CARICOM COMMUNITY SECRETARIAT

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DEVELOPMENT OF A GEOSPATIAL FRAMEWORK TO IMPLEMENT A REGIONAL SPATIAL DATA INFRASTRUCTURE (RSDI) IN CARICOM

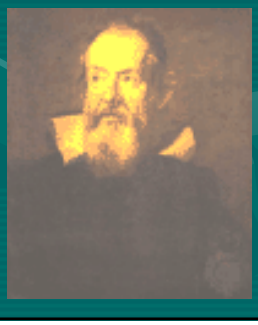
Outline of Presentation

- The Intelligence Imperative
- Introduction
- Problems & Challenges
- Framework for Coordination
- Data Harmonisation
- Recommendations
- Value Proposition
- Recommendations
- Conclusion
- Questions & Feedback

IMPORTANCE OF INFORMATION

WHAT CAN NOT BE MEASURED,
CAN NOT BE ADMINISTERED

"MEASURE ALL YOU CAN MEASURE,
WHAT YOU CANNOT MEASURE,
MAKE IT MEASURABLE"



Galileo Galilei
(1564-1642; Philosopher)

The Intelligence Imperative

- **HOW CAN "INFORMED" DECISIONS BE MADE WITHOUT THE INTELLIGENT USE OF COLLECTED INFORMATION.**
- **WHAT GOOD IS COLLECTING INFORMATION IF IT IS NOT GOING TO BE USED EFFECTIVELY TO DRIVE INFORMED EVIDENCE BASED DECISION MAKING.**
- **80% OF INFORMATION COLLECTED IS NOT USED.**
  (World Business Report, 2002)

$ million Population and Housing Censuses
$ million Social Surveys ie Poverty, MDGs, Budgetary
$ million Cadastre, Imagery, technology, Training, Staffing
$ million ICT Strategic Planning
$ millions on other Political, Social and Environmental Surveys

Introduction

- Empirical studies have found that approximately 75 percent of Regional Government's administrative decisions are related to, or impact on, the geographic domain of Member States, some examples are municipal, maritime, political, air/sea traffic control, border security, oil/gas exploration and fishing boundaries.

Introduction

- The effects of global climate change are becoming more destructive in small-island states in the Caribbean, Governments are becoming aware of the need to effectively manage this finite resource and its accompanying attribute data.
- However, effective management of land and its resources requires geospatial data that are current, timely, reliable and relevant.

Introduction

- Consequently the currency, availability and access to timely information in the region are necessary requirement for management effectiveness for economic, social and environmental planning.
- One such event to be effectively managed is the occurrence of natural disasters, particularly hurricanes.

ENVIRONMENTAL CONCERNS

The Challenges/Issues

- Human Behaviour
- Institutional Co-orporation
- Legislative/Administrative Issues
- Political Issues
- Cultural issues
- Financial Support

THE CHALLENGE

- The historical tradition of decision-making for sustainable development has shown inconsistencies with the social demographics, flaws in urban and rural planning and has created an environmental nightmare for the population.

A framework for Coordination

- What is needed is a framework to facilitate the coordinated exchange of geospatial information on natural resources, environment, land ownership, land use, transport, communication, demography and socio-economic indicators amongst geospatial data stakeholders within the CARICOM community.

PREVENTION IS CHEAPER THAN REPAIR

How much does it cost?

- The World Bank and U.S. Geological Survey have estimated that **US$40 billion invested in risk reduction strategies could have saved as much as US$280 billion** in worldwide economic and Social losses from disasters in the 1990s – a seven dollar return for each dollar invested.

American Planning Association
Planners Day on Capitol Hill
The Safe Communities Act of 2005 (H.R. 3524)

The Forecast

- The Caribbean has had its full share of storms and hurricanes within the past decade, severely damaging small-island economies.
- The forecasts suggest that the intensity and regularity of this phenomenon due to global climate change will increase, hence accelerating the need to be ready and proactive than reactive.

Compelling Reasons

- One of the most compelling reason for the development of a coordinated approach at this juncture is the need for timely, effective, relevant regional data-sets for disaster preparedness with respect to events that can/will be caused by Climate Change.

