Conference on Climate Change and Official Statistics

Oslo, Norway14 – 16 April 2008

Experiences on GHG Inventory and Climate Change Activities

By

Participants from Mauritius

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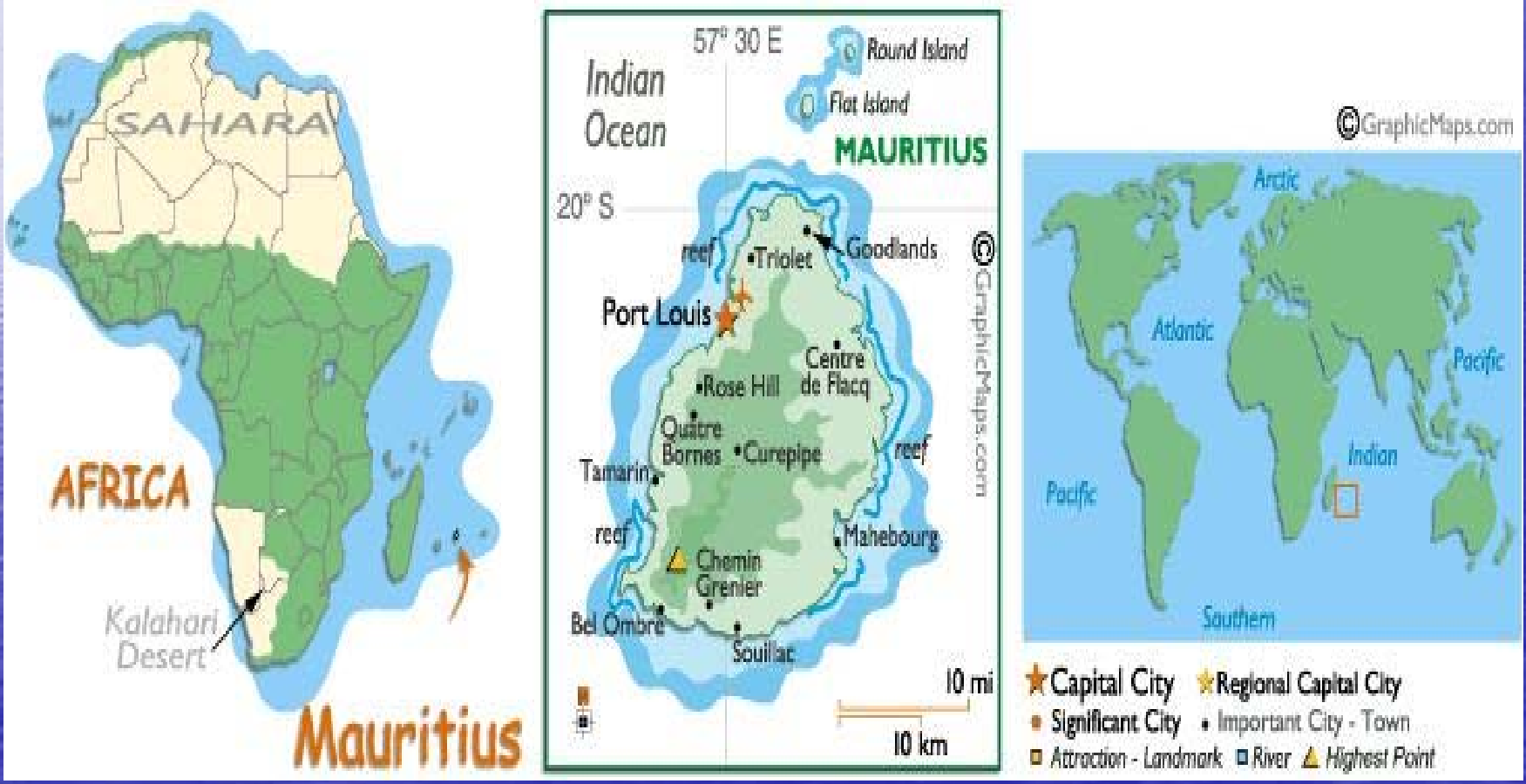
Location

- **Africa – Indian Ocean**



Country Snapshot

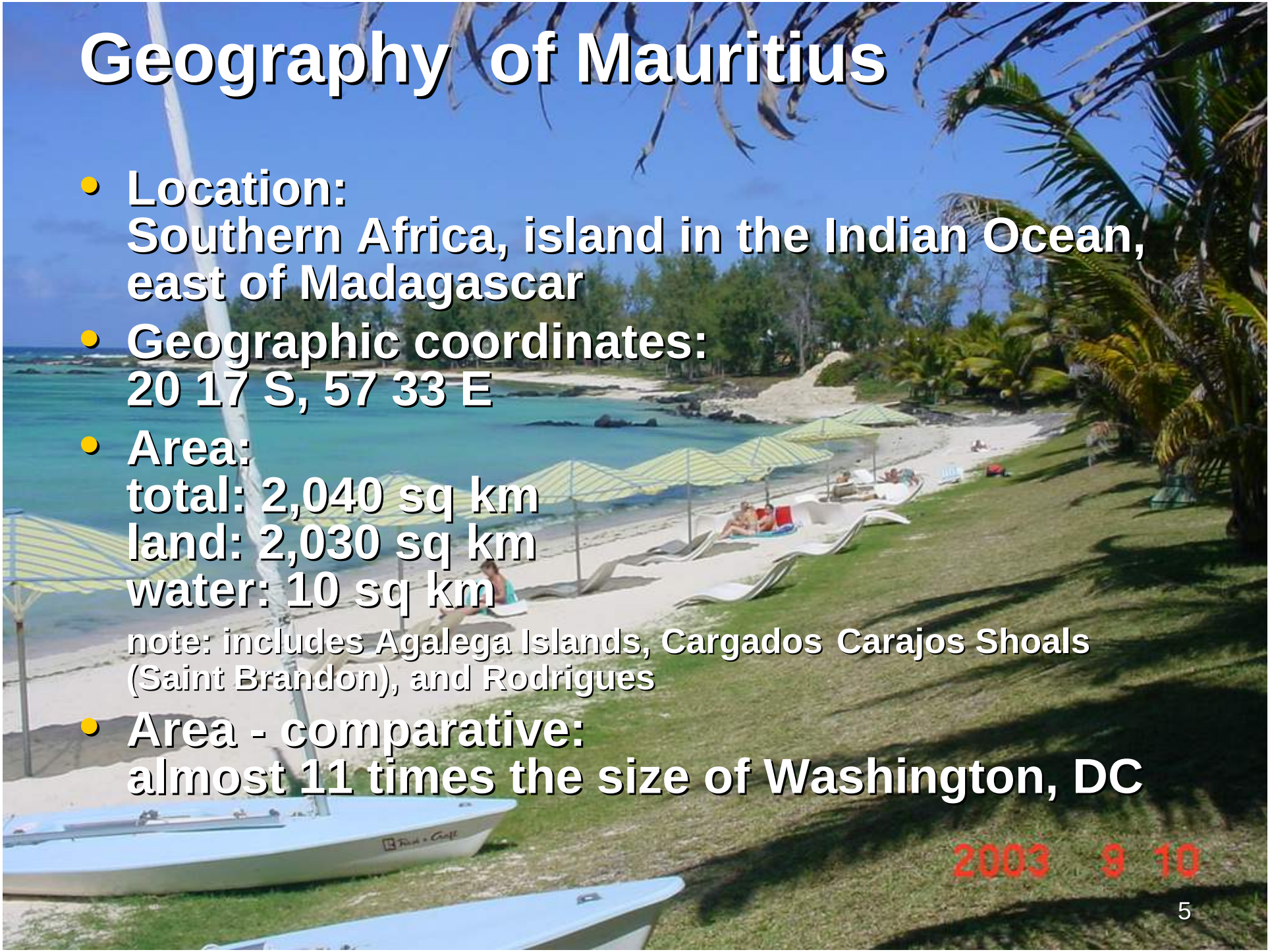
- Although known to Arab and Malay sailors as early as the 10th century, Mauritius was first explored by the Portuguese in 1505;
- It was subsequently held by the Dutch, French, and British before independence was attained in 1968.
- A stable democracy with regular free elections and a positive human rights record, the country has attracted considerable foreign investment and has earned one of Africa's highest per capita incomes.

