interest and to identify resources to facilitate the development and implementation of Caribbean ICT – based projects.*
- *It is proposed that a network should be established to mobilize the technological, entrepreneurial, and professional expertise of persons of Caribbean origin, now residing in North America (the Caribbean Diaspora), businesses with a Caribbean orientation, and Caribbean counterparts. While in this phase the focus is on the development of a North American / Caribbean network, it is recognized that it may be expanded in a later phase to include European and/or other countries with appropriate resource and networking capability.*

After discussing the DDN-C's mission, rational and process, Nurse goes on to describe the network's operation and its expected results. The main part of the paper then looks at Caribbean IT strategies, the Status of IT in the region and proposes a Framework for Action with an overview of important issues and challenges to IT development in the Caribbean. Some highlights are excerpted and presented below:

Mission:

- *The Caribbean Digital Diaspora Network will be programmed to provide a rich source of ideas, skills and support and to act as a platform for the exchange of information and other resources to create and sustain digital opportunities in the Caribbean*

Caribbean Strategies:

*Strategic Objectives*

*The CARICOM Secretariat is developing the ICT strategy for the Caribbean. They have already identified the following strategic objectives.*

- *Promotion of e-enabled human capital, to enhance human capacity through on-line communities and on-line learning (e-communities)*
- *An enabling e-business environment for the growth of on-line business (e-business) and creation of new business opportunities.*
- *Efficient functioning of governmental machinery to build civil society and democratic governance (e-government)*

*Application of ICTs*

*To achieve the strategic objectives, implementation of the action plan will target the major sectors of the region's economies, along with some cross-sectoral activities where important to achieving a broader national or regional goal. The application of ICT in the Caribbean will therefore be focused on the following areas.*

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*35 By Nurse, L.A. 2003 ICT Development in the CARICOM Countries Discussion Paper for the Meeting on Bridging the Digital Divide for the Caribbean. UN-ICT, UNDP & UNFIP. United Nations, New York*

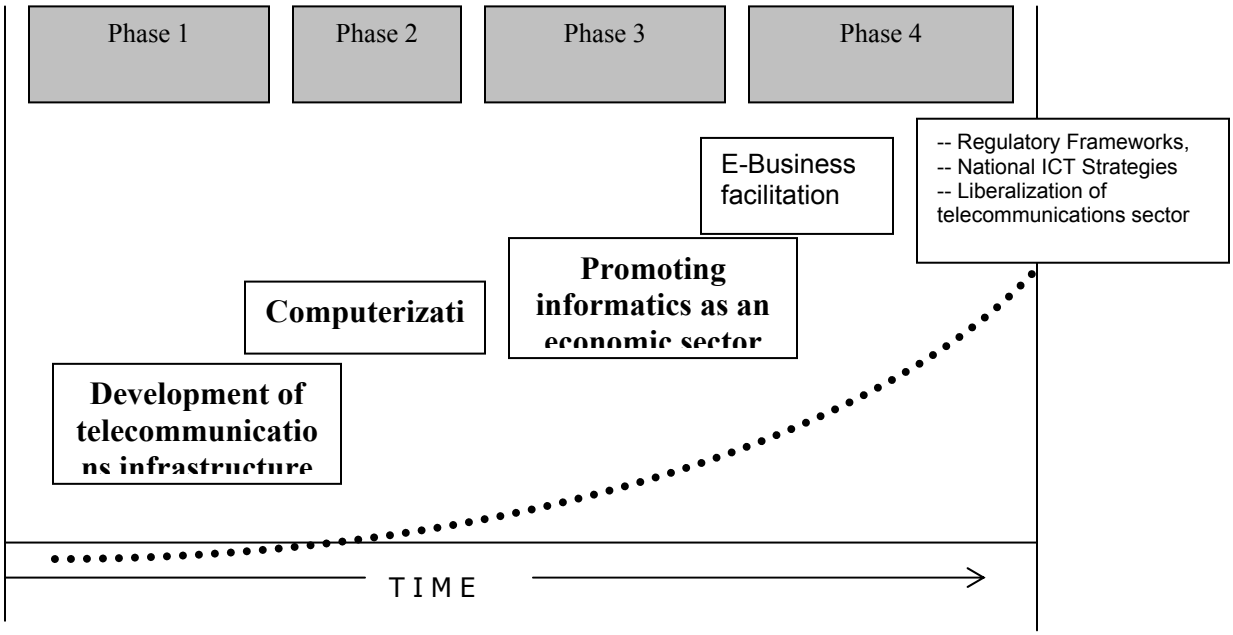
- *ICT policy Framework*
- *Infrastructure, Connectivity & Costs*
- *Human Capacity development – Education*
- *Health & Telemedicine*
- *E- Business Environment*
- *E-Government for Civil Society & Democratic Governance Economic Opportunities*
- *Enabling Efficiency & Productivity in the Tourism sector*
- *Resources for ICT development in the Caribbean*
- *Developing agriculture with Information.*
- *Outsourcing*
- *Culture & recreation*
- *Economic opportunities*
- *Environmental Stability*
- *International Business Services*
- *Disaster Recovery*
- *Manufacturing*

## Current Status of ICT in the Caribbean

*Overview*

*ICT activities in the Caribbean have been developing along a traditional continuum, focusing progressively on telecommunications infrastructure, computerization, development of informatics as an economic sector, and most recently on e-business facilitation. This process may be categorized as a sector enhancement approach.* See figure below:

**A typology of the ICT Development Continuum in the CARICOM Countries**




*Teledensity and Access*

*Teledensity is a measure of basic network capacity, which in turn is a major requirement for Internet access. It is defined as the number of telephone lines per 100 persons in the population. Best estimates by the ITU indicate that Teledensity is still rather low in the CARICOM countries averaging 27.7% compared to 65.51% in Canada and 66.45% in the USA.*

*Network access is also critical. In the ICT context access requires three main components viz. basic telephone access, PC penetration and Internet access. All are necessary because the Internet currently relies on the telecommunications network for transmission and the PC still provides the main interface to the Internet.*

*(a) Network Access*

*Network access can be measured through the statistics on 'household penetration.' The available estimates relate to the wire-line service only, but it must be remembered that the growth of mobile service will eventually modify the significance of the term 'household penetration'*

*(b) Penetration of PC's*

***On average there are only 9.14 PC's per 100 persons in the CARICOM Countries, which while being above the average for The Americas as a whole, contrasts very unfavourably with estimates for the leading countries of 40.31 PC's per 100 persons in the Canada and 62.50 in the USA.***

*(c) Internet Access*

*Table 2 also provides the ITU estimates of the number of Internet users in the CARICOM countries. The contrast with the USA and Canada is similar to that observed for PC penetration. For instance whereas there are approximately 2,014 users in Canada and 5,015 in the USA for every 1,000 inhabitants, the average for the Caribbean is only 507.96.*

*However it can be seen that there is not a linear relationship between PC penetration and the number of Internet users. There is a perception in the Caribbean that this is very much related to the cost of service provided by the ISPs, and to the extent to which the internet is used in business processes where there will be multiple users per service.*

*Legal and Regulatory Framework*

*Only Jamaica may be said to have developed and proclaimed a national ICT policy. Antigua, Barbados, Grenada, Guyana, St. Lucia and Trinidad and Tobago are understood to have drafts under consideration. The position of the other countries is unclear. However, it is questionable whether countries should try to pursue this path alone. Therefore it is now accepted that a more efficient and cost effective strategy would be to develop a regional approach. The countries have therefore put in place a CARICOM mechanism for determining a regional ICT policy.*

*The process has so far included the following:*

*i. The 13th Heads of Government Meeting in Georgetown Guyana recognized the potential of ICT for enhancing and integrating Caribbean societies in education, health, poverty reduction, delivery of public information and governance. All these principles are enunciated in the CARICOM Charter of Civil Society.*

*ii. Accepted recommendations of the special meeting of CARICOM Ministers responsible for information, communication and or technology from their June 2000 meeting in Antigua & Barbuda. These recommendations related to a process for outlining policy, agenda and strategy for development of ICT in the CARICOM region.*

*iii. Mandated the CARICOM Secretariat to present the CARICOM ICT strategy for consideration at its 14th meeting scheduled for early 2003.*

## Policy Framework for the Caribbean

*Setting the Agenda*

*The following processes among others will therefore influence the policy framework:*

- *The WTO negotiations*
- *The UN Millennium Development Goals (MDGs)*
- *The Summit of the Americas process*
- *The Proposed CARICOM ICT Strategy (to be presented at the 14th Inter-sessional Meeting in early 2003).*
- *National ICT policies*

*Each of these processes will be driven by its own specific goals, and its own 'raison d'etre'. There is however a point of convergence. That point is the resolve that ICT should be pursued not simply as an end in itself, but more importantly as a catalyst for human social and economic development, notwithstanding the fact that it is also an area of dynamic business activity.*

- *This position emerges partly from the realization that the difference between developing and developed countries is not only reflected in, but is also being exacerbated by the dramatic shift from a global income divide to a global knowledge divide. The modern development process is therefore being driven more by the harnessing of knowledge, rather than by simply managing production. ICT, the enabling process, will therefore be required to play an increasingly more crucial role in the development of developing countries.*

*Policy Forums*

- *As indicated earlier, the eventual ICT policy of the CARICOM countries will be greatly influenced by the agendas of the several forums to which the region is a party. Significantly, all of these recognize that ICT will play a defining role in the development process. ICT has therefore been a subject of special focus in the international, hemispheric, regional and national development policies and agendas which impact on the Caribbean.*

*(a) The Summit of the America's process*

*At its Montreal meeting the development agenda was prefaced with the following statement regarding connectivity.*

***"We, the democratically elected Heads of State and Government of the Americas, meeting in Quebec City[36], recognize that a technological revolution is unfolding and that our region is entering a new economy, one defined by a vastly enhanced capacity to access knowledge and to improve flows of information. We are convinced that the promotion of a Connectivity Agenda for the Americas will facilitate the beneficial integration of the hemisphere into an increasingly knowledge-based society. We share the goal of providing all citizens of the Americas with the opportunity to develop the tools to access and share knowledge that will allow them to fully seize opportunities to strengthen democracy, create prosperity and realize their human potential. Connectivity will open new opportunities to our society in all areas, for which equal access and appropriate training are necessary."***

*A connectivity agenda was also outlined as follows:*

*1) Individually and collectively move towards expanding access to global knowledge and full integration with the knowledge society*

*2) Promote the modernization of the telecommunications sector*

*3) Establish conditions taking into account national legal frameworks that promote and strengthen free and fair competition in telecommunications services*

*4) Seek out innovative ways of facilitating access to and usage of computers and software in our learning environments*

*(b) The CARICOM Strategy*

[36] The 2001 Summit of the Americas held in Quebec, Canada 2001

*In a communiqué following the most recent meeting[37] it was reaffirmed that the CARICOM Heads of Government:*

***"... Recognized the potential of information and communications technologies (ICTs) for enhancing and integrating our societies in areas such as education, health, poverty- reduction, delivery of public information and governance – objectives articulated in the CARICOM charter of civil Society. They also noted the potential (of ICTs) for transforming our economic landscape, growing the CSME and advancing the regional trade agenda, by increasing competitiveness in services and seizing opportunities offered by e-commerce. The heads are however not unmindful of increasing challenges the digital revolution has posed for smaller economies such as ours, underscoring the need for a regional approach.***

*The CARICOM Secretariat was mandated to present a CARICOM ICT strategy for ratification at the next meeting scheduled for early in the year 2003 and a commitment was made to*

***"... further pursue meaningful participation in hemispheric and other policy-making fora on the global information society."*** *Special mention was made of:*

*a. Full participation in the hemispheric ICT process under the OAS through the Inter-American Telecommunications Commission (CITEL); as outlined at the Quebec meeting, detailed in this report*

*b. Participate fully in the global process working with the European Latin America& Caribbean alliance for information Society. (IEU-LAC)*

*c. Cooperate with the UN task force for information society set up by Secretary -General Kofi Annan.*

*Policy Summary*

*It is therefore clear that development of a Caribbean ICT policy framework is in process. The outstanding features and overall principles may be summarized as:*

- *Participation in regional, hemispheric and global strategies for development of the information society.*
- *Implementation Process requiring:*
  - *The support and participation of civil society i.e. The private sector, the public sector, NGOs and the general population.*
  - *A forum where the players can participate in formulating policies, defining priorities, strategies, and plans of action.*
  - *A high-level government entity empowered to coordinate the short, medium, and long-term.*
- *A high level national executing agency to manage the planning, executing, and financing processes. The process should involve the entities responsible for defining economic policy and budgetary allocation at the applicable central, regional and sub-regional levels.*
- *A long-term commitment extending at least ten years*

## ICT Issues and Challenges

*Impact on Existing Activities*

*Potential for Development*

*However, in striving to benefit from this potential offered by ICT, a number of critical issues must be addressed. The issues include:*

[37] The 23rd meeting of CARICOM Heads of Government held in Georgetown, Guyana July 2002. At this meeting a document was presented by the Secretariat outlining strategy for development of a CARICOM ICT policy.

i. *Connectivity*
ii. *Skills Development*
iii. *Content*
iv. *Resource allocation*
v. *Bridging the digital divide*
vi.

*Connectivity*
*Skills Development*

- *Next to providing connectivity and access, skills development must be made a critical component of the ICT strategy. This issue is most important in areas where basic literacy is low. Even in countries with high literacy, e-literacy will be a necessary objective of skills development. However, basic literacy and e-literacy need not be treated as separate processes.*
- ***For Example, pupils using laptops in the classroom, or a classroom with an interactive whiteboard connected to a computer and to the Internet, can simultaneously facilitate teacher and student input, intellectual stimulation, creativity, downloading of content from the internet, and distance learning. All of the major learning processes, especially the cognitive and affective, are therefore integrated and need only to be managed through good lesson plans. Smart Technologies website (www.smarttech.com) among others provides guidance for teachers on how to use this type of technology in the classroom.***
- *If ICT can be incorporated into the education processes and classroom methodologies, especially at an early point in the educational cycle, a smooth and effective solution would have been achieved. The EduTech programme being implemented by the Ministry of Education in Barbados is an example of this approach.*
- *A comprehensive ICT skills development strategy will not be confined to the classroom and will require development of both end-user and technical skills. The end-user skills would include basic keyboarding skills, net literacy, handling ICT, hosting information, retrieving information etc. The technical skills would revolve around the development, management and maintenance of hardware and software systems and of course networking and connectivity.*

*Content*

- *The next important issue and challenge in developing a comprehensive ICT policy relates to content. Content must be understandable not only to highly trained professionals but also to the average citizen in the community. For example, a farmer in a rural community could also benefit directly from information about market prices for his products, best agricultural practices for the crops he produces, or the latest government assistance programmes for farmers without awaiting the uncertain visit of an extension officer. Therefore the way information is presented through ICTs will also be an important factor.*
- *This will have implications for the development of content in a contextual framework, including where possible, in the local language or idiom. In addition, content need not be restricted to written-text format, as in many communities voice data or graphics may be the most effective communication tools. Moreover, the use of culturally relevant icons in the software and hybrid voice/text technologies would be a distinct advantage. These factors will in turn have a linkage effect to the skills training programmes and also present business and or career development opportunities for programmers and developers.*

*Resource Allocation*

- *The deep linkages and interrelationships between ICT and all sectors of the economy have been established; consequently an effective ICT programme should be developed within a strategic planning framework. Governments therefore will need not only to spell out the vision, but also to break that vision down into manageable components with specific targets and time frames for each. This in turn would lead to rational resource allocation in a logical developmental framework.*
- *Each country's sustainable development needs should determine the national strategy in each case. Furthermore at the national level, Governments need to demonstrate the political will to incorporate more ICT into the operational and other aspects of governance (e-government), and to allocate appropriate resources for achieving this objective.*
- *In addition to governments' resource allocation strategy and deployment of ICT, the business sector, NGO's and international organizations will be required to contribute resources. This in turn is likely to lead to new business opportunities to be explored by the private sector participants.*

*Bridging the Digital Divide*

- *Another major issue, the digital divide, exists at two levels. Firstly it can be observed within countries i.e. at the national level and secondly between countries, i.e. at the international level. The most dramatic manifestation of the digital divide, however, is at the international level between developed and developing countries. It is precisely because of this that international intermediary organizations, e.g. The UN agencies, World Bank, Inter American Development Bank, will be required to play a major role in helping to bridge that digital divide.*

*Fortunately, the issue of the digital divide is at the top of the international political and economic agenda. This is reflected in:*

- *The adoption of the Information Society Charter by the G-8 countries at the Okinawa Summit in July 2000*
- *The United Nations Economic and Social Council establishing a Task Force on ICT and Development.*
- *The Proposed World Summits on "information society" scheduled for 2003 [38] and 2005.*

[38] The 2003 conference is presently proposed for December 2003, in Geneva, and expected to be at the level of Heads of State and Government. The process leading up to the summit will include four regional preparatory conferences. The regional preparatory conference for the Caribbean is scheduled for the end of January 2003 in the Dominican Republic.

- *The establishment of the Infodev programme by The World Bank for identifying, developing and supporting fundable ICT projects in eligible member countries.*
- *The FTAA process has outlined a connectivity agenda for the hemisphere of the Americas, with implementation to be managed by The Inter-American Telecommunications Agency (CITEL).*[39]*.*

*In addition to the policy positions, practical initiatives have also been created to address this issue. Some of these specifically target the Caribbean basin and/or the hemisphere. The Caribbean countries should actively seek to benefit directly from these.*

- *UNDP' Sustainable Development Networking Programme (www.sdnp.undp.org)*
- *World Bank's Global Development Network (www.gdnet.org)*
- *The Global Knowledge Partnership (www.globalknowledge.org). This is an informal partnership between public sector, business, NGO's and international organizations including UNDP and the World Bank.*
- *World Bank's Global Information and Communication Technologies Department of the IFC. (GITC) (http://info.worldbank.org/ict/policy.)*
- *Institute for Connectivity, a department within IDRC – Canada. This capability was established by Canada as a contribution to the Summit of the Americas process. It assists with developing and financing qualifying ICT projects in the developing countries of the hemisphere.*

48. The review of IT policy frameworks in the context of Caribbean IT Training & Capacity-Building has indicated that after connectivity, the issue of education and training may be considered the next highest regional priority. However, it is important to recognise that in order for the Caribbean to move effectively to address this almost universal cry, the requisite national legislative and institutional arrangements must be in place and in harmony with the regional administrative framework. The recommendations and guidelines from the UNSTD Working Group on IT and Development are still relevant and could form a template for a course on National ICT Policy formulation. CARICOM has elaborated a coherent strategy agenda that has been detailed by Britton and endorsed by Nurse in his DDN-C paper. Taking note of the indicators in the DDN-C paper, they are the type of measuring instruments required to ascertain regional use and assist in decision-making for all stakeholders[40]. With the development of a Caribbean ICT policy framework in process, the IDSD project could undertake to specifically support its advancement through training interventions. And, in the context of building regional environmental information management capacity, may wish to explore the sponsorship of a GEF project as a longer term partnership with the region. Before the closing section on a proposed action strategy for the IDSD project, a summary of some guiding principles for stakeholder decision-making is included in the next section.

### ➢ *Suggested Stakeholder Principles for Sustainable IT Training & Capacity Building Policies*

49. The concept of e-Governance has become recognised as the new emerging paradigm that is meant to encompass steps and procedures for administering the Knowledge Society and making decisions in a participatory and transparent manner using IT. Several instructive sets of guiding principles or processes for establishing rational decision-making for e-Governance are reviewed in this section; they include experiences from UNESCO, the Commonwealth Network of Information Technology for Development and a Workshop for the Exchange of Experience on Social Appropriation of New Information and Communication Technologies for Development in Latin America and the Caribbean. Finally, based on data gather during this consultancy, a matrix is offered for evaluating whether a proposed investment in capacity is needed and cost-effective for certain desired IT applications.

UNESCO E-Governance Survey

50. Taken from UNESCO's Webworld gateway, a recently completed survey (see text box below) offers some insights into practical e-governance experiences:

[39] CITEL has already started working with the CARICOM Secretariat on devising a regional connectivity strategy.

[40] One of this consultancy's outputs is a methodology for the development of indicators and the definition of such indicators that can reflect the status of generation and use of information in individual countries and that are capable of measuring progress in this area. The Teledensity indicators (basic telephone access, PC penetration and Internet access) are useful in that respect as well.

**UNESCO E-Governance Survey Text Box**

**E-Governance Survey of 15 Countries**

***Key Finding***

The "push" for public service reform has brought in its wake the pervasive harnessing of ICTs to achieve administrative and social goals. A key feature driving this reform is public pressure for increased accountability and value for money in public service operations. This is one of the findings of a study including 15 country abstracts providing an initial snapshot for countries chosen to represent different situations in each of UNESCO's region.

***E-Governance Government Initiatives:***

- **Development of cyberlaws**
- **Liberalization of telecommunications**
- **Plans for e-government**
- **Plans for the development of an info-society**
- **Deployment of community e-centres**
- **Instances of public feedback to statements of direction, draft legislation and so on**
- **Web-sites of government agencies, particularly if these offer value beyond a public relations image.**

***Special Case of Islands and Small States:***

- With unique challenges and opportunities [for Islands & Small States]...the traditional issues of economic vulnerability and geographical isolation are exacerbated in the digital era by lack of critical mass in terms of service provision and sweeping globalization.
- And yet these countries are facing the greatest opportunity, in relative terms. Government in these environments is often effectively a single-layer central administration, and there is an opportunity to tap into wider virtual markets. Access to information and education through ICTs is potentially vast, relative to the national supply, and planned seamless information and technical infrastructure building are within relatively easy reach.
- All this enables a leap-frogging of social and economic development into the digital age, given the political and managerial leadership and foresight.

**SOURCE: John Rose (j.rose@unesco.org), UNESCO, Information Society Division. News article "Country Profiles for e-Governance" on the Webworld gateway (http://www.unesco.org/webworld/index.shtml); Results of the Commonwealth Network of Information Technology for Development (COMNET IT)/UNESCO Global Survey on On-line Governance published in 2000.**

The main justification for the survey comes from today's aware and information-hungry public. Worldwide, citizens have been empowered by their timely access to data on Government policies, proposals and operations. So the push is on to use IT for decision-making in the broadest sense: Involving citizens and the public in 'on-line' civic, social and administrative endeavours. The lessons arising from this survey may be for governments and civil society to gain insight into what kinds of initiatives are being carried out globally, as well as to assess their effectiveness. The global E-Governance government initiatives are: (1) Development of cyberlaws; (2) Liberalization of telecommunications; (3) Plans for e-government; (4) Plans for the development of an info-society; (5) Deployment of community e-centres (Telecentres); (6) Instances of public feedback to statements of direction, draft legislation, etc.; and (7) Web-sites of government agencies, particularly if these offer value beyond a public relations image. Recognition is given to the special case of Small States and Islands in that size is a disadvantage in today's telecommunications-driven world that requires private sector inputs driven by profits based on volume of customers. However, given less bureaucratic government structures and rapid technology changes leading to ever cheaper products, small states and islands may be able to put these factors to their advantage if they utilise a planned approach for establishing seamless information structures and build the appropriate technical infrastructure. The idea is that later digital age entrants can learn from past experiences and therefore 'leapfrog' into the new global information order; the caveat is that political will and managerial expertise are prerequisites.

e-Government Principles from Malta

51. A useful set of principles was put forward in an article by Damian Xuereb (e-Government Technical Programme Manager, Ministry for Information Technology & Investments, Government

of Malta; E-mail: damian.xuereb@gov.mt), in the COMNET-IT[41] Forum (www.comnet-it.org). They offer a comprehensive five part set of E-Government principles for national decision-makers (see Annex 22). The headings for five elements and their respective principles have been placed in the text box below:

**Malta e-Government Principles Text Box**

| |
|---|
| **ESTABLISHING STRONG PRINCIPLES** |
| 1. Leadership |
| 2. Technical skills |
| 3. Business acumen |
| 4. Support across the board |
| **BUILDING THE FOUNDATIONS** |
| 5. Objective policy |
| 6. Centralisation of funds |
| **THE TECHNICAL SIDE** |
| 7. High speed networks |
| 8. Data vaults and unique identifiers |
| 9. Integrated processing & storage |
| 10. Reusable components |
| **MONITORING** |
| 12. Centralised administration |
| 13. Resilience |
| 14. Setting the alarms |
| **IMPROVEMENT** |
| 15. Planning ahead |
| 16. Re-engineering or re-inventing |

Beginning first with the need to establish strong principles, Mr. Xuereb explains that effective leadership at the highest levels is essential; that the importance of local technical skills cannot be minimised; that good business acumen must be brought to bear; and that support must be sought and gained from national stakeholders 'across the board' before going forward. The second area of the Malta e-Government prescription deals with the need to build appropriate foundations for a national e-Government process by first of all getting the policy right, meaning it must be balanced and address the needs of the nation; further, he suggests that the centralisation of funding will ensure coordinated sustainability of the initiative. Thirdly, the overall technical requirements are covered by recommendations for: High-Speed Networks, robust Data Vaults and Identification mechanisms, Integrated Processing & Storage and the employment of Reusable Components for economy and efficiency. The fourth part concerns monitoring and oversight of the infrastructure through building centralised administrative structures and policies that will foster the resiliency required for on-line operations across a myriad of departments and agencies; this centralised approach must, however, have the systems in place to alert the managers and technical staff at the first instance of any difficulty. The fifth and final area covered by Mr. Xuereb is a call for constant improvement through always planning ahead in this rapidly changing milieu going through regular re-engineering or re-inventing of the resulting policy framework and its constituent hardware, software and human resources.