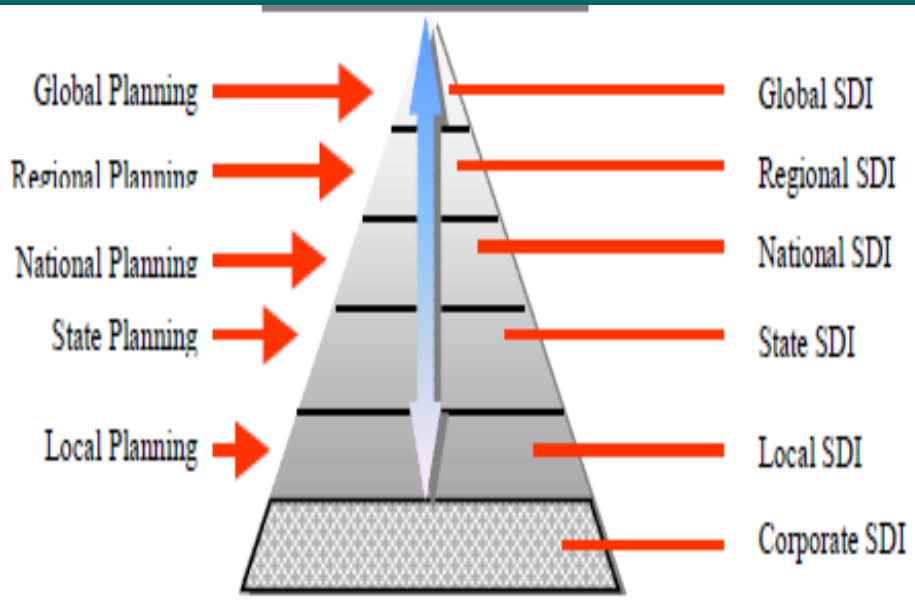
RSDI is Needed

- The recommendation is for the development and application of a Regional **Spatial Data Infrastructure (RSDI)**. A RSDI can be the framework to facilitate the coordinated exchange of spatial information amongst spatial data stakeholders within the spatial data community.

RSDI

- A RSDI that seek to explore a framework for CARICOM Member States and Associate Members to develop a Geospatial strategy that can assist the countries in the Caribbean to strategically plan, share, coordinate and adopt a framework for Disaster Management and its disastrous consequences.

Different Levels of Spatial Data Infrastructure



Data Sharing Approach

- The absence of a coordinated approach to sharing vital information, led to the destruction of many lives in the aftermath of the 2004 tsunami that hit several countries in the Asian region and the 2005 Kashmiri earthquake that affected the Northern region of Pakistan. The ability to forecast the path of Hurricane Katrina in 2005 provided ample time for the warning and evacuation of the large population of New Orleans.

Who wants to use it?

US President George W. Bush and Homeland Security Advisor, Tom Ridge after 911

Weather related disasters

- *In 2004 the Caribbean was hit by major hurricanes within three months, causing widespread devastation.*
- Devastating floods swept through the Dominican Republic in late May 2004, killing at least 2,000 people and destroying crops and homes.
- Some 200,000 people in Gonaïves were affected by Tropical Storm Jeanne, losing their homes, belongings or livelihoods. Jeanne left over 2000 people dead and 2,600 injured, while more than 2,000 are still unaccounted for.
- Cuba suffered extensive damage from Hurricane Charley. Homes, industries, infrastructure, and the best agricultural land were hit hardest. More than 40,000 houses in Cuba were damaged. Damage to schools, hospitals, electricity and telephone services, and water distribution systems was extensive.
- Reducing disaster risks through better preparedness and response is vital to safeguard development in the world's poorest regions.
- Lutheran World Relief Report, 2004

Recovery Cost

- The financial cost for disaster recovery considerably out-weights the cost to prepare and plan for a disaster. The CARICOM Region is expected to spend an estimated US$180 million dollars to conduct a Round of Population and Housing Censuses in the year 2010/2011
- This decennial data collection mandate can surely be the catapult for regional data coordination and policy planning, to drive disaster planning in the region.

