Stimulating Economic Development in the Caribbean

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Caribbean &
Central America
U.S.A.
The Bahamas
Atlantic
Ocean
Cuba
Turks &
Caicos Islands
Cozumel
Mexico
Cayman
Islands
Haiti
Dominican
Republic
Puerto
Rico
British Virgin Islands
U.S. Virgin Islands
St Martin/
Sint Maarten
Saba
Statia
Barbuda
Antigua
St. Kitts & Nevis
Montserrat
Guadeloupe
Jamaica
Belize
Bay Islands
(Honduras)
Caribbean
Sea
Guatemala
Honduras
Dominica
Martinique
St. Lucia
St. Vincent
El
Salvador
San Andres (Colombia)
Corn Islands
(Nicaragua)
Nicaragua
Aruba
Curacao
Bonaire
Grenada
Barbados
Margarita Is.
(Venezuela)
Tobago
Trinidad
Costa
Rica
San Blas
Pacific
Ocean
Colombia
Venezuela
Panama
Isla del Rey
Guyana

Outline

- Mission
- Overview of Status of the Region
- Strategies for Economic Development
- Youth Development and Education Reform
- Development of an Entrepreneurial Culture
- Engaging the Diaspora
- Infrastructure Development
- Final Remarks

My Mission

Help Improve Quality of Life in the Caribbean

Areas that need attention include:

infrastructure, education, employment, food security, energy security, healthcare, reducing our import bill - increasing exports

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Status - Existing Assets

These vary from country to country:

- Global network access – telecommunications systems reasonably good (but expensive)
- Some Natural resources in a few countries
- Political stability
- Trained labor pool
- Low-moderate operating costs
- Well-developed banking and insurance systems
- Reasonably close to North America
- Strong ties to UK and Europe

Status - Challenges in the Region

- **Weak Infrastructure (roads, schools, ports, etc.)**
- **Inadequate inter-island transportation systems**
- **Digital divide**
- **Educational systems in need of reform**
- **Low levels of relevant research and development**
- **Food insecurity**
- **Energy insecurity**
- **Inadequate health care problems**
- **Poverty and crime**
- **Environmental damage at sea and on land**

Public Expenditure on Education as Percentage of Total Government Expenditure

	1998-1999	2002-2003
Jamaica	**5.7***	**9.5**
Barbados	**15.4**	**17.3**
Guyana	**8.6**	**18.4**
Trinidad & Tobago	**13.1**	**13.4****
U.S.	**5.4**	**17.1*****