Letter to Aunt Ofelia: Seven Proposals for Human Development Using New ICTs

52. One of the better sets of decision-making codes comes in the form of a letter to a mythical "Aunt Ofelia" who has recently been appointed Secretary of Communications in a Latin American

[41] The Commonwealth Network of Information Technology for Development (COMNET-IT) is an international foundation sponsored by the Commonwealth Secretariat and the Government of Malta. It resources its activities through a network of collaborators and agencies including institutions represented on its Board, which act as operational centres providing primary expertise and support.

country. This approach allowed the authors to use their creativity in crafting proposals for taking better advantage of the opportunities for human development in the region offered by ICTs. They were prepared by Ricardo Gómez[42] and Benjamín Casadiego[43] as the result of a workshop involving three-dozen specialists who met in Cajamarca, Peru in March 2002.[44] These self-explanatory proposals are a useful contribution to the ongoing debate over the use of new technologies for human development, understood by the authors to mean *promoting democracy with social justice, economic prosperity with equity, and realization of the full human potential*. They close with this saying: ***In the end we ask ourselves, from a human development perspective, what is the usefulness of the Internet?***

**Letter to Aunt Ofelia: Seven Proposals for Human Development Using New Information and Communication Technologies**

***1. OFFER CONCRETE SOLUTIONS: Connectivity is not an end in itself, but it is a Tool that can help find concrete solutions to people's problems and needs.***

***2. MOVE FORWARD AT THE PACE OF THE COMMUNITY: Development projects take time and they generally work better when done in a manner consistent with the timing and pace of the communities involved.***

***3. LEARN FROM MISTAKES: It is usually very hard to evaluate the positive and negative results and the real impact that ICTs have on human development.***

***4. LOCALIZE GLOBALIZED COMMUNICATION: ICTs and development projects must be firmly rooted in people's local reality, their organizations, their customs and their culture.***

***5. WORK WITH A GENDER PERSPECTIVE: Working with a gender perspective means taking account of the differences that exist in our society in the relationships between men and women***

***6. LET PEOPLE SPEAK WITH THEIR OWN VOICE: What is important is to learn to communicate the way people communicate.***

***7. GENERATE NEW KNOWLEDGE: ICTs can play an important role in human development, to the extent that they become tools for generating useful new knowledge and contributing to the transformation of our reality.***

Technology/Capacity/Application Matrix

53. The following matrix tool is offered as a subjective approach for quickly determining if the associated investment in institutional capacity for delivery of a desired IT service or tool is appropriate, as well as sustainable, in the context of certain specific decision-making applications. The methodology is borrowed from the qualitative evaluation matrix employed in the field of Environmental Impact Assessment and hinges on estimating the capacity 'impact', in terms of

[42][1] Ricardo Gómez is coordinator of the PAN Americas Program, International Development Research Centre, IDRC, Canada. www.idrc.ca/pan

[43][2] Benjamín Casadiago is Director of the Fundación Raíces Mágicas, Colombia. Mincho@soon.com

[44][3] Workshop for the Exchange of Experience on Social Appropriation of New Information and Communication Technologies for Development in Latin America and the Caribbean organized by ITDG (www.itdg.org.pe), Cajamarca, Peru, March 2002. Although many people participated in the discussions and commented early drafts of this document, the final responsibility for its content is with the authors. Available at www.idrc.ca/pan/ricardo/publications/ofelia.htm

human resources, infrastructure & finance, that a desired IT mechanism may cause. Some suggested uses for Caribbean Sustainable Development IT stakeholders are as follows:

1. Certain applications, such as information sharing and coordination, can be accomplished via email or a network or a portal. However, the capacity implications of choosing one over the other differ markedly.
2. Alternately, if one is desirous of a video-conferencing service, e-mail's institutional capacity requirements, though lower, simply won't enable you to deliver the 'goods'.
3. Another use of this exploratory technique would be to determine the associated Human Resource requirements of an expected decision-making application; for example, if you don't have trained staff who are capable of utilising and programming in SQL (structured query language), a 'high' human resource is required, then don't decide to get that fancy new database even if you can afford it. You would need to be aware of the linkage between operating and maintaining the database and your current or anticipated human resources.

***Matrix for the Qualitative Determination of Appropriate Institutional Capacity for Desired IT Service and Application***
***(* = Low; ** = Medium; *** = High)***

| ***SERVICE*** | ***INSTITUTIONAL CAPACITY NEEDED*** | | | ***APPLICATIONS*** |
|---|---|---|---|---|
| ***Functional Use of Technology*** | ***Human Resources*** | ***Infrastructure*** | ***Finance*** | ***SD Decision-Making Areas*** |
| **Email** | * | * | * | **Information sharing, Coordination** |
| **Website** | ** | * | * | **Information sharing, Public Awareness** |
| **Database** | *** | ** | ** | **SIDS-POA & MEAs Monitoring, Other Regional & Local Indicators; GIS; Training; R&D, Knowledge Management** |
| **Networking** | ** | *** | *** | **GIS, Training, R&D, Knowledge Management, Coordination** |
| **Portal** | ** | *** | *** | **Training, R&D, GIS, Knowledge Management** |
| **E-Learning** | *** | ** | ** | **Training, R&D, GIS** |
| **Video-conferencing** | ** | *** | *** | **Training, Information Management, Coordination** |
| **E-Commerce** | ** | *** | ** | **Training, Financing, Distribution** |

This matrix could also assist decision-makers and other stakeholders in assessing the implications of acquiring a particular technology to implement a Sustainable Development IT programme.

- *The Immediate Way Forward: A Proposed IDSD Project Action Strategy*

**Recommended IT Training Packages**

54. In order to promote the effective use of information technology tools and the efficient management of information technology in the Caribbean, two training packages are recommended based on the findings of section 3.2, research carried out during this consultancy and consultations with stakeholders as well as project participants. The first training package (see IT Training Package text box) is oriented towards promoting the effective use of IT tools and begins with basic computer literacy and goes up to technical mastery. The beginning course component of this package can be implemented immediately almost anywhere in the region. However, the second and third levels require certification exams and might have to be done virtually or in a country that has the facilities and/or certification programmes. The establishment of an IDSD portal with e-Learning capabilities could allow the Level 1 Computer Literacy course to be taught on-line. The active collaboration of UWI-DLIS should be sought along with UWI's

Distance Education Centre and territorial campuses to provide venues for any required classroom on-line interaction and follow-up.

## IT Operations Training Package

- **Level 1. Basic Computer Literacy for Administrative & Support Staff**

**Training in full functionality of combination software packages for proficiency in operating Word-Processing, Spreadsheet, Database & Presentation programmes.**

- **Level 2. Network/PC Literacy for Technical Operations & Maintenance Staff**

**Training for IT and MIS Technicians in networking hardware and software installation, operation & maintenance (A+ Certificate); and**

- **Level 3. Network Operator for IT Unit/Department Managers or Database Administrators**

**Training for Network Managers in: Networking (i-Net +, Network +, Security & Microsoft SQL. Minimum: i-Net+ Certificate; Recommended: Network+ & Linux+ Certificates. Advanced: Microsoft Certified Systems Engineer (MCSE)**

The second package is a smorgasbord of courses, some representing training needs identified earlier. They are suggested for the strengthening of regional management capacity to enable the efficient administration of databases, networks and the Internet. An E-Government course, perhaps in association with CARICAD's on-going programme, is suggested for government official at the highest level possible. Serious constraints posed by inadequate and insufficient human resources, particularly in the context of the negative impact of haemorrhaging organisation memory due to rapid staff turnover, one of the mission/survey findings, is the justification for a Knowledge Management course. Portals, and their related digital libraries, are recommended as the best tool for IDSD project information dissemination and a course in their development & management should be a priority. The National ICT Policy development course is also an urgent need in the region, and UN-ICT could be partnered with the project in providing a learning intervention for senior regional policy & decision-makers. In carrying out the Sustainable Development Indicators & Statistics for Decision-Making course, besides the UNSD, the project can investigate a partnership with the UN University' Institute of Advanced Studies that has a related project (www.ias.unu.edu/research/scitech.cfm), see Annex 23. The GIS course is recommended, due to the utility of this software and the regional demand for training in it, for regional agencies associated with Environmental Management; UWI's St. Augustine & Cave Hill campuses and the Institute for Marine Affairs in Trinidad have GIS training and management capabilities. Except for the WIFI course, the region has institutions that are capable of delivering all of these courses. They could be delivered in the form of short seminars and would require, in and some instances oversight or sponsorship by university-level instructors. An alternate method of delivery would be for the IDSD project to sponsor the formulation of these IT management training courses as e-Learning modules that could be accessed on the project's website via a proposed portal.

## IT Management Training Package

- **E-Government Principles & Practice**
- **Knowledge Management for Knowledge Societies**
- **Development of Portals & Digital Libraries**
- **National ICT Policy Development & Management**
- **Using Sustainable Development Indicators & Statistics for Decision-Making**
- **Geographic Information Systems (GIS) for Environmental Decision-Making**
- **Managing Local Area Networks-LANs & Wide Area Networks-WANs**
- **Managing Email, the Web & the Internet**
- **Open Source & Proprietary Software Management for Networking**
- **Security Management for IT Systems & Infrastructure**
- **Wireless Fidelity (WIFI) Networking Technology & Management**

**Short to Medium Term Action Strategy**

55. The table below and following discussion outlines the proposed Short, Medium & Long term elements of an IDSD Project strategy consistent with the findings of this consultancy.

***IDSD Project Action Strategy: Focusing on Key Regional IT Training & Capacity-Building Needs***

| *Timeframe* | *Project Activity* | *Key Regional Training Area* | *Key Regional Capacity-Building Area* |
|---|---|---|---|
| On-going since May 2003 | Website Focus | SIDS-POA Pilot Issues & Themes Education, Sustainable Development (SD) Education, Information Science & Technology Education | Information Dissemination & Public Awareness, Connectivity Advocacy, Civil Society/NGO Participation |
| Developed at May 2003 meeting | List-serv | Project Communication & Coordination | Project Partnerships, Information Sharing |
| Immediate, July-September 2003 | Establish Collaborative Partnerships | National Ministries of Education, Natural Resources & Environment, Information or IT and Planning/Development Cooperation; UWI-DLIS; Private Sector (National, Regional & Global); OAS Education Portal (www.educoas.org); UNESCO Communication & Information in the Knowledge Society Gateway (www.unesco.org/webworld); UNU IAS (www.ias.unu.edu); Commonwealth Network of Information Technology for Development (COMNET-IT) | Regional<br>CARICOM Secretariat, OECS Secretariat, CCA/CREP-REIN, CARINFO, CIVIC, UWI-DLIS, CARICAD<br>International<br>OAS/IACD, ITU-Caribbean, UNECLAC-POS, UNEP-CAR/RCU, UNDP SDNP & SIDSNet, UN-WSIS/ITU,<br>Private Sector<br>Caribbean Tourism Organisation<br>Caribbean Association of Industry & Commerce |
| Immediate July-September 2003 | Training Workshop Planning | E-Government Principles & Practice<br>Development of Portals & Digital Libraries<br>National ICT Policy Development & Management<br>Development and Management of Databases<br>Managing Local Area Networks-LANs & Wide Area Networks-WANs<br>Managing Email, the Web & the Internet<br>Geographic Information Systems (GIS) for Decision-Making<br>Open Source & Proprietary Software Management for Networking<br>Security Management for IT Systems | IT Research & Development<br>National Policies & Institutional Capacity Arrangements<br>Regional & Global Resources Coordination<br>Science & Technology Transfer<br>SD Statistics & Indicators |

| ***Timeframe*** | ***Project Activity*** | ***Key Regional Training Area*** | ***Key Regional Capacity-Building Area*** |
|---|---|---|---|
| | | **& Infrastructure<br>Using Sustainable Development Indicators & Statistics for Decision-Making<br>Wireless Fidelity (WIFI) Networking Technology & Management<br>Knowledge Management for Knowledge Societies** | |
| **Short to Medium term, 2003-2005** | **Caribbean IT Knowledge Portal** | **E-Literacy, E-Learning, E-Commerce, MEAs Monitoring (National, Regional & Global), Regional SD Digital Library, Caribbean IT Skills Virtual Registry & Exchange** | **Human Resources Development, Financing, Partnerships, SIDS-POA Collaboration, Caribbean SIDSNet Guidance & Oversight** |
| **Medium to Long term, 2004-2009** | **CARICOM/OAS/UNDESA/UN-ICT GEF Information for Sustainable Development project formulation, assessment & development** | **MEAs Monitoring (National, Regional & Global), Regional SD Digital Library, Caribbean IT Skills Virtual Registry & Exchange** | **National Policies & Institutional Capacity; Regional & Global Resources Coordination; Science & Technology Transfer<br>SD Statistics & Indicators** |

Collaborative Partnerships

IDSD is being executed by the OAS in conjunction with the UN Department of Economic & Social Affairs (UN-DESA), and the DDN-C is also a UN sponsored very 'smart' partnership that includes the UN-ICT. As the acknowledged UN-level agency responsible for administering many aspects of global information policy and facilitating the WSIS process, UN-ICT would be a good partner for planned IDSD project activities. All this is to say that IDSD could seek out work with the DDN-C, perhaps through DESA or UNSD, to support the project's work plan. In collaboration with CIVIC, CARINFO and the identified participants and stakeholders, IDSD could assist in joining this virtual and more external driven initiative with the established regional networks on the ground. It would enable a wide participation of stakeholders, agencies and individuals across the Caribbean and abroad to collaborate. The DDN-C process has endorsed a regional capacity-building process centred on the CARICOM Secretariat and CARICOM countries are direct beneficiaries of IDSD.

September 2003 Training Workshop

One way of implementing the project's training might be to use a creative partnership revolving around UWI's DLIS and the Belize Institute for Information Technology-BIIT, to provide a globally relevant but locally available on-line programme of IT courses. Beginning with the planned IDSD training workshop and proposed portal infrastructure, e-Learning modules could be developed over the short-term and, as much as current regional IT infrastructure permits, made available via the web, perhaps using the UWI Distance Education infrastructure available at campuses throughout the region. For Caribbean Sustainable Development Decision-Making stakeholders, including those identified during this consultancy, a special effort should be made to include well planned interventions from both the ITU's Caribbean representative on the WSIS preparatory process and a representative of the UN SIDSNet. This might offer a 'trigger' for deepening collaboration and focusing on the up-coming WSIS 2003 and SIDS 2004 meetings. UWI-DLIS, in particular, is well-placed to act as a link to WSIS related international initiatives. Specialty courses in GIS, Remote Sensing, Satellite technologies and Sustainable Development Indicators could be arranged with the input of available regional specialists from both academia and agencies such as UNEP-CAR/RCU's CEPNET. Acknowledging the IDSD Project's limited resources and time-frame, perhaps its website could evolve, over the medium term with smart partnerships, to become the host for a Caribbean 'IT Training Portal' or Gateway, on which more will be discussed shortly. CARINFO and the CARICOM Secretariat could be pressed into service to facilitate regional oversight and organise content, particularly in regards to SIDS-POA thematic areas. By linking with SIDSNet, through the planned Caribbean SIDSNet node at UWICED, the IDSD website/portal/gateway could become a digital meeting place for SIDS IT Training globally.

Caribbean IT Training Portal

Given that the OAS is the executing agency for the IDSD project, another smart partnership that should be pursued is collaboration with the IACD in carrying out the action strategy recommended, specifically the development of a Caribbean IT Training & Capacity-Building Portal. Portals, when compared to other Internet and web applications for the diffusion of information, may offer the best model for the proposed IDSD project's information dissemination objectives. Besides their accessibility over the Internet for data acquisition via 'digital library' technology, portals also can contain links to the IDSD list-serv as well as the other key regional SIDS-POA stakeholders in the public and private sectors. Further, the issue of networking can be resolved by the proper establishment and provisioning of the pilot local nodes; the MBRS REIS approach could be useful here. However, given the ability of the selected portal model to accommodate user passwords, the input and linkage for IDSD pilot country area activities could be accomplished as well. An outline of the longer-term possibilities of such a Caribbean IT Training & Capacity-Building Portal would emphasise three operational elements: Supply (providing easy access to all available programmes of participating stakeholders); Demand (linking, via secure networking, individual and institutional IT requirements as well as profile information); and Service (a digital library with an 'IT Exchange' facility and perhaps archiving capabilities for SIDS-POA & other MEAs' monitoring reports). The end result would be to establish a virtual Caribbean Sustainable Development Decision-Support information service for regional stakeholders at all levels. The e-Learning aspect of the proposed portal could be the most dynamic and offers some prospects of financial sustainability. Once again, UWI could oversee the provision and certification of the academic-related competencies such as those suggested by Narasimhan: *Communication, Quantitative & Qualitative Analysis and Organisational Functions*. Regional private sector IT institutes, such as BIIT, with their access to vendor certified international curricula could provide state-of-the-art technical training in Networking and Web Software; including the much touted open-source versions that are being employed increasing by regional agencies such as the MBRS in its Regional Environmental Information System.

Long-term GEF Project Proposal

With the development of a Caribbean ICT policy framework in process, the IDSD project could undertake to specifically support its advancement through training interventions. And, in the context of building regional environmental information management capacity, may wish to explore the sponsorship of a GEF project as a longer term partnership with the region.

UNESCO Digital Divide Strategy

The recently published UNESCO Digital Divide strategy (see text box) is presented to reflect the paradigm shift taking place at the global level that can assist our proposed IDSD Action Strategy. The UNESCO strategy, though aimed mainly at the Education Sector, encourages the 'democratisation' of IT broadly throughout society and supports E-Government as well as Science & Technology uses. This consultancy's findings demonstrate that UNESCO's call for Universal Computer Literacy and free Internet access for schools & public libraries resonates well in the Caribbean. Barbados' EduTech, Belize's SWAN and Jamaica's TechSchool initiatives reflect well the region's possibilities for 'leap-frogging' in this area. Further, the S&T thrust of the UNESCO strategy emphasises environmental management and accords well with the Sustainable Development directions of the proposed IDSD strategy. Finally, the Caribbean IT Training & Capacity-Building portal scheme supports UNESCO's call for distance education & life-long learning opportunities.

**UNESCO Digital Divide Strategy Text Box**

## UNESCO Four Point Strategy to Combat the Digital Divide

***POINT ONE-FIRST A SET OF COMMON PRINCIPLES FOR THE INFORMATION SOCIETY OF THE FUTURE MUST BE DEFINED. THESE, SAYS UNESCO, SHOULD INCLUDE:***

- **Freedom of expression and its corollary, freedom of the press.**
- **Free, compulsory and universal primary education.**
- **The recognition that education as well as cultural goods and services cannot be treated as mere commodities.**
  **The pre-eminence of public policy.**
- **The promotion of public domain information and public service broadcasting.**

***POINT TWO-SUPPORT FOR ACCESS BY THE GREATEST NUMBER TO THE LEARNING OPPORTUNITIES OFFERED BY NEW INFORMATION TECHNOLOGIES. THIS IMPLIES THAT:***

- **Computer literacy be recognized as a basic skill in educational systems and free access to the internet be provided in schools and public libraries.**
- **Full advantage be taken of distance education and the life-long learning opportunities offered by ICTs.**

***POINT THREE-IN ORDER TO STRENGTHEN CAPACITIES FOR SCIENTIFIC RESEARCH AND INFORMATION SHARING, UNESCO WISHES TO SEE INCREASED EXCHANGE AND COOPERATION AMONG SPECIALISTS AND INTEREST GROUPS WORKING IN THE FIELDS OF EDUCATION, SCIENCE, CULTURE AND COMMUNICATION. TO THIS END UNESCO:***

- **Encourages the use of new methods of content development and access to education and to scientific information, e.g. virtual universities, virtual laboratories, and research groups. Such methods can contribute to bridging the scientific divide, enabling researchers in developing countries to participate in research at the international level and to share its results.**
- **Promotes actions that focus on building linkages and synergies between science and local and indigenous knowledge, particularly in environmental management practices and in the transmission of local knowledge from one generation to the next.**

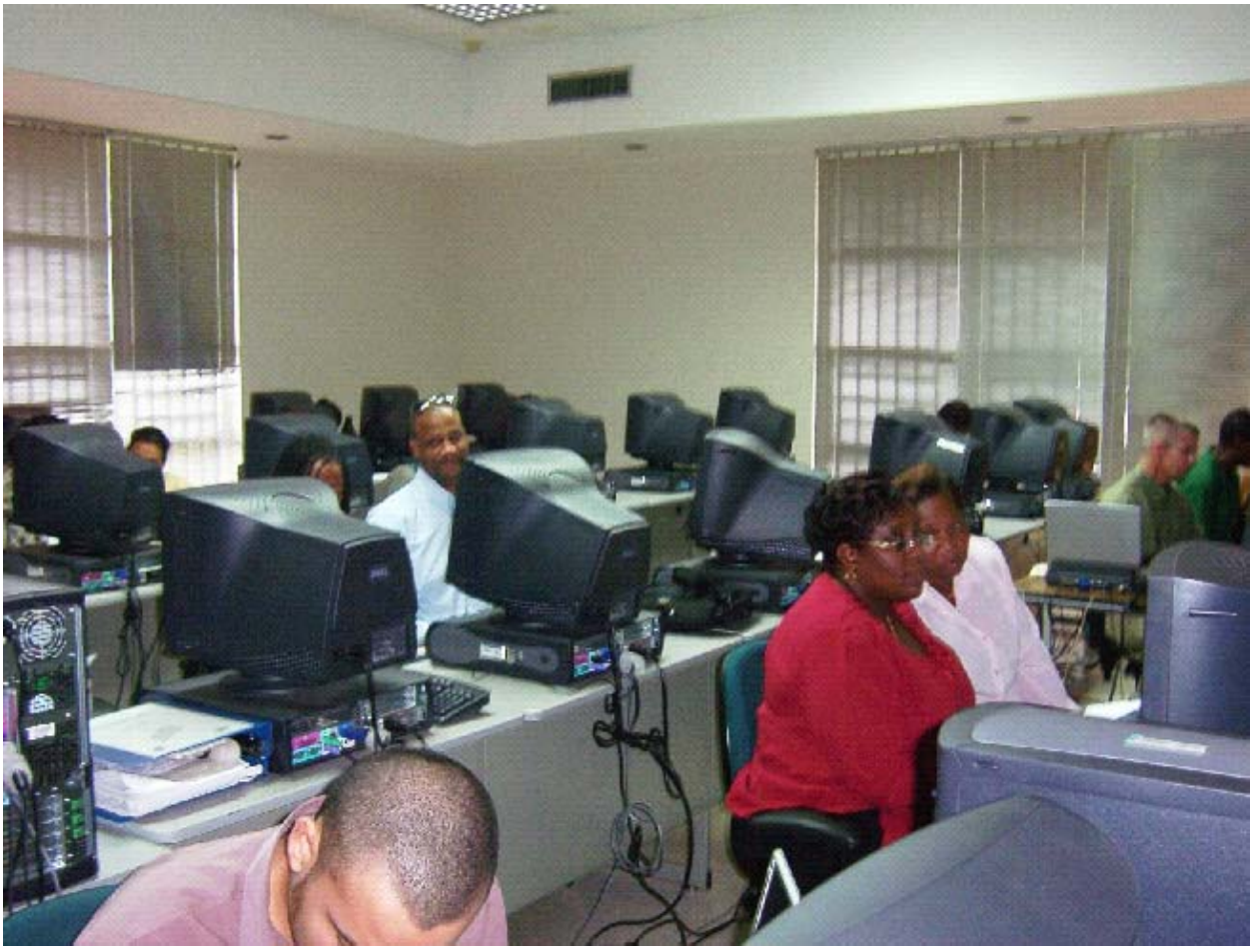
***POINT FOUR– UNESCO ENCOURAGES STATES TO USE ICTS TO PROMOTE GREATER PARTICIPATION BY CITIZENS IN DEMOCRATIC LIFE BY:***

- **Using the internet and other ICTs as tools for dialogue between citizens and the authorities.**
- **Integrating new and "traditional" technologies, including library services and community media; the production, adaptation, translation and sharing of local contents; and the setting up of pilot projects corresponding to different cultural contexts.**
- **Giving high priority to the needs of those disadvantaged and marginalized groups that are presently excluded so that information societies be open and inclusive.**
- **Improving access to the benefits of the information society for women and youth; and**
- **Extending material assistance to countries at present unable to offer access to ICTs to large numbers of their citizens.**

Source: UNESCO Director–General Koichïro Matsuura speech to UNESCO Members States on September 11, 2002 in Paris.

**Annex D**

# Training Workshop on Methodologies, Tools, and Best Practices for Managing Information for Decision-making on Sustainable Development in Caribbean SIDS



**Unit for Sustainable Development and Environment,**
**Organization of American States**
**&**
**Division for Sustainable Development,**
**United Nations Department of Economic and Social Affairs**

**October 27-31, 2003**
**ISER, University of the West Indies,Trinidad and Tobago**

## IDSD WORKSHOP ON METHODOLOGIES, TOOLS, AND BEST PRACTICES IN INFORMATION MANAGEMENT FOR SUSTAINABLE DEVELOPMENT IN CARIBBEAN SIDS

## INTRODUCTION

The utility and effectiveness of a decision is in direct proportion to the quality and availability of relevant information. Efficient information management greatly increases the probability of making timely, effective decisions. Furthermore, easy access to information on institutional procedures and frameworks increases the probability of being able to implement a decision once it has been taken.

One of the main objectives of the IDSD project was to train a cadre of resource persons in methodologies, techniques and tools related to general information management and as it related to four thematic areas of the project – Land use planning, Coastal Zone Management, Sustainable Tourism and Disaster Management/Climate Change. This capacity-building effort was based on a number of inputs, including the identification of priority issues and the identification of training needs, the identification of appropriate methodologies and tools, and the design of a training course to be implemented during the project.

The training course was performed during a workshop convened in Trinidad and Tobago in October 2003. Twenty-three participants from six countries – Barbados, Belize, Jamaica, St. Lucia, St. Kitts & Nevis, and Trinidad & Tobago – attended, amongst them representatives from national government; national and regional NGOs such as the Caribbean Network for Integrated Rural Development (CNIRD), the Caribbean Conservation Association (CCA) and the Belize Audubon Society; and specialized institutes such as the Caribbean Community Secretariat (CARICOM), the Caribbean Environmental Health Institute (CEHI), and the Organization of Eastern Caribbean States (OECS). Training was provided by representatives of Departments, Units or Centres from the three campuses of the University of the West Indies (UWI), as well as the University of Costa Rica. The development of the training materials was coordinated by the Caribbean Center for Administration for Administration and Development (CARICAD) – a regional agency. The Division for Sustainable Development of the UN Department of Economic and Social Affairs also participated as a trainer.

