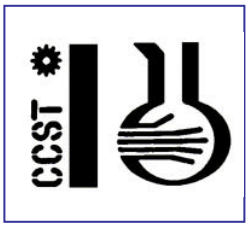
Science, Technology and Innovation

for Sustainable Development

Caribbean Regional Policy Framework for Action



Science, Technology & Innovation for Sustainable Development

- Caribbean Regional Policy Framework for Action

March 2007, CARICOM

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For further information or additional copies of this document, contact:

Secretariat
Caribbean Council for Science and Technology
c/o National Institute of Higher Education, Research, Science and Technology
P. O. Box 113
43-45 Woodford Street
Newtown
Trinidad and Tobago

www.ccst-caribbean.org
ccst@niherst.gov.tt

Tel.: (868) 622-7880, (868) 622-2264
Fax: (868) 622-1589

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CARIBBEAN COUNCIL FOR SCIENCE AND TECHNOLOGY

Foreword

The Caribbean Council for Science and Technology (CCST) is pleased to present, for the consideration of the leaders of the Caribbean Community (CARICOM), this Regional Policy Framework for Science, Technology and Innovation (STI). It is now the only such document to be put forward by a regional body which attempts to specifically guide the region's policy and decision-makers on building STI capacity to meet the pressing new demands of the knowledge-driven era.

The content of this document reflects the output of eighteen months of public consultations held in ten countries across the region, with the participation of the region's top academic and technical advisors as well as stakeholders from all interest groups. The recommendations are in accord with regional, hemispheric and international agreements endorsed by CARICOM heads.

CARICOM leaders have long recognized the need for building STI capacity in the region. However, as global developments race ahead in the industrialized and newly-industrialized nations, it has become even more urgent for the Caribbean to adopt and implement policies for immediate and further advancement in STI. The delay has already been costly in terms of both the physical infrastructure and the human resource development required to support innovation systems. There must be now clear policy direction, backed by more substantial commitment of resources, to drive the process and match the scale of the tasks ahead.

The CCST was conceptualized three decades ago to achieve for Science and Technology what the Caribbean Single Market and Economy (CSME) is attempting to do for trade today. A Regional Policy Framework for STI is directly in line with the 'single development vision' being articulated through the mechanism of the CSME. A single vision for STI will, in the same vein, foster greater collaboration and networking to optimize relatively scarce resources and help in the advancement of common STI goals that would be difficult to achieve individually by member states. A strategy for STI, harmonized with other sectoral polices, will directly support the economic aims of the CSME, since Science, Technology and Innovation cut across and underpin advancement in all socio-economic sectors, and drive productivity and competitiveness.

The CCST has included in this Regional Policy Framework recommendations for the use of future-oriented, strategic-planning tools such as technological foresighting, and technology and innovation road mapping, to support the policy development process and identifying niche areas in key sectors.

We hope that this proposed framework will be endorsed by CARICOM and translated into policies and action plans for immediate implementation, to accelerate the growth of all member states and ensure the sustainable development of the region.

Chairperson: Beverly J.T. Taylor Vice Chairperson: Lennox Chandler Secretary: Maureen Manchouck
Executive Members: James S. de Vere Pitt, Merline Bardowell & Armando Rodriguez Batista
CCST Secretariat: c/o National Institute of Higher Education, Research, Science and Technology
#43-45 Woodford Street, Newtown, Trinidad and Tobago. PO Box 113, Trinidad and Tobago
Tel: (868) 622-7880, 628-8523; Fax: (868) 622-1589; E-mail: ccst@niherst.gov.tt

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This document first reiterates the background and rationale for undertaking this exercise and distils that reasoning into a vision and mission for promoting and supporting the advancement of Science and Technology in the Caribbean. Then, the supporting institutions and mechanisms that must be addressed by each country are introduced, before the recommended objectives and strategies for each of the specific priority policy areas agreed upon in consultation are stated.

INTRODUCTION

1-1 BACKGROUND

In 1988, the Caribbean Community (CARICOM) adopted a regional Science and Technology policy that was never successfully integrated into national development planning, although that was the intent.

A decade later, in 1997, after discussions initiated by Grenada with representatives of regional Science and Technology bodies, the Caribbean Council for Science and Technology (CCST) accepted the responsibility for formulating a new regional science and technology policy.

Since then, with the support of the CARICOM Heads of Government, the Council for Trade and Economic Development (COTED) and the Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA), the CCST's original draft policy document has been repeatedly reviewed, revised, and strengthened. The document has been improved by the input of regional experts and senior officials with responsibility for science and technology, and by the outcomes of consultations held at the national-level throughout the Caribbean.

The overall goal of this whole exercise has been to provide a policy framework for the Caribbean for the national and regional promotion, application and attainment of excellence in Science, Technology and Innovation for meeting social and economic goals. This document is the culmination of that work, and is now submitted for the endorsement of CARICOM, by the Ministers with responsibility for Science and Technology.

1-2 RATIONALE

In order to achieve economic growth and diversification, the development process requires the appropriate application of sound scientific and technological innovation, by skilled human resources. This is a fact acknowledged by the most developed nations of the world, and by the countries of the hemisphere in the Declaration of Lima (OAS/CIDI, 2004). It is also acknowledged by myriad multilateral agreements that economic growth and diversification must be accomplished sustainably, in order to ensure that the environment is not polluted, and that resources are not exploited beyond their natural capacity for replacement.

The Caribbean Regional Policy Framework for Action provides a framework for guiding the formulation of decisions, and the consolidation of national and regional efforts, geared towards strengthening economic growth and diversification, by promoting, advancing, and sustainably utilising Science, Technology and Innovation (STI). Such efforts have the capacity to increase economic productivity, to enhance competitiveness, to create wealth, to alleviate poverty and unemployment, and to provide practical solutions that may improve the quality of life for all residents of the Caribbean. The adoption of this regional policy framework for STI provides an opportunity for Caribbean governments to acknowledge the potential benefits that science, technology and innovation may provide, when regarded as national investments.

The Caribbean region is operating within an increasingly competitive global economy. A country's ability to create wealth and jobs depends on the application of new technology to new enterprises, a well-trained and adaptive citizenry (to keep established industries competitive), and the development of a

knowledge-based economy. Countries face the task of strengthening innovation systems, in order to make the move towards knowledge-based economies and take greater advantage of globalisation.

Hence, there is a need to develop, within the Caribbean, a culture within which the advancement of knowledge is valued as an important component of national development. Citizens must be encouraged to be creative, innovative and productive, so as to increase competitiveness in local, regional and international trade. Efforts must also be made to establish efficient, integrated and complementary mechanisms, by which individual stakeholders, governments and industrial entities and may interact creatively and form collaborative partnerships, to their own benefit, and for the region at large.

Although great diversity exists among the countries of the Caribbean region as a group of developing economies, these countries share commonalities that traverse many economic sectors. Thus, any regional development policy must give focus to key productive sectors, including agriculture, manufacturing and heavy industry. The service-oriented sectors of health, education, energy and communication, and the issues of exploitation of our natural resources and protection of our environment and the Caribbean Sea, must also be addressed.

1-3 STATEMENT OF INTENT

The ministers participating in the First Meeting of the CARICOM Ministers of Science and Technology are called upon to affirm their commitment to utilise Science, Technology and Innovation for sustainable development, and to approve the mechanisms and priority strategies for science and technology proposed in this document, which were mandated for review and completion by the 21st Conference of the CARICOM Heads of Government, in July 2000.

By endorsing this Caribbean Regional Policy Framework for Action, the member states of the CARICOM confirm their commitment to act to put in place the necessary mechanisms, institutions and policy priorities elaborated herein, and to develop national Plans of Action for Science and Technology conforming to this framework.

1-4 VISION & MISSION FOR THE CARIBBEAN

Vision

A globally competitive, industrialised Caribbean, transformed and enhanced, by balanced and sustainable economic development in all key sectors, through the optimal advancement and application of scientific and technological knowledge and innovation, to competitive advantage, for the production of modern and advanced products and services, and for the improvement of the physical, social and cultural well-being of all Caribbean people.