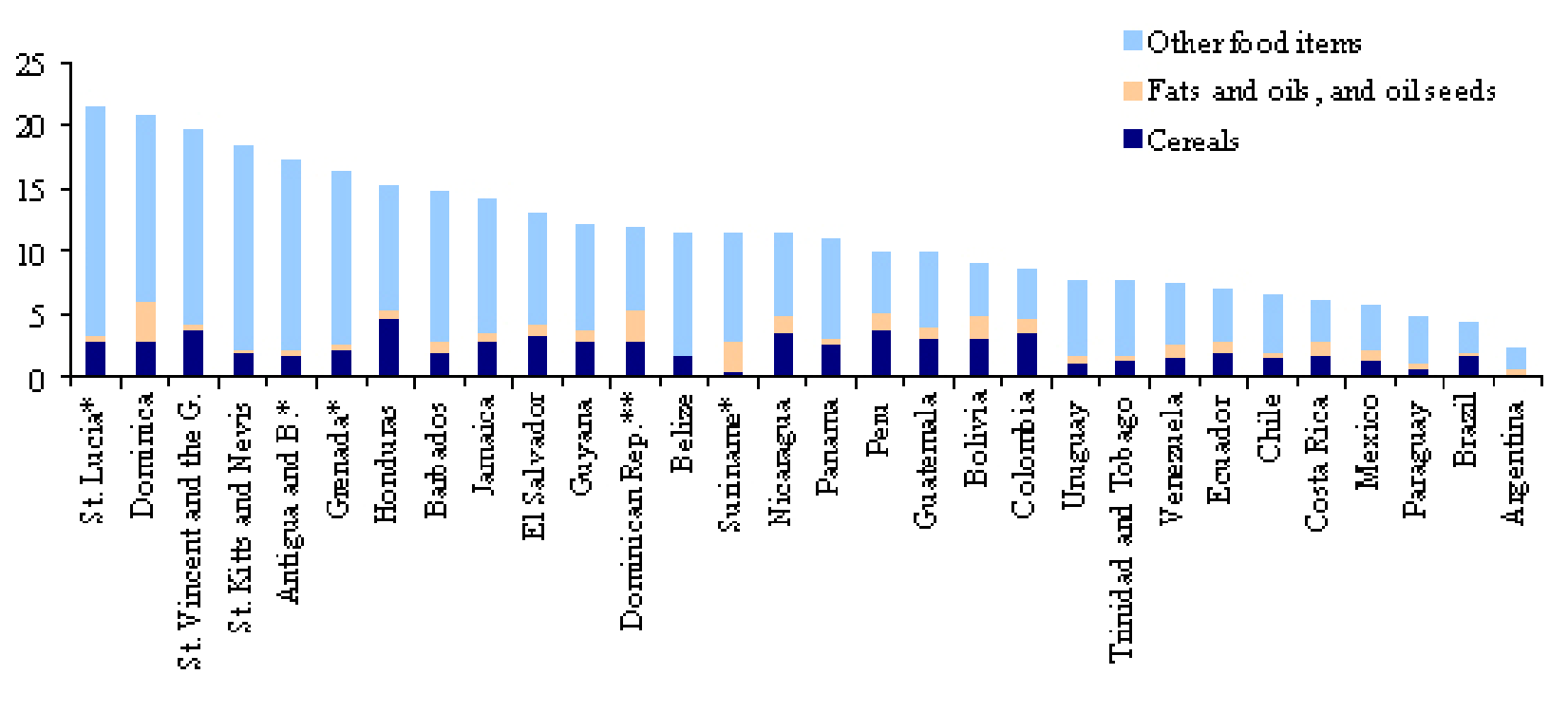
* 1999-2000
** 2001-2002
*** 2000-2001

Public Expenditure on Research and Development as Percentage of GDP (2002-2003)

	% GDP	No. Researchers per Million Inhabitants
Jamaica	0.1	-
Barbados	-	-
Guyana	-	-
Trinidad & Tobago	0.1	393
U.S.	2.7	4,526