The training course addressed the three main pillars of sustainable development: economic, social, and environment, as well as the specific issues of development in the context of Small Island Developing States. Secondly, the training materials also covered the thematic areas of the project and provided specific training in those areas that related to tools, techniques, methodologies and approaches. Participants were introduced to basic concepts in information for economic, social, environment/natural resources and development, as well as to the basics in statistics and indicators for sustainable development, and were exposed to the applications of GIS in information management.

## PRESENTATION SUMMARIES

**Economic Issues in Decision-Making -** *by Sharon Hutchinson & Marlene Attzs, UWI Sustainable Economic Development Unit (UWI/SEDU)*

The presenters examined the meaning and importance of economic concepts such as growth and development. They emphasized that whereas growth is an economic measure of performance, it is only the means to achieving development as a measure of human well-being. Therefore, it is development that one wishes to measure. Examples of development measures cited include adequate educational levels, freedom of speech, proportion of population below the poverty line, income gap ratio, sense of security, freedom of worship, etc. These indicators are explained, along with other, composite, measures of development, including HDI (human development index), GDI (Gender Development Index) GEM (Gender Empowerment Index), and HPI (Human Poverty Index). HDI, for example, measures average achievement of a country in basic human capabilities, health, income distribution, and education. The construction of these indices is illustrated with the example of HPI, which combines measures of longevity, in terms of percent of people expected to die before age 40; knowledge, using the rate of illiteracy; and lack of a decent standard of living, a composite index in itself which includes percent of people with access to health service and safe water and percent of malnourished children less than 5 years old.

The meaning of sustainable development is described, under the UNCED definition, as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs, where protection of the environment is required to achieve the sustainability objectives. This introduces the need to incorporate social and environmental concerns into economic decision-making. The economic goal of sustainable development therefore becomes: "… to maximize the net welfare of economic activities while maintaining or increasing the stock of economic, ecological, and sociocultural assets over time…. and providing a safety net to meet basic needs…". . *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/01_SEDU%20%20Module%201%20for%20IDSD%20Oct%2013.ppt

**Information Management for Social Aspects of Sustainable Development –** *by Janice Cumberbatch, Sir Arthur Lewis Institute for Social and Economic Studies (SALISES)*

Ms. Cumberbatch started by reviewing the World Commission on Environment and Development's definition of sustainable development: *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* She then examined different social aspects of sustainable development, including social, cultural, political, and institutional sustainability. The presenter then discussed social vulnerability as a result of several characteristics that challenge the achievement of sustainable development, and enlists those characteristics that make Caribbean SIDS particularly vulnerable. After discussing whether or not the characteristic of being small determines vulnerability, she concludes that determinants of vulnerability are more prevalent and more pronounced in small states than larger states.

Ms. Cumberbatch defines social vulnerability as a "reflection of the degree to which societies or socio-economic groups of people are affected negatively by stresses and hazards, whether brought about by external forces or intrinsic factors, that negatively impact on the social cohesion of a country." The characteristics that make Caribbean SIDS particularly vulnerable to climate change (low-lying, heavily dependent on tourism, small) are enlisted. Three methods are used to translate vulnerability to climate change into numbers, converting it into an index: component standardization, mapping on a categorical scale, and the regression method. The author then discusses the state of development of three types of vulnerability indexes, from less developed to more: economic, environmental, and social. The drawbacks and benefits of using indexes are discussed, as are their desirable attributes. Finally, the challenges to the collection of social data to feed these indices are discussed, and two best practices methodologies are described -- socioeconomic monitoring guidelines for coastal managers in the Caribbean, and risk assessment through social impact assessments, which would contribute social data to the risk assessment process. Social impact assessments are defined as a method of projecting the social consequences of actions that alter the environment.. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/02_TRAINING%20MODULE.doc

**Decision-making on Integrated Coastal Zone Management** – *by Marcia Creary, University of the West Indies, Centre for Environment and Development (UWICED).*

Ms. Creary introduces integrated coastal zone management (ICZM) as a continuous, interactive, adaptive, participatory, consensus-building process comprised of a related set of tasks, all of which must be carried out to achieve a desired set of goals and objectives, however they are specified, but in this case related to the management of the coastal areas. After reviewing the importance of the coastal zone to the Caribbean island-nations due to their reliance on the natural resources and services that it offers, Ms. Creary describes the coastal zone ecosystems and their value, including mangroves, estuaries, beaches, coral reefs, and seagrass. She then reviews the major uses of coastal resources in the Caribbean: fisheries, tourism and recreation, urban development, shipping and transportation, industrial and manufacturing activities, and shoreline protection. Finally, she gives an overview of the particular coastal zone development challenges faced by the region, including marine pollution, waste disposal, degradation of coastal ecosystems, depletion of the fishing stock, hazards and disasters, and land-use conflicts.

In discussing ICZM as a cross-sectoral, inter-agency, and multidisciplinary approach to the many and varied issues affecting the biological and physical and social resource base within the wider coastal and oceanic environment, Ms. Creary introduces the considerations that have to made for its application, including several levels of integration: intergovernmental, intersectoral, spatial, multidisciplinary, and international. Information gathering tools are required to provide information that allows the understanding of the coast's physical, biological, chemical and geological processes; of the concept of coastal health; of ocean and coastal biodiversity; of the functions performed by coastal ecosystems; of climate variability and climate change; of the structure and dynamics of coastal settlements; and of coastal resources management. Coastal management strategies, including zonation, coastal area protection, permits, setback areas, and development rights are enlisted. Finally, the author reviews regional initiatives in place in Barbados, Jamaica, and Saint Lucia. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/03_Creary%20ICZM%20Module.doc

**Sustainable Development Statistics, Indicators, and Decision-Making –** *by Reena Shah, Division for Sustainable Development, United Nations Department of Economic and Social Affairs.*

Ms. Shah reviewed the uses and policy demand for statistics and indicators as key information tools for decision-making in sustainable development coming out of the United Nations Conference on Environment and Development (UNCED), the United Nations Commission for Sustainable Development (CSD), and World Summit on Sustainable Development (WSSD) meetings. She reviewed the purposes and criteria for the selection of indicators, including their role in defining objectives, assessing present and future direction with respect to goals and values, evaluating specific programs, demonstrating progress, measuring changes in a specific condition or situation over time, determining the impact of programs, and conveying messages.

Ms. Shah then focused on the CSD guidelines and methodologies for selection of indicators, discussing the framework and the methodology sheets applied to this purpose. Under this framework, a core set of 58 indicators with flexible adaptation at the national level has been adopted and classified under a system of themes and sub-themes, with methodology sheets developed for each indicator by a lead agency, and guidelines established for national implementation.

Ms. Shah identified several challenges in the use of sustainable development indicators, including a lack of data and development capacity, of international harmonization efforts, of further indicator development in "less advanced" substantive areas, and of training in integrated information management. The presenter then examined the UN Division for Sustainable Development's response to these challenges, in particular with regards to its work in Caribbean SIDS with regional and disaster reduction indicators. Finally, the presenter reviewed challenges particular to the development of environmental indicators in the region, including lack of coordination amongst agencies, indicator definition uncertainty, and lack of time series data. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/05_OAS_Workshop_21Oct2003.ppt

**CDERA and the Integrated Decision-Making Support System (IDSS)** – *by Donovan Gentles, CDERA*

Mr. Gentles briefly described the Caribbean Disaster Emergency Response Agency (CDERA)'s role as the regional agency in charge of disaster response and development of disaster response capabilities. In particular, he mentioned CDERA's role in managing the CDM (Caribbean Strategy on Comprehensive Disaster Management), constructed to integrate disaster response into the development plans of the region. The presenter described how CDERA's information policy led to the development of the Integrated Decision-Making Support System (IDSS), a management tool which incorporates geographic information systems (GIS), visualization, and analytical models, in order to respond to requirements for hazard analysis, risk and vulnerability assessments, mitigation and preparedness planning, and to provide education, training and exercise support. Mr. Gentles described IDSS as a concept yet to be materialized, rather than as a unified hardware or software tool already in place, conceived to enable access, integration, sharing, and dissemination of timely and relevant information and knowledge, and the creation of a common operating environment for improved planning, collaboration, decision-making and

execution. Mr. Gentles described the many political and technical challenges and constraints confronting the development of IDSS, but emphasized that the emergency management field is heading in this direction. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/06_IDSS%20Pre%20for%20IDSD%20in%20TT.ppt

**Climate Change and the Caribbean: the Case and the Responses** - *by Ian C King, Adapting to Climate Change in the Caribbean (ACCC) Project*

Mr. King gave an overview of the evidence supporting the occurrence of climate change, as well as the potential impacts of climate change to the Caribbean. Expected impacts from global warming in the Caribbean, including: saline intrusion into freshwater aquifers, and coastal flooding and erosion due to sea level rise; heat stress, coral bleaching, loss of biodiversity, and increased emergence of vector borne diseases due to increased temperatures; droughts or floods, and decreased fresh water availability due to changes in rainfall patterns; and direct damage of infrastructure and loss of lives due to increased intensity of storm activity. The resulting economic costs to the region estimated in terms of potential revenue loss from tourism and infrastructure damage to several economic sectors are estimated as ranging from 3.5% to 16% of the region's GDP (US $1.5 billion per year) in a low increase scenario to 2050, and from 24% to 103% of GDP (US $9 billion per year) in a high increase scenario.

Mr. King then gave an overview of the regional response to the threat posed by CC, in the form of adaptive strategies developed by the CPACC program. CPACC's overall objective was to support Caribbean countries in preparing to cope with the adverse effects of CC, particularly sea-level rise in coastal areas, through vulnerability assessment, adaptation planning, and related capacity building. Mr. King then reviewed the ACCC and MACC projects, implemented as follow-up efforts to CPACC, and which are currently ongoing. While ACCC has ensured the continuation of capacity building efforts initiated under CPACC, MACC's central objective is the integration of climate change policies and risks into sectoral planning. Both projects will be enhanced by the establishment of the Caribbean Community Climate Change Center (CCCCC), to function as an executing agency for future regional climate change projects and to serve as a coordinating center for all regional climate change-related activities. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/07_IDSD%20CC%20Adapt%20%20Activities.ppt

**Coastal Zone Management and Global Climate Change** – *by Ian C King, Adapting to Climate Change in the Caribbean (ACCC) Project*

Mr. King reviewed the economic and environmental importance of coastal zone areas to the Caribbean SIDS. The coastal zone has a high concentration of economic activity and infrastructure, with 40% of the population within 2km of coastline, and with tourism (based on coastal zone activities) representing 25-35% total Caribbean earnings. The coastal zone of the Caribbean is an area of extreme ecological importance as well, and includes several habitats relevant to biodiversity such as coral reefs, sea grass beds, mangrove swamps, and beaches. Mr. King then examined the factors that contribute to coastal vulnerability to climate change, including the presence of land-use and resource allocation conflicts, the degradation of coastal resources, the depletion of fish stocks, declining water standards from land based activities, and

the inherent vulnerability to natural hazards due to geographic considerations. These factors would compound expected impacts from climate change on the coastal zone, including submergence of low-lying wetland and dry land areas, erosion of soft shores by increasing offshore loss of sediment, increased salinity of estuaries and aquifers, rising coastal water tables, and more severe and frequent coastal flooding and storm damage.

Mr. King reviewed potential adaptive responses, including the use of regulations, land use planning, economic and market-based incentives, public awareness campaigns, and research and monitoring activities. Mr. King then described CPACC's coastal vulnerability and risk assessment component, implemented as three pilot studies in Barbados, Guyana, and Grenada. In each country, a screening assessment of the biophysical and socioeconomic impacts of sea level rise on coastlines was conducted by applying UNEP's methodology for vulnerability assessment, by using the Brunn rule to determine beach erosion, and by employing IPCC climate change scenarios for 2020, 2050, and 2100. In all cases, very significant impacts on Caribbean countries and coastal areas were expected, due to factors mentioned above, and country-specific adaptive measures and recommendations were enlisted. Recommendations were made for all three countries in addressing their impacts.

**The Coastal Resources Information System (CRIS): An Approach to the Development of a Decision Support System** – *By Ian King, Adapting to Climate Change in the Caribbean (ACCC) Project*

Mr. King explained the development of the CRIS as part of the objectives of Component 3 of the CPACC Project, which were to develop a facility to enable wide access to coastal spatial data and monitoring capacity for the purpose of decision making, to develop the capacity within local institutions to apply and adapt the facility to meet institutional and national needs, and to promote sustainable data management. CRIS was developed through a process which started by assessing the state of coastal data in the Caribbean countries, followed by the cataloging the same data, establishing a database, collection of data where incomplete, conversion of the data to be included in the database, implementation of the database, and finally establishment of a training program for its use.

The CRIS' structure includes a spatial database stored within a GIS, and an attribute database with non-spatial attribute data stored in a relational database. The implementation of CRIS required a capacity building process, which included identifying key agencies, training of key personnel, provision of support tools, and sponsoring and participation in conferences and courses. CRIS successes have included the establishment of a community of GIS practitioners, the development of national and regional capacity, and the development of metadata for the countries. There are still challenges surrounding long-standing institutional approaches to data collection and management that have not been completely overcome. In the future, CRIS could become web-enabled, providing access to a wider range of users, and also adapted to sector-specific approaches. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/08_IDSD%20CRIS%20Overview%20%20Way%20forward.ppt

***Managing Information for Decision-making in Land Use Planning – Overview of Concerns Relating to Sustainable Land Use Planning and Agriculture in SIDS*** – by Glynnis Ford, UN Food and Agriculture Organization

Ms. Ford reviewed the issues that need to be addressed to ensure sustainable land management in Caribbean SIDS. These include shortages of arable land, land degradation, loss of agricultural land to urbanization, water shortages, biophysical constraints, socio-economic constraints, and a changing political climate. The characteristics of the two agricultural systems present in SIDS, production and subsistence farming, were then discussed and compared in the context of sustainability. Sustainability concerns included declining yields, the influence of soil-borne and other diseases on production, declining soil fertility, pollution of ground water, and soil salinity.

Under this context, the informational issues and challenges to be overcome in different areas relating to sustainable land use were examined, including those pertaining to water, soil, climate, land cover and biodiversity, and land use, crop, and production systems. For example, in terms of climate databases, the challenges relate specifically to data incompleteness. Thus, while all countries have a network of meteorological stations to observe and document climate and weather conditions, in areas of difficult access these stations may be wide apart, and with a limited number of recording years resulting in time gaps; additionally, there is an incomplete range of attributes needed. In terms of land use and crop production systems, there are informational challenges of a more diverse nature. In this area, in addition to data incompleteness, there are data classification and data relevance issues: a lack of practical, simple and widely accepted method of describing land uses and production systems, and a need to classify land uses according to their inherent sustainability. In all areas, the presenter identified limitations in data availability and data quality at all scales, especially those that require substantial ground truthing, and a lack of metadata and protocols for data collection. The author concludes there is a need to identify a set of sustainable land use indicators and orient data collection in this sense. *This presentation can be found at:*
http://www.oas.org/usde/idsd/workshops/workshop10-27-31/09a_fao-oas%20present%201.ppt

***Automated Land Information System (ALES) -*** by Glynis Ford, UN Food and Agriculture Organization

Ms. Ford presented the ALES as a computer program that allows land evaluators to build expert systems to evaluate land for agricultural purposes, according to the guidelines presented in the FAO "Framework on Land Evaluation". ALES utilizes a two-stage land evaluation approach. The first stage is a physical land evaluation, conducted by matching soils, climate and land use with crop requirements. The second stage is a socio-economic evaluation, conducted to derive the suitability of the land unit for specific land utilization types (e.g rain-fed agriculture with low inputs or commercial agriculture with high inputs, etc.) ALES' components include: a framework for a knowledge base describing proposed land uses in both physical and economic terms; a framework for a database describing the land areas to be evaluated; an inference mechanism to relate these two, thereby computing the physical suitability of a set of map units for a set of proposed land uses; a report generator; and an import/export module that allows data to be exchanged within external databases, geographical information systems, and spreadsheets. ALES therefore constitutes a decision-support system for the allocation of land, by providing measurable indices for sustainable land management, a selection of agricultural land use

alternatives, and an identification of under-utilized land and crops suitable for these lands. *This presentation can be found at*: http://www.oas.org/usde/idsd/workshops/workshop10-27-31/09b_fao-oas%20present%202.ppt.

**Applying Geographical Information Systems to the Territorial Organization of Coastal Zones** – *By Eduardo Gutiérrez-Espleta, Development Observatory, University of Costa Rica*

Dr. Gutiérrez-Espleta explained that the concept of territorial organization, though not fully established yet as a differentiated practice from others such as urban studies, and economic and environmental planning, is gradually being oriented toward the definition and management of territorial models suitable to supra-local areas. Territorial structures and systems are identified through the use of models, lending internal cohesion to territorial organization and integrating it into larger spaces, and distinguishing areas or zones requiring differentiated treatment or regimes. To achieve this purpose, territorial organization makes use of prospective techniques that make use of reasonably scientific affirmations about problems and the options in the future. Among prospective techniques are those of simulation and the scenario method, used to simulate, stage by stage and in a plausible, coherent fashion, a succession of events leading a system toward a future situation, illustrated by a comprehensive image of the situation.

He then introduced the use of Geographic Information Systems (GIS) as technology applied to the solving of territorial problems. He explained a GIS is a computer program with specific capacities, whose subsystems or logical components may include data entry functions, information output/graphic and cartographic representation functions, spatial information management functions, and analytical functions. Structurally, a GIS is comprised of a data sphere, and a processing sphere. The advantages and disadvantages of the two GIS data representation models, raster based and vector based, were explained.

Finally, Dr Gutiérrez-Espleta described the current and future trends in GIS use, including its integration into traditional Database Management Systems (DBMS) now known as Spatial Database Management Systems (SDBMS), which will make it possible to extend the range of action and the importance of GIS in businesses and institutions. Likewise, a clear trend has also been observed toward an integration of GIS with web applications, allowing GIS to be used over the internet, and the application of GIS for specialized uses, integrating it with economic and ecological models.

**Elements for the development of environmental variables, indicators, and indices** – *Edgar Gutiérrez-Espleta, Development Observatory, University of Costa Rica*

Dr. Gutiérrez-Espleta introduces the use of indicators and indices serving as “mediators” between science, politics, and public opinion, by synthesizing and quantifying relationships and complex processes. He describes the concept of the information pyramid, where the more aggregated the information is, the more useful it is for higher levels in the decision making process; indicators and indices are at the top of the pyramid. The development of useful environmental indicators and indices requires not only an understanding of concepts and definitions, but also a thorough knowledge of policy needs.

Dr. Gutiérrez-Espleta explained that different approaches could be taken to develop environmental indicators under the sustainable development paradigm. They must be able, however, to fulfill the challenge of fully integrating the social, economic, environmental, and institutional aspects of sustainable development. The national decision-making process requires indicators responsive to change, supported by reliable, readily available data, relevant to the issue, and understood and accepted by intended users. Depending on the number of environmental/societal characteristics selected for use in an indicator, it can be classified as a first (one environmental), second (more than one environmental), third (one environmental, one societal), fourth (more than one environmental, one societal) or fifth generation (more than one environmental, more than one societal) indicator.

Dr. Gutiérrez-Espleta emphasized that, for the construction of indices, it is necessary to use a conceptual framework that defines precisely the terms that will be used and that establishes the theoretical dimensions of the concept to ensure it is well understood. The elaboration of the conceptual framework includes two stages: 1) the exhaustive revision of the literature and 2) the adoption of a model. In order to give a concept an operational definition, a set of variables that could be included in the indicator has to be chosen. This selection is based on the degree to which the variables seem to be valid indicators of the dimension or sub-dimension under study, and would consider aspects of need, cost, quality, public interest, and political relevance. Once the index is constructed, it is necessary to validate it either through correlating it with the variables that were used to construct it, or through the use of external criteria that measure the same or something similar to what one is trying to measure with the indicator or index. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/04a_Elements%20for%20dev%20of%20enviro%20vars,%20etc.doc

**Sustainable Tourism -** *by Sharon Hutchinson & Marlene Attzs, UWI Sustainable Economic Development Unit (UWI/SEDU)*

The presenters gave an overview of sustainable tourism, its definition, and goals. They applied an operational definition of sustainable tourism in SIDS as tourism that is sensitive to the ecological fragility of small island states but which provides significant and sustained economic growth via employment and income, and that simultaneously maintains or enhances the social fabric of the community in which such tourism development occurs. They contrasted traditional tourism characteristics with those of sustainable tourism, where traditional tourism tends to be high-density, with a coastal concentration, on a large scale, and where the ownership of hotels and tourism facilities tends to be foreign and multinational, while sustainable tourism, on the other hand, tends to be geographically dispersed and low-density, of a smaller scale, and of the locally-owned, small-business variety.

They highlighted the concept of carrying capacity as key to measuring the fulfilment of sustainable tourism goals, and reviewed several indicators of carrying capacity that have been applied to this end; these included general indicators (use intensity, degradation) and SIDS-specific indicators (currency leakage, percent local ownership of businesses). The rationale behind the use of each of these indicators was then explained. Traditional economic concepts such as production choice, willingness to pay, contingent valuation, travel cost, and cost-benefit

analysis are reviewed as they apply to the valuation of environmental goods, and the protection of environmental areas potentially impacted by tourism.

**From Measurement to Management: Indicators of Sustainable Tourism Development in the Caribbean and the CTO Management Information System for Tourism (MIST)** – *by Gail Clarke, CTO*

Ms. Clarke explained that the primary source of tourist information used in the analysis of tourism data for Caribbean destinations is the entry/departure (E/D) card, which ideally contains information on the number of visitors to a destination, the main country or countries of origin of these visitors, the main purpose of visit and place of stay, the age, sex, and income demographics of the traveler, and some indication of first time versus multiple visits to the destination. Other sources of information are visitor surveys, surveys of tourism product suppliers, statistical and other publications from destinations, the WTO, source markets reports, travel and other publications, journal interviews and industry surveys, and the internet.

Ms. Clarke then described the development of the MIST, conceived to improve the ability of the Caribbean destinations to manage and develop a sustainable tourism industry, enhance their ability to respond to the changing market environment in which they operate, and to enhance their management capability through strengthening the information infrastructure. The MIST is a nationally and regionally integrated Management Information System, comprising three main components: 1) a performance component, containing a database of arrival/departure statistics, annual economic indicators, etc.; 2) a product inventory component, containing a database of tourism facilities (accommodation, cruise, carriers, attractions, etc., and destination information); and 3) a marketing database of source market information and marketing intelligence. *This presentation can be found at:* http://www.oas.org/usde/idsd/workshops/workshop10-27-31/11_summary%20of%20OAS%20Presents.doc

## DISCUSSION

The discussions during the training sessions and between sessions were fruitful and meaningful. There was significant discussion on the issues of Coastal Zone Management, Sustainable Tourism and Climate Change.

Specifically:

- Discussion re changes in the thinking on what can be termed "economic development" and whether a change had taken place at the fundamental level of policy and decision-making;
- Whether sustainable development was realistically achievable given the challenges and other incipient concerns with economic and social development issues;
- some participants expressed skepticism about climate change, its potential and if it was already occurring. Mr King responded by ably identifying signs and research positing that significant fluctuations were occurring which could suggest that a change could be imminent;
- participants expressed an interest in the social aspects of sustainable development issues and how these could be appropriately reflected in planning, thinking and decision-making;

- there was a debate regarding the true nature of sustainable tourism and "green tourism", "sustainable tourism" versus "eco-tourism". There was some concern that some "so-called green" tourism activities should not be so termed and that in fact critical interventions and decisions were lacking in truly making tourism activities more sustainable. A number of examples were cited from the region and from Trinidad and Tobago where in community-led and driven processes were reaping long-term environmental, social and economic benefits.
- Participants expressed concern about the lack of significant hands-on training and the possibility of working directly with some of the software packages identified.
- The issue of sustainability at its most critical – in terms of it very feasibility and whether it was compatible with economic drivers was also discussed at some length by participants. Also included in the discussion were the types of tools that could feasibly support this process.
- There was significant interest in the GEO-SIEAN software and on the tools presented by Jose Gerhartz and Edgar Gutierrez-Espleta. Participants requested that the packages be made available to them and were assured that the material would be available via the web.
- Participants identified a need for more regional examples of the implementation or use of the methodologies, tools and approaches identified.
- There was discussion regarding the status of the IDSS and the nest steps in its operation. Equally, participants queried how soon it would be active or the role it could play as part of an early-warning and response system. They also wondered how many countries were involved at this stage and the potential for further involvement.
- The need for more work on the socio-economic monitoring and information was identified. Participants noted that this aspect was still lacking in some respects.
- Participants expressed satisfaction with the practical exercises and made suggestions and recommendations for inclusion in the SocMon tool particularly as it related to "use of resources: in terms of coastal zone management".

**Next Steps and Way Forward**

This section of the programme involved a brief overview by the Project Manager, Ms. Leisa Perch, regarding where the workshop stood within the framework of the project and what the foreseeable next steps were. At this point, Ms. Perch also indicated that there were evaluation forms, which sought the honest reflections of the participants including recommendations for improvement and most particularly for next steps.

Ms. Perch noted that the workshop was seen as a key fundamental activity in the project both in terms of providing additional material and training but also in seeking to further identify the critical areas where interventions are needed. She noted that the workshop provided an opportunity for the material to be tested and to evaluate what was positive and negative about the present structure and also areas that could be improved – which would facilitate their further finalization. Even though some of the material was basic, given that the material would be on the web and available for use and download, she noted that given its access by the public it must start off from a basic level, given that the target audience would in fact include students, academia, and inexperienced technical personnel as well as more experienced professionals. For

those more experienced, it could serve as a refresher course or as part of a continuous training programme.

Following the workshop, the following steps were identified:

- uploading the materials on the web;
- distributing a revised CD to participants;
- the identification and procurement of equipment with an emphasis on software; and
- the identification and provision of short courses at the national level to coincide with the installation of equipment.

Country representatives were asked to discuss amongst themselves and to identify in a very preliminary way where they felt technological support through hardware and software could facilitate their present and future efforts in information for decision-making. Though countries could not speak specifically due to the lack of notice, some did identify areas for support. Specifically, Jamaica identified GIS and land use planning as a key area and Barbados identified equipment such as computers and ARCPAD that would support the Ministry of Environment and the overall Ministry approach to Environmental Information and Indicators.