Mission

To support and promote the successful transformation of the region into a globally competitive, industrialised body, through a regional Science and Technology policy that will promote innovation, technological advancement and industrial growth, by:

- *Individual and collective action, for the exploitation of science and technology in priority areas and key socio-economic sectors,*
- *Establishment of beneficial mechanisms and institutional arrangements, for the management of innovation,*
- *Human resource development, including the creation of a culture of innovation, and*
- *Encouragement of entrepreneurship and partnerships between relevant stakeholders, including government, business, labour and training institutions, at the national, regional and international levels.*

SUPPORTING INSTITUTIONS & MECHANISMS

2-1 INFRASTRUCTURE

Governments will intervene to address factors that restrain the number of valuable technology-based innovations, that raise obstacles to transforming innovation into entrepreneurial activity, and that weaken market selection processes to the detriment of innovative firms of high-growth potential. This includes:

- Providing conditions that are supportive to innovation and attractive to local and foreign investment, including:
  - stable macro-economic environments,
  - supportive tax and regulatory regimes,
  - appropriate physical infrastructure,
  - improved public sector efficiency and service, and
  - supportive education and training policies.
- Reforming regulations that inhibit innovation and entrepreneurship on the part of researchers in the public and private sectors, including the protection of intellectual property rights.
- Improving synergies between public and private investments in innovation, and encouraging partnerships between government, industry and academia for developmental technical research, both locally and internationally.

Governments will also identify, establish and support institutional frameworks that will direct the application of Science, Technology and Innovation for sustainable socio-economic development. The infrastructural institutions established shall include, inter alia:

- National statutory bodies that manage and give focus to Science and Technology (i.e. ministries, departments or other agencies);
- National Science Councils for advisement;
- Science, Technology and Innovation centres of excellence, and research institutes;
- National Science Foundations to access and distribute research funding;
- Accreditation boards for science and technology professions; and
- A Regional Council for tertiary education, research and development (R&D).

2-2 POLICY AND PLANNING

In order to ensure that national development planning processes integrate Science and Technology (S&T) considerations, Governments will:

- Develop policy statements, strategic plans and plans of action for Science, Technology and Innovation for sustainable socio-economic development,
  - Taking into account this Caribbean Regional Policy Framework,
  - Identifying and incorporating the technological requirements for the fulfilment of goals, objectives and targets for each Priority Policy Area, and for selected projects, and
  - Utilising Foresighting and Technology and Innovation Roadmapping, to evaluate possible future scenarios and their implications and to produce useful guides for strategies and operational policies.
- Establish processes for the review and evaluation of results.

- Establish focal points for coordination at the national level, and contributions to regional activities.
- Develop statistical indicators to measure benchmarks for S&T in industry and education.

Governments will also put in place suitable mechanisms by which relevant, independent scientific advisement will be obtained on a continuous basis from a wide cross section of scientists and technologists, so that government decision making, policy formulation, planning and implementation will be based on the best available scientific knowledge. Relevant scientific advisement and continuous foresighting should form an integral part of the planning process for programmes relating to all socio-economic sectors.

Government mechanisms for advisement will include the establishment of National Science Councils that will allow for broad representation from relevant stakeholders in Science, Technology and Innovation, including independent and private sector inputs. National Science Councils will report to the highest executive levels of statutory bodies responsible for Science and Technology, including the Ministers.

2-3 DEVELOPMENT FINANCE

Governments will endeavour to achieve targets of at least 3% of GDP, in active R&D programmes as an essential investment for the future. This represents a significant increase in R&D spending, from the current, relatively low, regional average of ~0.13% or less, of GDP, to a median investment level between that of other Small Island Developing States, and that of developed countries.

Governments will formulate focused financial strategies, and employ fiscal measures designed to ensure successful implementation of policy objectives, based on input from economists, financial experts and management experts and scientists. Strategies shall include:

- Development of incentives for R&D activities, particularly in industry.
- Establishment of an efficient and flexible financing system for development activity and business R&D, comprising of government tax incentives, loans and grants from national, regional and international sources, tailored to the specific obstacles that confront firms and industry sectors in each country.
- Methods of attracting higher levels of private investment for scientific and technological development, and identifying additional sources of financing, including foreign support and donor agencies, especially for Agriculture and Environmental Management.
- Encouragement of long-term financial commitments, esp. for Agriculture and Environmental Management.
- Methods of increasing the availability of venture capital funds for new technology-based firms, and for supporting R&D in Small and Medium Sized Enterprises (SMEs).

2-4 INNOVATION AND ENTREPRENEURSHIP

Governments will promote measures that enable their societies to make better use of available intellectual capital to generate greater levels of innovation and develop new technologies. Governments will also help to create linkages for translating knowledge generated into business development, and solutions to social problems. Such measures shall include providing:

- Financial and other support for research and development (R&D), such as will attract and help to retain internationally recognised researchers.
- Encouragement and incentives for commercialisation and industry, acknowledging that competition provides incentive to innovate.
- Support for the development of information networks, and fora for the sharing of resources, skills and capabilities, to enable new levels of collaboration and cross-disciplinary interaction between research entities and industry.
- Encouragement of linkages with the international scientific community, for technology transfer, knowledge sharing and the pooling of resources between countries, in Priority Policy Areas for STI.

In order to create supportive societal cultures that are conducive to scientific and technological innovation, and to encourage the expansion of entrepreneurial efforts, Governments will:

- Make efforts to enhance public awareness and appreciation of the benefits and opportunities that may be generated by the application of Science and Technology.
- Encourage the inculcation of cultural values and altitudes that create a positive climate for innovation, including openness to competition and risk-taking.
- Improve incentives for innovation, including providing funding for basic research in strategic areas.
- Manage human resource development in Priority Policy Areas, in order to ensure the availability of individuals with the necessary skill and creativity to develop and follow through on ideas from conception to production.

2-5 STANDARDISATION

In order to facilitate investment, trade and the diffusion of technology, Governments will apply coherent measures to transform production, and to demonstrate compliance with the growing range of regional and international technical regulations and standards that play a significant role in:

- encouraging global acceptance of emerging technologies,
- ensuring conformity to trade, health, safety and environmental obligations, and
- promoting quality, safety and efficiency in a wide range of activities.

As such, Governments will employ the following strategies for ensuring improved quality and standards for science, technology and industry:

- Establish and upgrade national and regional standardisation bodies, and network with standardisation bodies at the regional and international levels.
- Establish and upgrade national and regional facilities for industrial and legal metrology, product quality and testing, sectoral calibration and testing frameworks.
- Develop capacity-building programmes for improved industrial quality and management, based on the application of methodologies for continuous improvement of product and process quality.
- Harmonise legal and regulatory frameworks – review and evaluate, streamline and integrate existing and proposed laws and regulations.
- Establish and improve certification and accreditation bodies at national and regional levels:

- Act to ensure international recognition of accreditations and certifications.
- Incorporate the accreditation of medical laboratories, to ensure basic standards are being adhered to in terms of sanitation and equipment.

Governments will develop plans for the systematic dissemination of simplified information on new and emerging international standards, with particular emphasis on the young. Governments will also endeavour to create a culture of knowledge and interest in quality and productivity issues, including encouraging metrological practices and standards among vendors and the self-employed.

2-6 HUMAN RESOURCE DEVELOPMENT

Governments will endeavour to build capacity and set standards in Priority Policy Areas for Science, Technology and Innovation. Human resource development (HRD) strategies for Science and Technology must utilise a flexible, trans-sectoral approach that will focus attention on:

- Capacity building in Science and Technology Education.
- Capacity building in all Priority Policy Areas by:
  - Identifying needs in specific areas and devise strategies.
  - Harmonising the needs and capacity strengthening of each country with others in the region.
  - Establishing national priorities and identifying common regional priorities.
  - Formulating strategies for each priority area at the national level.
  - Conducting baseline inventories of resources, including personnel and institutions based on expected deliverables.
- Encouraging capacity building in policy development and programme and project management.
- Establishing standards, accreditation and certification criteria for professional scientific fields.
- Encouraging continuing education for professional development and certification by professional boards.
- Increasing the overall numbers of working scientists and assisting young scientists with their career planning and development.
- Supporting the advancement of women to more prominent roles in science and technology initiatives.
- Encouraging the use of incentives to attract, retain and reward scientists and engineers in their respective fields, especially Agriculture.
- Developing labour-market statistics and indicators, and information systems to help to predict human resource needs in strategic fields, such as engineering, biotechnology and environmental science.
- Encouraging the re-engineering of organisational systems for the optimal development and utilisation of human capital to facilitate innovation, creativity and efficiency in production.
- Enhancing training and improving skills by:
  - Developing tools for identifying skill and knowledge gaps.
  - Developing new training materials, and modify existing training materials.
  - Providing for strategic delivery of training, utilising partnerships with training institutions and industry.