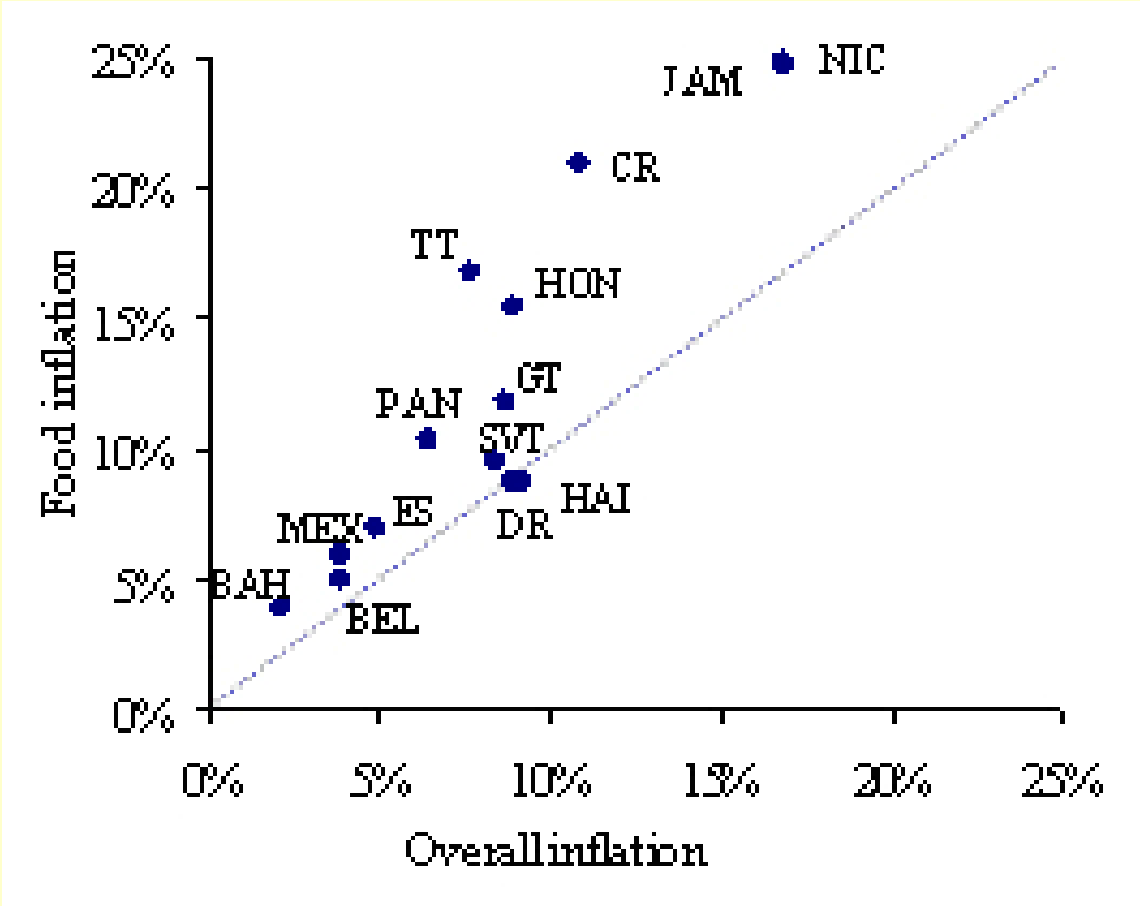
Share of Food in Total Imports, 2006

% Total Imports



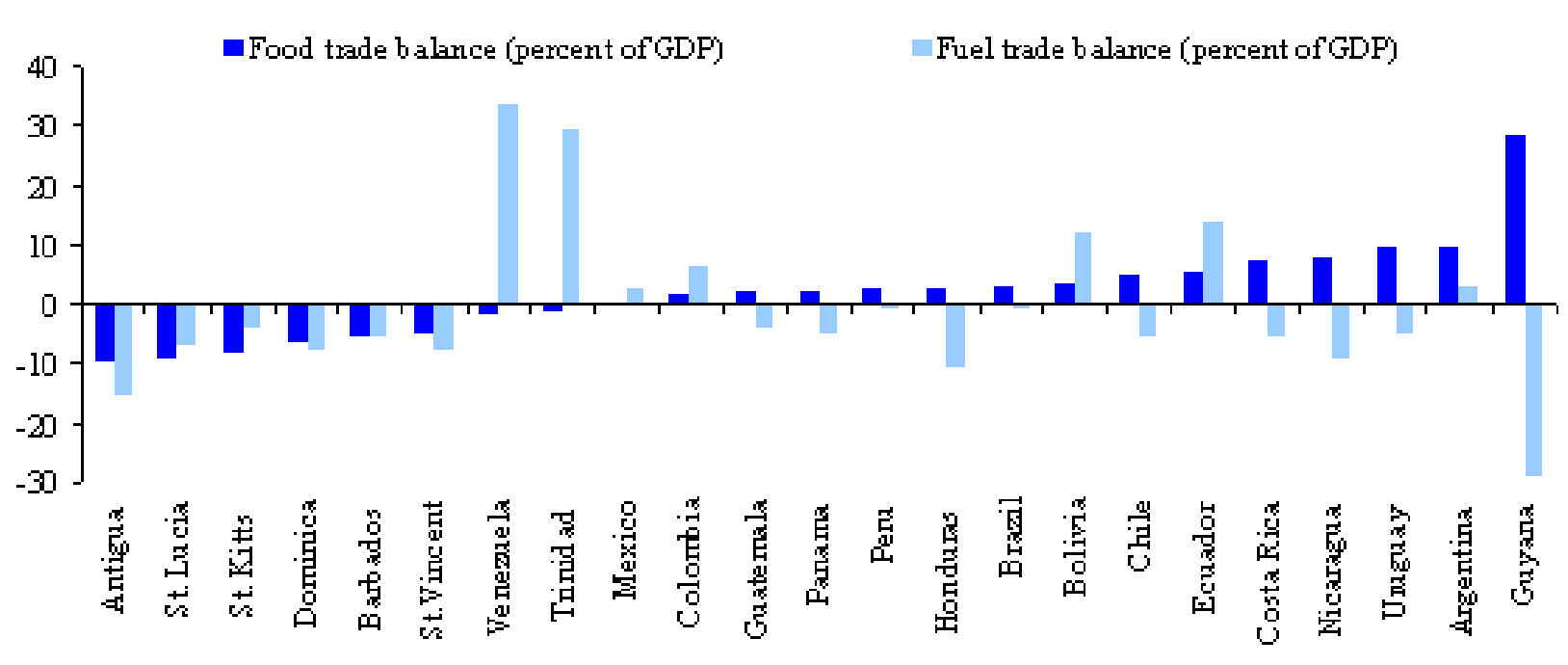
From web.worldbank.org, 'What are the facts about rising food prices and their effect on the region?'