It was noted by the IDSD project Manager that the intention was to support training at the national level to complement the installation of new equipment and that she would follow-up with each country Focal Point on this issue.

A representative from St. Kitts and Nevis raised a question regarding their role in the project. The project manager noted that St. Kitts and Nevis had been included because of a specific request by FAO to provide them with some exposure to ALES. The project could continue to facilitate access to methodologies and tools but additional support was limited to the four participating countries.

**Closing**

After the discussion on Next Steps, the IDSD Project Manager thanked the participants and the trainers for the exciting discussions and deliberations. She noted the excellent efforts of the trainers to provide materials that were relevant and easy to absorb and the identification of tools and methodologies that could assist countries. She thanked the participants for their patience regarding delays and coordination challenges and hoped that they had found the material useful and the workshop informative. She noted the participation of the three campuses of the University of the West Indies in this program and also the contribution from the University of Costa Rica. The IDSD Project Manager also extended appreciation to ISER for the loan of their training room and to SEDU for the excellent supportive role they played in addressing difficulties that arose during the workshop e.g. coordination and logistics.

Trainees also extended their thanks and appreciation to the trainers, citing the course elements, which they had found most relevant and interesting. One trainee on behalf of the workshop also thanked the IDSD project Manager for the coordination of the workshop and the course.

The workshop concluded at this point.

**Summary of Comments on the Workshop**

1. *Overall evaluation of the workshop:* Overall, the comments indicate a general satisfaction with the value of the workshop, with clear majority giving it a rating of 3 out of 4. Although some comments indicated that parts of the material were familiar to them, most comments reflect knowledge gained in some, if not all, of the subjects touched upon by the workshop. There was a general consensus that the workshop increased the level of awareness on the issues and techniques related to information management in sustainable development, and would help the participants to make more informed decisions related to planning and/or in deciding which kind of computer software and programs would be of interest to their organizations. The establishment of a network of information management personnel was mentioned as a major contribution of the workshop. Everybody stated a belief that the materials coming out of the workshop would be used as a reference. There was a generally good impression on the instructors' knowledge and ability to convey the subject material.

2. *Favorite topics:* Technical topics seemed to be of major interest, with decision-support systems, GIS, and the development of indicators more frequently mentioned as subjects of interest. However, exposure to theoretical issues on sustainable development, climate change, and land use planning seemed to be appreciated as well in some cases if not all. Several comments expressed a desire to delve deeper into integrated development planning issues/techniques.

3. *Main criticisms:* The main criticisms were directed towards what was perceived as an excessive emphasis on/time allotted to the theoretical aspects of the workshop vs. the practical hands-on training modules. Another common criticism, related to the previous one, was that the daily schedule was too long and therefore the last sessions on each day suffered from lack of attention from the participants due to tiredness/information overload. The impression on the quality of workshop materials varied somewhat and from the comments, it seems that whenever there was a criticism in this regard it related to the issue of the length and perceived repetition of some subject material by various presenters.

4. *Other comments:* A majority of the comments expressed a desire for follow-up workshops of a more hands-on nature that developed specific subjects and/or techniques further. Thus, separate specialized workshops on GIS, development of indicators, decision-support systems, and information management under each of the four general thematic areas was suggested. There was also mention of the need to use regional case studies to better illustrate the practical application of the techniques, and to relate it to local needs/experiences.

## LIST OF WORKSHOP PARTICIPANTS

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| Mr. | Earl | Bailey | Jamaica Institute of Planners | University of Technology, 237 Old Hope Road, Kingston 6, Jamaica | 876-927-1680 | | earlplanner@hotmail.com |
| Ms. | Natalie | Boodram | CEHI | P.O. Box 1111, The Morne, Castries, St. Lucia | 758-452-2501 | 758-453-2721 | cehi@candw.lc; natalieboodram@hotmail.com |
| Ms. | Debra | Branker | Barbados National Trust | Wildey House, St. Michael, Barbados | (246) 426-2421 | (246) 429-9055 | wings2runfree@hotmail.com, natrust@sunbeach.net |
| Ms. | Malikah | Cardona | MNREI, Physical Planning Section | Market Square,Belmopan, Belize | 501 8222226, 8222711 | 501 8221526 | lincenbze@btl.net, peachmc@hotmail.com |
| Mr. | Bryan | Farrell | Department of Environment | Ministry of Health & Environment, Pelican Mall, Basseterre, St. Kitts | 869 465 4970 | 869 466 3915 | rasbenjie@hotmail.com |
| Mr. | Glenn | Goddard | Environmental Management Authority | 8 Elizabeth Street St. Clair Port-of-Spain | (868) 628 80 42 | (868) 628 91 22 | ggoddard@ema.co.tt |

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| Mr. | Ron | Goodridge | Coastal Zone Management Unit | Bay Street, Bridgetown, St. Michael, BARBADOS | 246-228-5950 | 246-228-5956 | coastal_planner@coastal.gov.bb |
| Ms. | Karen | Hackshaw | Caribbean Conservation Association | Bush Hill, The Garrison, St. Michael, Barbados | 246-426-5373 | 246-429-8483 | reic@ccanet.net |
| Mr. | Kirk | Haughton | National Environment & Planning Agency | 1 Lina Close, Portmore, Jamaica | 876-906-2730 | | khaughton@nepa.gov.jm |
| Mr. | Daune | Heholt | Ministry of Physical Development Environment and Housing | Min. Physical Development Env and Housing, PO Box 709, Conway, Castries, Saint Lucia | 758-468-4438 | 758-452-2506, 758-451-6958 | dheholt@planning.gov.lc, dcp@planning.gov.lc |
| Mr. | Gene | Knight | Department of Agriculture | P.O. Box 39, La Guerite, Basseterre, St. Kitts | (869) 465-2335 | (869) 465-2928 | doastk@caribsurf.com |
| Mr. | Michael | Link | Belize Audubon Society | 12 Fort Street, PO Box 1001, Belize City, Belize | 501-223-5004/4987/4988 | 501-223-4985 | research@bas.bz, datamanager@bas.bz |
| Ms. | Dulcie | Linton | Center for Marine Sciences | University of the West Indies, Mona, Kingston 7, Jamaica | 876-927-1609, 876-977-0262 | 876-977-1033 | dmlinton@uwimona.edu.jm, dulcie.linton@uwimona.edu.jm |

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| Ms. | Jeanne Majella | Louis | National Statistics Department | 50 Chrekei Bldg., Micoud St, Castries, St. Lucia | 1 758 4523716/1 758 4524410 | 1 758 4518254 | majellalouis@hotmail.com, statsdept@candw.lc |
| Mr. | Anthony | McKenzie | National Environment & Planning Agency | 10 Caledonia Ave., Kingston 10, Jamaica | 876-754-7550 | 876-754-7592 | amckenzie@nepa.gov.jm |
| Mr. | Anthony | Mills | Caribbean Regional Fisheries Mechanism | P.O.Box 642, Princess Margaret Dr., Belize City, Belize | 501-223-4443 | 501-223-4446 | mills@caricom-fisheries.com |
| Mr. | Raymond | Mossiah | Belize Tourism Board | Level 2, Central Bank Building, Gabourel Lane, P.O. Box 325, Belize City, Belize | 501-223-1910/1913 | 501-223-1943 | raymond@travelbelize.org |
| Ms. | Tracey | Oliveira | Ministry of Public Utilities and the Environment | Sacred Heart Building, 16 – 18 Sackville Street, Port-of-Spain, Trinidad W.I. | (868) 624-6024 | (868) 625 - 7003 | environment@tstt.net.tt; tracey_oliveira@hotmail.com |
| Ms. | Indira | Persaud | CARICOM Secretariat | Eddy Grant Building, High Street, Georgetown, Guyana | (592) 226 9280-9, (592) 225 2961-5, (592) 225 8850-1 | (592) 226 6091, (592) 225 7341 | stats2@caricom.org |
| Ms. | Martina | Regis | Ministry of Physical Development Environment and Housing | PO Box 709, Conway, Castries, Saint | 758-468-4463 | 758-452-2506, 758-451-6958 | mkregis@planning.gov.lc |

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| | | | | Lucia | | | |
| | | | | | | | |
| Mr. | Travis | Sinckler | Ministry of Housing, Lands and the Environment | Environmental Special Projects Unit, #1 Sturges, St. Thomas, BARBADOS | 246-438-7761 | 246-438-7767 | espu@caribsurf.com, mbouh8@yahoo.com |
| Ms. | Zakiya | Uzoma-Wadada | CNIRD | | 868-662-6473 | 868-645-5936 | cnird@carib-link.net; zwadada@hotmail.com |
| Ms. | Naula | Williams | Organisation of Eastern Caribbean States (OECS) | Morne Fortune, P.O. Box 179, Castries, St.Lucia | (758) 453 1920, (758) 452 2537 ext.8136 | (758)453 1628 | nwilliams@oecs.org; naulawilliams@hotmail.com |
| **TRAINERS** | | | | | | | |
| Ms. | Marlene | Attzs | SEDU/UWI | Department of Economics Development Unit St. Augustine Trinidad & Tobago | 868 662 9461 | 868 662 6555 | mattzs@hotmail.com |
| Ms. | Gail | Clarke | Caribbean Tourism Organisation | One Financial Place, Collymore Rock, St. Michael, | 246-427-5242 | 246-429-3065 | gclarke@caribtourism.com |

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| | | | | Barbados | | | |
| Ms. | Marcia | Creary | UWICED | UWI, Mona<br>Kingston 7<br>JAMAICA | (876) 927-1609 | (876) 977-1033 | mcreary@uwimona.edu.jm |
| Ms. | Janice | Cumberbatch | SALISES | 14 Ocean City<br>St. Philip<br>Barbados | (246) 416-4887 | (246) 416-4887 | jancum@caribsurf.com |
| Ms. | Glynis | Ford | FAO/Ministry of Agriculture | 14 LIGNUM WAY,<br>BARBICAN TERRACE,<br>Jamaica | 1-876-977-0849 | | gford@cwjamaica.com |
| Mr. | Donovan | Gentles | CDERA | Bldg 1, Manor Lodge, Lodge Hill, St. Michael,<br>Barbados | (246) 425 0386 | (246) 425 8854 | dg@cdera.org |
| Mr. | Jose | Gerhartz | UWICED | 3 Gibraltar Camp Road<br>University of the West Indies<br>Mona,<br>Kingston 7<br>Jamaica | (876) 977-1659 /5413/5545/1660-9 (Ext. 2363) | (876) 977-1658 | jgmuro@uwimona.edu.jm; pepegerhartz@yahoo.com |
| Mr. | Edgar | Gutierrez-Espleta | Costa Rica Development Observatory, University of Costa Rica | Universidad de Costa Rica<br>San José<br>2060<br>Costa Rica | (506) 207-4878 /9 | (506) 283-7563 | egutierr@cariari.ucr.ac.cr |

| Title | First Name | Last Name | Organization | Address | Phone | Fax | Email |
|---|---|---|---|---|---|---|---|
| Ms. | Sharon | Hutchinson | SEDU/UWI | UWI - St. Augustine, Trinidad | (868) 645-3233 /662/2002 Ext. 2444 | | shutchinson@fans.uwi.tt |
| Mr. | Ian | King | CARICOM/ACCC RPIU | Lazaretto Complex,Black Rock,St. Michael, BARBADOS | (246) 417-4579/80 | (246) 417-0461 | kingcpacc@sunbeach.net |
| Ms. | Reena | Shah | UN Department of Economic and Social Affairs | DC2-2262, 2 UN Plaza, New York, NY, 10017, USA | 1-212-963-4586 | 1-212-963-1267 | shahr@un.org |
| **OTHER PARTICIPANTS** | | | | | | | |
| Ms. | Leisa | Perch | Organization of American States | 1889 F St NW, #622-A, Washington, DC, 20006 | 202-458-3228 | 202-458-3560 | lperch@oas.org |
| Ms. | Angela | Skeete | CARICAD | Weymouth Corporate Centre, Roebuck Street, Barbados | 246-427-8535 | 246-436-1709 | askeete@caricad.net |

**Annex E1**

# Report on the Training Workshop on Information to Support Decision Making for Sustainable Development - Disasters and Climate Change Belmopan, Belize, February 2004

**Ian C King**
**GIST (Barbados) Inc.**

## Introduction

The Belize workshop on Information to Support Decision Making for Sustainable Development – Disasters and Climate Change was a one-day training activity following a larger regional initiative held in October 2003. Specifically, UNDESA and the OAS implemented a regional project titled "Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Islands Developing States (SIDS)" also referred to as the IDSD project with four pilot countries. An element of that project involved convening a regional workshop to address regional capacity building in information for sustainable development with a number of key areas comprising, landuse planning; sustainable tourism; coastal zone management and disaster management and climate change. Following my presentation of the training module on disaster management and climate change at the regional workshop, I was requested by the OAS to repeat this activity in Belize to coincide with another mission I was conducting to that country.

This activity was undertaken on Friday 6th February at the Belmopan Convention Hotel.

## Agenda

The agenda of the workshop is appended to the report.

## Participants

The training activity was primarily attended by Belizean public servants from a wide cross section of institutions. A full participants list is appended to this report.

## Workshop Objectives and Structure

The objectives of the workshop were stated as follows:

- Present a decision-making framework in the context of disaster management and climate change adaptation
- Highlight the challenges to decision making on disaster management and adapting to climate change.

- Identify and define tools for effective decision making on disaster management and adapting to climate change.
- Highlight international, regional and local approaches to disaster management and responses to climate change

The workshop was based on the training module delivered at the IDSD Regional Workshop held in Trinidad in October 2003. The training manual that was produced "Methodologies, Tools and Best Practices for Managing Information for Decision-making on Sustainable Development in Caribbean SIDS - Disaster Management and Adaptation to Climate Change Module " was the main document utilized and was provided to each of the participants at the start of the activity. The structure of the workshop was as follows:

- Decision making and challenges in Disaster Management and Adapting to Climate Change
- Disaster Management and Adapting to Climate Change initiatives
- Tools
- Examples
- Exercises

In addition to powerpoint presentations, some group exercises were also scheduled to facilitate a brief hands-on to some of the tools and concepts presented.

**Review of the Workshop**

Generally the workshop appeared to be well received and generated some interesting discussion. Participation remained almost constant up to the end of the activity. Furthermore, Dr. Ulric Trotz, Project Manager of the MACC initiative and Dr. Kenrick Leslie, Interim Director of the Climate Change Centre were present for some of the meeting and utilized the opportunity, particularly in the case of Dr. Trotz, of sharing their own perceptions and visions in the areas addressed.

One of the areas that generated most discussion and indeed some difference of opinion was the concept of managing uncertainty in decision-making. Some felt that policy makers as an example, desired unambiguous signals or recommendations and did not see how expressing concepts of uncertainty was beneficial or realistic. This was countered with the point that all decisions have some degree of uncertainty, even if this is not explicitly stated. Examples of hurricane warnings were offered in this regard. This was important as GCC especially but also disaster management does contain a great deal of uncertainty and the issue to be considered is the risk exposure that is acceptable.

It was also noted that greater utilization of cost benefit analysis is and will be critical to comprehensive disaster management and adapting to climate change.

**Appreciation**

Much appreciation must go to the Ministry of Natural Resources and Ms. Sharon Lindo particularly for organizing the workshop and taking care of the logistics.

**Decision making and its Challenges in Disaster Management and Adaptation to Climate Change**
Belmopan Convention Hotel
February 6, 2004

| | |
|---|---|
| 8.30 am | Registration |
| 9.00 am | Welcome – Mrs. Pat Mendoza, CEO, Ministry of Natural Resources |
| 9.05am | Introduction of participants |
| 9.10 am | Overview of the IDSD project – its aims and objectives |
| 9.15am | Overview of the workshop |
| 920am | Decision making and its challenges in disaster management and adapting to climate change |
| 9.50 am | Decision making exercise |
| 10.15 am | BREAK |
| 10.30 am | Disaster management and adapting to climate change responses |
| 11.30 am | Tools to address disaster management and adaptation to climate change |
| 12.00 noon | EIA and Risk Management Exercises |
| 12.30 pm | LUNCH |
| 1.30 pm | Way forward and examples of applications<br>CPACC CRIS; EPA SDMIS; BVI GIS |
| 3.00 pm | Discussion and wrap-up |

3.15 pm Closing

**Decision-making and its Challenges in Disaster Management and Adaptation to Climate Change**
Belmopan Convention Hotel
February 6, 2004

| Name | Organization | Telephone | Fax | Email |
|---|---|---|---|---|
| Dareece Chuc | Programme for Belize | 227-5616 | 227-5635 | pfbel@btl.net |
| Ann Gordon | National MET Office | 225-2011 | | anngordon@hotmail.com |
| Rafael Lima | Central Statistics Office | 822-2207 | 822-3206 | csogob@btl.net |
| Carlos Montero | Min/National Developemnt | 822-2526 | 822-3673 | econdev@btl.net; camontero@belizemail.net |
| George Hanson | National Emergency Management Secr. | 822-2054/0995 | | nemo@btl.net |
| Jose Chacon | Min/Human Development | 822-2684 | 822-3175 | mhd@btl.net |
| Garson Ramnarace | Min/Works | 822-2139/36 | 822-3282 | mow@btl.net |
| Ian Gillett | Coastal Zone Mgmt. Authority and Inst. | 223-0719 | | czmbze@btl.net |
| Stewart Cruz | Coastal Zone Mgmt. Authority and Inst. | 223-0719 | | czmbze@btl.net |
| P.Noreen Fariweather | Land Information Centre – MNREI | 822-2249 | 822-2333 | lincenbze@btl.net |
| Malikah Cardona | Lands and Survey Dept. – MNREI | 822-2226 | 822-1526 | peachmc@hotmail.com |
| B.Tillett-Abdul Hadi | Lands and Survey Dept. | 822-2226 | 822-1526 | babsyhadi@hotmail.com |
| Craig Moore | Geology and Petroleum | 822-2651 | 822-3338 | geology_petroleumbz@yahoo.com |
| Michael Link | Belize Audubon Society | 223-5004 | 223-4987 | datamanager@bas.bz |
| Neville Trotz | MACC Project Office | | | trotzcpacc@sunbeach.net |
| Amir Constanza | Min/Human Development | 822-2161 | | aconstanza@uwimona@edu.bz |
| Godswell Flores | Min of Health | 822-2325/63 | 822-2942 | godswellflores@hotmail.com |
| Francis Crawford | IT - Min/Natural Resources | 822-2249 | 822-2333 | admin@mnrei.gov.bz |
| Raymond James Mossiah | Belize Tourist Board | 223-1910 | 223-1943 | raymond@travelbelize.org |
| Ivis Chan | Forest Department | 822-1524 | 822-1523 | bioprojpsc@hotmail.com |
| Ian King | ACCC/CARICOM PIU | 246-429-6064 | | kingcpacc@sunbeach.net |

**Annex E2**

# *Saint Lucia Training Report: Demonstration Exercise for GEO-SIEAN*

On February 24, 2004, a demonstration exercise was held at the Conference Room of the O.E.C.S' Environment and Sustainable Development Unit. The exercise was funded by the United Nations DESA and Organisation of American States (OAS) through the Ministry of Physical Development, under the regional project "Information for Decision-Making for Sustainable Development of Small Island Developing States."

This demonstration exercise was the result of a culmination of two major workshops held with Caribbean SIDS to determine their specific and general needs for managing the multiplicity of concerns for information for sustainable development and integrating the social, environmental and economic aspects for decision-making. St. Lucia expressed its requirement of an efficient and easily accessible software package which would assist the island's information users to use, manage, store and analyze data and information to develop indicators and to guide decision-making.

Thus, the major aim of the demonstration was to determine the relevance and feasibility of the GEO-SIEAN software package- developed by the University of Costa Rica- to manage data from across different sectors and which would aid users in building a baseline for our development of Indicators for sustainable development under the current Integrated Planning for Sustainable Development process.

Brief opening remarks were delivered by Mr. Alphonsus Antoine of the OAS, St. Lucia office who welcomed participants and urged them to assess software carefully both for their local/sector needs and national needs.

The demonstration exercise was attended by twelve participants who represented a number of Agencies, covering the major pillars of sustainable development (economic, environmental, social, spatial). A list of the participants is included in Annex 1 of this report.

Dr. Freddy Abarca represented the Development Observatory of Costa Rica conducted the demonstration exercise of the GEO-SIEAN. He began with a presentation on the objectives and a summary of the software package. A few slides of his presentation are carried in Annex 2 of this report.

A brief to the software package was used to guide participants through the demonstration exercise. The guide has also been included in Annex 3 of this report.

The demonstration exercise considered the following:

- Overview and summary of the GEO software
- What it can do for users/participants?
- How various agencies across the different sectors can use this data to make long term decisions in their various sectors
- Storing data in database
- Compatibility and flexibility of software to other programs such as Access, Excel, etc
- Using graphics, reports as outputs in the program
- What led to the development of the software?
- Multiple input points of raw data into the program, data entry and their protocols
- Using Baseline information
- System requirements
- Adding new data sets
- Inputting data from multiple sources eg environment, economic, social data
- Possibility of geo-referencing

**Discussions, Recommendations and Way Forward**

During the discussions which followed, the participants noted and recommended the following:

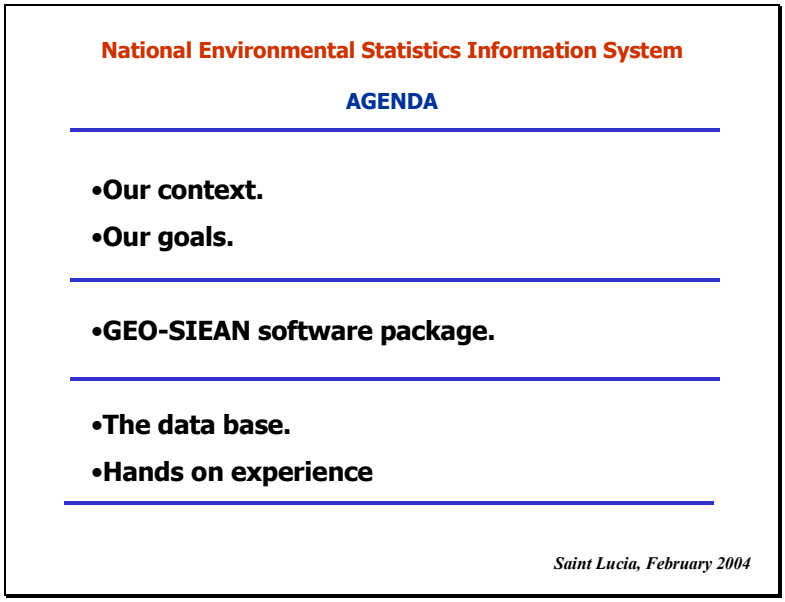
- Need for a database or integrated information system which should be part of the overall Integrated Development Planning process
- A prerequisite is the upgrading of the current system of information storage, sharing from hard copy to software
- The database should be used for integrating needs across different sectors, as is done by GEO-SIEAN
- Advantage of GEO-SIEAN: The package presented is an openly available software which has great potential because of its simplicity in use, and attractiveness to various users
- Work should begin immediately on baseline study of data and information currently available. Should look at rationalizing the needs of different data users eg the Statistics department, agencies' needs and reconciling various needs to identify collaborative best practices;
- The participants of the workshop to consider being a part of a Working Group/Information point person/liaison officer for the development of the process of the baseline study for the integrated management system
- Some Agencies have already developed or are in the process of developing databases and the process should determine ways for inclusion of information and data that are available, as is the case with the Forestry Department;

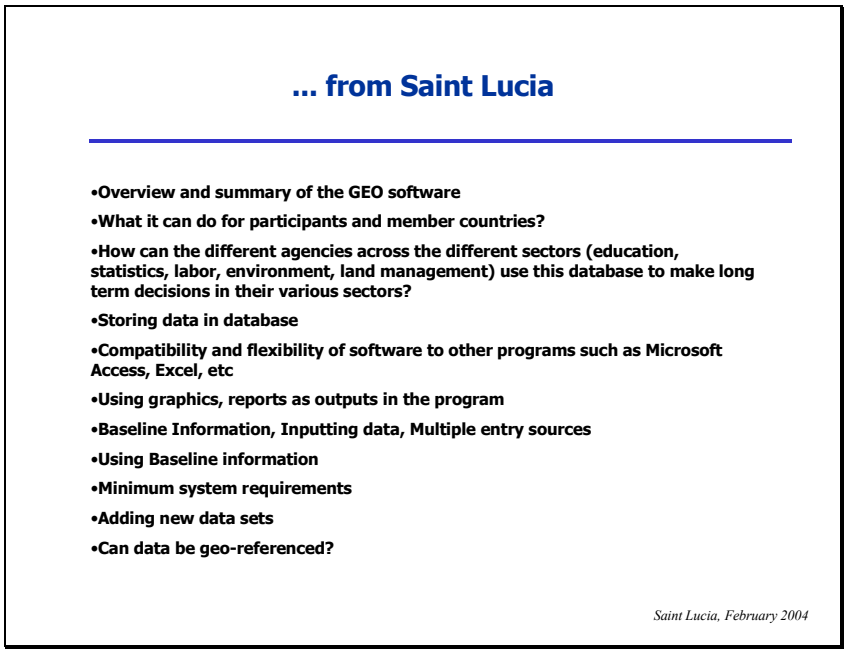
- Need for a GIS and graphics-related aspect to be an integral part of the software, to allow for dynamicism, with the ability to simultaneously access and process both map and attribute data.
- A Needs assessment was identified as an important step in this process: looking at an understanding of the particular users of the information, their demands of the system, and an evaluation of the educational and training needs.