2-7 SCIENCE AND TECHNOLOGY EDUCATION

Governments will ensure that instructional methodologies and foci, and budgetary allocations for Education, reflect the importance of Science and Technology Education to national development. Governments will also promote technological innovation through the use of knowledge management for local and regional development.

As such, Governments will improve the methodologies and relevance of resources used in the teaching/pedagogy of Science and Technology, by:

- Undertaking research to enhance the teaching of Science and Technology, to provide a foundation for good practice, and to develop integrated approaches to science learning for development.
- Development of integrated curricula relevant to both the needs of the individual and the socio-economic demands of society.
- Revolutionising methods of teaching science in kindergarten and early childhood, to make science fun and develop innovative hands-on approaches that stimulates curiosity without the use of textbooks.
- Incorporating observation, deductive reasoning, experimentation, research and problem solving skills, as pedagogical tools in curriculum delivery in science.
- Making mathematics and science compulsory at pre-tertiary levels, and fostering creativity, problem solving, a culture of research among students.
- Re-examining how examinations are set, and reintroducing science as a common entrance exam or SEA.
- Developing textbooks up to the CAPE level (equivalent to British GCSE A-level) that are relevant to CARICOM.
- Promoting mobile/satellite learning, and identifying and utilising 'master teachers' to provide instructions to a wider audience of students over the internet.
- Utilising state-of-the-art information and communication technologies, including virtual labs, distance learning, educational software, networks, etc., for teacher training and upgrading.
- Encourage the development of mechanisms linking tertiary institutions with primary and secondary institutions, in order to:
  - Enhance the consistency and continuity of S&T education.
  - Foster innovation in classroom methodologies.
  - Develop a cooperative bridge for helping classroom teachers to stay on the cutting edge.
  - Develop continuing dialogues for the benefit of industry and development.

Governments will encourage improved university management, assessment, syllabi and curricula, and will enhance quality assurance mechanisms and accountability for the expenditure of funds in public universities and colleges. International competitiveness of higher education institutions must be strengthened while reducing state regulation and intervention in university activities.

Governments will further improve higher education through enhanced opportunities in:

- Basic research, which provides the foundations that underpin technological and social progress;
- Cross-disciplinary programmes;
- Technical and vocational education; and
- Lifelong-learning, which serves a wide range of learners through structures that are readily accessible and affordable.

Governments will aim to popularise science, and to increase the levels of awareness and

appreciation of Science, Technology and Innovation in the general public, through:

- Seminars and workshops for the general public, promoting awareness, understanding and consideration of the region's scientific heritage, and regional pioneers in STI.
- National awards for excellence and contributions to STI, and for the recognition of inventions and innovations.
- Partnerships with local civic and community-based organisations.
- Formal advertising and marketing activities.
- Encouragement of activities that lead to STI awareness, experimentation and problem-solving within the workforce.
- Development and production of science magazines, websites, books, etc.

Governments will also aim to increase the quality and quantity of the available human resources trained in all Priority Policy Areas for Science and Technology, based on the needs of industry and society, by:

- Offering attractive/salaries and benefits to science educators based on their levels of expertise.
- Exposing science teachers to industry, to improve their appreciation of S&T and increase their effectiveness as teachers.
- Encouraging collaboration between local and regional tertiary institutions, for the transference of knowledge and skills into initiatives for economic growth, environmental improvement and community development.

Further, in order to increase students' appreciation of the relevance of STI to wealth creation, Governments will:

- Teach innovation and entrepreneurship from at least the secondary school level, and demonstrate S&T as a means of creating businesses. Postgraduate students engaged in relevant studies should be encouraged to include business plans in their theses.
- Develop assessment curricula for teaching and learning.

Finally, since health and physical fitness, and the training of athletes must be grounded in scientific knowledge, Governments will build capacity in this field, with highly qualified technicians and specialists, and promote physical fitness and sports, by:

- Developing physical and therapeutic education in schools.
- Conducting studies to assess the physical fitness of the Caribbean population.
- Conducting analyses of athletic potential, and athlete selection and preparation.
- Conducting studies on more efficacious and efficient uses of leisure time, sanely, formatively and creatively, through the incorporation of physical activity programmes, healthy living, and the promotion of good health in general.

2-8 RESEARCH AND DEVELOPMENT

Governments will endeavour to de-compartmentalise, better integrate, and thus invigorate major Science and Technology research areas, by pursuing the following strategies:

- Encourage the development of national and regional research institutes and overarching research management plans.
- Emphasise infrastructural development for STI in national development programmes, and prepare strategic projections for the determination of prioritised programmes.
- Encourage the development of greater linkages between the institutions along the innovation chain.

- Encourage the development of mechanisms to translate research results into industrial commercial applications.
- Improve awareness of and availability of existing information and data resources.
- Encourage the identification of data and research gaps, and encourage research and the collection of information to fill those gaps.
- Encourage the involvement of community groups, government agencies, universities and others in data collection and research.

Governments will also act to increase competitiveness and enhance future industrial development by:

- Encouraging more results-oriented research that is industry-related and market-driven as opposed to publication-oriented research, including re-engineering.
- Encouraging the development of entrepreneurial frameworks, to capitalise on opportunities presented by new fields of research, e.g. nanotechnology and biotechnology.
- Encouraging R&D and facilitating appropriate adoptions and transfers of technology in all Priority Policy Areas.
- Investing in research that has the potential to build economic strength.
- Reinforcing regional R&D projects.
- Develop mechanisms for identifying, valuing and making use of traditional knowledge and indigenous technologies.

2-9 REGULATORY FRAMEWORK AND INTELLECTUAL PROPERTY RIGHTS

Governments will facilitate and promote the stimulation of creativity and innovation, through the protection and use of Intellectual and Industrial Property Rights (IIPR), and utilising the following strategies:

- Establish efficient IIPR offices, fully equipped to undertake searches, formal and substantive examinations, grant and register patents, trademarks and copyrights.
- Establish legal systems that can adjust to changing environments, while protecting the rights of all to benefit materially from their inventions and creations.
- Encourage membership in regional and global organisations for IIPR, in order to enhance efficiency and effectiveness of national STI systems.
- Encourage professional study of the law as it relates to IIPR, patents and copyright.
- Encourage an awareness of Intellectual Property Rights among researchers and the general public, through mechanisms including training schemes and legal advice.
- Set up advisory networks for the production, commercialisation, use and protection of inventions.

Governments will also take action to ensure that regulatory regimes for copyright and patents, all Priority Policy Areas, especially environment and health, and standards for product performance and compatibility, are modernised through legislative reform, streamlined regulations, and simplified procedures. Well-developed regulations serve to stimulate innovation, to enhance the competitiveness of industry, and to reduce litigation, and must be based on sound science, and international standards.

PRIORITY POLICY AREAS

3-1 AGRICULTURE AND THE FOOD SECTOR

Governments will modernise agricultural sectors, by increasing investment in Science and Technology research and development, and acquiring the technological tools to:

- Enhance agricultural, forestry and fishery conservation, production and processing activities.
- Improve primary production, marketing, processing and export competitiveness.
- Control the use and abuse of natural resources by poor agricultural practices.
- Predict and mitigate the effects of global climate change on agriculture.
- Develop attractive and competitive value added products.
- Conserve and protect the genetic resources of the Caribbean.

General Strategies:

- Improve primary production in areas of post-harvest technology and systems.
- Develop sustainable land management technologies.
- Develop agricultural systems predicated on conservation of biodiversity.
- Promote pilot projects and awareness of the herbal industry, nutraceuticals and functional foods, as a target industry for assistance.
- Promote appropriate commercial technological support systems, such as for diagnostics and market information for agriculture, to improve the competitiveness of the sector.
- Encourage improvements in shipping services in the Caribbean.

Policy Priorities:

- Provide for the protection of energy and food sources.
- Provide for the use of alternative species and technologies.
- Develop best agricultural practices regarding the use and protection of natural resources.
- Establish an interaction between food security, health status and food policy.
- Establish a link to food safety in the health sector.
- Establish regulations and practices concerning food security, food safety for imports, job creation and revenue enhancement.