Food and Overall Inflation in Central America and the Caribbean, 2007



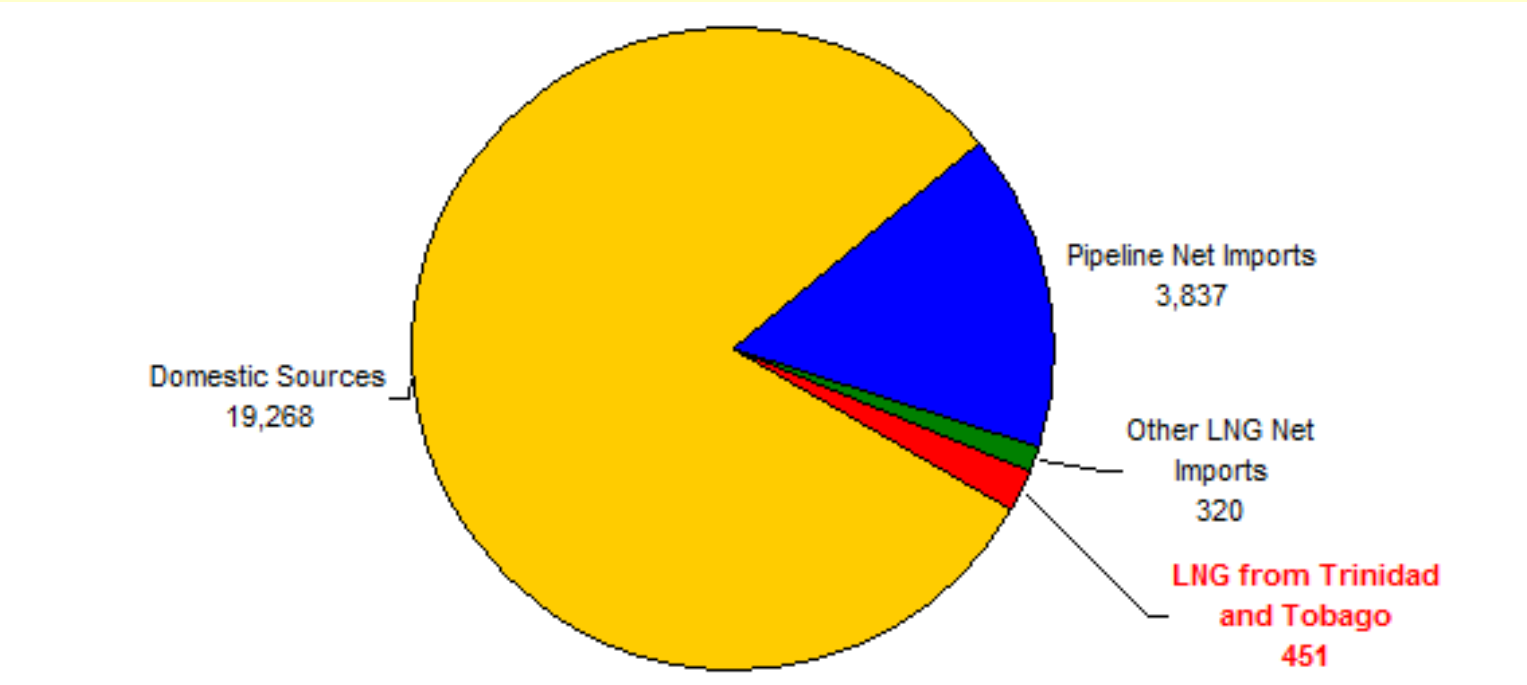
From web.worldbank.org, 'What are the facts about rising food prices and their effect on the region?'