**Appendix 1**

| **NAME** | AGENCY/DEPARTEMNT | **EMAIL ADDRESS** |
|---|---|---|
| | | |
| Cornelius Isaac | Forestry Department | Corneliusi@hotmail.com |
| Lucius mc Donald | Ministry of Agriculture | mcdonaldl@candw.lc |
| Naula Williams | OECS Secretariat | nwilliams@oecs.org |
| Jacinta Francis | Ministry of Tourism | aurejfrancis@hotmail.com |
| Chauncey Raggie | Ministry of Finance | chraggie@gosl.gov.lc |
| Sherma Laurence | Statistics Department | Sherma_l@hotmail.com |
| Majella Louis | Statistics Department | majellalouis@hotmail.com |
| Dayna La Force | Statistics | Caplina40@hotmail.com |
| Olympia Joseph | Statistics | pearpet@hotmail.com |
| David Alphonse | Physical Planning | dalphonse@planning.gov.lc |
| Celsus Baptiste | Surveys Section | |
| Martina Regis | Sustainable Development & Environment Section | mkregis@planning.gov.lc |

Annex 2: Excerpt of the Presentation by Dr. Abarca



## Our context (1-3)

- There is the 11th Decision of the XIV Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean.
- There is a software application which the OdD has been developing.
- Latin American and The Caribbean countries are the focus of this effort.
- By now, there are over 200 variables related to environmental statistics and indicators.
- There is a variable classification (a taxonomy) to display data.

*Saint Lucia, February 2004*

## Our context (2-3)

- There should be a data base server with, at least, two data base engines: an international and a national one.
- As a result, there must be a national effort looking for a "national data base"...
- ... and there should be computer instruments capable of building both platforms.

*Saint Lucia, February 2004*

**Annex E3**

# National Training Workshop on Information Management Methodologies, Tools and Best Practices

- Kingston Jamaica -
- Thursday February 4, 2004 -

Venue: UWICED, 3 Gibraltar Camp Way, UWI Mona Campus, Kingston 7

## Agenda

| | |
|---|---|
| 8:15-8:30 | Registration & distribution of workshop materials |
| 8:30-8:45 | Kick- off: introducing people and defining expectations |
| 8:45-9:35 | Introduction to information concepts: data, information and geographic information |
| 9:35-9:40 | Break |
| 9:40-10:30 | Introduction to information system concepts: From databases to information systems |
| 10:30-10:45 | Coffee break |
| 10:45:11:35 | Introduction to remote sensing concepts |
| 11:35-11:40 | Break |
| 11:40-12:40 | Exercise Remote Sensing |
| 12:40-13:55 | Lunch |
| 13:55-14:00 | Energizer Session |
| 14:00-14:50 | Introduction to GIS concepts |
| 14:50-15:00 | Break |
| 15:00-16:30 | Exercise GIS |
| 16:30-17:00 | Discussion on experiences and ways forward |
| 17:00-17:15 | Wrap-Up: Assessment of the seminar and recommendations |

**Annex F**

# Evaluation of the "Information for Decision-making on Sustainable Development (IDSD) Project"

## Report

## by


## Carol James
## Independent Development Facilitator


## Consultant for the
## Unit for Sustainable Development and Environment
## Organization of American States

## 20 February 2004

*Background to the Project*

One of the key aspects for achieving sustainable development is open access to reliable and accurate data and information. Small Island Developing States (SIDS) have long expressed a concern regarding the lack of readily available data and information on the environment, the human impact on the environment and the challenge this poses for charting pathways to sustainable development. There have been many efforts to address this challenge including the United Nations Commission on Sustainable Development (UN CSD) Indicators programme, the recent United Nation Statistics Division (UNSD) project on *"Strengthening Capacity in the Compilation and Dissemination of Statistics and Indicators for Conference Follow-up in the Caribbean region,"* and inputs from the United Nations Environment Programme (UNEP) in the field of environmental information management. It was evident that countries in the Caribbean still required support for creating mechanisms for the sustainable management of sustainable development information and defining ways to harness this information for decision-making purposes.

The General Secretariat of the Organization of American States (GS/OAS) signed a Memorandum of Understanding with the United Nations Department of Economic and Social Affairs (UNDESA) to act as the Field Managing Institution for a project implemented in the Caribbean entitled **" Capacity-Building in Creating Information Management Systems to Improve Decision-making for Sustainable Development for Small Island Developing States (SIDS)"** hereafter referred to as Information for Decision-making for Sustainable Development (IDSD).

The project aimed to: (i) identify and assess regional and country needs in information management systems for sustainable development; (ii) develop core curriculum and materials for regional training of trainers; and (iii) create a regional electronic site for accessing information on information management systems and techniques. The project was executed from November 2002 – December 2003 with an evaluation conducted in January/February 2004, and final completion in February 2004.

It was envisaged that the following outputs will have been achieved:

- A pilot network of national, regional and possibly local institutions involved in information management in the Caribbean region;
- Resource persons trained as trainers within the region to support national and regional training of information managers;
- Training materials on information management systems for training of trainers accessible through SIDSNET connected to regional networks and UN-system sites;
- A forum of exchange for experiences among regional and national information systems' managers; and
- Final report on implementation including an assessment and evaluation of the projects.

The project was expected to build upon work carried out by the UNSD in collaboration with the Caribbean Community (CARICOM) Secretariat and CARICOM Member States on *"Strengthening Capacity in the Compilation and Dissemination of Statistics and Indicators for Conference Follow-up in the Caribbean region"* and UNEP's work in the field of environmental information management.

*Terms of Reference of the Assignment*

## I. Objective

Too often, projects or activities are not reviewed to assess the degree to which the project met desired outputs. The evaluation proposed is to be undertaken once all major activities have been initiated and/or completed, to conduct an independent assessment to "ascertain the project's success in meeting its goals and objectives and to attempt to evaluate any level of impact of the project on the beneficiaries, particularly in terms of capacity building".

The consultant will carry out an evaluation of the IDSD project activities and their impacts vis-à-vis the projected outputs as outlined in the Project Briefing Note. The evaluation will also facilitate the finalization of other project outputs and furnish recommendations for further activities in this area. The results will serve to guide the finalization of the training materials for placement on the website.

The output will inform the final report of the project, which will be prepared for submission upon completion of all project activities in February 2004.

## II. Consultant's Responsibilities:

(i) The development of a brief methodology for undertaking the assignment;

(ii) The assessment of IDSD project implementation, specifically the impact of project activities from the perspective of the IDSD participating countries and other participants in project activities through:

- (a) a summary review of project implementation vis-à-vis the stated outputs;
- (b) an in-depth study in two countries – Barbados and St. Lucia, which represent the range of existing capacity amongst the IDSD participating countries with regard to managing information for decision-making on sustainable development. This would allow the review to cover the range of needs and capacities that would not only serve the present group of countries but also the entire region. Selected respondents should represent a cross-section of government, NGO and agencies;
- (c) more general interviews with participants from Jamaica and Belize in terms of their existing capacities and concerns and the identification of further areas where intervention and support would be needed. Selected respondents should represent a cross-section of government, NGO and agencies;
- (d) review of the evaluations by participants of the October 2003 IDSD Training Workshop which took place in Trinidad and Tobago;
- (e) a review of the IDSD website and an assessment of its capacity as a portal for methodologies and tools on information management for sustainable development.

(iii). The preparation of an evaluation report summarizing the findings on the issues highlighted in (ii) which would include recommendations for follow-up activities in this area including areas, which will require more work and investment for sustainable capacity-building. The revision and finalization of the evaluation report should be based on comments received from the IDSD Project Manager and UNDESA.

## III. Outputs

The draft and final reports associated with this assignment should be presented in electronic format in Word 2000 or higher with one (1) hard copy.

The outputs for this assignment are anticipated by:

(i) Draft report by January 16th, 2004; and (ii) the final report by January 31st, 2004[45].

The report should consist of:

1. an introduction to the assignment,
2. an outline of the methodology utilized,
3. findings of the interviews and contact with respondents,
4. identification of both successes and constraints,
5. lessons learnt, and
6. recommendations for the way forward on this issue generally.

## IV. Coordination and reporting.

[45] These dates have been subsequently changed in communications with the OAS to initiation of the process on 21 January 2004 instead of late Dec 2003 or early Jan 2004.

The consultant will carry out her activities under the supervision of the Field Manager for the IDSD Project.

*A. Introduction and Context of the Assignment*

The Consultant was requested to undertake a desk study for a duration of eight days using electronic means to conduct

> [46] "a brief evaluation of the project in terms of activities and outputs. Specifically, the evaluation will seek to "ascertain the project's success in meeting its goals and objectives and attempt to evaluate any level of impact of the project on the beneficiaries, particularly in terms of capacity-building".
>
> Given the limited available time towards project completion and noting that we are still working on providing equipment and additional training to you, we propose to carry out an in-depth study in only two countries. Based on the assessment at the start of the project and where countries were and are, in terms of their capacity to absorb IDSD - we have chosen Barbados and St. Lucia. We feel that in this way, we could cover the range of needs and capacities that would not only serve the present group of countries but also the entire region. Further, the consultant would conduct a more general review with the Focal Points from Jamaica and Belize in terms of their existing capacities and concerns and the identification of further areas where intervention and support would be needed.
>
> We are seeking your cooperation with the evaluation, and in making recommendations for areas of improvement, gaps and constraints and recommendations from *(sic)* the Way Forward. Particularly, we would wish you to provide input on how the IDSD website could best serve your needs and what material you would wish to see made available. We would welcome your suggestions on other persons with whom the consultant could discuss this issue."

The limited time frame available [47] underscored the fact that *traditional modes of project evaluation* could not have been utilized, to assess effectively, a project of the nature and scope of the IDSD project in four pilot Caribbean countries. Even with the expected approach that a more in-depth evaluation of two of the four participating countries, and a more general review of the other two countries would be conducted, an underlying assumption was made that attainment of the highest levels of reliability would have been constrained without field evaluations, to ground-truth activities in selected national and regional institutions. This report thus represents the best level of assessment possible, within a limited timeframe, using only virtual means of evaluation.

Despite this constraint and key challenge, the consultant's approach was expected to be highly beneficial through the utilization of a mix of assessment tools which were intended to provide valuable snapshots of the views and impressions of beneficiaries on the impacts and effectiveness of project deliverables. Where possible the consultant focused on identifying, assessing and utilizing in-built project monitoring, feedback and evaluation mechanisms to ascertain impacts during and following the project implementation process.

*B. Methodology*

The consultant spent the initial period of the evaluation process obtaining and reviewing project documentation, principally from the project website www.oas.org/usde/idsd/. This was the only source of project information available to the consultant as no national or institutional visits were included as part of the assessment process.

[46] Excerpts from an e-mail message to focal points by IDSD Project Manager dated 16 December 2003
[47] 8 person days from 21 January 2004 spread over a period of one month to final reporting on 20 Feb 2004

Internet searches of websites of participating countries and institutions, highlighted throughout the report, were also conducted to determine incorporation of IDSD documentation, references, activities or linkages to the IDSD website.

The project website was also evaluated specifically within the context of the following criteria;

- ✓ Content: scope/coverage, relevance and linkages
- ✓ Content management
- ✓ User-friendliness
- ✓ Built-in user feedback monitoring mechanisms
- ✓ Responsiveness to user enquiries

with a view to assessing its capacity as a portal for methodologies and tools on information management for sustainable development.

Based upon documentation reviewed, and on the assessment of the website, question sets were designed and developed for use in electronic questionnaires conducted via e-mail and in telephone surveys with selected participants, under the following headings;

1. Overall Project Objectives
2. Overall Project Activities
3. Facilitation of information management for effective national decision-making
4. Facilitation of reporting obligations to Multilateral Environmental Agreements (MEAs) and Donor Organizations
5. Assessment of Project Implementation Methodology (PIM)

As far as possible, the mix of questions was designed to ascertain levels of performance, effectiveness and impact of the project; relating inputs to outputs; outputs to use; and relating use to outcomes.

Some questions were designed deliberately to ascertain the respondents' knowledge of specific names of persons or institutions, in order to keep in focus the need for highlighting the fact that the traditional "people net" is an essential part of driving the sharing and decision-making processes envisaged under this project. A key methodological assumption which underscored this approach was that,

> *the most efficient and effective technological tools and operational systems can be limited if they are not facilitated by well oiled "people networks" and the commitment of institutional leaders with a vision that improved information management must become central to driving the process of effective decision making .*

During the preliminary *telephone scoping process* to ascertain levels of involvement and participation, it was realized that, apart from resource persons used in project delivery, only *project focal points* and a limited number of *operational collaborators*, were aware of the project's existence, and thus the evaluation process would have to be limited to this group of individuals. It is therefore stressed here that use of the questionnaire was not intended as a poll, but merely to focus the attention of this selected group of respondents, on specific areas of the project implementation process, objectivities activities, outcomes and impacts. Thus, the cohort is a small one supplemented by telephone interviews with project participants which ranged from 45-75 minutes[48] per country (Annex 1).

Results of the questionnaires and telephone surveys were assessed and evaluated for formulation into findings, identification of successes and constraints, lessons learnt and recommendations on the way forward.

[48] This is in addition to telephone duration times spent on initial scoping and repeated contacts with respondents.

*C. Findings*

# 1. EVALUATION PROCESS

## *1.1. Initial contact and scoping exercise*

The process of making contact with appropriate personnel proved to be a constraining factor with varying degrees of difficulty being experienced across the four countries evaluated. Numerous telephone messages left for the attention of focal points were either unanswered or were not forwarded to the intended recipients. Non-responses to all e-mail messages were also routine in all four countries. In two cases (Barbados and Jamaica) it was discovered that operational e-mail addresses differed from those supplied by the IDSD Project Manager in the 16 December 2003 e-mail communication to country focal points[49].

In all countries, especially Belize, responses to repeated telephone messages were unsatisfactory[50]. Once direct contact was made by telephone with focal points, all except St Lucia were enthusiastic and promised early responses. In the case of St Lucia, concern was expressed about the difficult nature of the questionnaire, an experience not expressed by any other respondent. Unfamiliarity with the IDSD website was the reason cited by the St. Lucian focal point, however, the post questionnaire telephone interview was highly productive.

## *1.2. Participants in the Evaluation Process*

It was agreed that since knowledge of the IDSD project was non-existent outside of those who participated in the project, that evaluation using questionnaires and direct telephone interviews would be limited to this group. Thus, questionnaires were sent to focal points, who were requested to engage other national collaborators in the process of responding to the questions posed. Expectations for the return of questionnaires within ten days, was somewhat ambitious and most were received 10-12 days after the initial deadline for submission[51](see Annex 1). In all cases, focal points took the lead in responding and included the views of other institutional collaborators some of whom had limited exposure to various aspects of the project and its implementation processes. 4 completed responses from country focal points were received representing inputs from 15 persons. Telephone interviews and contacts were conducted with 6 persons for a total on-phone duration of 5 hours 25 minutes (see Annex 1).

# 2. EVALUATION OF IDSD PROJECT OBJECTIVES AND ACTIVITIES

## *2.1 Overall Project Objectives*

In general, from analysis of questionnaire responses, summarized in Annex 1, three of the four participating countries felt that the project met most of the objectives established at the outset of the implementation process. In one country which consistently gave low scores for most of the questions, it was apparent that a clear understanding of what specific outcomes were to be related directly to the project, was not established at the outset. *Difficulty in separating the baseline of existing country activities from what the project was*

[49] However, no *bouncing back* of e-mail messages was experienced except for the case of Barbados when only two formal of the four e-mail messages sent (31st January and 06 Feb 2004) were returned with the following error messages '*User mailbox exceeds allowed size: technical@meenr.gov.bb'*

[50] Blame is not being apportioned here but mention is made as others might be stimulated to consider delays in the process an interesting side study, from an information management perspective. Indeed, dates and times of contacts and names of recipients of messages were recorded after the third week of trying to fast track the rate of responses, to be pursued as a separate evaluation exercise within this broader evaluation study, in order to provide valuable insights into public sector constraints and related responses to initiatives which are not central to day to day institutional operations. This was not pursued due to time limitations, but remains an interesting idea for further study.

[51] The initial 8 person-day time line for this evaluation more than doubled due to time delays, with the final receipt of information coming within 20 hours of reporting deadlines for the interim draft. Lessons from this process can benefit future initiatives of this nature in which public sector constraints op cit, need to be factored into evaluation timelines.

*intended to accomplish, may have accounted for this outcome*. Thus, during the telephone interview process, frequent remarks that the country already undertook various initiatives and that the project made no difference in some areas, were irrelevant since values added above this baseline were the focus areas of the evaluation. This experience was dissimilar to that of the other three countries which were clearer about the distinction between pre-existing conditions and those that the project were expected to address.

Notwithstanding these differences, in the consultant's experience, it is not always easy for participants to distinguish clearly between initiatives that already exist in countries and the 'topping-up' or 'value-added' received from projects such as the IDSD project. Nevertheless, the structure of the evaluation process by way of examination of publicly available country information using the internet, responses to a series of cross-linked question-sets based upon project specific activities, administered using a detailed questionnaire and the use of exhaustive free-ranging interviews, enabled the consultant to separate baseline activities and to ascertain the project value-added.

### *2.1.1 Training*

Outputs related to training received high ratings and all countries responded positively when asked about their awareness of the identity of information managers trained under the project. Satisfactory ratings were also given about the enhanced capacity of managers to act as trainers nationally and regionally and about the adequacy of training materials on Information Management Systems (IMS) available on the IDSD website. Some concern was expressed that accessing IMS training materials was moderately difficulty and it is recommended that efforts to be made in any next phase of support on IDSD must address this issue.

Moderate satisfaction was expressed about the level of training and tools received, but most respondents were reasonably satisfied with all of the technological upgrades made available for information management in these countries.

### *2.1.2. Electronic networking*

Linkages to regional electronic networks although adequate for most countries could benefit from the development of a database to enable access to resource links using *key words* (for issues and for geographical parameters). Similar concerns were expressed about limitations in the linkages to UN system sites by at least one country, Jamaica, which made recommendations for inclusion of key sites (Annex1).

The consultant found no evidence on the development of a forum for exchanges of experiences between regional and national IMS managers other than through e-mail communications, despite the positive response of Barbados that one exists and is being utilized moderately. Time did not permit the consultant to engage in further contact with this country, or to pursue the discrepancy in a response by St. Lucia, which although initially expressing no knowledge of the existence of a forum, noted in response to a subsequent question that the forum was being used mainly by government agencies. It is recommended that further examination of this discrepancy in information be pursued as some informal mechanism might exist which can be beneficial to a wider regional grouping. Several references were made by Barbados to the E-Group managed by the Caribbean Conservation Association (CCA), but this was not viewed as a substitute for the forum envisaged under the project.

### *2.1.3. Active sourcing of information by decision-makers*

Increased accessing of information by decision-makers has been reported although the level of feedback on the value of the information provided and ease of access for decision-making purposes, appear somewhat limited. When asked differently (Question 2s) this opinion was confirmed since levels of comfort were low with respect to the adequacy of monitoring and feed-back mechanisms for assessing levels of use of data and processed information by institutional managers and national decision-makers.

# 3. OVERALL PROJECT ACTIVITIES

## *3.1. Needs Identification for IMS*

Countries reported that a reasonable rate of advancement was made towards identifying national and regional needs for information management systems for sustainable development. The appropriateness of core curricula for training of trainers in the development of IMS at both national and regional levels, the adequacy, effectiveness and user friendliness of training materials, all received positive responses from three countries. Despite making such strides, it was felt that provision of these inputs to training, did not result in increased developments in IMS nationally and regionally. However it is still a relatively short timeframe since project implementation and processes for public sector planning and budgeting for capital developments are somewhat lengthy in most countries.

Only one country, Jamaica, had read the draft Final Report on Implementation and had found it to be accurate, useful and adequate. In the opinion of only two countries, Barbados and Jamaica, moderate improvements had been made in information sharing and exchanges between national and regional institutions. The IDSD website was not regarded as meeting national needs in one country, Belize, but was considered to be of adequate value in Barbados and of moderate value in both St Lucia and Jamaica.

## *3.2. Facilitation of information management for effective national decision-making*

Barbados, Jamaica and Belize expressed strong satisfaction with the enhanced capacity for handling and managing data and Barbados and Jamaica were also extremely positive about improvements in capacities for transforming data and information to forms that were suitable for decision-making. These countries were also very satisfied with the improved levels of involvement of civil society institutions; NGOs, CBOs, SIGs in the processes of information management for decision-making while St. Lucia was very dissatisfied with the lack of involvement of its non-governmental sector in this process.

## *3.3. Data management systems*

High levels of satisfaction were expressed by Barbados, St. Lucia and Jamaica for the level of facilitation the project provided for the creation of mechanisms for long-term management of sustainable development and environmental information. Barbados was very satisfied with the training received, and access to available tools and methodologies provided for the creation of integrated data management systems, while Jamaica and Belize were also reasonably positive about these outputs of the project. Additionally, all countries except Belize were very positive about benefits received for defining ways of harnessing sustainable development and environmental information for decision-making purposes.

Only St Lucia had been unfamiliar with the recommendations of the Training Needs Report and as such did not share the positive views expressed by the other three pilot countries that their governments should give the highest priority towards investing resources to address training needs identified therein. Indeed, Jamaica and Barbados both expressed the view that such investment will lead to transformation of current modes of decision-making in their countries.

## *3.4. Assessment of the IDSD Website*

### *3.4.1. Content: scope/coverage, relevance and linkages*

Barbados and Jamaica were both highly satisfied with the levels of access to new information from sources relevant to areas of work promoted under the project and also valued highly the availability of all of the outputs of the IDSD project which are housed on the site, in particular, *Presentations from the Resource Persons Meeting; the Report on Information Needs; the Report on Pilot networks; the Report on the Training Workshop; Databases; Institutions;*

*Methodologies; Themes; the Project Background and Related project Activities.* Despite this level of satisfaction, Jamaica also expressed the view that more country specific content will further enhance the effectiveness of this site and recommended inclusion of information to deepen and enrich the site (Annex 1).

#### *3.4.2. Content management*

Mixed reactions were received with respect to questions about the regularity of updating site content as both Belize and Jamaica were concerned about the infrequency of updates while Barbados and St Lucia were satisfied. The currency of information was generally considered to be sufficiently up to date for the purposes of providing information to decision-makers by all except St Lucia.

#### *3.4.3. User satisfaction*

Very high levels of user satisfaction were reported. Levels of comfort by users, ease of downloading PDF files and accessing other sites via links, all received very high ratings. St Lucia reported being plagued by error messages and was extremely dissatisfied with the level of user feedback and monitoring mechanisms built into the site, experiences not shared by the other pilot countries. A need for an improved human interface on the site was inherent in some of the indirectly expressed responses to the questionnaire, for example, responses/ non-responses to Questions 3.1.3f-h (Annex 1). It is recommended that online resources such as chat rooms and polling could enhance the effectiveness of the IDSD website, as collaborators would not have to use other offsite resources to communicate directly when necessary.

#### *3.4.4. Effectiveness as a portal for methodologies and tools on information management for sustainable development*

Interestingly no country felt that information obtained from the site changed the way respondents worked on a day to day basis, and as Jamaica noted, capacity had already been built within that country's baseline of existing activities. Despite no real enhancement of capacity of its focal point, Barbados reported its awareness that a fifty percent increase in capacity had been realized in collaborating institutions and individuals because of access to information on the site. Jamaica was also pleased with the level of value that NEPA realized through enhanced access to training tools and information on streamlining data and information for decision-making. Additionally, both Barbados and Jamaica were very positive about positive impacts on collaborating organizations noted.

## 4. FACILITATION OF REPORTING OBLIGATIONS TO MEAS AND DONOR ORGANIZATIONS

The whole question of impositions on the limited national institutional capacity for reporting to MEAs and other multilateral mechanisms has been a source of concern to three of the four pilot countries and are addressed more definitively elsewhere in this report. However, a quick overview of responses to questions on this issue revealed that the project could/should have given this issue greater priority, with a focus on early resolution. Recommendations for addressing this issue have been made by Jamaica during free ranging telephone interviews and are reported under country sections below. Countries felt generally that opportunities may have been missed during the implementation process of the IDSD project and that donors were insufficiently involved.

### *4.1. Building on pre-project capacities/experiences in the region*

Positive acknowledgement was expressed about the value of access to the range and volume of pre-existing materials on IMS in the region via the IDSD site. Good ratings were given by St

Lucia and Jamaica on the value-added achieved through the IDSD project, which in turn might have been facilitated because of successful baseline activities resulting from the UNSD/CARICOM project on 'compilation and dissemination of statistics and indicators for conference follow-up' and from UNEP's work in the field of environmental information management in the region. This report also highlights the excellent baseline scenario for information management in Jamaica reported under the country analysis section of this report. Indeed, it is the view of this consultant that the IDSD project has been well designed to take advantage of such baselines in order to add value and make positive impacts on information systems in the four pilot countries.

## 5. ASSESSMENT OF PROJECT IMPLEMENTATION METHODOLOGY (PIM)

### *5.1. Baseline assessment of pre-existing activities and capacities*

Only Barbados had read the assessment report on pre-project initiatives on the IDSD website and gave a positive evaluation of its content with regard to its comprehensiveness, accuracy and usefulness in highlighting pre-existing activities in IMS and IDSD. All countries except Jamaica also felt that the IDSD project implementation process enhanced their capacities to utilize pre-project resources more effectively. These same countries also expressed the opinion that because of the IDSD project implementation process, they have been made aware of information resources that can contribute more efficiently to decision-making in their countries. Special mention was made by St. Lucia of the use of the GEO-SEIAN project of the University of Costa Rica and by Belize of the following links, www.oas.org/publications, www.cpacc.org and www.uvic.ca/scenarios

### *5.2. Assessment of choices of best practices and tools for IMS and Reporting on Sustainable Development*

Only Belize had reviewed the collation of best practices and tools for assisting pilot countries in managing information for and reporting on sustainable development while the other three pilot countries were unaware of the existence of this report. Its content was found to be limited and could benefit from more relevant regional best practices and case studies. Several suggestions for case studies have been made under the country specific sections of this report.

The IDSD project did not pay sufficient attention to raising awareness of links to best practices on other sites and it is recommended that direct population of the IDSD site, supplemented by links to other key sites, should be a *next steps* priority action.

### *5.3. Establishment of the Pilot Network*

All countries had read the proposal for the establishment of the pilot network for decision-making for sustainable development but were all unaware whether any progress had been made on implementation of its key recommendations. This is of concern since Jamaica and Barbados are convinced that the level of training on tools and methodologies for operation of the pilot network, received through the IDSD project were adequate. It was generally felt, with some reservations, that needs for building capacity for efficient information supply into the decision-making processes, can be achieved through the operations of the pilot network.