Facts and Figures

- Official Name: Mauritius
- Capital City : Port Louis
- Languages: English (official), French, Hindi, others
- Official Currency : Mauritian Rupee (MRU: US $

  =27:30)
- Religions: Hindu, Christian, Muslim, others
- Population: 1,260,403 (July 2007 est.)
  Land Area (Mainland) : 1,860 sq km (718 sq

Geography of Mauritius



- **Location:**
  Southern Africa, island in the Indian Ocean, east of Madagascar
- **Geographic coordinates:**
  20 17 S, 57 33 E
- **Area:**
  total: 2,040 sq km
  land: 2,030 sq km
  water: 10 sq km
  note: includes Agalega Islands, Cargados Carajos Shoals (Saint Brandon), and Rodrigues
- **Area - comparative:**
  almost 11 times the size of Washington, DC

Economic Indicators

- **GDP (purchasing power parity):**
  $13.5 billion (2007 est.)
- **GDP - per capita (PPP):**
  $10,725 (2007 est.)
- **GDP - composition by sector:**
  agriculture: 5.3%
  industry: 19.6%
  services: 75% (2007 est.)
- **HDI: 0.804; RANK 65 (2005)**

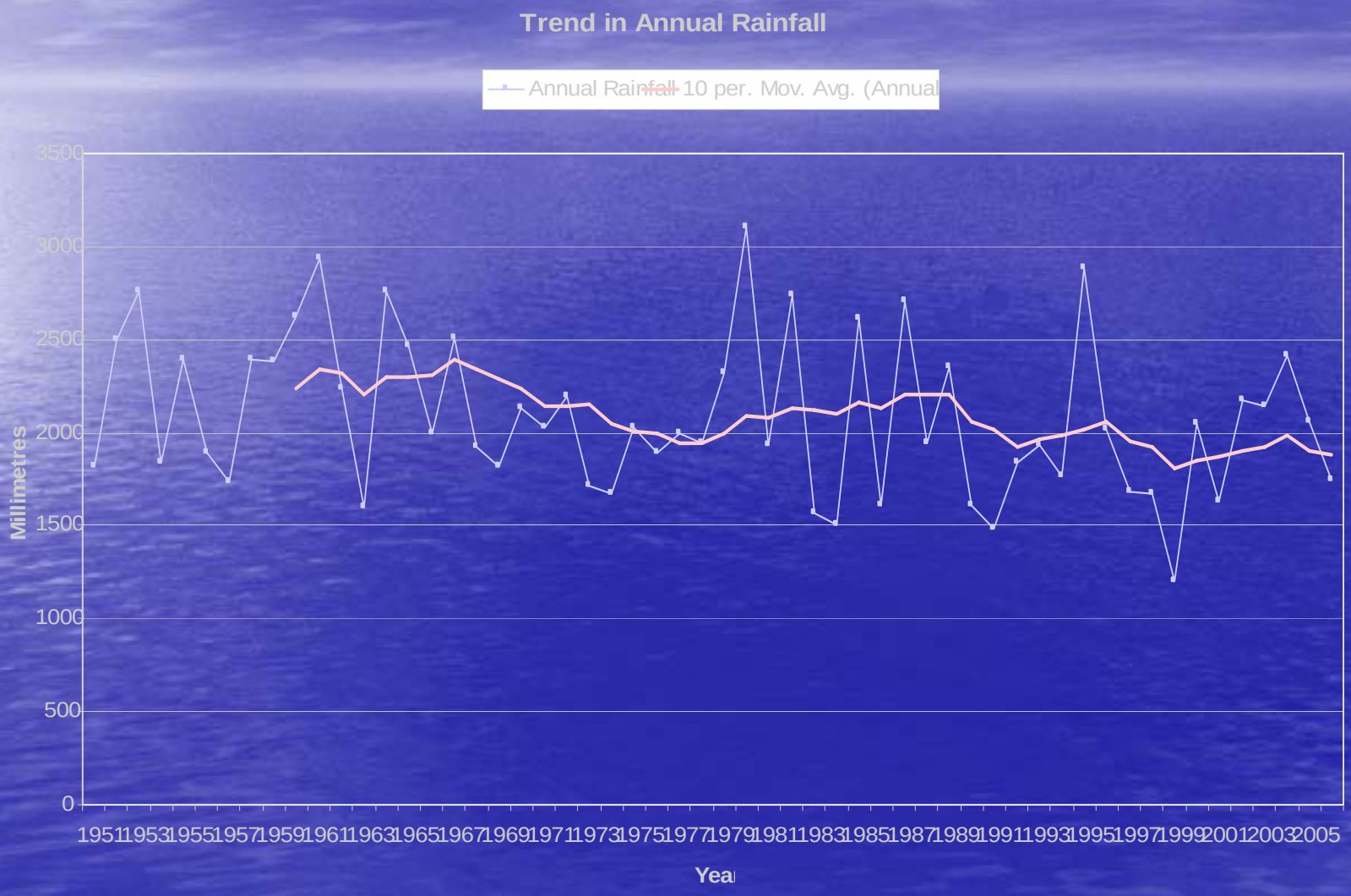
Climate

- Climate:
  tropical, modified by southeast trade winds; warm, dry winter (May to November); hot, wet, humid summer (November to May)
- Terrain:
  small coastal plain rising to discontinuous mountains encircling central plateau
- Elevation extremes:
  lowest point: Indian Ocean
  highest point: Mont Piton 8
- Natural resources:
  arable land, fish
- Land use:
  arable land: 49.02%
  permanent crops: 2.94%
  other: 48.04% (2005)
- Irrigated land:
  214 sq km (2006)