Harmonisation Approach

IDB/UNFP Funded

Common Census Framework for the 2010/2011 Round of Population and Housing Censuses in CARICOM

Harmonisation Objective

The development and adoption of a Common Framework for Gathering, Processing and Disseminating Population Census data for Region-wide comparability.

The Framework Components

This Framework consists of Three Components:

1. Common Questionnaire,
2. Common Methodologies for data collection and validation, and
3. Common Tool for Data Access and Dissemination.

PROJECT BENEFITS

- The project's main benefit will be the creation, adoption, and dissemination of a standardized methodology to produce high-quality social statistics from Population Census data.
- The Region will benefit as a whole in the framework of its economic integration process and the ability to compare information across countries.

In the absence of a Regional data sharing policy on land and land related Geospatial information many debilitating factors for data management have developed

- Data comparison and cross-correlation are severely hindered by the several non-standardized referencing systems, platforms and operating systems, software and map projections across agencies.
- Lack of knowledge and inaccessibility to existing data stores has resulted in difficulties in compiling basic inventories of land assets including government social infrastructure.
- Interagency coordination does not exist and in the few areas, is restricted to facilitate the ease of sharing government collected information, therefore leading to costly duplication of data collection, redundancy and analysis.

- Delays in the development of National Physical Development Plans due to the limited access to up-to-date, timely, relevant socio-economic, geographic data, modern technology and satellite imagery.
- Critical shortage of Geographic Information Systems (GIS) management specialists and skilled operational technical staff.
- The lack of metadata or information on the "who, what, when, where, why, and how" of databases inhibits one's ability to find and use data, and consequently, makes data sharing among organizations harder.
- No data ware-housing and Archiving of historical data

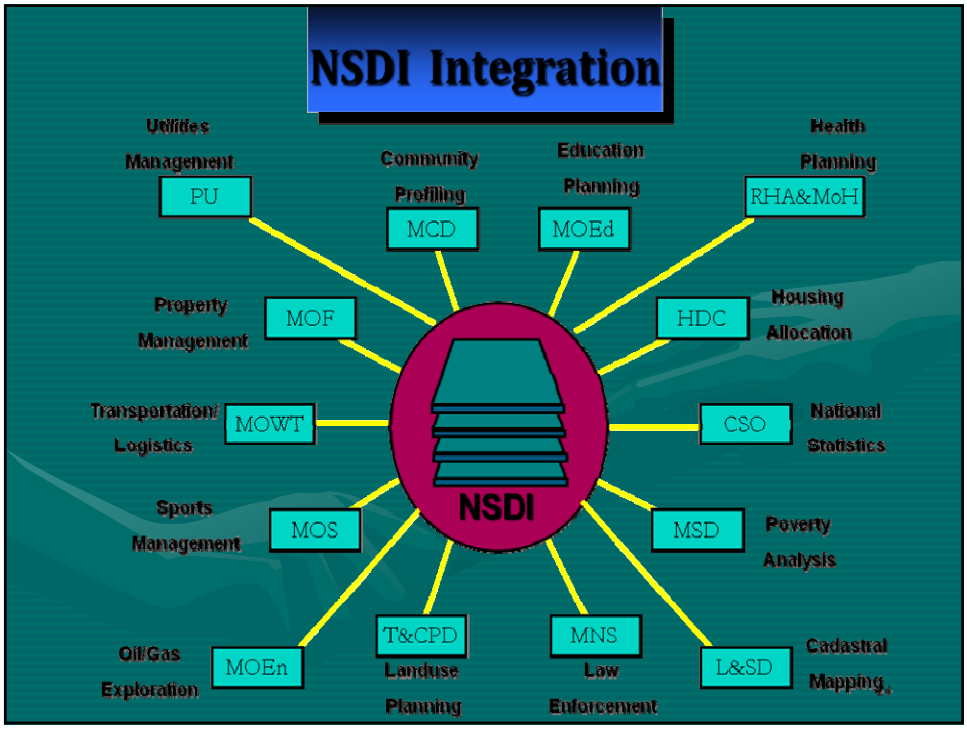
Organisational Resistance

- Another issue common to spatial data sharing is the question of organizational resistance to sharing data.
- Resistance to share data may be due to a notion of a loss of power, control and institutional positioning.