### *5.4. Process of website development*

Barbados and Jamaica were aware that country personnel benefited from hands-on training on website development during construction of the IDSD website, and only Jamaica is aware that other collaborating institutions have been stimulated to develop websites for better management of their institutions' data and information. All countries except Barbados are aware of the capacity of national information providers to use the tools necessary for contributing to the content management of the IDSD website, and that adding links to the site can be streamlined by requesting participants to use of the "Development Links" Form which is readily downloaded from the site.

St Lucia feels strongly that the information management process of the IDSD site is too rigidly controlled and that like Jamaica, it feels that there should be some degree of decentralization to the pilot countries as a means of building regional capacity.

*5.5. Identification of gaps in information*

Generally all countries except St Lucia are satisfied with the system for addressing gaps in knowledge and information necessary for national decision-makers to function, however *all of the pilot countries noted that such gaps in information which remain are significant enough to influence negatively, decision-making for sustainable development at the national level.*

*5.6. Links to other information portals and hubs*

IDSD website hyperlinks to virtual information centers have greatly enhanced the capacity of Barbados to provide information for decision-making. It has had a more moderate impact on national capacity in St Lucia and has not added significant value to the baseline capacity in Jamaica. Regular use is made of access to related information hubs by all countries except Belize although St Lucia reported visiting the following sites regularly, not necessarily using the IDSD portal, but going directly to sites for UNDESA; St Lucia Statistics Dept; UNEP/ROLAC; OECS and ECLAC. Jamaica uses both the IDSD site as well as making direct access to the following sites which it uses regularly, IISD http://www.iisd.org/, and csd http://www.un.org/esa/sustdev/ . It was felt by the latter country that these sites should be linked to the IDSD site.

*5.7. Procurement process for new hardware and software and training for enhancing technical capacity*

All countries except St. Lucia have already received some of their provision of operational hardware and software systems under the project and St Lucia's is expected within the near future. Without exception all countries were very satisfied with the level of provision of technological upgrades for information management for their countries under this project.

6. Impact of IDSD Project Activities vis-à-vis Projected Outputs

*6.1. Participating Countries In General*

***6.1.1. Learning through direct contact.***

All countries reported that participation in various meetings and training workshops convened through the IDSD project added significant value to their knowledge and experiences on the value of information management systems (IMS). Special mention was made of exposure through the project to methods and tools for IMS which *served to raise awareness of options available for upgrading hardware/software, information needs and inputs for government and other national*

*institutional strategies for effective decision-making, and knowledge of other professionals in neighbouring countries.*

Host country advantages were also realized by countries in which regional activities were convened. For example, although four persons in St Lucia were the designated partners in the project, hosting of the Resource Persons Meeting there in May 2003, afforded exposure to several other persons from various sectoral departments including statistics and tourism.

#### *6.1.2. Collaboration between pilot countries*

An *enhanced process of collaboration* between pilot countries has also been fostered through direct contact among professionals under this project. Sharing experiences on *the development and use of sustainable development indicators,* was especially evident. Focal points in Barbados and St. Lucia have already taken steps beyond initial contacts made during the Resource Persons Meeting in St. Lucia to hold dialogue on next steps towards deepening collaboration. Formal procedures are being developed by St Lucia to obtain guidance from Barbados, which is among the most advanced in the region in its indicators programme. Belize has also expressed an interest in receiving support from other Caribbean countries in this regard and Jamaica proposes that it is also in a good position to share its experience and expertise with others and to learn from regional countries which have made strides in reducing the long lists of indicators to more manageable lists for which actual data can be collected and processed into usable information.

## 6.2. BARBADOS

#### *6.2.1. In-country-status of the process of managing information for decision-making on sustainable development*

An examination of the process of information dissemination in Barbados through its publicly accessible official government websites demonstrates a vision that is noble and infrastructure that can become a potentially powerful tool for use by decision-makers.

> Vision of the Barbados Government Information Service (BGIS)
> http://www.barbados.gov.bb/bgis.htm
> To Be The Communication Hub Of Government,
> An Agency Which Drives National Development
> In Ways That Make The Business Of Government,
> "A Vibrant Living Thing"
>
> and of the Government of Barbados Information Network (GOBINET)
> http://www.barbados.gov.bb/
> "In this era of globalisation, it is important that Barbados positions itself to serve the global public with information on demand. The Government of Barbados Information Network (GOBINET) in seeking to accomplish this goal will also achieve, for its users, more transparency of government operations.
> While government will be pushing its information out to the world, users of the websites under the GOBINET banner will have a medium through which they can correspond easily with government. This interchange of information can only be to the benefit of government and its customers."

Despite such ideals, content and content management of sites appear to have limited sustainable development focus. Environment and development are insufficiently integrated and the sites reflect the traditional sectoral focus of most governments. Notwithstanding this, the potential is great for using existing information infrastructure to assist in national decision making on

sustainable development. Greater use of electronic linkages between sites will enhance the value of existing infrastructure for sharing information on sustainable development. Nowhere were links readily visible to resources such as those available through the IDSD website, although links on national environmentally related sites led *indirectly* to portals such as SIDSNET.

Since 1998, the Government of Barbados (GOB) had embarked upon a process of collecting data and processing it into information for addressing sustainable development goals and objectives through its national sustainable development indicators programme. It therefore had in process, as in all of the countries evaluated under this project, a viable baseline of activities with similar objectives as envisaged under the IDSD project. However, mechanisms for making relevant information available for guiding decision-making processes remain a challenge.

The IDSD project implementation process gave the institutions involved an opportunity to focus on addressing gaps in existing processes, related mainly to information sharing among existing institutions. The Ministry of Housing, Lands and the Environment (MHLE) receives on a regular basis many requests for information on environment and development from other government institutions, the private sector, NGOs and CBOs. Responding via the use of e-mail, photocopying and by telephone put an added strain on the thin human resource capacity of the Environmental Division of that Ministry. Referral to the IDSD website or downloading required information on behalf of agencies making requests, became a method of choice and a viable strategy for responding to information needs of the wider community in Barbados.

However, it is underscored that this consultant found no clear structures or mechanisms for channeling information in electronic form directly to decision-makers. Traditional means of requests/ response are utilized, and technical recommendations continue to be made in reports and in formal notes to Cabinet. Several government sites evaluated contained documents and reports as downloadable pdf files but links to sources of processed data collected on a routine basis by various government departments are unavailable.

*The role of the media for influencing decision making for sustainable development can be significant*. However, in Barbados it is reported that its media has not played the role envisaged for the dissemination of information on sustainable development even when invited as participants in various fora. Often, coverage tends to be limited to activities of politicians and it is not uncommon to witness the departure of media personnel following the end of participation by a politician. *Strategies to enhance the role of media personnel in making information available through public dissemination are crucial and should be addressed through future phases of the IDSD process*.

The consultant was advised that few people outside of the project participants and related institutional colleagues were aware of the IDSD project and its outputs so that informational letters would be prepared for dissemination via the Ministry's regular mailing list.

It was recommended by this consultant that the opportunity of the formal launch, through a press conference, of the *National Policy on Sustainable Development* scheduled for Wednesday 18 Feb 2004 by the Honourable Minister of Housing Lands and the Environment should also be utilized as an opportunity for wider publicity on the resources available through the IDSD website. This was accepted and information on the IDSD project would be included in press kits for attending media. Additionally, development of a website for the Ministry, cross-linked to key national institutions, is envisaged as a tool for facilitating public access to information.

### *6.2.2. National and institutional needs*

The thematic area for Barbados under the project was sustainable tourism. However, the training under the IDSD project using the CTO MIST system was not seen as relevant to the routine operational needs of stakeholders within the tourism sector in Barbados. It is felt that a series of brain-storming sessions within a focus group comprising representatives of the tourism sector is a necessary next-step for fine-tuning needs under the sustainable tourism indicators programme. Such facilitated dialogue sessions will serve to identify country-oriented specific needs for data gathering and information processing within the tourism sector. It is envisaged that persons trained under the IDSD Project should be used to guide the local dialogue on information systems for sustainable tourism.

On the broader issues of addressing institutional needs for human resource capacity building through training, it was felt that the IDSD project added significant value. It was also noted that a great mix in the selection of persons for training provided a basis for on-going capacity building within and outside of the government institutional framework. Two persons with strong IT backgrounds from the Environment Special Projects Unit of the Ministry and one from the Coastal Zone Management Unit (Travis Sinclair and Ron Goodridge respectively) and a civil society representative from the Barbados National Trust (Debra Branker) now form an invaluable core of trained trainers.

A major drawback, from an operational perspective, is that the MHLE does not have a website apart from its link through the BGIS and GOBINET. Time devoted to sending e-mails, faxing and photocopying in response to requests for information makes for an inefficient use of limited human resources. It is envisaged by the Ministry that establishment of a functional website will address this constraint. One key objective of the Ministry is for the *Environment Division to become a Clearing House for Information on Sustainable Development for Barbados* with the website operating as the major tool in this process. The Ministry's role as facilitator for the work of the Commission on Sustainable Development will be enhanced significantly when it becomes sufficiently tooled to become a genuine information clearing house for information. The process of fostering partnerships with the media can also be enhanced through ready access to information for wider public dissemination.

### *6.2.3. Capacities for data and information processing and sharing*

Significant capacity for data gathering and information processing had already been built in Barbados under the National Sustainable Development Indicators Programme. However many gaps remained and tools and methodologies provided under the IDSD project training modules were utilized to address some of these needs.

Information sharing has been somewhat more problematic and as cited above, URLs to the IDSD website are being forwarded in response to requests for information from various sources in Barbados. However, specific data and information generated as a result of day to day operations of governmental agencies are not yet being shared in any systematic manner by the Ministry. Methods are still very much response-specific and the need for establishing a network of national institutions remains a key objective. The Ministry also intends to address the issues of gaps in information dissemination through the establishment of its own website on sustainable development. Support for this activity has not yet been accessed and has been identified as one of the needs for next steps in the IDSD implementation process.

The IDSD E-Group coordinated by the CCA Technical Officer has met an important need for information sharing among participants exposed to IMS processes during project implementation. A professional relationship has been fostered so that requests for information or guidance on issues related to data management can be requested of fellow participants using this mechanism. However, because of the sheer volume of e-mail traffic, keeping up with information generated through the e-group has become problematic; routine monitoring without active participation has therefore been adopted as a coping strategy. Active intervention is only made if direct assistance to a query can be offered or if a specific request needs to be made.

The input of the IDSD project in providing state of the art computers and a digital camera was identified as the high point of the implementation process. The MHLE had identified many years ago specifications for the type of equipment necessary for addressing its IT needs but it was only through the timely intervention of the project that these needs have been met. Each staff member of the Environment Special Projects Unit will now have an individual computer.

### *6.2.4. Institutional landscape (status, collaboration, coordination: government, NGOs and CBOs)*

Sustainable development is still perceived as a largely secular activity in Barbados despite major strides towards addressing such issues since the SIDS Conference and more specifically, through the establishment of the Commission on Sustainable Development, which was structured to have a broad base of institutional and sectoral representation. Collaboration across the hemisphere through the work of the Earth Council based in Costa Rica has been of major benefit to the work of the CSD.

The MHLE remains the major institutional framework for fostering and managing the process of inter-institutional collaboration around the issues of sustainable management of the country's natural and human resources. The Environmental Division is the secretariat for the work of the CSD and provides logistical support for the work of the various sub-committees established under its National Sustainable Development Indicators Programme. The National Steering Committee on Indicators established in 1998 also has broad base representation from government and private sector institutions. The work of the Trade and Environment Committee which is Chaired by a private sector industry captain and which comprises a broad range of governmental and private sector interests, utilizes significant amounts of information accessed via the IDSD website.

Collaboration at the intergovernmental and donor level on information management for sustainable development has not been formalized but remains project and process specific. For example UNEP has provided support for the state of the environment reporting (SOER) process but this is not conducted in a vacuum since outputs of the support received from UNDESA and UNSD on the National Sustainable Development Indicators Programme are germane to the SOER process.

A government initiative spearheaded through the Environment Division on "Greening of Government Procedures" utilizes information resources available through the IDSD site and staff members often direct their governmental institutional colleagues to this resource to address their queries and requests for information.

Good relationships between government institutions and NGOs and CBOs, as expected, pre-existed the IDSD project but collaboration was ad-hoc and information sharing was reactive. However it was felt that relationships between one NGO in particular was strengthened through the IDSD project. Staffing of the Barbados National Trust is relatively thin on the ground due to

financial resource constraints. However their needs for information management are great and through the IDSD project one of the non-staff members of the Trust was trained in aspects of IMS. This has fostered a working relationship between the Environment Division of the MHLE and this NGO. Relationships with other NGOs are not as strong, but ad hoc responses for information are made regularly. A stronger relationship exists with CBOs especially with community based fishing groups and with trade unions where information exchanges are now routine.

Private sector collaboration occurs primarily through the work of the multi-sectoral Working Group on Trade and Environment chaired by an influential private sector representative, the CEO of Mt Gay Rum Refinery. The IDSD site is used as a portal for information in support of the work of this Group, in particular for accessing and sharing information on Environmental Management Systems, specifically, assistance to companies with their progress towards ISO 14000 certification. Mt Gay which is the only ISO 14000 certified company in the country freely shares its expertise with others supplementing its information with other relevant inputs accessed through the IDSD site.

Relationships with the Hotel and Tourism association are also greatly enhanced through the sharing of information and providing inputs on the Green Globe Certification process.

#### *6.2.5. Applicability of Barbados' experience to the region*

Barbados' experience in articulating its National Sustainable Development Indicators programme along with that of Jamaica are probably the most advanced among Caribbean SIDS. Collaboration on sharing these experiences with St Lucia has already been initiated as a result of exposure during the IDSD process. Barbados felt that its personnel trained under the IDSD project are now fully capable of training others in the region. The capacities of two persons in particular, whose backgrounds were strong on IT, were greatly enhanced. Formal mechanisms should be explored for making this trained resource available to others in the region on a south-south co-operative basis.

### 6.3. ST. LUCIA

#### *6.3.1. In-country-status of the process of managing information for decision-making on sustainable development*

As is the case with Barbados, the Government of St. Lucia (GOSL) expressed noble intentions of using information technology to address its goals for sustainable development. The following excerpt from the GOSL website articulating this vision is reproduced in full to highlight the cogency of the message and its relevance to the context of the objectives of the IDSD project.

http://www.stlucia.gov.lc/pr2004/february/caribbean_ready_to_reap_the_benefits_of_Egovernment.htm

> **"Tuesday, February 10, 2004 -** The Government of St. Lucia and it's counterparts from the Caribbean are well on their way to providing the much needed environment that would make their services more accessible, responsive and cost efficient. St. Lucia's Communications, Works, Transport and Public Utilities Minister, Honourable Felix Finisterre made the disclosure today, as he addressed a three-day regional workshop on E-Government and Sectoral Development at the Cara Suites Hotel in Castries.

> Minister Finisterre told the regional grouping that new information and telecommunication technologies (ITCs) were facilitating the acquisition and adoption of information, thereby offering developing states unprecedented opportunities to enhance their education systems, improve policy formulation and execution, while expanding the possibilities for social change.
>
> The Caribbean, he said, had proven itself ready to reap the benefits of E-government Readiness, placing second only to North America with respect to the human capacity index for e-government, while outperforming regions, such as South and Eastern Asia, South-Central Asia, Western Asia, South and Central America, and Europe. "The development of St. Lucia as a service-based or information and knowledge-based economy, therefore, aims at exploiting digital technologies to stimulate the achievement of the country's development objectives," Minister Finisterre said.
>
> He noted that the establishment of a knowledge-based society "was the platform on which the region must foster, accelerate and sustain long-term social, cultural and economic development." He admitted however, that much work still needed to be done to realize the goal of shaping a new economy, predicated fully on information and communication technologies.
>
> Government, the Communications Minister pointed out, was seeking to create an enabling environment to attract local and foreign investors through appropriate policies, legislation and improved public sector efficiency. That note struck a cord with officials of the Commonwealth Secretariat, who are sponsors of the three-day event. "E-government without the culture change becomes expensive government and I think we have to focus not so much on the technology, but on the re-engineering of processes, of regulations, of information and data sharing, and those are always the tough issues," said Henry Alamango of the Commonwealth Network for Information Technology for Development (COMNET-IT)
>
> E-Government is a concept aimed at encouraging governments to use less ink and paper and more electronic information technology in their day-to-day affairs."

Although this vision is clear, its operationalization into action within the various structures of government still lags way behind the objectives of this IDSD process. Despite this, a definitive baseline of activities exists in St Lucia which augurs well for making e-government a reality in the short to medium term future. Principal among these is the *Integrated Development Planning (IDP) for Sustainable Development Project.* This project has passed through a lengthy period of gestation, emerging from a long process in which St. Lucia has been engaged, facilitating the integration of various phases of sectoral development. The actual IDP project was initiated in 2000 as an expansion of the 1998 OECS[52] Integrated Planning for Environmental Sustainability programme, and received from the GOSL in 2001 an additional allocation of staff resources. Further support was received through UNDESA, which also served to enhance the evolution of integrated planning for sustainable development in St. Lucia. The IDP process was officially launched in November of 2003 and this programme is expected to be the major platform for

[52] Organization of Eastern Caribbean States

promoting information suitable for decision-making on sustainable development in St Lucia. Failure of an earlier mechanism for promoting integrated decision-making for development in St. Lucia, initiated since 1995, the *Economic Social and Development Council,* appears to have its genesis in the lack of information technology management which accompanied the process.

### *6.3.2. National and institutional needs*

St Lucian participants believed that the IDSD project added some value to the process of national information management through its training component but more particularly through its provision of hardware for data and information back-up. The latter is valued highly since a long recognized, but un-addressed concern for St. Lucia, was that potential threats to efficient decision-making at institutional and political levels, could be a major constraining factor if losses of data and information were realized. The GOSL is exceedingly pleased with the provision of technology to ensure continued back-up storage of data and information.

Additional needs for data management software developed by the University of Costa Rica, are being sourced with funding support from UNEP/ROLAC[53]. This technology is expected to enhance the value of data storage hardware provided under the IDSD project.

The country is also planning to advance its needs for information for decision-making through its National Sustainable Development Indicators Programme. The IDSD project enhanced the process of collaboration between pilot countries on indicators. Focal points in Barbados and St. Lucia have taken steps beyond initial contacts made during the Resource Persons Meeting in St. Lucia. Formal procedures are being developed by St Lucia to obtain guidance from Barbados, which is among the most advanced in its indicators programme. Similar arrangements with Barbados for the development of Indicators for Coastal Zone Management and for its State of the Environment Reporting (SOER) process are engaging the attention of the focal points of both countries.

### *6.3.3. Capacities for data and information processing and sharing*

Four persons in St Lucia participated in the IDSD project and because the country was host to the Resource Persons Meeting held there in May 2003, six other persons also benefited from participation in this meeting. Exposure through the project to methods and tools for IMS has served to raise awareness of options available for upgrading government and other national institutional strategies for effective decision-making for sustainable development. In particular, expectations exist for enhanced training on IMS for coastal zone management, the thematic area chosen for St Lucia under the IDSD project, notably indicators for CZM. The Ministry of Physical Development, Environment and Housing (MPDEH) has shared the value and role of indicators in decision-making for sustainable development with other government institutions, and there has been significant buy-in by the Ministry of Finance. Thus, support from UNDESA for the National Sustainable Development Indicators Programme is being topped up by funding from the Ministry of Finance in the budget for 2004.

It was felt that the IDSD project built upon pre-project activities in St. Lucia which was already far along the road in establishing its IDP programme with objectives similar to those of the IDSD project. The focus on coastal zone policy formulation and management was also well advanced through funding support from the European Union since 1998 and it is expected that the Coastal Zone Management Project will be incorporated by June 2004 into the Sustainable Development

[53] Regional Office for Latin America and the Caribbean

and Environment Unit (SDE) of the MPDEH. The coastal zone theme, selected by default[54] for St. Lucia under the IDSD project, has therefore found resonance with on-going work on data processing and information management planned within the SDE. It was proposed that the US$1500 made available for the national training component under the IDSD project would be used more effectively for assessment of software packages for development within the CZM indicators programme rather than for use for which it was originally intended, as funding might not have been adequate for this purpose.

St. Lucia is now poised to take advantage of UNDESA Phase 2 funding for its SD Indicators programme with added funding from government. It is also expected that the SDE will be in a position to articulate the Sustainable Development Strategy for St. Lucia by 2005 as envisaged under the Millennium Development Goals (MDGs).

This consultant felt it necessary to engage the St. Lucian focal point on the value of indicators as key inputs to the information for decision making for sustainable development process, and a rich discourse emerged.

A shift from the widespread use of economic indicators for decision-making in government must be made to the use of sustainable development indicators. This presents a unique opportunity for governments who must now seek to take into account the challenges for identifying suitable indicators for addressing goals for sustainable development adopted by governments through a range of intergovernmental processes. Principal among these are the MDGs and those outputs of the Johannesburg meeting which related to the sustainable development of SIDS. Support for identifying data and information processing needs with respect to developing country specific indicators for
each developmental goal remains a major challenge to be addressed under the IDSD project.

It is clear that sustainable development goals are located within the context of long term time frames, which are precisely the opposite to the goals of political decision-makers. It also appears that transforming the thinking of decision-makers at every level within governments and within the other driving sectors of the economies of all the participating IDSD pilot countries, as is the case in most other SIDS, to think and plan long-term has not been realized.

Opportunities must be created to address this crucial issue that continues to have significant negative impacts upon realizing sustainable development objectives in SIDS. It is recommended that an essential next step in the IDSD process, must be a major drive towards publicizing the role of sustainable development indicators in effective decision-making for SD. This is quite apart from the on-going technical and financial support that either should or could continue to be facilitated through the IDSD in collaboration with others to enable countries to,

(i) Collect data suitable for use within SD indicators programme and
(ii) Process such data into useful and easily understood information for decision makers at both government managerial and political levels.

National capacity issues related to processing and generating information for the purposes of reporting to MEAs are being addressed actively through the GEF funded project on National Capacity Assessment. Concerns have repeatedly been articulated at meetings of the Conference of Parties of the various MEAs and collaboration is ongoing with Convention Secretariats.

[54] As host of the Resource Persons Meeting in May 2003, the other three pilot countries were given the opportunity to choose IDSD themes, and CZM was selected as the last of four topics by St. Lucia.

Opportunities exist for the IDSD project to make inputs for action at the regional level to address this capacity constraining issue that continues to plague under resourced SIDS.

### *6.3.4. Institutional landscape (status, collaboration, coordination: government, NGOs and CBOs)*

The MPDEH remains the principal government Institution with the mandate for facilitating the process in St. Lucia through its Sustainable Development and Environment Unit (SDE). Its high priority goal is to facilitate integration of government's sectoral development activities under the IDP *op cit*.

Prior to the IDSD project, information was shared among professionals within the SDE Unit on its server on which a long list of Favourites has been earmarked for ease of reference and access. SIDSNET was also utilized very heavily prior to the IDSD project for information and especially for tracking proceedings of international sustainable meetings in which SDE staff were participants. The advent of the IDSD website has not changed this scenario as a high level of satisfaction exists about use of these resources.

Involvement of civil society in information management appears to be very limited. The proposed development of the Ministry's website, which is already in progress, will be used as a tool to foster engagement of all national groups in sharing information on environment and development.

An over-reliance on the use of e-mail is evident and part of the problem with regard to poor response rates to the questionnaire and other communications sent via e-mail by this consultant was that the majority of e-mail received is never read by the focal point who admitted to being overwhelmed by sheer volume. Frightening statistics were provided to illustrate this. On the day of the telephone interview the respondent's in-box contained had 627 pieces of mail and after 2 hours of addressing this correspondence, had only managed to reduce this volume to 530 messages. It was recommended that a filter system be programmed into his e-mail programme in order to direct selected mail to folders as this would aid in prioritizing just what were the most important pieces of mail for quick review daily. One solution preferred by the focal point was for use of his home e-mail for important follow-up. It is recommended that periodic refresher programmes on the management of e-mail systems be provided to professionals.

### *6.3.5. Applicability of St. Lucia's experience to the region*

The evolution of St. Lucia's IDP process can be considered a seminal experience in which a regional country has been able to advance its efforts towards practical integration of sectoral institutional arrangements for sustainable development. Its approach towards integrating sectoral planning as a means of fostering a more holistic public sector management framework represents a landmark in the region. It is still too early to see radical transformation of entrenched patterns of institutional operations, so sectors still continue to operate independently, but the St. Lucia experience represents a learning opportunity for other SIDS. Modern methods and tools for effective information management for decision making on sustainable development appears to be insufficiently incorporated into the IDP process, so a greater level of awareness needs to be promoted within the country. Nevertheless, evolution of the St. Lucian experience on integrated planning for sustainable development remains a regional best practice that is worthy of further analysis and sharing on the IDSD website.

## 6.4. JAMAICA

In general Jamaica was satisfied that the project fulfilled promises made at the outset of the implementation process and was pleased that it benefited greatly from its selection of the physical planning thematic area of the IDSD and the related support it received for the provision of software and hardware.

### *6.4.1. Existing capacities and concerns*

Review of publicly available information, adopted as part of this evaluation process revealed that many of the ideals of the IDSD project were already in place in Jamaica

#### ***6.4.1.1. Existing capacities***

Jamaica has perhaps made the greatest advancements in the region, possibly even among all developing countries, with regard to the use of information technology and information management systems for sustainable development. The website for the National Environment and Planning Agency (NEPA), www.nepa.gov.jm is a decision-makers dream. It is comprehensive in its coverage and can be considered as an efficient and effective portal for data and information to all facets of the national community. The site is interlinked in the most effective manner across a range of national, regional and global institutions. Additionally, access exists to a myriad of NGOs, CBOs and several other civil society structures enabling decision-makers to have knowledge of and the ability to communicate if necessary with a range of publics.