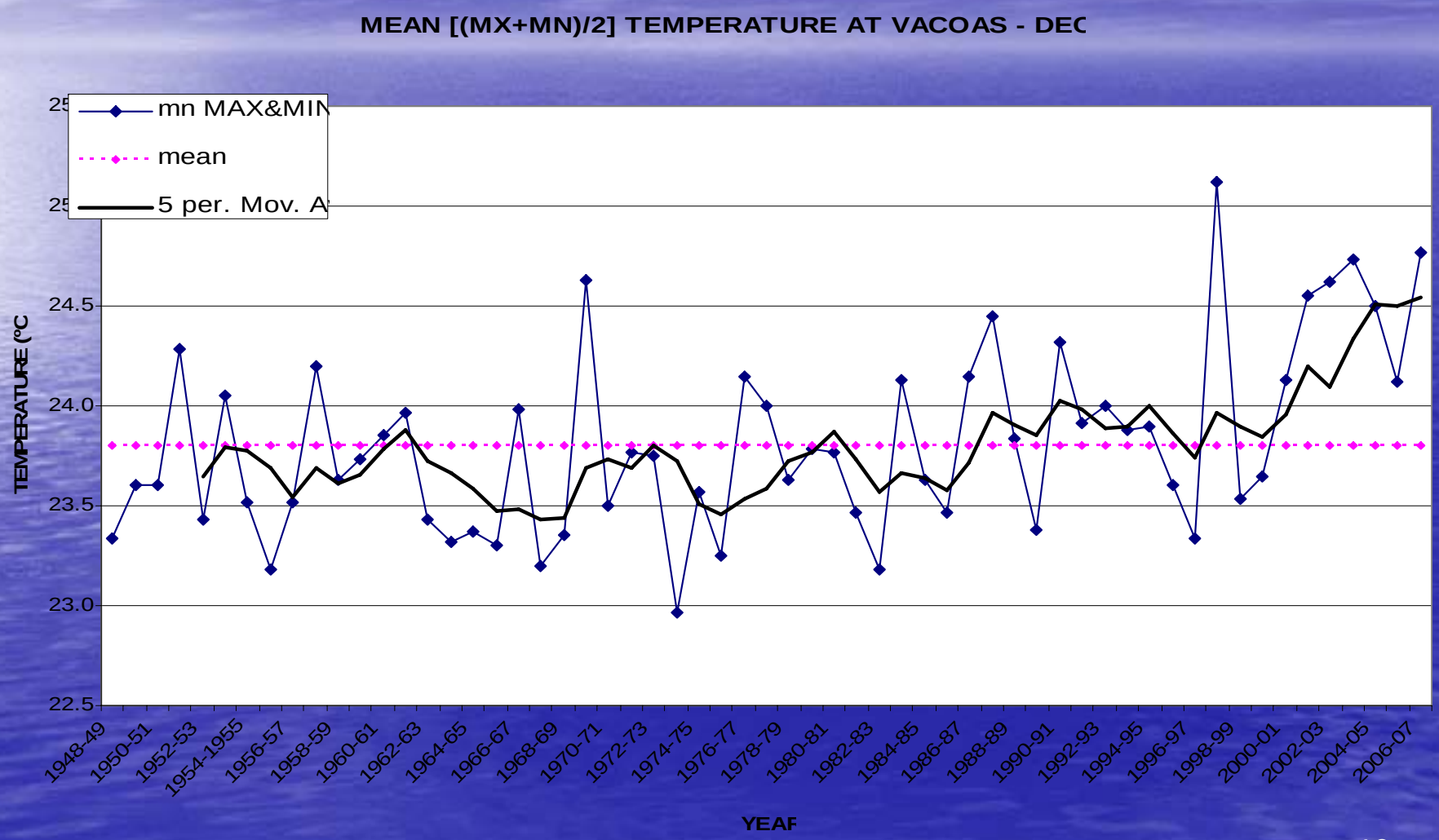
Effects of Climate Change in Mauritius

- Year 2006 was 0.74 degrees Celsius warmer than normal
- Average Temperature during the last decade (1997-2006) was higher than the normal by 0.60 to 1.0 degrees Celsius
- Year 2006 was the third warmest year after 2003 and 1998
- Mean temperature (1997-2006) has risen by 0.86 degrees Celsius compared to decade 1961-70
- Seven of the warmest years ever (1998, 2001, 2002, 2003, 2004, 2005, 2006) occurred in the last decades
- Rainfall deficit for past 100 years = 100 mm
- Mean Sea Level Rise during the past decade (1997 – 2006) = 1.2 cm
- Mean Sea Level Rise per year = 1.2 mm