Research Priorities:

- Establish and support greater levels of collaboration between regional institutions involved in agricultural research and development of:
  - Systems of agricultural and livestock health protection.
  - Sustainable production technologies.
  - Land conservation and deforestation solutions.
  - Improved species, varieties and breeds, including GMOs.
  - Improved quality and diversity of agricultural and livestock products.
- Establish improved linkages with international agricultural scientists, through training courses, and sharing of experiences and information.

Educational Priorities:

- Improve the teaching of agricultural science to inspire more young scientists to work in this field, and to promote it as an attractive career option.

- Promote and encourage the integration of environmentally-friendly practices into traditional agriculture, and endeavour to reduce any cultural resistance to change in the agriculture industry.

3-2 BIOTECHNOLOGY AND BIOSAFETY

To enhance the growth of knowledge-based economies in the region, Governments will foster the strategic development of research capabilities to biotechnology to improve competitiveness in agriculture and food production, environmental sustainability and public health.

General Strategies:

- Develop relevant pilot projects for pursuit in the Caribbean.

Policy Priorities:

- Develop solid regulatory and legislative frameworks to address the evaluation of health and environmental risks and ethical issues with respect to the application of biotechnology.

Research Priorities:

- Develop support systems for the creation of effective, commercially-oriented networks within the research and industry sectors, with a view to identifying and removing impediments to the development and commercialisation of biotechnology.
- Encourage collaborative arrangements between research bodies, publicly and privately funded, in biotechnology and related areas, including microbiology, biochemistry, genetics, biochemical, chemical and agricultural engineering.

Educational Priorities:

- Establish independent information centres for biotechnology, with sufficient resources to provide up-to-date, balanced and comprehensive information on new biotechnological applications.
- Disseminate information to the public on current and proposed uses of genetically modified organisms (GMOs) in agriculture, food processing, health-care, waste treatment and other sectors.

3-3 ENVIRONMENTAL MANAGEMENT

In order to maintain and improve the quality of life for all Caribbean people, Governments will promote environmental protection, and the sustainable management and conservation of natural resources and biological diversity, by developing and strengthening educational activities, research programmes, technologies and other measures.

Governments will also develop and implement National Environmental Management and Action Plans (NEMAP) that will specify natural resource management targets, environmental activity areas for investment, and systems for environmental information management, including environmental reporting and auditing. Environmental Management shall include the following subdivisions:

- *Natural Resource Management (NRM)*
  - air, land and sea resource management
  - wildlife and biodiversity conservation
  - climate change and sea level rise (including the critical issues of desertification, ozone depletion and chemical management)

  - parks, beaches and other recreation areas
  - environmental emergencies
- *Environmental Health and Safety (EHS)*
  - food safety
  - occupational and industrial health and safety
  - the built environment
  - water/wastewater management
  - solid waste management
  - environmental pollution

Further, to support the sustainable use and management of environmental resources and to advise decision-making on sustainable natural resource management issues, Governments will utilise environmental economic tools to quantify and monetise natural resources and environmental impacts, especially in relation to agriculture, biotechnology, coastal and marine resource management, waste management and sustainable tourism.

General Strategies:

- Support the development of consistent and reliable frameworks for natural resource monitoring and reporting in the region, incorporating the use of geographic information systems (GIS).
- Provide technical support for regional bodies involved in developing integrated regional natural resource management plans.
- Employ mechanisms for engaging all stakeholders, inc. local governments and the agricultural industry.
- Foster the formation of firms in the environmental field.
- Provide support and encouragement for innovation, commitment and action, through community support networks, and motivation through the recognition of accomplishments.

Policy Priorities:

- Provide for Integrated Coastal Management and invasive species.
- Develop comprehensive legislation and guidelines to address Environmental Health and Safety (EHS) issues.
- Encourage the use of clean technologies, by creating protected markets.
- Develop knowledge management frameworks for bio-diversity, to support decision-making at national and regional levels.
- Develop regulatory policies to address issues related to the exploitation and misuse of national and regional bio-diversity.

Research Priorities:

- Provide funding for basic research, including efforts towards understanding the nature of environmental effects on human well-being.
- Support research into the following priority topics:
  - The impediments of change to more sustainable NRM practices
  - Climate change
  - Trends in environmental change
  - Vulnerability assessment
  - Adaptation
  - Mitigation of greenhouse gas emissions
  - Impacts of land use and development
- Cooperate for assessment of the state of the regional environment and natural resource base, creating an information clearing house for sharing of national assessment results.
- Develop programmes for funding students writing university theses or doing graduate research in related areas (recommend intake at least every 2 years).

Educational Priorities:

- Engage primary and secondary educational institutions in increasing awareness with regard to NRM issues.
- Create awareness of the important connection between health and environment.

- Build capacity in environmental health and safety, port health, risk assessment, diagnostics and surveillance.
- Prepare students for careers in all fields of environmental management.

3-4 COASTAL AND MARINE RESOURCES MANAGEMENT

Governments will manage coastal zones and marine resources effectively, and will encourage diversification of fishing industries, including fish processing, aquaculture, tourism and small-scale farming concerns, in order to increase the abundance of marine resources, to improve the resilience of coastal communities, and to reduce large work-forces of full-time fishermen.

General Strategies:

- Rehabilitate impacted coastal ecosystems
- Improve monitoring, surveillance and control (MCS) systems for sustainability, and for the safety of fishermen
- Promote the farming of edible marine species, including urchins
- Create and maintain national, regional and international linkages for providing global marine data, for use in work related to climate forecasting, sustainability, etc.
- Strengthen co-operation with IOCARIBE (COI)

Policy Priorities:

- Establish Integrated Watershed Management, and Coastal Zone Management Plans, including the development of appropriate strategies to manage watersheds ecologically, and to prevent or reduce extreme flood and drought risks.
- Develop legislation specifically for integrated coastal management.
- Establish relevant cross-sectoral linkages between Government agencies.

Research Priorities:

- Conduct and update resource assessments and biological studies, strengthen data capture systems and increase the region's information base.
- Conduct studies on ecosystem rehabilitation, and environmental services for marine-coastal ecosystems.
- Investigate the impact of harmful environmental contaminants on the condition of fishery resources, by determining the levels of bio-accumulation in tissues.
- Develop predictive models and decision-support systems to assist in management of the marine zone, biodiversity and resources.
- Support research into marine biodiversity, genetic technologies for mariculture, and the farming of urchins and other edible marine species.
- Investigate non-exploitive uses for living marine resources.
- Conduct joint research on shared/common stock possibly through the Caribbean Regional Fisheries Mechanism (CRFM) Working Group on the Common Fisheries Regime.

Educational Priorities:

- Create more awareness programmes, and improve the provision of public education, for conservation and sustainability.
- Focus on building the marine science skills base, and incorporate a marine studies module into environmental studies in primary and secondary schools, to improve the transition to university studies.
- Promote and encourage the integration of environmentally friendly practices into traditional fish harvesting, to reduce the strain on diminishing fish populations in the region, and endeavour to reduce any

cultural resistance to change in the fishing industry.

3-5 WASTE MANAGEMENT

Governments will develop regulations and economic instruments to prevent and minimise waste generation, as well as to aid waste recovery, treatment, and disposal. Governments will cooperate and coordinate their efforts to improve hazardous waste management and to promote adoption of clean and sustainable technologies.

Governments will also set priorities for actions to prevent and reduce eco-toxicological damage and human exposure to hazardous wastes, and to improve research on the health risks of exposed populations and on the protection of populations at risk.

General Strategies:

- Develop sustainable systems for the reduction of household wastes.
- Support educational, institutional and promotional programmes in waste reduction.
- Provide for the sourcing of external funding for hazardous waste disposal solutions.

Policy Priorities:

- Set standards for solid waste management, grey water management, and marine pollution.
- Provide for hazardous waste disposal and management issues, storage issues and incineration.
- Develop linkages and maintain cooperation between health, waste management, engineering and planning departments, for the establishment and enforcement of policies and regulations for waste treatment and management, including new technologies.
- Develop incentives and introduce mechanisms to encourage recycling and home composting.

Research Priorities:

- Pursue integrated health-effects research agendas to systematically improve knowledge of the health consequences arising from environmental and occupational exposure to hazardous materials and hazardous waste.
- Systematically gather data on material flows before and after the generation of waste.
- Conduct research into small-scale, alternative sewage treatment systems, e.g. solar aquatic sewage treatment systems, and systems for composting waste sludge leftover after sewage treatment.