This leading edge information network did not happen by accident but resulted from a continuously evolving creative process initiated in 1992 that benefited from the vision and strong dynamic leadership of the present CEO of NEPA. Encapsulated in the approach was a vision that sustainable development could only be achieved if information was made available as widely as possible to all actors both within government and to all non-government sectors, and that such widespread dissemination was only possible through the development and use of a strong IT platform. Although the website forms the cornerstone of information sharing, its effectiveness is supplemented through wide dissemination of CDs of every project undertaken by NEPA[55] and with hard copies if necessary, especially to communities and institutions which might be constrained by lack of ready access to the internet or through limitations of internet download time.

Management of the governance process has therefore been transparent, fostering an ethic of openness by government institutions, which has paid significant dividends in promoting sustainable approaches towards the use of natural, human and financial resources in Jamaica. Not only is the public well informed through projects, programmes and activities of NEPA by both direct means and virtually through its website, but sharing of information has become routine between units of NEPA and between other government institutions and civil society structures, a process that is literally state of the art in Jamaica.

*Jamaica's Information Management Systems for environment and sustainable development is a best practice that can contribute to wider Caribbean/global adoption of IT mechanisms for improving environmental governance, and enabling greater transparency of government operations.* Many great stories exist of Jamaican citizens being able to take actions against government decisions because of their empowerment through transparent access to information.

[55] CDs are compiled to include all inputs and outputs of projects including copies of the approved source project document.

It is recommended that next steps of the IDSD process take the Jamaican example of the effective use of IMS for promoting environment and sustainable development as a Best Practice for sharing with other SIDS. It will be necessary to address some process issues prior to sharing /promoting the model as best practice. Principally, this will revolve around documentation of the key elements of this revolutionary public sector management process, through the formulation of a case study.

***6.4.1.2. Areas of concern***

Constraints imposed upon small states for reporting on MEAs and other global conventions and agreements should be addressed through the use of available advanced information technological and methodological tools. A clear case of modernization is recommended. It has been the experience of Jamaica that many international organizations, including secretariats of conventions have not made best use of available information technology. Efforts to use information adequately and effectively for decision-making within these intergovernmental and donor institutions must be directed there primarily. Under the IDSD project, this issue was identified as a major concern and has engaged the attention of IDSD participants in general. Except for the focal point in St. Lucia, the level of satisfaction with intergovernmental and donor efforts towards addressing this issue remains low.

Solutions to reporting problems must be anchored in the development of digitized record systems for all government technical departments. Integrating existing paper records into digital modes are necessary first steps for many such departments throughout the Caribbean. The IDSD project exposed participants to methods and tools in this regard but much support is necessary for transforming existing operations.

NEPA has had occasionally to refuse donor aid in the past where its staff was aware that their own internal information technology knowledge exceeded that of consultants. Often 1st or 2nd generation information products were offered when Jamaica was already using newer top market products. In a more general sense, international consultants frequently underestimate technical competencies of recipient country professionals[56]. This is not only relative to aid linked support but also to commercial providers of information technology and equipment suppliers. NEPA has had the experience of having to teach consultants to move from paper mapping to digital mapping and in 1995, had to assist a group of consultants, unfamiliar with the use of e-mail, to establish e-mail addresses to streamline communications with them.

NEPA has adopted an approach of obtaining leading edge knowledge and information from relevant public sector operations in developed countries and from among brilliant intellectuals in technologically advanced 'smart cities' of the north. For example, ideas for upgrading services on physical planning processes in Jamaica benefited from both formal and informal bi-lateral collaboration with Her Majesty's Planning Office in London.

[56] An interesting anecdote was provided by the CEO, who reported on support from a northern European University to NEPA. Included in the project offerings was arc info software, but NEPA's specifications for advanced GIS software were ignored and the arc info was promoted as being the most appropriate and within the technological capability of staff. The project refused to provide NEPA with the $4000 budget line so the Department used instead other funds to source appropriate GIS tools and populated the site for themselves with relevant information. The consultant was in great shock when his recommended package arrived and there was no need for that aspect of project inputs as the fully populated system was already up and running. Similar experiences under other projects in which donors were advised that the provision of inappropriate foolscap size scanners requiring that maps be folded into quarters, would constrain the effectiveness of service, were ignored. Internal resolve to get the best technology resulted in the sourcing of scanners which could scan whole maps.

NEPA underscored the point that much of its IT advancement would not have happened without the support of donors and indeed its experiences with UNEP RCU[57] and with CIDA[58] have been outstanding.

The project approach to IT development rather than a programmatic approach might well be responsible for the many constraints experienced by intended beneficiary countries. Fruitless attempts to harmonize the range of ad-hoc methods, tools and technology received under various projects are legion around the region. Software provided under one project which may or may not work with hardware provided under another or worst yet, within the same project; or hardware which might become obsolete before the end of the life of the project. It is recommended that the IDSD project assist Caribbean countries on a regional basis in drafting guidelines and policies on the acquisition of information technology. This can be expected to strengthen countries' capacity for avoiding past disasters and will go a long way towards alleviating most of the problems highlighted in this report.

### *6.4.2. Areas of need for further intervention and support*

*Notwithstanding the high level of experience with IT for sustainable development in Jamaica, the NEPA team were exceedingly pleased with the outputs of the IDSD project and felt that there has been significant valued added to the baseline of activities in that country*. Of note were the opportunities provided for exchanging experiences on its Indicators for Sustainable Development programme with contacts in Barbados and St. Lucia. An *Issues Paper on Indicators for Sustainable Development* has already been prepared by the Sustainable Development Unit (SDU) of the Planning Institute of Jamaica (PIOJ) which has responsibility for sustainable development in the country. NEPA and the PIOJ have already embraced the potential which exists under the IDSD project for opportunities for further advancement on its indicators programme and have expectations for these to be fulfilled through collaboration with counterparts in the Caribbean, fostered under the IDSD project.

170 indicators have been signaled by a range of development sectors as being important for Jamaica. However, information managers recognize the unmanageability of this long list and have begun the process of interagency collaboration to pare down this list to the more manageable 60 as recommended by the UN Commission on Sustainable Development (CSD). Initial objectives are to reduce the list to address indicators for which data is already being collected. Thus, adoption of the use of indicators, which are based upon data that are routinely collected by several agencies, will serve to provide information that will serve to influence changes in behaviour, in the targets groups of relevant agencies, from decision-makers to users of services.

The Jamaican participants also cited one major benefit under the IDSD project as being the provision of additional GIS tools for use in management of its physical planning application and approval procedures. Physical planning had been the thematic area selected by Jamaica for implementation under the IDSD project, and inputs have provided significant valued added to operations of NEPA in addressing its mandate for physical planning. Improved systems for tracking development approvals were facilitated by the software provided. Further needs were identified for;

[57] Regional Coordinating Unit
[58] Canadian International Development Agency

- ✓ The provision of technology to provide greater public access to information on progress of their applications.
- ✓ The provision of software to assist in processing the wealth of data generated in its application process, for further integration into GIS and streamlining licensing and permit procedures.

Expected outcomes would be the facility of applicants for planning permission to track progress in approvals and for enforcement personnel to track violations of approved plans.

### *6.4.3. Institutional landscape (status, collaboration, coordination: government, NGOs and CBOs)*

NEPA's 200 staff complement, one-third of whom are in the technical and professional cadre, all have varying degrees of familiarity with GIS. This capacity was built largely in-house to enable all NEPA staff to become frontline information disseminators. Data management and information processing are managed through a professionally led and staffed, IT department within NEPA and this has been the 'engine room' of innovation under the visionary guidance of the CEO. Prior to the development of the strong IT platform within NEPA, all EIA information was scanned but was not available to the public.

In keeping with government's strategy for modernization of the public sector through the provision of computers to facilitate electronic communications, NEPA adopted the vision 10 years ago that development of a website would be its key strategy not only for integrating the work of its departments, but also for use as a public interface for information dissemination. Recognizing that it did not have adequate resources to acquire the services of a consultant, NEPA took an approach that "we will do as much as we can do ourselves" and set about building its internal capacity for website development and management using any means that became available, through workshops, seeking free assistance etc. Hands on processes afforded all staff to develop an IT savvy that is uncommon within most public sector institutions across the region and internationally. NEPA's capacity built as a result of these internal processes, both on the technical side of information management and on the content management side, has meant that every unit manages its own information and do not have to always depend upon the services of its dedicated IT Unit.

All EIAs are now publicly available on NEPA's site, and feedback is routine, especially from overseas Jamaicans who have adopted the culture of developed countries in which they reside, to publicly comment on EIAs. Electronic methods do not replace public consultations but supplement this essential public process.

Jamaica has also been a beneficiary of UNDP support for information sharing through its SDNP[59] programme in the early nineties. At the time of its establishment, the SDNP was intended to provide broad based public access to the Internet and achieved that objective, prior to Jamaica's up tooling in the late nineties. Its impact has been supplemented by Government provision of Internet access in schools, libraries, agricultural and other rural based societies and groups. Additionally, UNDP's SIDSNET is utilized heavily and is readily accessed through the NEPA and IDSD sites.

The Jamaican Government remains committed to the use of the Internet as an essential means of disseminating information quickly and cheaply. Journalists have begun to rely on the use of the

[59] Sustainable Development Networking Programme

NEPA site, and to utilize e-mail frequently to access additional information to facilitate their work. An interesting example was provided of how access to information influenced official decision-making on a proposed housing project in Hope Gardens recently. When plans were disclosed by the Ministry of Housing that it proposed to build houses on lands which appeared to be part of the historic, century old Botanic Gardens, there was a major public outcry from concerned citizens and groups against the proposal. Swarms of e-mail were received seeking further information on the issue and NEPA's response was merely to place the location of the proposed development on a GIS map of the area. This factual information showed that the proposed project was indeed located within the boundaries of the Gardens, and the end result was that the Minister demitted Cabinet! The intervention of NEPA in any other manner was unnecessary as transparent use of its information tools under its mandate is a routine practice.

The NGO community makes heavy use of all resources available on electronic sites throughout Jamaica and NEPA as an information portal, serves this need almost as a "one stop shop". The Documentation Centre of NEPA has a small staff which supplements the use of the website, with copies of CDs and hard copies of e-mail and other information as necessary.

Draft policy documents are posted on the site immediately upon completion of the drafting process, as readily downloadable files, with requests for feedback. Responses are usually prompt from large sections of the national community at both institutional and personal levels.

A remarkable milestone has been achieved by Jamaica in its quest to promote transparency in information dissemination for effective environmental management within the context of sustainable development. It produced a CD with 10 years of publications and other documentation on environment and development that have been produced by Jamaica since the Rio Conference in 1992, covering the period 1992 –2002. This CD had been distributed free of charge to NGOs and other government departments. This is another example of a best practice that can be of significant benefit for SIDS and other developing countries and it is recommended that the IDSD project promotes this practice in the next steps of its programme. The practice of creating CDs as an *end of project product* for all NEPA projects has already been cited and its influence and impact on enhancing environmental /sustainable development education and awareness in Jamaica can be phenomenal.

The consultant found that appropriate tools for evaluating the various mechanisms of information dissemination and their impacts upon decision-making at all levels have not been built into IMS processes in Jamaica, as indeed in many other countries. It is uncertain how routine internal advice and formal recommendations, as well as public comments fed to decision-makers, are utilized within higher-level decision-making processes of public institutions and within the political process. Face to face feed-back from superiors appears to predominate, as are traditional cabinet decisions, which drive governance processes. *Cabinet notes are fantastic compendia of information and it is posited in this report that periodic five year reviews of this important category of documentation can serve to provide very interesting and useful retrospective analyses on the outcomes and impacts of the use of information which had been fed into political decision making processes within countries.* It is recommended that the IDSD project takes up this challenge of learning from the rich sources of cabinet led decision-making in selected SIDS by using retrospective analyses of how information in-puts influenced those decisions.

Use of appropriate feedback mechanisms to determine the effectiveness of end use of information continues to remain a challenge. Despite this, it is necessary for Caribbean countries to initiate the process in order for them to adopt the best approaches for use of scarce use of human and technological resources for information management. The Jamaica model is the best example in

the region of maximized use of IT for decision-making. It is therefore recommended that the IDSD project uses Jamaica as a case study for beginning the process of designing and building monitoring and evaluation systems to assess the use and value of information in decision-making.

## 6.5. BELIZE

Support was provided to Belize through the Ministry of Natural Resources, Environment and Industry (MNREI), which is comprised of the Central Administration and the following six Departments;

Ministry of Natural Resources (Central Administration)
Ministry of Commerce and Industry
Lands and Survey Department
Geology and Petroleum Department
Forest Department
Department of the Environment
Bureau of Standards

### *6.5.1. Existing capacities and concerns*

Past technical support for enhancing the capacity of government institutions in Belize for managing its data processing and information systems tended to be in the area of managing Government statistics with beneficiary institutions being the Central Statistical Office of the Ministry of Finance. Respondents were not aware of technical assistance for IMS within natural resource agencies and felt that the IDSD project was the first of its kind to do so in Belize.

Thus, the value-added of the IDSD project outputs were considered to be significant. Specifically access to methods and tools on information, and to information on sustainable development via the IDSD website are invaluable. It was felt that links on the site afforded easy access to project reports and facilitated acquisition of a wide range of environment and sustainable development information. Despite such knowledge, it is apparent that irregular use is made of resources on the IDSD website (Annex 1).

The training workshop on Climate Change and Disaster Management provided through the project on 6 February was well received and active participation by some of the larger NGOs, which have information management capacities, is expected to raise the level of their effectiveness. NGOs in general are not yet aware of the IDSD website and it is the intention of the Ministry of Natural Resources, Environment and Industry to correct this situation through public awareness programmes.

Technical equipment received under the IDSD project was considered the most beneficial of the products of this project as it met outstanding needs within the Physical Planning Section and Lands Department. Three computers, a hand held GIS plotter and related GIS based software are all intended to enhance the capacity and efficiency of the Land Information System of the Physical Planning Section.

Belize is proud of progress it has been making through its internationally well respected *Protected Area Conservation Trust*, a fund established to support the work of CBOs, some NGOs and a few government departments for implementation of conservation activities in protected areas. Funding for this activity is through a legislated taxation mechanism for collecting an

environmental tax on tourist arrivals. Management of the Trust is effected through a Board which oversees the provision of project support up to a maximum of Bz.$35,000 (US$ 2:1) per project. *Because of the many requests it receives for information on the work of this Trust, the MNREI seeks to find a mechanism of sharing its experience and explored opportunities for proposing this case as a Best Practice for sharing across SIDS and other developing countries.* It is recommended that this initiative be examined and written up as a case study, perhaps by a national or regional academic or research institution, and promoted electronically through an enhanced MNRE website with appropriate links through websites such as the IDSD and SIDSNET sites.

Processes used to access information and to communicate with colleagues are predominantly via the e-mail route and because of the fluctuating volumes of e-mail, can become very onerous at times. All requests to the MNREI for information are received by the Communications Officer whose task is to direct such requests to relevant persons within the Ministry. Responding using traditional means consumes significant staff time.

> *It was apparent that use of information technology has not been the means of choice by the MNREI for responding to the information needs of the public and governmental partners.* Use of its own website is very limited as are the use of the Internet in general. Respondents to this evaluation process admitted their own limitations on knowledge of the full value and potential of IDSD website as it was not used regularly. Indeed, for purposes of answering the evaluation questionnaire, project participants were compelled to revisit the site regularly. Also, the CCA-managed E-Group established to facilitate communications between project participants, is not used.

*Exposure of Belizean participants to the IDSD process therefore did not have a lasting impact on changing behaviours or changing working modalities with respect to the use of information technology for data management, information processing and sharing.*

*6.5.2. Areas of need for further intervention and support*

*High priority has been attached to the need for establishment of a sustainable development council or commission* and a proposal has been developed to this end. Assistance will be necessary to examine suitable structures that will formalize mechanisms for integration, planning and information sharing between Belizean governmental and non-state institutions. Many models exist and recommendations were made to source information using the IDSD site and SIDSNET which both provide useful links to best practices on countries' efforts to meet this important goal of Rio and Johannesburg. Next steps under the IDSD project could be assistance to Belize in fostering active networking between countries in the Caribbean and Latin America which have made great advancements in establishing formal structures for sustainable development collaboration.

*Establishment of a national sustainable development indicators programme was also identified as a high priority goal of the government*. Interest was strengthened following Belize's active participation in the January 2004 Sustainable Development Indicators Workshop held in St. Lucia. CEOs of MNREI Units have already held meetings with colleagues in other ministries and there is general buy-in for the process in Belize. To date no assistance has been sourced for this purpose outside of the country, and any guidance will be welcomed. *The work of Barbados in advancing its sustainable development indicators programme is viewed as a best practice in the region and, among SIDS globally, the role of SPREP has also been flagged as another best practice for sustainable development indicators*.

*Hardware and software needs are always ongoing* especially after exposure under the IDSD training elements where participants were made aware of a significant range of tools and methods for IMS. Acquisition of additional plotters and related software were identified as priorities for the government.

*Additional training is proposed and anticipated* under any further phase of the IDSD project. It was felt that the one day training session on climate change and disaster management held on 6 Feb 2004 was inadequate. Perhaps one and a half days would have been more effective. Additionally, topics should be expanded to include training on sustainable tourism and land use practices.

Improved content management of the Ministry's Website is seen as a crucial need. The site has been established but updating of information is not as active as expected. Constraints are imposed by the limited human resource capacity available for this purpose in the Ministry's Public Education and Communications Unit which comprises one Communications Officer. The unacceptably intense workload of this officer whose responsibilities include media communications, speech writing and website management has led to a recommendation for an additional staff member in this department whose focus will be upon website management, leaving the other traditional communications role of the Ministry to the incumbent. This position is still only a proposal and has not yet been budgeted. *Training of the new staff member in website content management will be necessary and recommendations for a cost effective approach to this would be an attachment to one of the leading IT departments, either in-country, or elsewhere in the Caribbean.*

A Clearing House Mechanism under the National Biodversity Project is expected to be established within one year and it will be monitored keenly to determine its applicability for other sectors or for providing information inputs for meeting the country's sustainable development objectives. It was considered to be too early to assess specific needs for this level of data processing, information management and information sharing required within Belize. Satisfaction with the existing process of bilateral cross sharing of data and information between Ministries and agencies, both formally and on an ad hoc basis, has proven beneficial and effective in a small government administration, and provided recipients with great results. *The greater efficiencies that can be achieved from the use of more cost effective information tools and technology must be promoted in Belize as the approach taken that because of smallness, there is no need to up tool, can continue to constrain data and information inputs for effective decision making on sustainable development*.

Additionally, interagency sharing of information within government does not necessarily engage collaboration and participation of non-government actors within this existing framework of governance. Good governance practices must be anchored in processes of transparent information gathering and dissemination in which all sectors of the national community must participate. Although there is a Freedom of Information Act, as in many other countries, it could not be ascertained how much this was used, should any member of the non-state sector wish to access information that was only shared inter and intra ministerially.

The value of electronic networking for engaging active public participation in sustainable management of natural resources and other national assets needs to be highlighted in Belize perhaps through a next phase of the IDSD project on a bilateral basis with countries such as Jamaica or Costa Rica.

### *6.5.3. Institutional landscape[60] (status, collaboration, coordination: government, NGOs and CBOs)*

The Policy Unit of the MNREI is central to the work of the Ministry in its support of both administrative and technical arms of the institution. An internal network server links all departments so intra-ministerial information is readily available to all staff.

In addition to such electronic means, face-to-face contacts are maintained within what is considered to be a small close-nit organization. Information is shared directly in regular monthly meetings between the CEO of the Policy Unit and senior staff of the Ministry.

The information gathering role of the Policy Unit leads to filtered and analyzed information being provided for the benefit of decision-making by the CEO.

Inter ministerial information sharing and exchanges are also considered effective via the 'people net' since the Belizean government is relatively small and all ministries interact on a regular basis. The system of Cabinet meetings every Tuesday and Cabinet De-briefings for CEOs every Wednesday is considered to be an effective form of sharing the end results of inputs of information to the decision-making process. As in all countries, Cabinet decision-making is a political process which may or may not reflect inputs from all factions of a country. Thus, as recommended elsewhere in this report, Belize can also benefit from a retrospective analysis of Cabinet decisions to determine whether information inputs to this process led to greater sustainable approaches to decision-making.

#### *6.5.3.1. Collaboration with Civil Society Institutions*

Involvement of NGOs, CBOs and private sector interests ranges from a mix of active participation within certain fora, to reactionary responses to public sector decisions or activities. In general when included as members of councils/ task forces/ boards or committees, there is active engagement. In this manner a good working relationship has been fostered with larger more organized environmental NGOs such as the Belize Audubon Society, Programme for Belize and Wild Tracks all of which have representation in the National Biodiversity project and its related Clearing House Mechanism. It is reported that these groups find ways of getting their agendas onto the table and although NGOs are often times reactionary, some have adopted progressive approaches to collaborating with government on environmental management.

Experience with trades unions and similar groups have been through their formal participation as members of government convened councils/ task forces/ boards such as the Human Development Advisory Council and the Economic Council. Support for the work of these *fora* imposes a measure of strain on the limited human resource capacity of government, and in response to specific questions on information management to facilitate such processes, it was revealed that no electronic means of shared access to data and information exists. Traditional modes are utilized,

[60] Excerpts from website www.mnrei.gov.bz The Department of Environment (DOE) of the MNREI has as its major functions as described by the Environmental Protection Act:
(1) To advise government on the formulation of policies relating to good management of natural resources and the environment;
(2) To foster, through Inter-Ministerial Cooperation, the prudent use and proper management of the natural resources of Belize, the control of pollution and re-establishment of an ecological equilibrium;
(3) To provide decision-makers with the necessary information and direction so as to achieve long-term sustainable development;
(4) To provide information and education to the public regarding the importance of protection and improvement of the environment;

distributing hard copies of minutes, responding directly to requests for information and using other bi-lateral means for information exchanges between government departments and forum memberships.

Creating awareness and knowledge of the power, cost effectiveness and value of electronic networking in support of the work within these several *fora* must be of top priority to assist Belize in transforming from such time consuming and inefficient means of making information available and engaging in IT facilitated two-way flows of communication with its civil society partners.

In response to specific questions on transparency of information management and whether a Freedom of Information Act was utilized by the public, the consultant was informed of the role of the new Ministry of National Development which incorporated a good governance focus and which has responsibility for operations of the FIA.

7. Review of Evaluations by Participants of the October 2003 IDSD Training Workshop in Trinidad and Tobago

The consultant was guided by e-mail communications from the Project Manager for the IDSD Project, Leisa Perch that an evaluation of this Workshop was no longer necessary as originally conceived since this was subsequently undertaken by OAS staff. Following an overview of the original questionnaire forms completed by participants, and of the summary of comments prepared by OAS Staff, it was agreed that this summary is adequate for inclusion in the final report of the project and no further action was required.

8. Facilitation of the Finalization of Other Project Outputs

1) Outstanding deliverables under the project relate to the delivery of additional training modules under the Project themes, specifically for St Lucia under its Coastal Zone Management Theme. However, as mentioned previously under the country analysis section, St. Lucia would rather utilise the training budget line for additional hardware and software since the quantum was considered inadequate for training.

2) Completion of the procurement process for hardware and software acquisitions was expected within the near future by all countries.

3) Top priority was assigned to initiation of recommendations for the establishment of the Pilot Network.

4) The E-Group managed by CCA has not been as effective as anticipated since it is e-mail based and overload using this means of communication has been cited as a major constraining factor by respondents. Thus, establishment of a more effective Forum for exchanges of experiences between persons trained in IMS is still seen as high priority.

5) Expansion of the value of the IDSD website through increasing links to UN sites and populating it with more region-specific information is necessary.

6) Increased access to Best Practices of relevance to the region need to be developed through appropriate links on the IDSD website.

7) Mechanisms for monitoring and evaluating information flows into decision-making processes and outflows from decision-makers are yet to be addressed under the project.

8) Additional support was requested to address more effectively reporting constraints to MEAs and other global agreements, experienced by SIDS on an ongoing basis.

## 9. Recommendations For Further Activities

### *9.1. Areas requiring more work and investment for sustainable capacity building*

Recommendations for action have been provided throughout the text and are not summarized here. However, because of the importance of a major information gap facing the region, which needs to be addressed as part of a *programmatic framework rather than through discrete projects*, only one recommendation is offered as a major next step as determined through this evaluation process.

*Overwhelmingly, the role of indicators in decision making for sustainable development was seen as the major area of information management requiring further support in the Caribbean* (see Country analysis sections of the report).

Despite substantial support from UNDESA and UNSD for building capacity in some Caribbean countries, much more support for national indicators programmes has been identified as a priority for countries. It is recommended that a programmatic approach be undertaken to ensure that incremental progress is made in transforming approaches to data collecting and processing and in converting such processed data to information that can be utilized effectively within an indicators programme.

Respondents were all cognizant of the need for building national capacity for undertaking the careful process of selecting those indicators for which data is either already being collected or for which data can be or needs to be collected.

It is therefore recommended that priority attention be given under any new phase of an IDSD programme to;

- ✓ Providing opportunities for south-south technical assistance for scoping needs for national sustainable development programmes - matching countries with advanced progress in developing and implementing national sustainable development indicator programmes with those seeking assistance. The outstanding value of such bilateral collaboration at the country level is that practical insights, constraints, pitfalls can be flagged in the early stages for the guidance of the beneficiary country.

- ✓ Making technical support available for paring down lengthy lists of indicators to relevant and manageable levels. Too often, countries preference for quantity and comprehensiveness under indicators programmes are counterproductive as data collection and information processing for large numbers of indicators cannot be implemented cost-effectively.

- ✓ Assisting countries with implementing the process of linking indicator selection to country specific sustainable development goals that have been identified within the framework of the Millennium Development Goals

- ✓ Building capacity for prioritizing indicators to be addresses on an incremental basis.

All efforts should be made to ensure that all of the above elements are incorporated into a programme rather than as one off projects.

## 10. Recommendations For Training Materials To Be Placed on The IDSD Website

It was not possible to assess effectively specific additional training needs for placement on the website. Existing resources and access to others via the IDSD website were considered to have been adequate for all participating countries. Participants have not exhausted the use of training materials made available under the project. However, it was recommended, in response to specific questions on the subject, that great benefits would be realized if urgent action is taken to increase the numbers of links to a range of other websites with tools and methodologies for IMS.