Precipitation Trend - Mauritius



Temperature trend - Mauritius

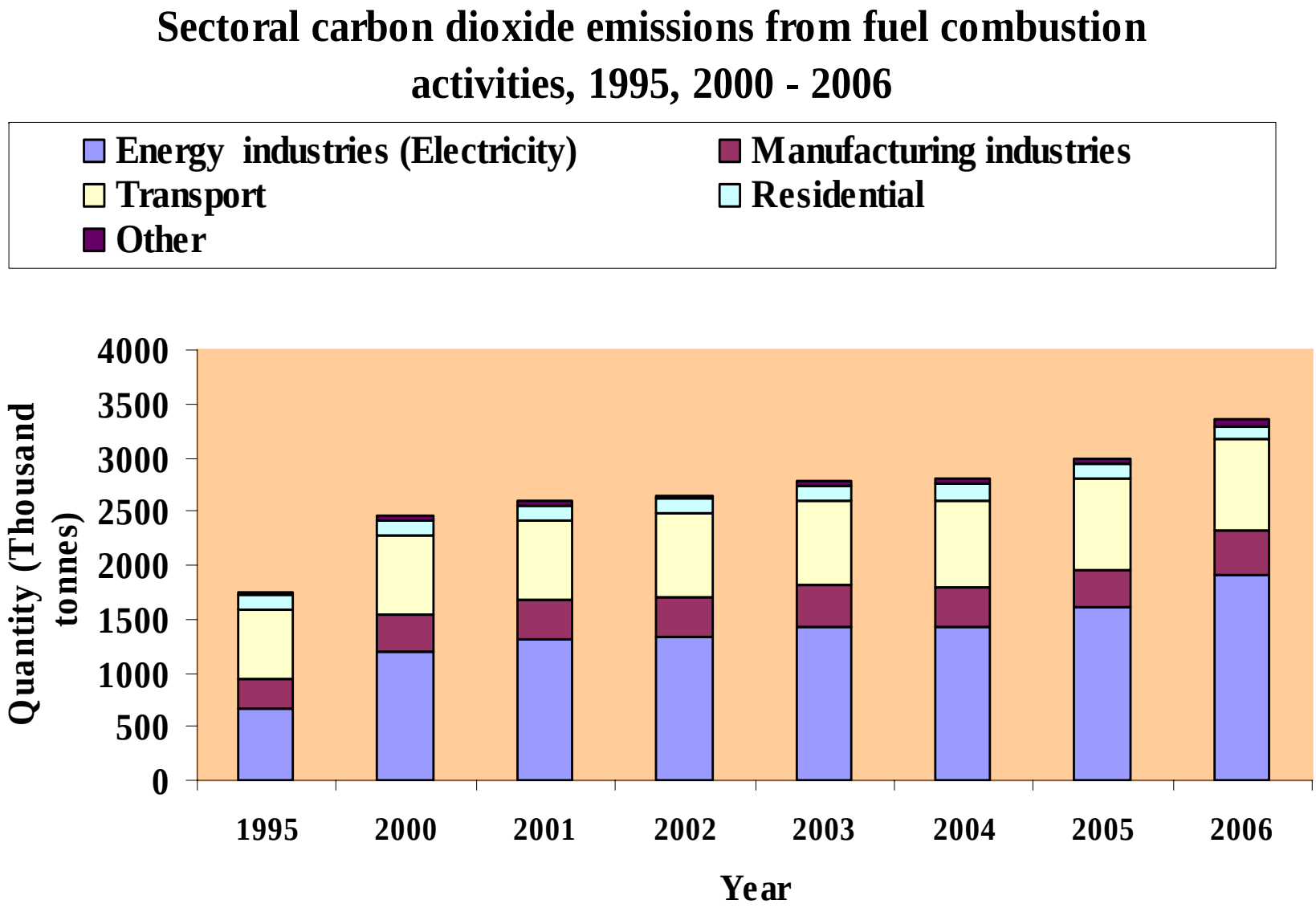


Environment

- **Natural hazards:**
  cyclones (November to April); almost completely surrounded by reefs that may pose maritime hazards
- **Environment - current issues:**
  water , energy, coastal zones
- **Environment - international agreements:**
  party to: Antarctic-Marine Living Resources, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands
  signed, but not ratified: none of the selected agreements

2003 10 2

Emissions from fuel combustion

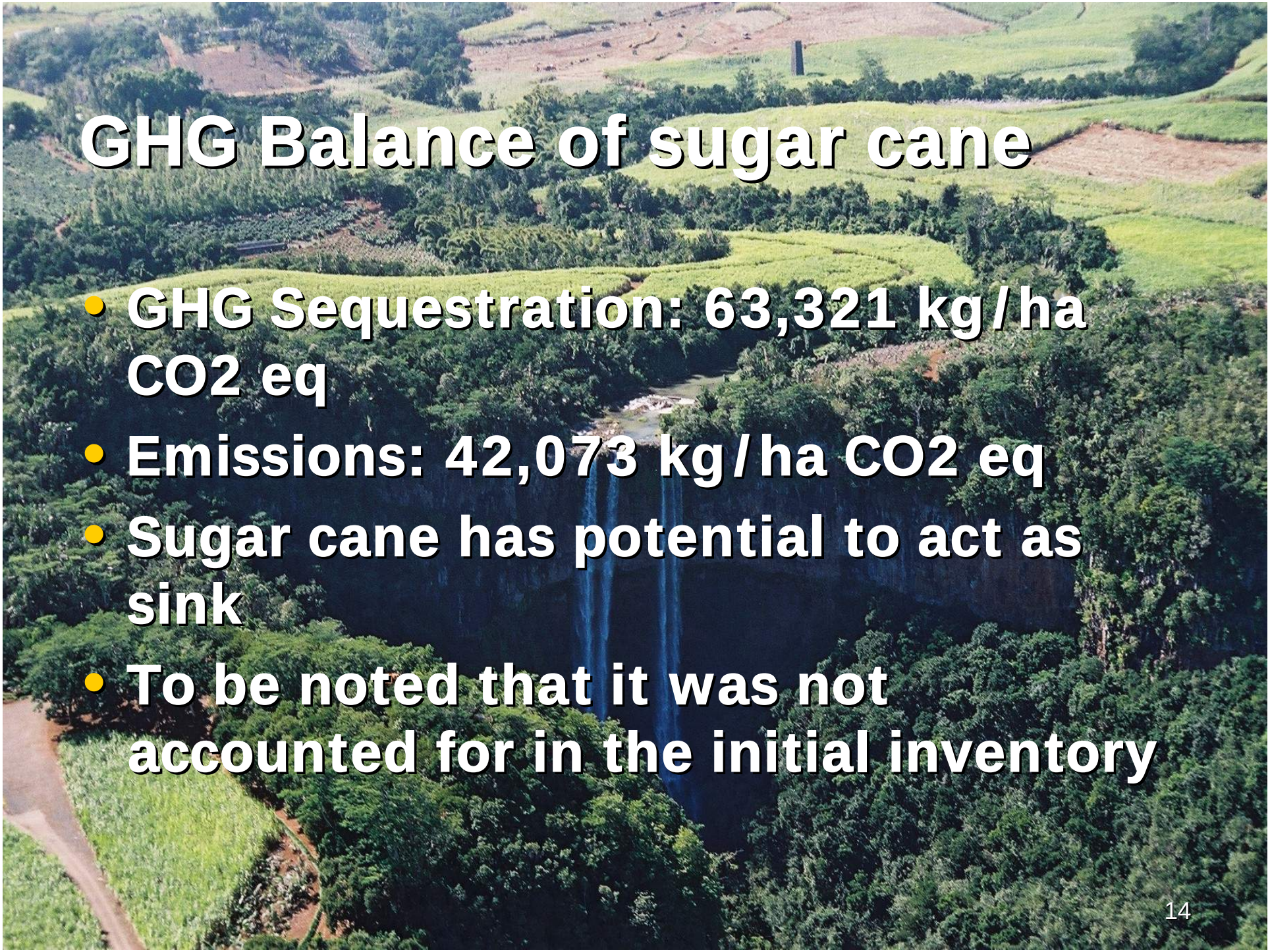


Emissions and Removals of CO 2

- Increase

	1995	2000	2005	2006
Emissions	1736.9	2454.0	2994	3349
Removals	229.2	234.5	223.7	193.2

- Mauritius (as SIDS) contributes insignificantly to global emissions: <<< 0.1 %



GHG Balance of sugar cane

- GHG Sequestration: 63,321 kg/ha CO_2 eq
- Emissions: 42,073 kg/ha CO_2 eq
- Sugar cane has potential to act as sink
- To be noted that it was not accounted for in the initial inventory

MITIGATION AND ADAPTATION In Mauritius

- Mauritius being a non-Annex 1 country has NO obligations to reduce green house gases but as signatory of the UNFCCC, mitigation and adaptation measures in line with the objectives of the UNFCCC objectives are being taken
- Coastal protection works, mangrove propagation programme, monitoring and protection of coral reefs
- *Renewable Energy:* use of solar water heaters Energy Efficiency and Energy Conservation in Buildings
- From use of petrol to liquefied petroleum gas
- Production of energy through renewable sources

National communications

- National Communications- a reporting tool at the international level of monitoring of national GHG emissions
- Commitments of Parties to UNFCCC
- Initial National Communication submitted in 1999
- Second National Communication now due

ACTION INITIATED UNDER THE UNFCCC in Mauritius.