Food and Fuel Trade Balance in 2005 as Percentage of GDP



From web.worldbank.org, ‘What are the facts about rising food prices and their effect on the region?‘

U.S. Natural Gas Supply, 2007



billion cubic feet

From Energy Information Administration, www.eia.doe.gov

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Looking Forward

"brains are equally distributed among the world's peoples" - Kofi Anan, Sept 6, 1999 address to the 188 UN member states

He went on to say that with minimal investment in basic education, the technological revolution can be harnessed to stimulate economic growth so that millions of poor can participate in the global economy of the 21st century.

Thus, the payoff can be huge for small investments

Looking Forward

Further, some experts have predicted that:

- **Computers will eventually be as commonplace as electric motors**
- **Computers will simulate brain functions (Don't worry !!!)**
- **Biological science will combine with chemistry and computer science to help fight disease, produce more efficient fertilizers, and help increase food production (e.g. Human genome project, genetically altered crops)**
- **Telecommunications technologies will bring the world's people closer, and allow more people to participate in the political process**

However, cultural and political problems will remain the biggest barriers to progress.

Strategies for Economic Development

- **Government must play a facilitating role**
- **We must provide leadership and vision to our young people (identify role models and offer more encouragement)**
- **Education Reform**
- **Stimulate Entrepreneurship**
- **Engage the Diaspora (especially scientists, other professionals and institutions outside the Region)**
- **Bring in tools, means and expertise – forge international partnerships (e.g., Caribbean Science Foundation)**
- **Find ways to provide more financing for companies**

  (credit unions in the Region offer more help to micro-business)
- **Capitalize on proximity to North America**
- **Learn from mistakes and successes of Brazil, Israel, Singapore, Ireland, etc.**

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Youth Development and Education Reform

Increase access to education and information

- **Conquer Digital Divide (e.g. through community centers to access computers and Internet)**
- **Early exposure of our students to business principles and entrepreneurship through curriculum reform that includes:**
  - **how businesses make money, contracts and contract negotiation, intellectual property, patents and inventions**
  - **how the stock market works**
  - **international trade, global economics**
  - **accounting principles**
  - **information technology**

Can begin early – at age 8 !

Youth Development and Education Reform (Continued)

- Establish more distance learning programs
- Promote science and technology in schools; educate more women in science and engineering
- Undergraduate degree - the flagship educational credential
- Our Universities, or major parts thereof, should focus on research and technology with economic relevance, including formation of incubators and IP transfer to business sector
- To teaching, research and service, we could add “impact on economic development” as a fourth metric by which we evaluate our university faculty

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Developing an Entrepreneurial Culture

What Should Entrepreneurs Do Today?

- **Entrepreneurs should organize themselves into societies and associations so they can share information, help each other, and influence legislation**
- **Entrepreneurs should try to tap into the large reserves of investment capital in the developed world (*stay away from debt, use OPM*)**
- **Seek technical and business help from our universities – (participate in their incubator programs)**
- **Entrepreneurs should get experts with international business perspective to serve on their board of directors and forge international alliances**

Developing an Entrepreneurial Culture: Role of Government

Government, as facilitator, should:

- **Use radio, TV, Internet, billboards and education system to indoctrinate (brainwash) the people with the new entrepreneurship culture**
- **More aggressively set up small business technology development plans that provide equity-based capital**
- **Act to make all types of investment capital more accessible to start-up businesses**
- **Devise creative taxation systems that are not a disincentive to business development**
- **Help to establish centralized IP system for Caribbean**
- **Expedite CSME (good idea but moving too slowly)**

Developing an Entrepreneurial Culture: Role of Government (continued)

Government, as facilitator, should:

- **Motivate the people in the same way effective corporate leadership does (incentives and rewards)**
- **Work to reverse the sense of hopelessness in many of our young people**
  - **Develop a social safety net and social programs for the less fortunate**
  - **Provide free learning opportunities for some sectors of the population (transform unemployed tax takers into tax payers)**
- **The people, on the other hand, must practice discipline, diligence, a shared sense of responsibility for self, and a code of self-reliance**