Educational Priorities:

- Educate decision makers against deliberately importing hazardous materials, as a risk management issue.
- Conduct educational programmes for the general public in solid waste management.

3-6 INTEGRATED WATER RESOURCES MANAGEMENT (WRM)

Governments will aim to provide healthy water supplies for all and to provide water resources for developmental activities, by utilising Science and Technology to eradicate or alleviate problems in the water sector, and to improve the quality,

quantity, utilisation and conservation of ground and surface water.

General Strategies:

- Mandate the use of pollution prevention and minimisation strategies and technologies to improve the quality of water resources and groundwater in particular, including wastewater treatment and disposal systems.
- Develop enhanced irrigation technologies, and promote the adaptation of appropriate technologies for the efficient use, reuse and recycling of water.
- Utilise resource mapping, and develop databases for information on water usage and resources, to support effective decision-making and policy formulation in environment, land use and development.
- Provide support for regional organisations that have related agendas for water management.

Policy Priorities:

- Develop environmental controls and regimes for inspection, assessment and monitoring, to ensure the quality of water resources.
- Establish legal frameworks, efficient protocols and best practices for effective integrated water resources management and conservation, to ensure efficiency and sustainability in the use of freshwater resources.
- Develop institutional arrangements for cooperation to ensure the environmentally-sound management of trans-boundary water resources -
  - to reduce pollution and flood risks, and
  - to minimise potential conflicts.

3-7 ALTERNATIVE ENERGY AND ENERGY MANAGEMENT

Governments will pursue reliable and affordable sources of energy, including the strategic harnessing of cleaner and renewable energy sources. Special consideration shall be given to supply costs, quality and security. As such, Governments will commit to exploring conservation and efficiency possibilities, and pursuing fuel-switching options, in order to reduce the economic costs and the environmental degradation related to current energy consumption patterns.

Governments will promote and support the research, development, supply, and utilisation of affordable, efficient, sustainable and environmentally friendly, alternative energy sources and technologies. Governments will also increase the amounts of financial resources available for these efforts. Relevant emerging technologies, which have all remained largely undeveloped and under-utilised in the region, include hydro, solar, wind, and geothermal energy, as well as fuel cell technologies, biogas and energy derived from manufacturing waste products.

General Strategies:

- Encourage technology transfer through relevant joint partnerships and projects within the Caribbean region, while strictly avoiding the adoption of obsolete technology solutions.
- Invest in technology commercialisation activities that develop and attract opportunities.
- Support the development of photovoltaic capacity for electrification of remote areas.

Policy Priorities:

- Develop national energy models, including formulation of appropriate energy policies and programmes that embrace regional and

domestic economic, political and cultural activities, in order to reduce wastage.

- Establish stricter standards for energy efficiency and emissions, and regulations for energy users.
- Establish and review relevant environmental policies, and conduct relevant internal environmental audits, since energy development must be linked to environmental preservation.
- Institute fiscal incentives, including removal of import duties on solar panels, to encourage the use of alternative energy sources, green technologies and environmentally-friendly practices.
- Provide incentives to electrical utilities for accelerated development, strengthen the environment for business innovation opportunities, and encourage the assessment of market opportunities for energy efficiency.

Research Priorities:

- Conduct rigorous analyses of natural resources, utilising databases, resource mapping and GIS, to inform decisions making and development of national energy models.
- Create and foster linkages that increase opportunities for innovation.

Educational Priorities:

- Increase trained manpower and technology transfer capabilities for alternative and renewable energy.
- Build capacity in energy management, and promote technologies and practices that reduce energy consumption, especially in industry.
- Actively promote alternative energy options in the education environment, such as the use of biogas and waste products from manufacturing processes.

3-8 DISASTER PREPAREDNESS

Governments will utilise Science, Technology and Innovation in the development of general strategies and action plans to enhance predictive capabilities and preparedness for meeting emergencies arising from floods, cyclones, earthquakes, and landslides, inter alia, and to address the problems of mitigation and management of the impacts of natural hazards.

Further, Governments will promote research on natural phenomena that lead to disasters, and human activities that aggravate them, with the ultimate goal of developing practical technological solutions for pre-disaster preparedness, and mitigation and management of post-disaster situations.

General Strategies:

- Pre-disaster Preparedness:
  - Pre-stock essential disaster management tools, equipment, materials, and vehicles.
  - Select and prepare relief centres for public shelter, ensuring satisfactory water and food availability and storage.
  - Ensure installation of communications infrastructure.
  - Organise health care training and readiness for management and recovery stages.
  - Provide for proper sanitation and environmental health and safety training and preparedness, for management and recovery stages.
- Post-disaster Mitigation and Management:
  - Provide for search and rescue operations, and the collection of bodies.
  - Provide for the clean-up of debris in public places.

  - Provide for survey and repair of power and transport systems.
  - Carry out damage assessment of the built environment and infrastructure.
  - Collect data on community redevelopment needs – environmental and socio-economic.
- Strengthen institutional capabilities / capacities for regional, national and local coordination of disaster management.
- Provide timely weather information, monitoring and prediction services, for floods, earthquake and related natural phenomena. This requires:
  - Support for the integration of relevant agencies, with regard to information sharing, data collection and research.
  - Establishment of local, national and regional early warning systems, and provide ready access to, and broad dissemination of warnings.
  - Development of comprehensive databases and accurate mapping of environmentally fragile and hazard/risk prone areas.
  - Establishment of forecasting service centres in strategic locations, local and regional, including national weather gauge systems, flood watches and seismic monitoring stations, as necessary.
  - Greater utilisation of relevant Information and Communication Technology (ICT) solutions for disaster management, including:
    - Geographic Information Systems (GIS)
    - Emergency Information Systems (EIS)
    - Hazard modelling, e.g. flood modelling
    - Real-time monitoring of vulnerable areas, e.g. via strategically placed web-cams.

Policy Priorities:

- Upgrade emergency mechanisms.
- Focus on implementation of strategies to mitigate the impact of natural phenomena.
- Develop information networks to support mitigation strategies.
- Provide for inter-agency contingency planning, readiness and coordination – include both public and private sectors.
- Develop, implement and enforce national building codes, and a regional standard for building codes.
- Encourage public/private collaboration, especially in the area of land use planning and improved building codes.
- Develop proposals/projects for local, regional and international assistance, for post-disaster mitigation and management.

Research Priorities:

- Conduct national and community-level risk and vulnerability assessments, studies of the impacts natural disasters, and analyses of water/wastewater treatment plants and systems.
- Conduct studies to establish economic-social-environmental vulnerability relation-ships.
- Conduct research to create and improve housing solutions and construction materials suitable for Caribbean weather paradigms. Utilise local knowledge, such as the addition of cellulose fibres to asphalted concrete, or the use of bamboo fibres in the production of high-strength concrete.

Educational Priorities:

- Develop university degree programmes in environmental studies
- Improve public awareness of natural hazards and risks

3-9 HEALTH

Governments will support the application of science, technology and innovation for improvement of the health and overall physical and psychological well being of their people, devoting greater attention to the development of more effective treatments for the chronic health conditions that plague millions of Caribbean citizens.

General Strategies:

- Combat HIV/AIDS, malaria and other infectious diseases.
- Improve maternal health, and reduce child mortality.
- Acting to eradicate extreme poverty and hunger, and improve access to proper dietary requirements.
- Act to ensure environmental sustainability, and improve access to clean water.
- Develop international partnerships to improve access to drugs.
- Promote technology transfer, and the use of relevant biotechnology.
- Monitor and regulate food imports with regard to National Health Goals.
- Adapt existing heath sector technologies for regional needs and circumstances.
- Conduct relevant statistical and clinical epidemiology studies.
- Conduct surveillance of practices in the measurement and standardisation of foods, pharmaceuticals and other health-related products.
- Promote the provision and use of complementary and alternative systems of medical diagnosis, case management, treatment and prevention, including the use of nutraceuticals, functional foods, and phytochemicals.