- A multi-sectoral National Climate Committee (NCC) was established in June 1991 under the chairmanship of the Prime Minister's Office and co-chaired by the Meteorological Services.
- A National Climate Change Action Plan has been prepared by the National Climate Committee in 1998.
- The Ministry of Environment & NDU has set up an Implementation Committee in 2001 to coordinate the implementation of this Action Plan.
- Mauritius submitted its Initial National Communication (national inventory of sources and sinks of greenhouse gases) to the UNFCCC secretariat in 1999, and is in the process of submitting its Second National Communication

Successful implementation of the SNC will:

- Facilitate integration of climate change responses into national development priorities (agri.,health, infras...)
- Provide substantive inputs to policy-makers to address climate change concerns (budgetary allocations)
- Further enhance public awareness of climate change
- Generate knowledge and disseminate information on climate change at different levels of the society

SNC Project groups

- 6 Team Leaders for the different working groups:

- GHG Inventory
- National Circumstances
- Vulnerability and Adaptation (V&A)
- Mitigation
- Projects and Policies
- Education. Training and Public Awareness

What is a National GHG Inventory?

- A framework which provides all the emissions by source and removals by sink, of GHG's (whenever and whatever applicable), based on the IPCC Guidelines

- Important because most man-made impacts on the climate derive from consumption and production activities that releases GHG's

- The main GHG is CO2. Other's: CO. CH4, NO_2,N_2O,NMVOC and SO_2

INVENTORY

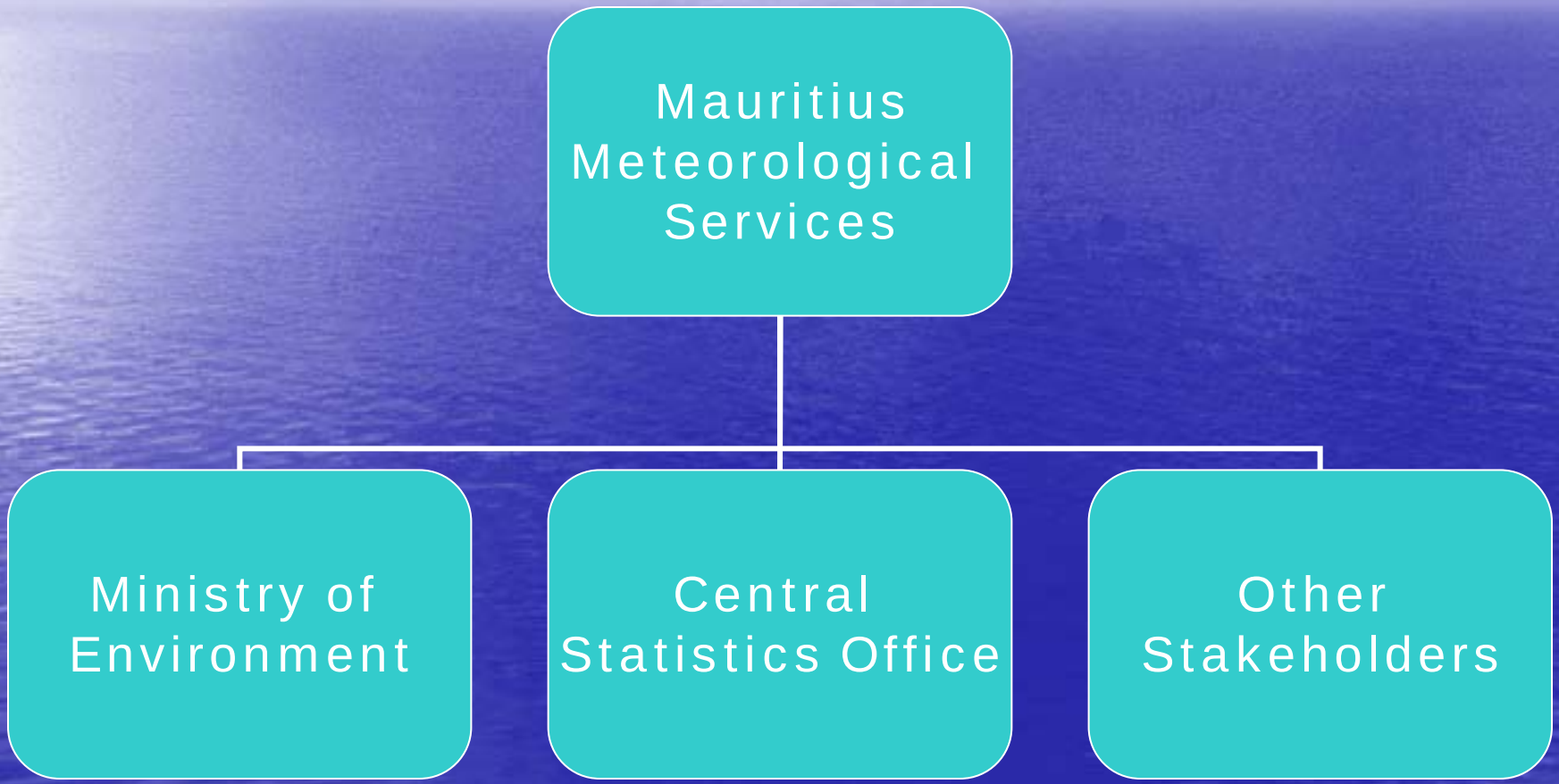
- First Inventory for Mauritius was attempted at during the Climate Change Action Plan in the early 90's
- During the preparation of the Initial National Communications (INC), the complete inventory for 1995 was compiled
- As from 2000 subsequent inventories were compiled using the1995 template and methodologies (Tier 1)
- The 1996 Revised IPCC Guidelines were used