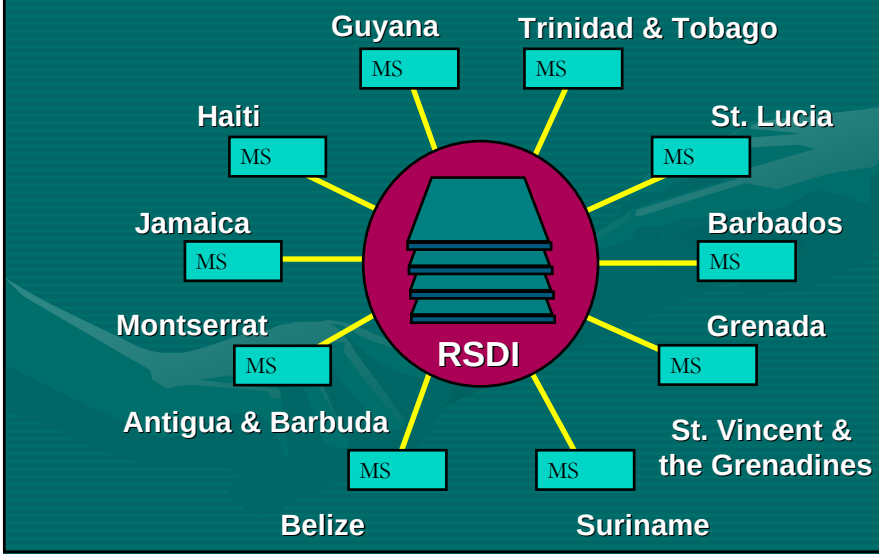
Recommendations

This role is outlined as the Secretary General recommendation of "delivering as one".

- Facilitate the National and Regional portal.
- Create operational links with the (sub) National Geo-information stakeholders
- Contribute to the realization of National Government's policies and needs with respect to issues relying on the use of Geo-information
- Coordination and execution of geo-information disclosure activities for large enterprises, companies or multi-nationals in order to fulfill their Corporate Governance goals
- Capacity Building activities
- Financial Support for the development of Geo-Nodes.