Caribbean SBTD Program: A Possible Model*

Small Business Technology Development Program

Government heavily advertises the availability of seed capital and solicits proposals (with business plans included) for evaluation and funding

- **Encourages plans involving joint product or service development between industry and universities**
- **Plans are evaluated based on technical merit, competence of the management team, size of the potential market, the realism of proposed market share, global competitiveness, impact on economy, etc**
- **Evaluations would be carried out by a committee of experts (no nepotism, no special-interest advantages, no committee members with conflicts of interest)**

* First proposed in 1998, see *http://web.mit.edu/caribbean/www/cdf/warde98-1.pdf*

SBTD Program (continued)*

- **Phase I - feasibility phase where technical feasibility of the product or service is established**
- **Phase II (by Invitation if Phase I is successful) - Submit new technical proposal and updated business plans for possible Phase II funding**
- **Government would take a small equity stake in companies that are awarded Phase II funds**
- **If company becomes highly successful (only a handful), government would eventually sell its equity and plough the proceeds back into the basic pool of SBTD funds**
- **Pool could actually grow after about ten years and be self-sustaining, if well-managed**

* First proposed in 1998, see
http://web.mit.edu/caribbean/www/cdf/warde98-1.pdf

Traits of an Entrepreneur

Common traits of successful entrepreneurs:

Dreamers, visionaries, creative, disciplined, flexible, goal-oriented, highly motivated, well-informed, well-connected, opportunistic, optimistic, workaholic risk takers, resourceful, persuasive, pragmatic, and have the ability to inspire and motivate people.

Developing an Entrepreneurial Culture: Progress in the Region

- **In Barbados, CIEX (Council for Investments, Exports, Foreign Exchange & the Diaspora) seems to be on the right track in its thinking**
- **Barbados does already have a kind of SBTD program (needs to be advertised more and expanded)**
- **UWI (Cave Hill and St. Augustine) are setting up incubators within the university – resources very limited**
- **Dominican Republic has created a Cyberpark**
- **Trinidad and Jamaica have their technology universities**
- **Trinidad petroleum and natural gas exports a singularity in the region, but progress, nonetheless**

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Engaging the Diaspora

Establishment of the Caribbean Science Foundation (CSF)

by

The Caribbean Diaspora for Science Technology & Innovation (CADSTI)

Website is under development at http://www.cardsti.org

Caribbean Diaspora for Science, Technology and Innovation (CADSTI)

- **Scientific community in the Region brought together April 2006 in Trinidad & Tobago by Prof. Harold Ramkissoon (UWI, St. Augustine) with support from UNESCO, CARICOM with help from Prime Minister Mitchell (Grenada)**
- **Goal is to mobilize scientists, engineers, medical and business professionals in the Diaspora to make a contribution to economic development of the Region**
- **Also to identify and set up collaborations between businesses and universities in the Diaspora and in the Region**
- **Recently incorporated in Barbados**

CADSTI: Founding Members

- Prof. Cardinal Warde, President (U.S.)
- Prof. Harold Ramkissoon (Trinidad and Tobago)
- Prof. Baldwin Mootoo (Trinidad and Tobago)
- Dr. Brian Tom (U.K.)
- Dr. Basil Burke (U.S.)
- Mr. Ravi Ramkissoon (U.S.)
- Prof. John Paul Clarke (U.S.)
- Prof. Suresh Narine (Canada)
- Prof. Maya Trotz (U.S.)

CADSTI First Project: Formation of CSF

Caribbean Science Foundation (CSF)

- **An independent semi-autonomous Caribbean agency whose mission is to:**
  - **promote sustainable economic development, national health, prosperity and the welfare of Caribbean people through the advancement of science, technology and innovation (STI)**
- **An agency that will liaise with international organizations, donor agencies and NGO's interested in collaborative science education, medical research and educational activities in the Caribbean**
- **A resource that all Caribbean nation states can turn to for assistance with local science, technology, innovation and medical projects (activities)**

CSF Disciplines

Science, Technology and Innovation areas include:

- **Energy**
- **Agriculture**
- **Food Science**
- **Medicine**
- **Manufacturing**
- **Small Business Development & Entrepreneurship**
- **Software**
- **Environmental Science**