Greenhouse Gas (GHG) Inventory

Inventory Agency Responsibilities

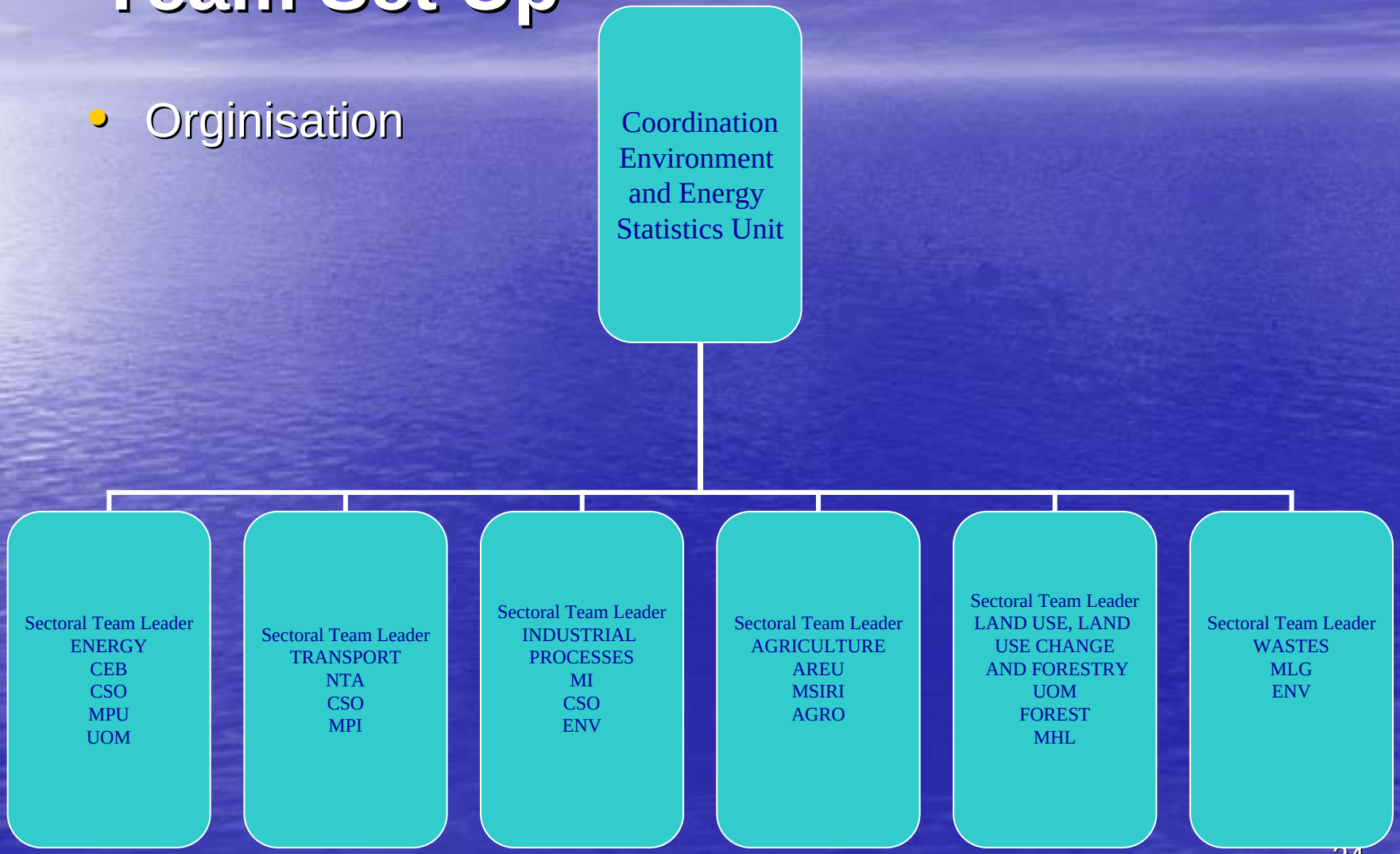
- A single national entity is responsible for the overall inventory – The CSO
- Arrangements with collaborating entities that contribute data, research, estimate emissions or provide expert reviews
- Define legal authority to collect and disseminate data necessary for the preparation of the inventory
- Ensure inventory processes are in compliance with COP decisions
- Define and apply procedures for collecting data, preparing inventory, communicating results, submitting report, and archiving
- Liaise among government departments, national agencies,
- Ensure the implementation of QA/QC

Institutional Set up

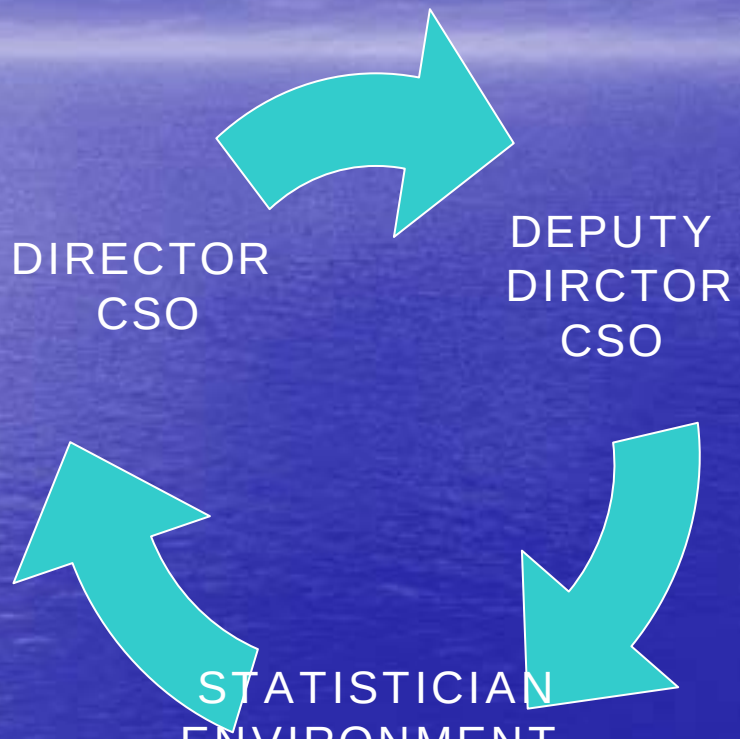


Team Set Up

- Orginisation



Organisational Set up at CSO



PROPOSED NATIONAL STRATEGY FOR THE DEVELOPMENT OF STATISTICS (NSDS)

- Reform the National Statistical System (NSS)
- Provide better statistics
- Better policies
- Better Development outcomes

Linkages for GHG Inventory

Research & national scientific community – E.g.Univ. of Mauritius

Central Statistics Office

Forestry Department
LU/LUCF
(Sinks policies)

Min. of Environment

Mauritius Meteorological Services

Interest groups & the public

Emission projections, climate & economic modeling

27

Tasks for the GHG Team

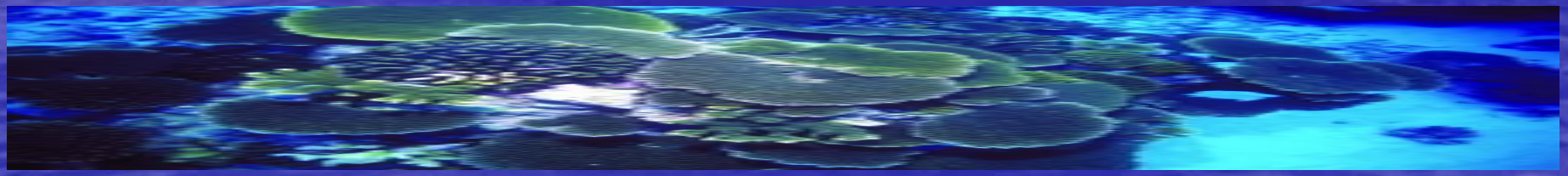
- Participate in workshops and meetings
- Collect all the Activity Data (AD) required
- Use appropriate methods to develop or estimate Emission Factors (EF)
- Review and fill data gaps
- Compile the emissions
- Perform QA/QC on all data
- Document all methodologies
- Archive all data and information

METHODOLOGIES

- **Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories**
- Parties should only use the **latest version** (i.e. **Revised 1996**) of the "IPCC Guidelines for National Greenhouse Gas Inventories" (3 volumes)
- The use of IPCC Guidelines is enhanced by the **inventory software**.
- These Guidelines are **complemented** by the IPCC **GPG**.
  - The **GPG on Uncertainty** - 2000
  - The **GPG on LULUCF** – 2003
  - 2006 Guidelines

Tiers 1 and 2 or 3 methodologies

- The **higher** the number designating the tier, the **more detailed** is the methodology and the **more accurate** are the emission estimates.
- **Tier 1** represents the **minimum**, or default, methodology. If sufficient data is available, a Party can also try to apply a higher tier.
- **Tiers 2 or 3** involve **more elaborate methods** which could be either source category-specific or technology-based. These methods require more detailed data and/or measurements for their application.