Regional Integration



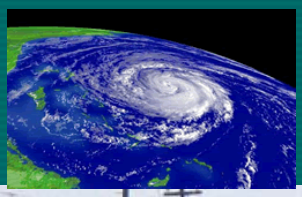
RSDI Regional Benefits

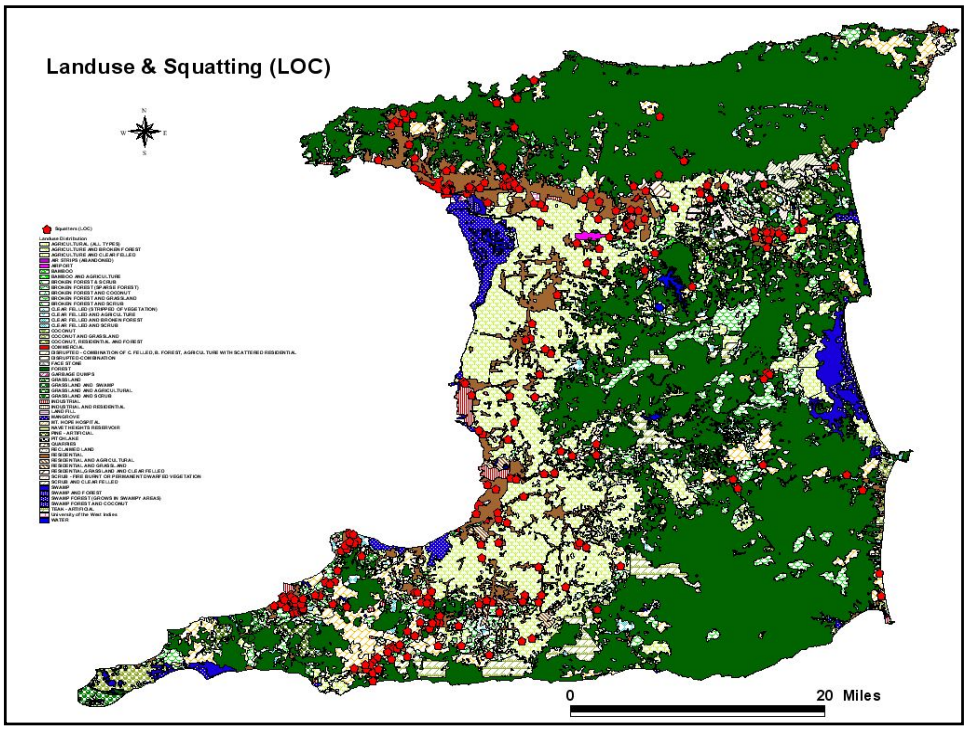
- Economic
- Social
- Environment

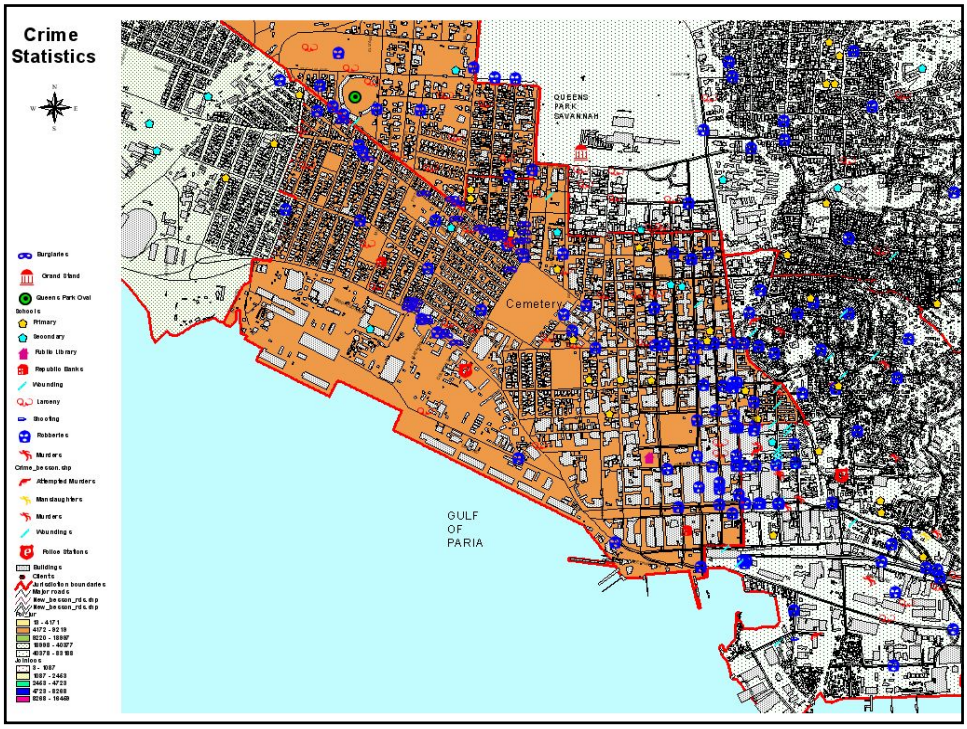
There are at least 40 International Organisations for Standards (ISOs) and ISO Agreements (ISO/TC211) that have completed hundreds of classification of content related standards for SDI development, namely ISO19101 - ISO19140.