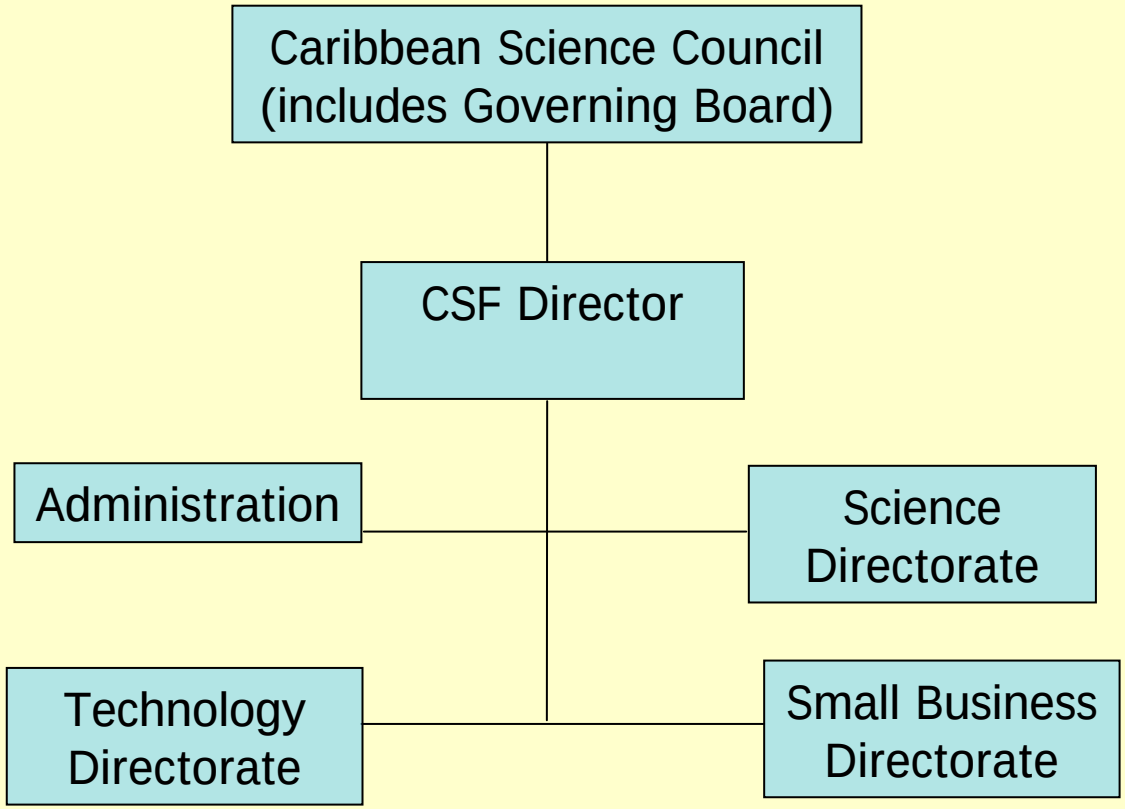
CSF Activities

- **Keeps close track of research around the world and maintains constant contact with research communities**
- **Identifies and funds work at the frontiers of STI (with a "bottom up" approach) that is of relevance to the development of the Caribbean.**
  - **Process begins with workshops and conferences to identify and discuss problems of the Region**
  - **Agency (CSF) secures funding**
  - **Agency publishes solicitation for proposals**
  - **Facilitates partnerships between research institutions, private industry, governments in the Region and overseas**
  - **Ensures that research is fully integrated with education**
  - **Supports technology transfer, and invests in engineering and manufacturing developments in areas of relevance**

CSF Activities (continued)

- **Offers professional development activities for our teachers, development of new learning techniques, and the creation of higher academic standards**
- **Offers public science education programs on TV and at museums of science**
- **Statistical studies of the impact of research in the Region**

CSF Proposed Organization Chart



CSF Budgetary Considerations

- **CSF could require a 2009 investment of US$ 1M to set up the organization**
- **Sources of support could include:**
  - **Annual member country contributions (about 20%); goal is to reduce this contribution over time as CSF becomes more financially viable**
  - **Diaspora support (UK, EU, USA), China, etc.**
  - **Commercial entities in the Region**