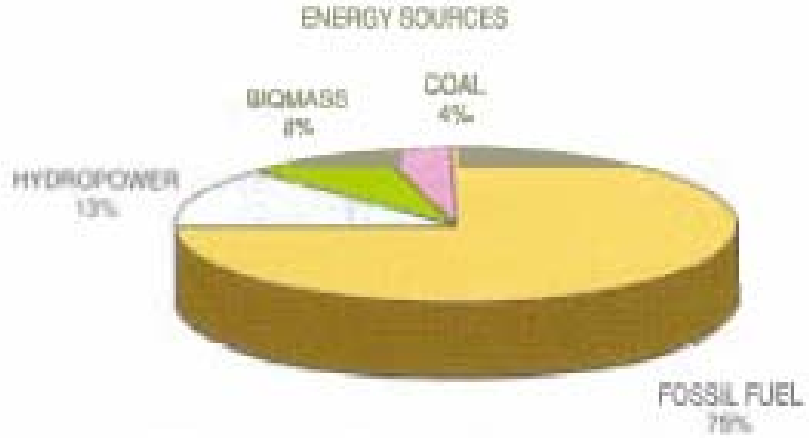
SECTORS AND DATA SOURCES

- Energy: Energy Balance and Trade - CSO
- Agriculture: Agric Stats – CSO & Agric. Ministry
- Land Use, Land Use Change and Forestry (LULUCF): Forestry Services
- Industrial Processes: Industries
- Waste: Environment Stats – CSO & Min. Local Govt.

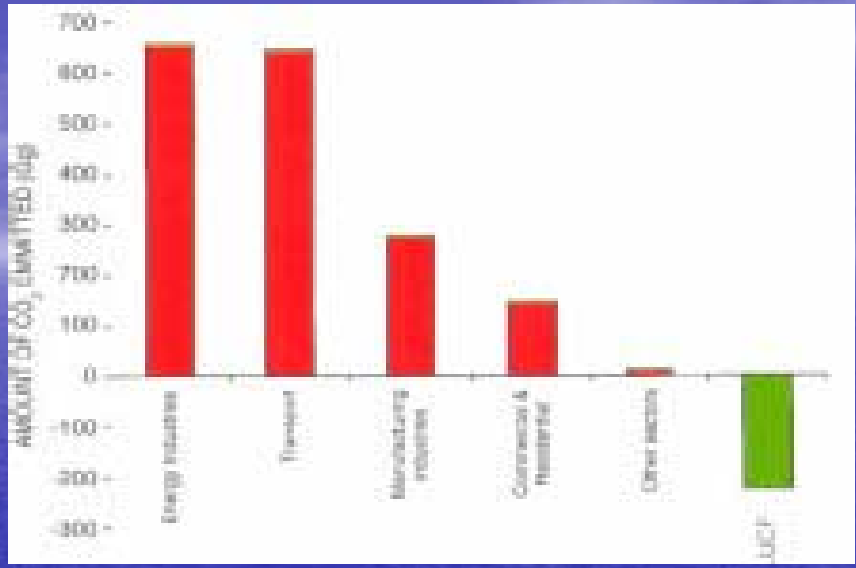
Output

- **The Second National Communication which is a document to be submitted as part of our obligation under the UNFCCC is presently under preparation. Apart from providing an inventory for greenhouse gas emission, it will also identify Mitigation and Adaptation measures which will be submitted to funding agencies including the GEF and the Adaptation Fund**