Policy Priorities:

- Develop comprehensive legislation and guidelines for health to address the following issues:
  - Healthcare standards and maintenance (especially maintenance of equipment)
  - Controlling infectious and contagious diseases
  - Infant and mother health
  - Food and nutrition
  - Primary and tertiary health care (hospital care)
  - Clinical technology
  - Health information systems
  - Health financing
  - Health tourism
- Develop strategies for addressing the following social and health issues:
  - Distribution of health services in relation to healthcare needs.
  - Surveillance and diagnosis procedures for emerging diseases.
  - Prevalence of infectious and non-communicable diseases in the Caribbean.
  - Prevention and control of the top ten causes of morbidity/mortality in the Caribbean.
  - High mortality rates due to: cardio-vascular disease, poor nutrition, drug abuse, mental disturbances, suicide and stress-related issues.
  - Obesity prevention.
  - Teenage pregnancy and birth control.
- Establish and implement appropriate systems for the protection of traditional knowledge and natural resources, of acknowledged or potential medicinal importance.
- Provide for regulation of complementary and alternative systems of medicine, including the use of substances, methods, individualisation of care, and analysis of impacts, safety and efficacy.
- Establish independent institutes for health that will be responsible for:
  - Conducting comprehensive evaluation of the assumptions for the application

of existing heath sector technologies, and the consequences of such application.
    - Assessing rationale and making decisions with regard to cost containment and other relevant issues.
- Develop strategies for involving the private sector in overall public health efforts, particularly in relation to the research, development and manufacture of vaccines and antibiotics, and the development of microbial surveillance technology.
- Develop and promote National Health Goals, including healthy diet and lifestyle choices.

Research Priorities:

- Develop strong, focused scientific programmes encompassing basic and clinical research on specific diseases or biomedical problems, or health-related issues that have clear impact on quality of life, including HIV, chronic diseases, nutritional values of traditional foods, etc.
- Conduct research into the use of traditional knowledge and natural resources, of acknowledged or potential medicinal importance.
- Conduct studies on complementary and alternative medicine systems as well as substances and methods, and analyse the effects on pathology and health status.
- Conduct research into tropical diseases, taking into consideration the implications of climate change.
- Establish mechanisms to monitor developmental and feasibility studies, and to respond quickly to act on new research opportunities.
- Compile a regional network of databases on institutions engaged in R&D related to health issues.

Educational Priorities:

- Educate the public on the presence of communicable and infectious diseases, including malaria, tuberculosis and dengue, and on the increase in non-communicable or chronic health conditions, such as diabetes, hypertension and cancer.
- Augment health education curricula to include possible nutritional linkages to some non-communicable or chronic health conditions.
- Promote health careers in statistics and epidemiology, and measurement and standardisation of foods, pharmaceuticals and other health-related products.
- Enhance skills in mathematics, basic computation and analysis of data – basic skills in S&T that are still required for work in this field.

3-10 SUSTAINABLE TOURISM

Governments will promote and support the utilisation of Science, Technology and Innovation to contribute to the diversification of the region's economic base through the advancement of tourism, and for the conservation and sustainable utilisation of natural resources, national monuments and cultural heritage.

Therefore, Governments will develop tourism sector capacity to respond to consumer demands and the ever-changing market for outdoor touring products and eco-tourism. Governments will also encourage the development and introduction of cutting-edge, consumer-focused technologies, for competitive advantage in the tourism industry.

General Strategies:

- Create physical infrastructure for cooperative environments, including:
    - Express check-in facilities on airport shuttle buses for efficiency

  - Integrated internet and smart card systems – improved information links, upgrade regional websites, and unobtrusive, user-friendly smart card readers for participating operators
- Develop Tourism Satellite Accounts, to help governments and industry to become fully aware of the current and future economic performance of the tourism industry, and convert this information into innovation and cooperative strategies to support further tourism growth.
- Create Agro-tourism linkages through the development of farm tours, herbal medicine and sustainable fisheries.
- Develop heritage villages.
- Provide basic amenities for tourist sites, inc. washrooms on beaches.
- Encourage sustainable tourism through improved environmental health and safety, including:
  - solid waste management, including recycling;
  - water quality and water/wastewater management, including swimming pool management and maintenance; and
  - food hygiene/sanitation.
- Encourage sustainable tourism through improved environmental protection and management, by:
  - Controlling coastal marine pollution from ship-generated wastes and inland pollution sources.
  - Conducting regular environmental audits.
  - Promoting eco-tourism developments, while protecting environmental resources.

Policy Priorities:

- Develop a Science, Technology and Innovation oriented tourism policy which will reduce conflicting objectives due to the "cross-sectional" aspects of tourism policy and increase the effectiveness of public authorities in charge of tourism development.
- Develop sustainable tourism units within all National Tourism Organisations to address specifically with sustainable tourism development issues.
- Encourage the use of Science, Technology and Innovation in energy management and construction within the tourism industry.

Educational Priorities:

- Provide S&T education in sustainable tourism development principles. Such efforts should include:
  - Tourist Education
  - Public Environmental Education
  - Education in Schools
- Provide broad-based environmental education, training and awareness for tourists and tourism workers.

3-11 DEVELOPMENT OF SMALL, MEDIUM AND MICRO ENTERPRISES

Considering recent increases in technology-oriented competition, Governments will encourage innovation in Small, Medium and Micro Enterprises (SMEs), to support sustainable industrial sector output and employment growth, and to bolster national economic growth and competitiveness.

Therefore, Governments will seek to institutionalise innovation, and will support the development of National Innovation Systems to drive development and build capacity in SMEs, through the following actions:

- Encourage the formation of backward and forward linkages between Universities, Centres of Excellence, venture capital companies and local consumer markets.
- Support Centres of Excellence linked to Universities, encourage the development of

commercially viable projects, and stimulate the formation of new SMEs.

- Ensure the provision of government funding opportunities, and encourage the development of venture capital markets, for entrepreneurs and SMEs.

Governments will also support the development of markets for SMEs, by encouraging:

- Formation of linkages between the agricultural and manufacturing sectors, and the non-agricultural or energy sector.
- Development of market access to the global energy sector, in particular.
- Formation of linkages with universities, to facilitate the development and commercialisation of projects.

General Strategies:

- Encourage entrepreneurship and job creation, and retain tertiary level graduates.
- Establish and maintain national communication and information networks, establish regional networks.
- Provide adequate and easily accessible training networks, infrastructure and materials to support technology transfer and skills development.

Policy Priorities:

- Establish regulations or guidelines to allow products to be export-worthy. Pre-requisites for exports, e.g. HACCP and GMP compliance, can be cost prohibitive for small enterprises.
- Provide incentives to encourage local consumer markets to support SMEs buy buying locally produced goods.

Research Priorities:

- Support research and technology transfer for SMEs, and expand networks and infrastructure to facilitate technology transfer.
- Encourage cooperation between firms and universities/public research institutions.
- Encourage and provide funding for research and development institutions and for small medium and micro enterprises to adopt and adapt new technologies and processes in their operations.

3-12 INFORMATION AND COMMUNICATION TECHNOLOGY

Governments will facilitate the transformation into knowledge-based societies through the effective use and application of Information and Communication Technology (ICT), to generate high quality, timely information and make it available to potential users for commercial exploitation, and to improve efficiency, productivity and competitiveness, in the Caribbean.

Governments will also support the acquisition of knowledge management skills, in order to compete more successfully in the global information technology industry. Countries must discover new ways to generate new knowledge, translate information into knowledge that will be useful for the development of goals and competitiveness, while effectively capturing global information and applying it to the local environment.

General Strategies:

- Provide the necessary infrastructure to build connectivity and improve access to information.
- Establish Access Centres that provide a broad range of ICT services, esp. in disadvantaged communities.
- Encourage financial institutions to play a positive and innovative role in the emergence of the regional e-commerce economy.

- Utilise ICT to foster the creation of economic and employment opportunities, consider the possibility of marketing the region as a hub for information technology operations.

Policy Priorities:

- Develop legal frameworks and regulations for consumer protection in e-commerce, and to regulate and facilitate all forms of electronic interactions. This includes provisions for:
  - data protection and on-line security / privacy, and
  - protection of intellectual property rights.
- Develop and implement policies and mechanisms for information and knowledge management for socio-economic development.
- Implement modernised e-Government programmes.
- Encourage competition in the telecommunications market.
- Implement incentives for consumers, including tax breaks, to facilitate computer access and to increase in the number of Internet users.

Research Priorities:

- Promote and support research and development in ICT, including hardware and software engineering.