CSF Potential Partners

ARGENTINA

ANPCYT: *Agencia Nacional de Promocion Cientifica y Tecnologica*

CONICET: *Consejo Nacional de Investigaciones Cientificas y Tecnicas*

AUSTRALIA

AAS: *Australian Academy of Science*

ATSE: *Australian Academy of Technological Sciences and Engineering*

Australian Research Council: *Foundation for Research, Science and Technology*

CSIRO: *Commonwealth Scientific and Industrial Research Organization*

DEST: *Department of Education, Science and Training*

ITR: *Department of Industry, Tourism and Resources*

BRAZIL

ABC: *Academia Brasileira de Ciencias*

CNPQ: *National Council of Scientific Research*

FINEP: *Financiadora de Estudos e Projetos*

CANADA

NRC: *National Research Council*

NSERC: *Natural Sciences and Engineering Research Council*

SSHRC: *Social Sciences and Humanities Research Council*

CHILE

CONICYT: *National Council of Science and Technology*

FONDECYT: *Fondo Nacional de Desarrollo Cientifico y Tecnologico*

FONDEF: *Fondo de Fomento al Desarrollo Cientifico y Tecnologio*

CHINA

CAS: *Chinese Academy of Sciences*

CERN: *China Education and Research Network (Universities)*

NSFC: *National Natural Science Foundation of China*

COLOMBIA

COLCIENCIAS: *Consejo Nacional de Ciencia y Tecnologia*

FRANCE

CNES: *National Center of Space Studies*

CNRS: *Centre National de la Recherche Scientifique*

IFREMER: *French Institute of Research on Sea Use*

INRA: *National Institute of Agricultural Research*

INRIA: *Institut National de Recherche en Informatique et en Automatique*

INSERM: *National Institute of Health & Medical Research*

MOR: *Ministry of Research and Technology*

GERMANY

BMBF: *Federal Ministry for Education, Science, Research, and Technology*

DAAD: *German Academic Exchange Service*

DFG: *German Research Association*

JAPAN

NSF/Tokyo: *National Science Foundation--Tokyo Office site*

KOREA

KOSEF: *Korea Science and Engineering Foundation*

KUSCO: *Korea-U.S. Science Cooperation Organization*

KRF: *Korea Research Foundation*

MEXICO

CONACYT: *Consejo Nacional de Ciencia y Tecnologia*

FUMEC: *The United States-Mexico Foundation for Science*

SOUTH AFRICA

CSIR: *Council for Scientific and Industrial Research*

HSRC: *Human Sciences Research Council*

NRF: *National Research Foundation*

SAAG: *South African Association for Geotechnology*

SASBMB: *South African Society of Biochemistry and Molecular Biology*

SASC: *South African Science Councils*

SPAIN

CSIC: *Higher Council for Scientific Research*

MCYT: *Ministry of Science and Technology*

TAIWAN

NSC: *National Science Council*

UNITED KINGDOM

BBRSC: *Biotechnology and Biological Sciences Research Council*

EPSRC: *Engineering and Physical Sciences Research Council*

ESRC: *Economic and Social Research Council*

MRC: *Medical Research Council*

NERC: *Natural Environment Research Council*

OST: *Office of Science and Technology--Related Sites*

RCUK: *The Research Councils of the United Kingdom*

UNITED STATES

NSF: *National Science Foundation*

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Infrastructure Development

The Caribbean should continue to invest in the development of:

- **Modern, low-cost telecommunications systems (especially telephone and the Internet)**
- **Well-equipped universities, community colleges, trade schools, high schools and elementary school**
- **Modern and efficient transportation systems (roads, rail, harbors, airports)**
- **Efficient, affordable and plentiful utilities**
- **Affordable and accessible health care systems with an emphasis on preventive health**

Infrastructure Development Plan (continued)

The Caribbean should continue to invest in the development of:

- **Safe drinking water systems**
- **Sewage and sewage treatment systems**
- **Environmental clean up, environmental preservation, and preventive environmental policies**
- **An excellent intellectual property system**
- **Effective banking and other financial services, and a vibrant stock exchange in which both the rich and the poor can participate**

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Final Remarks

… Google could have started in Barbados!

We are limited only by our imagination!

THANK YOU!

http://web.mit.edu/caribbean/www/cdf/warde98-1.pdf

warde@mit.edu