Emissions 1995

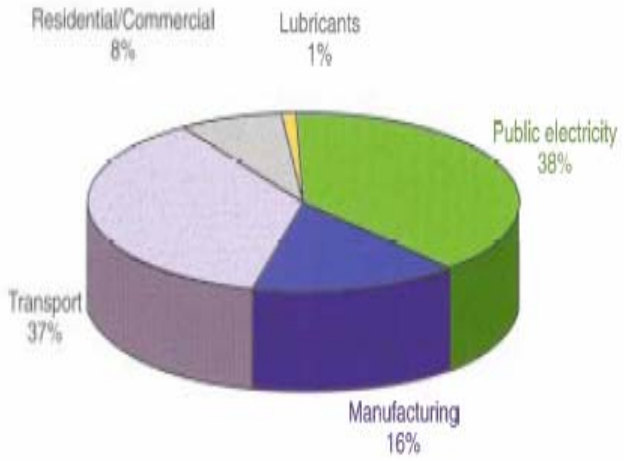


Energy sources



GAS	AMOUNT (Gg)
CH_4	4.600
N_2O	0.727
NO_X	10.180
CO	67.003
NMVOC	15.481
SO_2	13.369

Non-CO_2 emissions

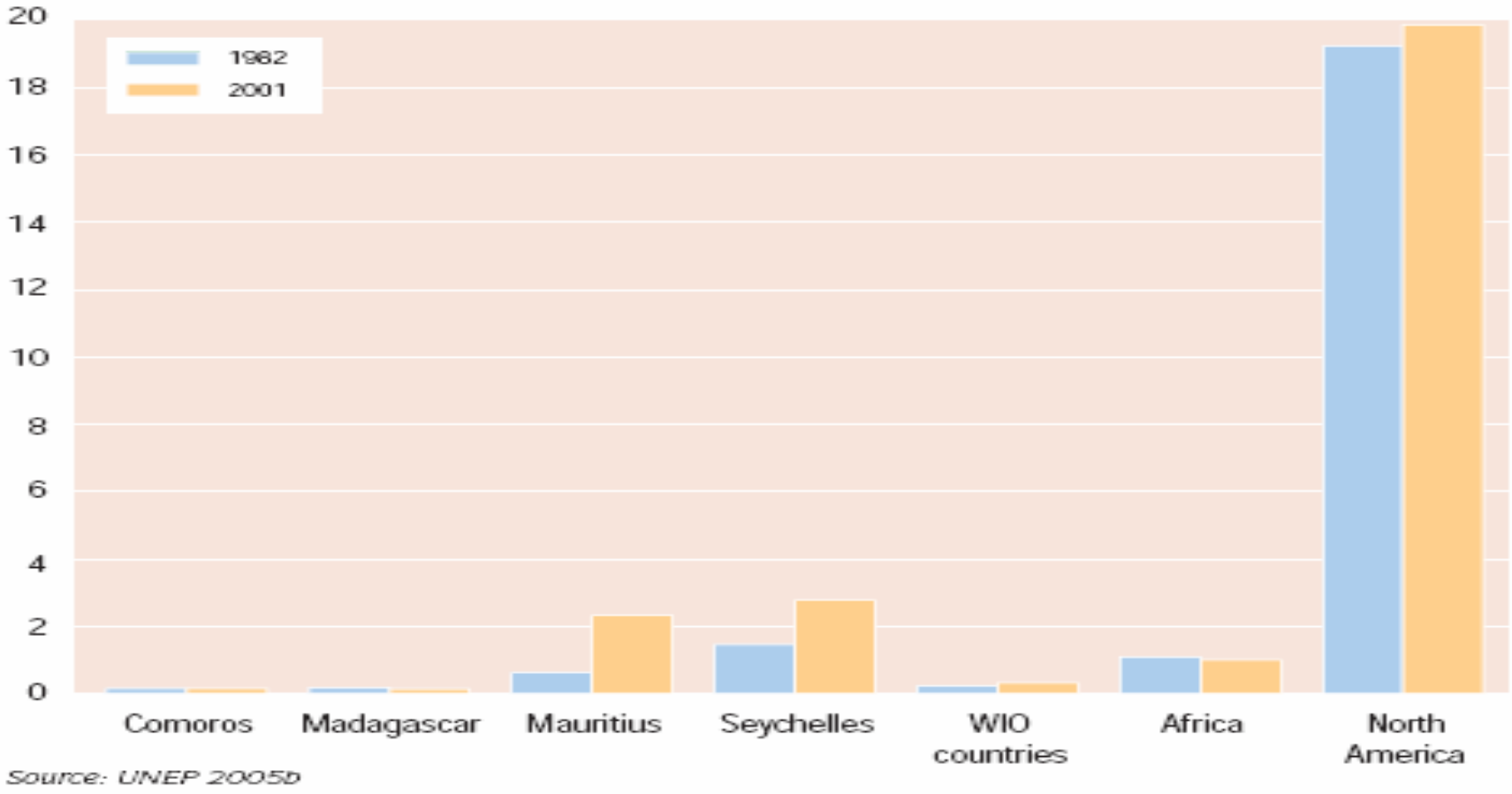


Sectoral CO_2 emissions from fossil fuel

CO_2 Emissions per capita

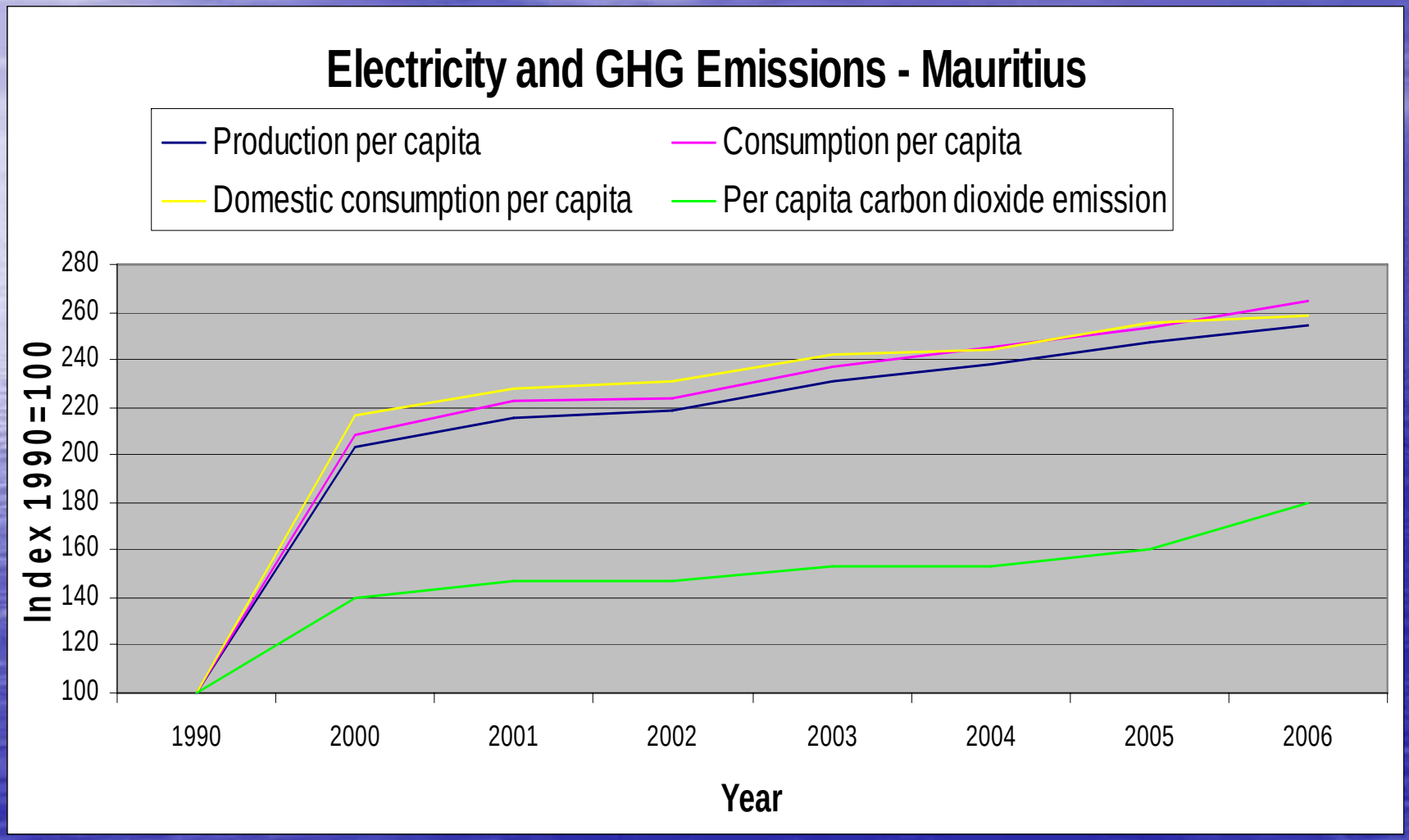
Figure 9: Comparison of emission levels

metric tonnes per head per year

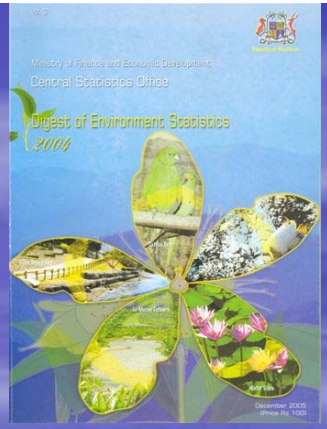


Source: UNEP 2005b

Trends


Electricity and GHG Emissions - Mauritius
Production per capita
Consumption per capita
Domestic consumption per capita
Per capita carbon dioxide emission
Index 1990=100
280
260
240
220
200
180
160
140
120
100
1990
2000
2001
2002
2003
2004
2005
2006
Year

Uses of GHG emissions data



- International commitments – UNFCCC, UNDP, COI, SADC, MDG's,Africa Environment Information Network (AEIN), etc
- Local : Environment Statistics, Environment Accounting, Environment Information System (EIS),
- Building baseline for Carbon Credits, CER's, CDM's etc
- Scenario Building

Challenges for data availability

- System in place at CSO for quality control, integrity and transparency to ensure reliability of estimates
- Statistics Act
- Data suppliers are motivated
- Regular contacts
- Needs more harmonisation
- Commitments
- Lack some expertise in the different sectors, eg data on age cohort and fuel type of vehicles

Final Remark

*A national inventory is **not** a research project...*

*It is a **national program** that works closely with statistical and research institutions to create high quality emissions data.*

Michael Gillenwater – GHG Management Institute, USA

That's all

THANK YOU