Educational Priorities:

- Provide the training and education necessary to build capacity in the ICT industry.
- Increase computer literacy, raise awareness and encourage the advantageous social and economic utilisation of ICT.

APPENDIX I

AUTHORS, REVIEWERS & CONSULTATION PARTICIPANTS

AUTHORS

Dr. Keith Mitchell, position paper presented in1997 at 18th CARICOM Heads of Government Meeting
"Science and Technology and Human Resource Development in the context of the CARICOM Single Market & Economy"
Culmination of discussions initiated by Grenada with representatives of regional S&T bodies including the CCST.

CTA/CCST workshop, Dominica, April 2004
"Enhancing the Science and Technology Dialogue – Innovation for Development"
Representatives of Caribbean member states agreed to prepare and submit various sections for inclusion in a draft compilation.

COORDINATORS

Mrs. Maureen Manchouck
National Institute of Higher Education,
Research, Science and Technology
P. O. Box 113, 43-45 Woodford Street
Newtown, Trinidad and Tobago

Ms. Joycelyn Lee Young
Ms. Lovaan Superville
Secretariat, Caribbean Council on Science and Technology
Trinidad and Tobago

EDITORS

Mr. Richardson Andrews (August 2004)
Special Advisor to the Prime Minister of Grenada

Dr. Elsie Alleyne (Sept. 2006)

Ms. Lynette Virgil (Nov. 2006 – Current Draft)
Technical Consultant
Nassau, Bahamas

CONSULTATION PARTICIPANTS

Consultative workshops were held throughout the region in 2005 and 2006 to examine the drafts in greater detail, and have provided a much wider Caribbean perspective.

Consultation Outputs – Contributors: Antigua & Barbuda, Bahamas, Barbados, Cuba, Dominica, Guyana, Grenada, Jamaica, St. Lucia and Trinidad & Tobago

Bahamas Consultation Exercise

Coordinated by: Ms. Beverly J. T. Taylor, Asst. Director of Education
Ms. Lynette Virgil, Technical Consultant
Science and Technology Section, Department of Education
P. O. Box N-3913/4, Thompson Blvd.
Nassau, Bahamas
Phone: (242) 502-2901

Participants:

College of the Bahamas	Dr. Patricia Grant	*Department of Meteorology*	Jeffery Simmons
The Research Unit, COB	Denise Samuels	*Min. Health & Environment*	Camelta Barnes
	Dr. Joan Vanderpool	*BEST Commission, MOHE*	Stacey Wells-Moultrie
Computer Dev. Centre, RBPF	Karoldann Darville	*HIV/AIDS Centre, MOHE*	Nurse Rosa Mae Bain
	Kimbler Romer	*Dept. of Env. Health Services*	Winston Sweeting
Department of Agriculture	Dr. Maurice Isaacs	*Risk Assessment Division, DEHS*	Dwayne Curtis
Department of Education	Hamblin Newbold	*Department of Public Health*	Dr. Evaneth McPhee
	Heloise Stuart-Newbold	*Eco Tourism, Min. of Tourism*	Sheila Cox
Government High School	Charles Major	*Sustainable Tourism Dev., MOT*	Earlston McPhee
H. O. Nash Jr. High	Sharon L. Sweeting	*Water and Sewerage Corp.*	Shantelle Lopez
Department of Fisheries	Edison Deleveaux		

Barbados Consultation Exercise

Participants:

Minister of Commerce, Consumer Affairs & Business Development	Senator the Hon. Lynette Eastmond
Deputy Permanent Secretary	Emesta Drakes
UWI Cave Hill Campus	Prof. Winston Tinto
	Prof. Sean Carrington
Barbados Workers Union	Veronica Griffith
Ministry of Economic Affairs & Development	Ronnie Griffith
National Council for Science & Technology	Charles Cyrus
	Lennox Chandler
Ministry of Agriculture	Ralph Farnum
IICA	Carol Thomas
Government Analytical Laboratory	Leon Jordon
Fisheries Division	Philip Jackman
	Dr. Stephen Willoughby
Barbados Agricultural Management Co. Ltd.	Dr. Sandra Bellamy
Caribbean Institute of Meteorology & Hydrology	Adrian Trotman
	David Farrell
Barbados Society for Technologists in Agri	Keith Laurie
Samuel Jackman Prescod Polytechnic	Hector Belle
Barbados Community College	Dr. Sonia Peter
Solid Waste Project Unit	Ricardo Marshall
Environmental Protection Dept.	Philip Pile
Coastal Zone Mngt.Unit	Ramon Roach
	Dr. Lorna Inniss
Barbados National Tenninal Co.Ltd	Dave St. Hill
Ministry of the Environment	Travis A. Sinckler
Erdiston Teachers Training College	Errol Best
Meteorological Office	Leonard Field
Analytical Services	Delores Haynes
Biotechnologist	Dr. Wendy Hollingsworth
Corporate Affairs & Intellectual Property	Deborah Beckles

Dominica Consultation Exercise

Participants:

Forestry Division	E. Hypolite
CFO	Andrew Magoloire
Environment Coordinating Unit	Lloyd Pascal
Ministry of Agriculture	O.Grell
Permanent Secretary	Claudia Bellot
Youth Division	Terry Raymond
CARDI	Gregory Robin
IICA	Kervin Stephenson
Ministry of Land & Telecommunications	Dr. Colmore Christian
	Sylvester Cadette
Bureau of Standards	Steve John
Office of Disaster Preparedness	Cecil Shillingford
Ministry of Public Works & Utilities	Dr. Joseph Bannis
Ministry of Health & Social Security	Davis Letang
Dominica Solid Waste Mngt.	Boniface Xavier
Dominica Water & Sewage Company	
Ministry of Tourism	Rhoda Celarie
Tourism Division, NDC	Sharon Pascal
Dominica Hotel & Tourism Ass.	Judith Pestaina
NDFD, Manager	Bernard Etinoffe
Dominica State College	Catherine Abraham
	Karen Prevost
	Simpson Roberts
	Adrien Durand
	Merrill Matthew
Ministry of Legal Affairs	Permanent Secretary
Ministry of Physical Planning	Kelvin Rolle
St. Mary's Academy	Rupert Lance
Dominica Coconut Products	Patrick Pemberton
	Rupert Sorhaindo
Marinor Enterprises	Michael Astaphan
Bello	Vantil Fagan
Domlec	Jeol Huggins
Cable & Wireless	Nabeel Bhatti
IT Coordinator	Abraham Durand

Grenada Consultation Exercise

Participants:

Biotechnology Lab	Malachy Dottin
Grenada Bureau of Standards	Robert Medford
Grenada Cooperative Nutmeg Assoc.	Roland Courtney
Grenada Information Services	Ayana Allard
	Yolande John
Grenada Today Newspaper	Judy John
Impact Consulting	Basil Harford
Ministry of Education	Jean Brizan
National Disaster Management Agency	Sylvan McIntyre
NAWASA	Lester Arnald
Produce Chemist Lab	Eunice Chiddick
	Guido Marcell
	Camille St. Louis
Science & Technology Council	Carlton Frederick
	Gail Gilchrist
	Raphael James
	Jean Noel
	James Pitt
	Peter Thomas
T. A. Marryshow Community College	Benjamin Aird
	Alister James
	Loretta McMillan
	Esther O'Neale
	Mae Patterson
	Dr. Dumber Steele
	Meryl Thompson
Building Tech., TAMCC	Shornell Martin
Roland	Medford

Jamaica Consultation Exercises

Participants:

Church Teachers College	Judith Morgan
Consumers Affairs Commission	Cleveland Parker
Cornwall College	Ryan Buchanan
	Shane Buckle
	O'Brian Clarke
	Shane Malcolm
	Chevan Maxwell
	Lincoln Reid
	Neiko White
Cross Keys Community	Jennifer Haffeden
Flower Hill Producers Co-operative Society	Edna Edwards
Huntley Farmers Association	Vita E. Cowan
Knox Community College	Melissa Brown
	Racquel Brown
	Andre Campbell
	Lennox Haldane
	Damion Mitchell
	Velishon Walker
	Diane Williams
Manchester Environmental Committee	Cedwick Conells
Manchester Parish Library	Ambrozene Johnson
Ministry of Education	Devon Ruddock
Ministry of Health	Dr. Beverley Wright
National Water Commission	Phillipa Campbell
Parish Development Committee	Hudlyn Pitter
Postal Corporation of Jamaica	Miguel Arthurs
Regal Bakery	Locksley Vassell
Resource Citizens Association	Wilbert Loftman
Retired Teacher	Raymond S. Rose
St. James Parish Library	Annette Daley
	Mary-Ann Whitfield
Sam Sharpe Teachers College	Dian Bowen
	Michann Francis
Trade Board Ltd	Jacqueline Jackson
	Iredell Rattray
Wilderness Progressive Group	Nicholas Robinson
	Curtis N. Taylor