## 11. Overall Conclusion

The IDSD project contributed significantly to raising awareness of the need for improving information management systems in the Caribbean countries which participated in the pilot programme. The establishment of a website which houses most of the resources produced during the project development process has also added significant value through providing access to tools, methodologies and other training materials that are important reference sources for use by participants and other collaborators.

The project built upon pre-existing experiences and addressed needs for equipment and training in each of the pilot countries.

With some exceptions, which were mentioned within the report, participants received deliverables promised at the outset of the project implementation process. A new baseline has been established under this project which demonstrates a positive impact upon the process of information management for the region. Clear mechanisms for monitoring how information is fed into national decision-making machineries, and for determining how much of that information is actually utilized in making decisions have not been articulated in the project and a special focus is necessary to examine this aspect of information for decision making for sustainable development.

*ANNEX 1- SUMMARY OF QUESTIONNAIRE RESPONSES*

| **Question Number** | *Responses* | | | |
|---|---|---|---|---|
| | **Barbados** | **St . Lucia** | **Belize** www.mnrei.gov.bz | **Jamaica** www.nepa.gov.jm |
| 1. Overall Project Objectives | | | | |
| 1a Have overall project objectives been achieved? _____ (Scale of 1-10)[61] | 7 | 4 | 6 | 6 |
| 1b Has the project stimulated development of an operational network of information management institutions at the national level? Yes ____/ No ____ / Don't know_____ | No | yes | No | No |
| 1c If yes, kindly provide the name / website URL of the network and name/contact information of its principal facilitator/s | | In progress www.planning.gov.lc | | |
| 1d Has an operational network of information management institutions been established at the regional level? Yes ____/ No ____ / Don't know_____ | Yes | Don't know | Don't know | Don't know |
| 1e If yes, kindly provide the name / website URL of the network and name/contact information of its principal facilitator/s | CCA E-Group | - | | |
| 1f Name the local level institutions (NGOs, CBOs, SIGs) involved in the pilot network of information management institutions within the country and name their principal collaborators | Bdos Nat Trust; Regional; CCA | Work in progress | | |
| 1g Are you aware of who the information managers trained under this project are? Yes ____/ No ____ / Unaware of training programme _____ | Yes | yes | Yes | Yes |
| 1h If yes, are personnel trained under the project capable of training information managers nationally? _____ (Scale of 1-5) | 4 | 2 | 3 | 4 |

[61] *On scales of 1-5 and 1-10 throughout this document the higher number refers to the most positive/favourable assessment and 1 refers to the least. Respondents are free to use minus 1 if absolutely convinced that the action/output is well below par and deserves to be highlighted in this manner.*

| | | | | |
|---|---|---|---|---|
| 1i Are personnel trained under the project capable of training information managers regionally? _____ (Scale of 1-5) | 4 | 1 | 2 | 4 |
| 1j Are training materials on Information Management Systems (IMS) adequate? _____ (Scale of 1-10) | 8 | 1 | 7 | 6 |
| 1k Comment on the degree of accessibility of training materials on IMS for use by trainers; Select ONE: Easy? _____ Moderately difficult? _____Very Difficult? _____ Inaccessible? _____ Unavailable? _____ | Easy | Very difficult | Moderately difficult | Moderately difficult |
| 1l Are electronic linkages to regional information networks Adequate? _____ Limited? _____ Inadequate? _____ (Select ONE) Expand on what is missing and what needs to be prioritized. Missing links (with URLs where possible) | Adequate; - - | Adequate; - - | Adequate; - - | Inadequate – database must be developed to find resource links using keywords (for issues, geographical references) |
| 1mAre electronic linkages to United Nations System sites and information networks adequate? _____ Limited? _____ Inadequate? _____ (Select ONE) Expand on what is missing and what needs to be prioritized. Missing links (with URLs where possible) | Adequate; - - | adequate | Adequate; - - | Limited |
| 1n Has a forum for the exchanges of experiences between regional and national IMS managers been developed? Yes ____/ No ____/ Don't know_____ | Yes | Don't know | Don't know | No |
| 1o If yes, is it being utilized, Select ONE: sufficiently?_____, moderately?_____, rarely?_____, not at all? _____ / Don't know_____ | Moderately | - | | |
| 1p What institutional groups constitute the main participants of the forum; government?_____ Multilateral? _____ NGO? _____ CBO? _____ SIG? _____ (weight EACH on a scale of 1-10) | Multilateral no weighting | Government 4 | | |
| 1q Have national decision-makers begun to source and utilize information from institutions | 5 | 3 | 5 | 6 |

| | | | | |
|---|---|---|---|---|
| and resource persons more frequently? _____ (scale of 1-10) | | | | |
| 1r Are you satisfied with the level of feed-back by decision-makers on the value of information provided? ___ (scale of 1-10) or made accessible? ___ (scale of 1-10) | 5; 5 | 1;1 | | 5; 5 |
| 1a (s/b 1s) Have your expectations been satisfied with the level of training ___tools __and technological upgrades __ for information management for your country provided under this project?__ (scale of 1-10) | 5;5;8 | 3;2;2 | 7; 10; 10; 9 | 6; 6; 7 |
| 2. Overall Project Activities | | | | |
| 2a Have <u>regional</u> needs for information management systems for sustainable development been identified adequately? ___ (scale of 1-10) or Don't know ___ | 8 | 2 | Don't know | 5 |
| 2b Have <u>national</u> needs for information management systems for sustainable development been identified adequately? __ (scale of 1-10) or Don't know _____ | 5 | 2 | 6 | 5 |
| 2c Was the core curriculum for training of trainers suitable for developing IMS at the <u>national</u> level? _____ (scale of 1-10) or Don't know _____ | 7 | 3 | 7 | 5 |
| 2d Was the core curriculum for training of trainers suitable for developing IMS at the <u>regional</u> level? _____ (scale of 1-10) or Don't know _____ | 7 | 2 | Don't know | 5 |
| 2e Are training materials adequate? _____ (scale of 1-10) or Don't know _____ | 8 | 2 | 7 | 6 |
| 2f Are training materials effective? _____ (scale of 1-10) or Don't know _____ | 5 | 2 | 7 | 6 |
| 2g Are training materials user friendly? ____ (scale of 1-10) or Don't know _____ | 8 | 2 | 7 | 7 |
| 2h Are training materials available to others as a means of addressing the train the trainers goal of the project? _____ (scale of 1-10) or Don't | 8 | 1 | 7 | 6 |

| | | | | |
|---|---|---|---|---|
| know _____ | | | | |
| 2i Have training and training materials led to the development of IMS in- country? _____ (scale of 1-10) or Don't know _____ | Don't know | 2 | 3 | 5 |
| 2j Have training and training materials led to the development of IMS regionally? _____ (scale of 1-10) or Don't know _____ | Don't know | Don't know | Don't know | 5 |
| 2k Is the draft Final Report on Implementation Accessible? Yes _/ No __ | Not sure | no | | Yes |
| 2l On a scale of 1-10, is the draft Final Report on Implementation accurate?_____; Useful?_____; Adequate?_____; Readily understandable by the un-initiated? _____ | | | | 7; 7; 7 - |
| 2m Is the IDSD website meeting national needs adequately? Yes ___/ No ____ Moderately? Yes ____/ No ____ Not at all? Yes ____/ No ____; | Adequately; yes | Moderately -Yes | Not at all | Moderately -Yes |
| 2n Have information sharing and exchanges between national institutions improved? (scale of 1-10) | 5 | 3 | 3 | 6 |
| 2o Have information sharing and exchanges between Caribbean institutions improved? (scale of 1-10) | 5 | 2 | (Self marker used) DK -Don't know | 6 |
| 2s (s/b 2p) Have adequate monitoring and feed-back mechanisms been developed to monitor the use of data and processed information by institutional managers and national decision-makers? _____ (scale of 1-10) | 5 | 1 | 3 | 3 |
| 3. Facilitation of information management for effective national decision-making | | | | |
| 3a Has the capacity of collaborating institutions in your country been enhanced for the handling and management of data? _____ (Scale of 1-10) | 10 | 3 | 7 | 8 |
| 3b Has the capacity for transforming data and information suitable for decision-making improved? _____ (scale of 1-10) | 9 | 3 | | 7 |
| 3c How satisfied are you with the level of involvement of civil society institutions; NGOs, | 9 | 0 | 4 | 7 |

| | | | | |
|---|---|---|---|---|
| CBOs, SIGs in the processes of information management for decision-making in your country? __ (scale of 1-10) | | | | |
| 3d What is your level of satisfaction with the training and access to available tools and methodologies provided for the creation of integrated data management systems _____ (Scale of 1-10) | 8 | 2 | 6 | 5 |
| 3e Has the IDSD project facilitated your country to create mechanisms for long-term management of sustainable development and environmental information. ____; (scale of 1-5) or Don't know _____ | 3 | 3 | 1 | 4 |
| 3f Has the IDSD project assisted /facilitated your country to define ways of harnessing sustainable development and environmental information for decision-making purposes? ____; (scale of 1-5) or Don't know _____ | 3 | 3 | 1 | 4 |
| 3g Are you familiar with the findings /recommendations of the training needs report? Yes_____/ No _____ Unaware of its existence_____ | Yes | no | Yes | Yes |
| 3h If yes, what level of priority should governments give to investing resources to address training needs identified? _____ (scale of 1-10) | 9 | (2) | 6 | 8 |
| 3i Will such investment lead to transforming current modes of decision-making in your country? _____ (scale of 1-10) | 9 | (2) | 4 | 8 |
| *3.1. Assessment of the IDSD Website*<br>***3.1.1 Content: scope/coverage, relevance and linkages*** | | | | |
| 3.1.1a Has the site exposed you to new information from sources relevant to your area of work? _____ (scale 1-10) | 10 | 4 | 3 | 7 |
| 3.1.1b How useful for your work are the outputs of the IDSD project which are housed on the site? | 10 | 4 | 6 | 8 |

| | | | | |
|---|---|---|---|---|
| _____ (scale 1-10) | | | | |
| 3.1.1c Rate the usefulness of each of the following site resources on a scale of 1-10; *Presentations from Resource Persons Meeting _; Report on Information Needs _; Report on Pilot networks _; Report on Training Workshop _; Databases_; Institutions_; Methodologies_; Themes_; Project Background _; Related Activities _* | 8; 8; 8; 8; 9; 9; 8; 9; 9; 9 | 6; 3; 2; 5; -; -; -; 4; 4; - | 6; 7; 4; 7; 8; 7; 8; 8; 7; 7 | 8; 9; 9; 8; 7; 8; 7; 7; 8; 8 |
| 3.1.1d What is missing? Specify | | | | More country specific content, content must be deepened, enriched |
| ***3.1.2. Content management*** | | | | |
| 3.1.2a Is updating of the site sufficiently regular? _ infrequent?__ inadequate?__ | Regular | regular | Infrequent | Infrequent |
| 3.1.2b Are you satisfied that the information provided is sufficiently up to date for the purposes of providing information to decision-makers? _____ (scale 1-10) | 9 | 3 | 6 | 7 |
| ***3.1.3. User satisfaction*** | | | | |
| 3.1.3a Are you comfortable using the site? _____ (scale 1-5) | 5 | 3 | 5 | 4 |
| 3.1.3b Are you plagued by error messages? Yes _____ / No _____ | No | yes | No | No |
| 3.1.3c Are PDF files downloaded easily? _____ (scale 1-5) | 4 | 4 | 4 | 4 |
| 3.1.3d Do the links to other sites work? _____ (scale 1-5) | 4 | 4 | 4 | 4 |
| 3.1.3e Are you satisfied with the level of user feedback and monitoring mechanisms built into the site?_____ (scale 1-10) | 9 | 1 | | 7 |
| 3.1.3f How important is the need for mechanisms to monitor responsiveness to user enquiries for information? _ (scale 1-10) | 9 | 5 | | 9 |
| 3.1.3g Are responses to online enquires prompt?_____ Slow? _____ None? _____ | Prompt | N/a | | Did not try |

| | | | | |
|---|---|---|---|---|
| 3.1.3h Have you ever been directed to suitable linkages when the site does not address your queries? Yes _____/ No _____ | No | | (Self Marker) - Haven't used online requests | No |
| ***3.1.4. Effectiveness as a portal for methodologies and tools on information management for sustainable development*** | | | | |
| 3.1.4a Has information obtained from the site changed the way <u>you</u> work on a day to day basis? Yes ____/ No ____ | No | no | No | No (mainly because NEPA was already applying this) |
| 3.1.4b If yes, what has been the degree of this change? _____ (scale of 1-10) | | | | |
| 3.1.4c Are you aware whether information on the site has changed the way <u>institutions/ individuals</u> with which you collaborate work? Yes ____/ No ____ | Yes | no | No | |
| 3.1.4d If yes, what has been the degree of this change? _____ (scale of 1-10) | 5 | | | |
| 3.1.4e Have the enhanced access to training tools and information made an in-put to streamlining data and information for decision-making in your organization? _____ (scale of 1-10) | 5 | 2 | 3 | 8 |
| 3.1.4f And in other organizations with which you collaborate? ___ (scale of 1-10) do not know _ | 8 | 1 | Do not know | 8 |
| 4. Facilitation of reporting obligations to MEAs and Donor Organizations | | | | |
| 4a Was the training provided to personnel for identifying effective approaches to MEA mandatory reporting processes satisfactory? _____ (scale of 1-10) | 7 | 1 | (Self Marker) Don't know of training | 3 |
| 4b Has such training led to the adoption of more sustainable approaches to the challenges of annual reporting in different formats of MEAs and donors? _____ (scale of 1-5) or Don't know _____ | 2 | 1 | Don't know | 4 |
| 4c Have any opportunities been missed during project implementation to address the challenge of streamlining/ harmonizing data and information inputs to the varying reporting formats of MEAs and donors? Yes ____/ No | Yes | Yes | Not sure | Yes |

| | | | | |
|---|---|---|---|---|
| ____ Not sure _____ | | | | |
| 4d If yes, have MEAs and donors been sufficiently involved in the process of correcting a process which constrains the limited human and institutional resources of SIDS? _____ (scale of 1-10) | 5 | 9 | | 3 |
| *4.1. Building on pre-project capacities/experiences in the region.* | | | | |
| 4.1a Has the IDSD project added value to the work of the UNSD/CARICOM project on 'compilation and dissemination of statistics and indicators for conference follow-up? Yes ____/ No ____ Not sure _____ | Not sure | Yes | Not sure | Yes |
| 4.1b Has the IDSD project added value to UNEP's work in the field of environmental information management? Yes ____/ No ____ Not sure _____ | Not sure | Yes | Not sure | Yes |
| 4.1c Has the IDSD project improved access to the range and volume of pre-existing materials on IMS in the region? (scale of 1-5) _____ or Don't know _____ | 3 | 3 | 3 | 4 |
| 5. Assessment of Project Implementation Methodology (PIM) | | | | |
| *5.1* Baseline assessment of pre-existing activities and capacities | | | | |
| 5.1a Have you read the assessment report on pre-project initiatives on the IDSD website? Yes _____; No ____; Unaware of its existence _____ | Yes | Unaware of its existence | Unaware of its existence | Unaware of its existence |
| 5.1b Is the assessment report on pre-existing activities in IMS and IDSD comprehensive? _____; limited? _____; accurate? _____; useful? _____ (scale of 1-5 for each) | 3; -; 4; 4 | | | Limited (no scale given) |
| 5.1c Has the IDSD project implementation process enhanced your capacity to utilize pre-project resources more effectively? Yes _____; No ____; | Yes | yes | Yes | |
| 5.1d What information resources are you now aware of that can contribute more efficiently to decision-making in your country because of the | Comprehensive listing of resource sites especially | GEO-SEIAN project by the Univ. of Costa Rica | www.oas.org/publications www.cpacc.org | |

| | | | | |
|---|---|---|---|---|
| IDSD project? Provide names (and URLs where possible) | regional sites are very useful | | www.uvic.ca/scenarios | |
| *5.2. Assessment of choices of best practices and tools for IMS and Reporting on SD* | | | | |
| 5.2a Have you reviewed the collation of best practices and tools for assisting pilot countries in managing information for and reporting on sustainable development? Yes ____; No __; Unaware of its existence __ | No | Unaware of its existence | Yes | Unaware of its existence |
| 5.2b Is this collation of best practices and tools comprehensive? _____; limited? _____; accurate? _____; useful? _____ ; useless? _____ (scale of 1-5 for each) | | | Limited | |
| 5.2c Is access by information managers to information on these best practices and tools adequate for all stakeholders? _____ or limited to selected government or other official stakeholders? _____ (scale of 1-5) or Don't know _____ | | Don't know | 3, Limited to selected gov't or other official stakeholders | |
| 5.2d Was the collation of best practices and tools sufficiently collaborative? _____ (scale of 1-5) or Don't know _____ | | Don't know | Don't know | |
| 5.2e Are you aware of relevant practices and tools that may have been omitted or missed? Yes _____; No ____; | | no | | |
| 5.2f If yes, provide details or links to missing but useful practices/ experiences / tools for managing information and for reporting on sustainable development. | | | | |
| *5.3 Establishment of the Pilot Network* | | | | |
| 5.3a Have you read the proposal for the establishment of the pilot network for decision-making for sustainable development? Yes_____ / No _____ Do not know of its existence _____ | Yes | Yes | Yes | Yes |
| 5.3b If yes, are you aware of the level of progress made on implementation of key | No | No | No | No |

| | | | | |
|---|---|---|---|---|
| recommendations? Yes_____ / No _____ Do not know _____ | | | | |
| 5.3c Has the level of training on tools and methodologies been adequate for operation of the pilot network? _____ (scale 1-10) | 7 | 3 | | 7 |
| 5.3d Will the full operationalization of its recommendations satisfy needs for building capacity for efficient information supply into the decision-making processes of your country?_____ (scale 1-10) | 5 | 2 | 4 | 6 |
| *5.4. Process of website development.* | | | | |
| 5.4a Are you aware whether the process of development of the IDSD website was used as a training opportunity for pilot country personnel? Yes _ / No _ Do not know _ | Yes | No | Don't know | Yes |
| 5.4b If yes, have institutions with which you collaborate been stimulated to develop websites for better management of their institutions' data and information? Yes___ / No _____ Do not know _____ | Don't know | No | | Yes |
| 5.4c Is the "Development Links" Form on the IDSD site adequate for adding your link to this site? Yes_____ / No _____ Not aware of this form _____ | Yes | Not aware of this form | | Yes |
| 5.4d Do information providers in your country have tools necessary for contributing to the content management of the IDSD website? Yes__/ No __ Do not know __ | Do not know | Yes | Yes | Yes |
| 5.4e Is the information management process of the IDSD site too rigidly or controlled? Yes_____ / No _____ or; Should there be some degree of decentralization to the pilot countries Yes_____ / No _____ Do not know _____ | No; don't know | Yes; yes | | -; yes |
| *5.5 Identification of gaps in information* | | | | |
| 5.5a Has the system in your country been | 3 | 1 | 3 | 3 |

| | | | | |
|---|---|---|---|---|
| satisfactory for addressing gaps in knowledge and information necessary for decision-makers to function?_ (scale of 1-5) | | | | |
| 5.5b Are those gaps in information which remain, significant enough to influence negatively decision-making for sustainable development in your country? Yes_____ / No _____ Do not know ____ | Yes | Yes | Yes | Yes |
| *5.6 Links to other information portals and hubs (e.g. how were these selected?; why SIDSNET)* | | | | |
| 5.6a Have IDSD website hyperlinks to virtual information centers enhanced your capacity to provide information for decision-making? (scale of 1-5) | 4 | 3 | | 2 |
| 5.6b Were you involved in the selection of these sites for linkage? Yes___ / No _____ | No | Yes | No | No |
| 5.6c Name related information sites and hubs (names and URLs) which you visit regularly for information on sustainable development | All are already listed on the IDSD website | UNDESA; St Lu Statistics Dept; UNEP/ROLAC; OECS; ECLAC | | IISD http://www.iisd.org/, csd http://://www.un.org/esa/sustdev/ |
| 5.6d How do you access these sites? Via the IDSD site? _____ or directly? _____ | Directly | DIRECTLY | Via the IDSD site | Via the IDSD site & DIRECTLY |
| 5.6e Name key sites which should be linked to the IDSD site (names and URLs). | | | | IISD http://www.iisd.org/, csd http://://www.un.org/esa/sustdev/ |
| 5.7. *Procurement process for new hardware and software and training for enhancing technical* | | | | |
| 5.7b s/b 5.7a Has your country received operational hardware and software systems under the project Yes_ / No _ Do not know _ | Yes | No | Yes | Yes |
| 5.7c s/b 5.7b If No, are you aware when these would be expected? Yes_ / No _Do not know _ | | Yes | | |
| a) 5.7d s/b 5.7c Have your expectations been satisfied with the level of provision of technological upgrades for information management for your country under this | 5 | 4 on order | 4 Procurement process ongoing | X (5) after phone dialogue. What we obtained through the project has enhanced our capacity, but more resources |

| | | | | |
|---|---|---|---|---|
| project?_____ (scale of 1-5) | | | | will be required to set up the IT systems necessary for effective decision making. |
| *NAME OF RESPONDENT* [62]<br>*JOB DESIGNATION:*<br>*ADDRESS:*<br>Phone: _ Fax:_ e-mail: _ *Website: Date:_*<br>*Signature:*_____ | Amrikha D Singh<br>Environmental Officer<br>Ministry of Housing Lands and the Environment<br>1st Flr. S.P. Musson Bldg.<br>Bridgetown, Barbados<br>Ph. 246 467-5704<br>Fx. 246 437-8859<br>singha@gob.bb<br>Sgd. 13 Feb 2004<br>Fx. Rec'd 13Feb04 1:45 p.m. | Bishnu Tulsie<br>Chief Sustainable Development & Environment Officer<br>Ministry of Physical Development, Environment & Housing<br>-------<br>Ph. 758 451-8746<br>Fx. 758 451-6958<br>btulsie@planning.gov.lc<br>Sgd. 16 Feb 2004<br>Fx. Rec'd 16 Feb04 3:30 p.m. | Sharon Lindo<br>Sustainable Development Officer<br>------<br>Market Sq., Belmopan, Belize<br>Ph. 501 822-2082<br>Fx. 822-2333<br>policy@mnrei.gov.bz<br>www.mnrei.gov.bz<br>Sgd Feb 16 2004<br>Fx. Rec'd 18Feb04<br>Missing page received 19 Feb 04 | Franklin Mc Donald<br>CEO NEPA<br>10 Caledonia Avenue, Kingston 5<br>Ph. 876 754-7526<br>Fx. 876 754-7495<br>fmcdonald@nepa.gov.jm<br>www.nepa.gov.jm<br><br>16 Feb 2004<br>unsgd & received as a pdf file via e-mail 17 Feb 2004 1:00 a.m. |
| SPACE FOR ADDITIONAL COMMENTS IF NECESSARY | NOT USED | You may call me at 3:30 p.m. today or tomorrow at 2:00 p.m. sgd and dated 16 Feb 2004 | Illegible but clarification sought and advice received clarified that some equipment was received and others were in various stages of procurement. | NOT USED |
| Total Telephone Duration Times:<br>(i) Initial Contacts and Follow-Up;<br>(ii) Formal Interviews | 18 mins; 45 mins | 26 mins; 52 mins | 16 mins; 54 mins | 27 mins; 1 hr. 15 mins. |

[62] In all cases this person represented the team of respondents who collaborated on responding to the questionnaire. Team members are listed above.

**OAS Comments in Response to the IDSD Project Evaluation**

Leisa Perch served as project manager from the inception of the IDSD Project until December 2003, when she accepted a new position with UNDP. The final months of IDSD were managed by Sasha Gottlieb and Steven Stichter. Although no longer officially working on the project at the time of the evaluation, Leisa Perch provided comments on which are listed below. These comments were not included in the evaluation report itself in order to keep it independent, but are useful as annex for an additional perspective.

- In terms of value-added it should be noted that out of the Assessment Mission to St. Lucia for this project and their interest and proposed approach to Integrated Development Planning, St. Lucia benefited from additional support from UNDESA specifically to support IDP and indicator development.
- As regards electronic networking in 2.1.2, it should be noted that e-groups were established after all training workshops and specifically after the training workshop to facilitate discussions amongst trainers and participants.
- Regarding the pilot network - it should be noted that there simply was no time, given the limited support resources to the project, to dedicate the time that this would have necessitated. Discussions were had with ACS on their current effort. Efforts to engage CTO, CCA, Government of Barbados on the proposal for the pilot network to address sustainable tourism, received little to no responses.
- Section 3.2, St. Lucia's dissatisfaction with their NGO involvement is noted. However, there were not significant recommendations to improve the involvement of the sector even in the Resource Persons Meeting held there. The opportunity was provided for an NGO rep to participate in the training workshop in St. Lucia - none were recommended - there were three from government and one from the OECS.
- Website - difficulties registered by St. Lucia. Should be noted/reflected that these were never passed on to project manager. The website also provides a link to the project manager so that the concern could have been transmitted.
- The issue of reporting obligations was critical. We intended to work on this in the context of the SIDS/POA and the preparations for SIDS +10. However, there were many delays in tracking the progress and accessing the reporting mechanisms. It was difficult to fully address this within the limited time-frame of the project. The consultants involved in the training workshop were asked, however, to take the SIDS report into consideration in developing their sections.
- Section 6.2.1 - last paragraph which refers to the need for more PR on IDSD - note that OAS offices will likely organize a formal hand-over ceremony for the presentation of the equipment. OAS/Barbados is planning such an event for March 2004.
- Section 6.3.3 - first line re the default selection of "coastal zone management" for St. Lucia. As memory serves and as my note of the meeting will confirm, St. Lucia requested this topic which Barbados was actually pushing for. Since there was an opportunity for south-south cooperation and Barbados was already ahead in this area, Barbados agreed to go for Sustainable Tourism instead. That is my memory of the events and not what was submitted in the response to your question.
- Lastly, it should be noted that, as you well know, the countries were not always quick to respond to recommendations and proposals for action.
- Implementation has to be geared towards the absorptive capacity and at the time, more was to be gained by focusing on the training and the equipment than the efforts needed to get the network up and running.
- The website does have a "search" feature on it. While this is not a database, users can search the site using keywords.