Trinidad & Tobago Consultation Exercise

Participants:

BOETT	Hollis Charles
Bureau of Standards	Rodney Harnarine
CARDI	Bruce Lauckner
CTS Programme	Randy Hickson
	Gregory O. Young
Caribbean Academy of Sciences	Winston Mellowes
E.C.	Peter Ashton
ECLAC	Joanne Mora
	Neil Pierre
EMA	Soriaya Manwaring
Ixanos Ltd.	St. Clair King
MALMR	Cavelle Motilal
Research Division, MALMR	Vish Mooleedhar
	Terrence Indalsingh
MPUE	Jasmine Gopaul
MSTTE	Gregory Jones
Ministry of Health	Andrea Yearwood
Min. of Planning & Development	Maria Lewis
NIHERST	Christiane Francios
	J Lee Young
ODPM	Myron W Chin
PAPWFT	Karilyn Shepard
UWI	Julian Duncan
	Stephan Gift
	Clement K Sankat
UWI, Emeritus Professor	Baldwin Mootoo
UWI, Dep't of Agro- Econ	Ranjit Singh
UWI / Metal Industries Co. Ltd.	Clement Imbert
UWI, Office of the V.C.	Dr. Fazal I Ali
WRA	Pat Massiah

APPENDIX II

BACKGROUND – ST&I POLICY FRAMEWORK FOR THE CARIBBEAN

BACKGROUND

In 1988, CARICOM adopted a regional Science and Technology policy with the intention of it being integrated into national development planning. However the implementation of that decision has since not yet materialised. A paper entitled "Science and Technology and Human Resource Development in the context of the CARICOM Single Market & Economy" was presented by Dr. Keith Mitchell to the 18th Meeting of Conference of Heads of Government in 1997. The position paper was a culmination of discussions initiated by Grenada with representatives of regional S&T bodies including the CCST at whose 14th Plenary Session the imperative for a regional S&T policy was raised and accepted. The building of a regional infrastructure for Science and Technology (S&T) is also included within the strategic goal of Regional Natural Resources & Environment Management in the CARICOM Secretariat's 1998-1999 Sustainable Development Work Programme (SDWP).

CCST proceeded to work on the formulation of a regional science and technology policy document taking into consideration the general directions contained in Dr. Mitchell's position paper. At a meeting held in November 1998 CCST's draft policy document entitled "Towards a Regional Science and Technology for the Caribbean" was presented to the Council for Trade and Economic Development COTED. The meeting requested CCST and CARICOM to "strengthen current efforts to revise the regional policy for science and technology". Revision of the policy document was completed in 1999 and thus the revised document was considered and noted by COTED at its January 2000 meeting in Guyana.

The policy document was due to be considered and approved by CARICOM Heads of Government. In June 2000 NIHERST also advised the Government of Trinidad and Tobago to endorse the regional policy prepared by the CCST.

At the Meeting of the Conference of the Heads of Government of CARICOM in Canouan, St. Vincent and the Grenadines from 2-5 July 2000, CCST was designated as the agency for coordinating and implementing CARICOM's policies in Science and Technology. As outlined in the document Science and Technology in Sustainable Development (**Supplemental Paper I** Agenda Item 12), the Conference of the Heads requested that the CCST include in its future planning to " review and complete the definition of the Regional Science and Technology Policy (S&T) which would include levels of funding and staffing".

The original draft S& T Policy Paper was expected to be completed and ready for publication by December 31st 2000. However, to comply with the request of the Conference of Heads, publication of the document was delayed in order to address properly the following areas:

- National Development Plans and Projects
- Food Security and Development
- Marine Resources Management
- Tourism
- Waste Management
- Water Resource Management
- Technology in Education
- Development of Small, Medium and Micro Enterprise.

REVIEW OF DRAFT POLICY DOCUMENT BY REGIONAL OFFICIALS & EXPERTS
CTA (TECHNICAL CENTRE FOR AGRICULTURAL AND RURAL COOPERATION) / CCST COLLABORATION

It was felt that before the policy document could be published, it should be reviewed by a panel of regional experts and senior officials with responsibility for science and technology. The draft regional S&T policy was accordingly placed as a specific agenda item of the CTA/CCST Caribbean Regional Meeting on Science and Technology, April 27th to April 29th, 2004 entitled "Enhancing the Science and Technology Dialogue – Innovation for Development" held in the Commonwealth of Dominica for discussions in working groups. These working group session reports assisted in the development of strategies and plans to improve the policy document. At the Caribbean Council for Science and Technology 19th Plenary Meeting held on the 29th –30th of April 2004, discussions also focused on the format and elements of the policy. After compilation the plenary decided that the revised draft ST&I policy framework would be submitted to Mr. Richardson Andrews, Special Advisor to the Prime Minister of Grenada for further editing.

The revised draft policy framework was circulated as agreed at the 19th Plenary and it was requested that the CCST focal points hold national consultations. There was therefore an urgent need for the draft to be widely disseminated and discussed at a national level to get wider stakeholder buy-in. It would then need the endorsement of ministers. Consequently the national consultations were to be followed by a ministerial meeting to adopt the revised ST&I framework for the Caribbean.

The CCST also collaborated with the CTA in hosting a series of national stakeholder dialogues on the draft ST&I Policy Framework for the Caribbean and will support in the convening of the ministerial forum to ratify the ST&I policy. The CTA therefore played a major role in facilitating the preparation of the updated draft ST&I framework for the Caribbean from 2004 to 2006.

APPENDIX III

ABBREVIATIONS AND ACRONYMS

ACP-EU	Africa Caribbean Pacific – European Union
BOETT	Board of Engineering of Trinidad & Tobago
CAPE	Caribbean Advanced Proficiency Examinations
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community
CCST	Caribbean Council for Science and Technology
COB	College of the Bahamas
COTED	Council for Trade and Economic Development
CRFM	Caribbean Regional Fisheries Mechanism
CTA	Technical Centre for Agricultural and Rural Cooperation ACP-EU
CTS	CARICOM Trade Support (CTS) Programme
DEHS	Department of Environmental Health Services
EC	European Commission
ECLAC	Economic Commission for Latin America & the Caribbean
EHS	Environmental Health and Safety
EIS	Environmental Information Systems
EMA	Environmental Management Authority
GCSE	General Certificate of Secondary Education
GDP	Gross Domestic Product
GIS	Geographic Information System
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Points
HIV/AIDS	Human Immuno-Deficiency Virus / Acquired Immune Deficiency Syndrome
HRD	Human Resource Development
ICT	Information & Communication Technology
IIPR	Intellectual and Industrial Property Rights
IOCARIBE / COI	Intergovernmental Oceanographic Commission – Sub-Commission for the Caribbean and Adjacent Regions
MALMR	Ministry of Agriculture, Land & Marine Resources
MCS	Monitoring Surveillance and Control
MOHE	Ministry of Health and Environment
MOT	Ministry of Tourism
MPUE	Ministry of Public Utilities & the Environment
MSTTE	Ministry of Science, Technology & Tertiary Education
NAWASA	National Water & Sewerage Authority
NEMAP	National Environmental Management and Action Plan
NIHERST	National Institute of Higher Education, Research, Science and Technology
NRM	Natural Resources Management

NSC	National Science Council
OAS/CIDI	Organisation of American States / Inter-American Council for Integral Development
ODPM	Office of Disaster Preparedness & Management
PAPWFT	Pointe-A-Pierre Wildfowl Trust
R&D	Research and Development
RBPF	Royal Bahamas Police Force
S&T	Science and Technology
SDWP	Sustainable Development Work Plan
SEA	Secondary Entrance Assessment
SMEs	Small, Medium and Micro Enterprises
STI / ST&I	Science, Technology and Innovation
TAMCC	T. A. Marryshow Community College
UWI	University of the West Indies
WRA	Water Resources Agency
WRM	Water Resources Management