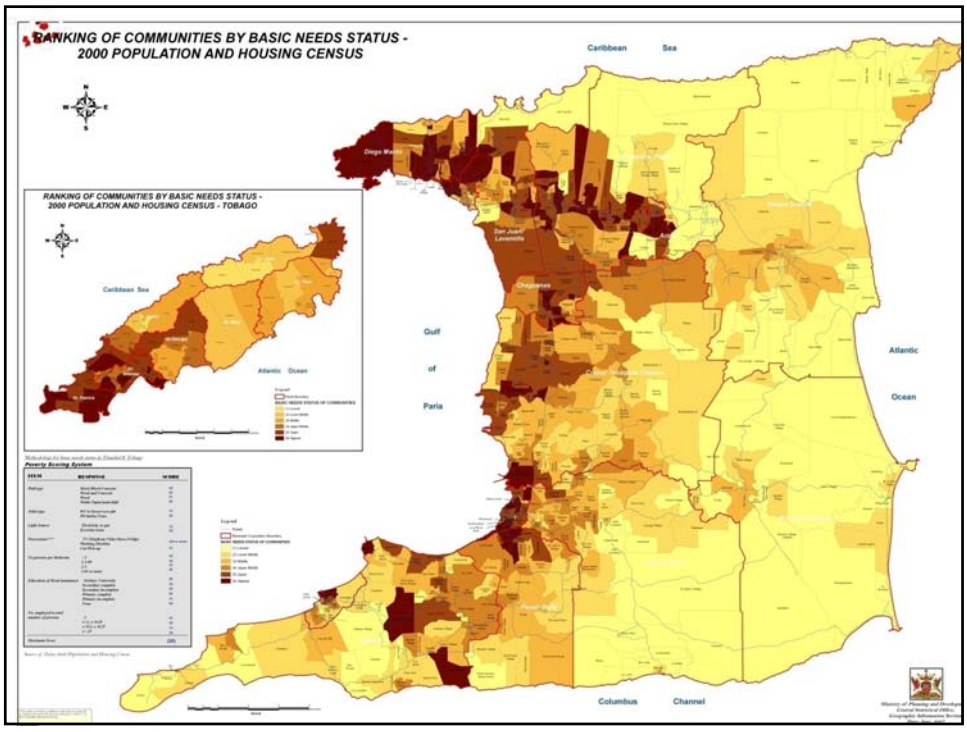
Please refer to paper submitted.

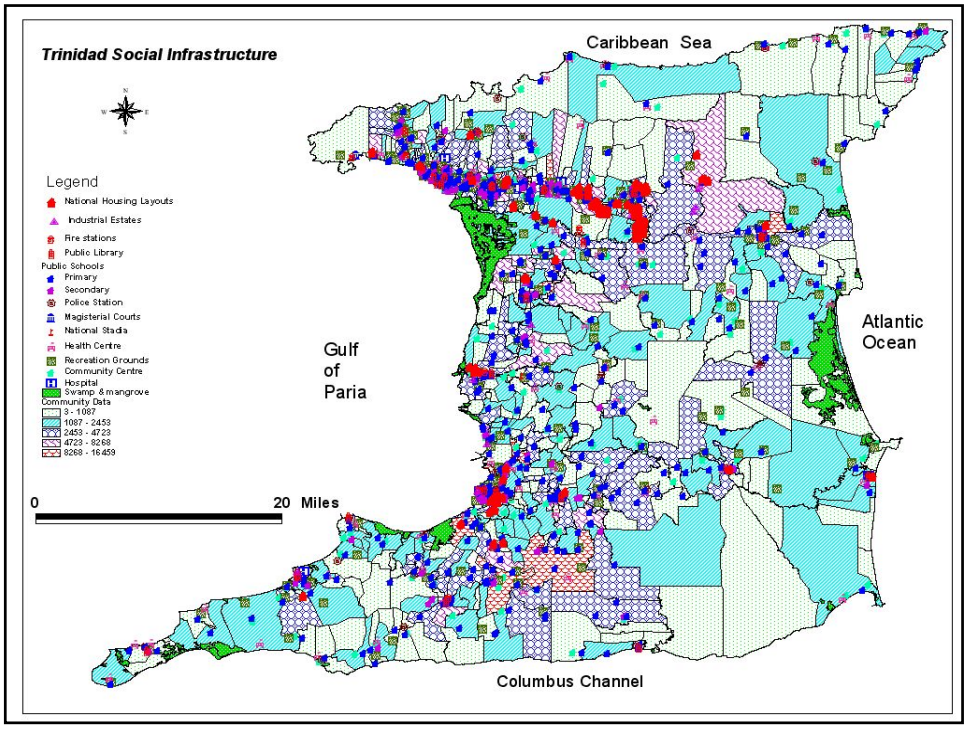
Value Proposition in Trinidad and Tobago

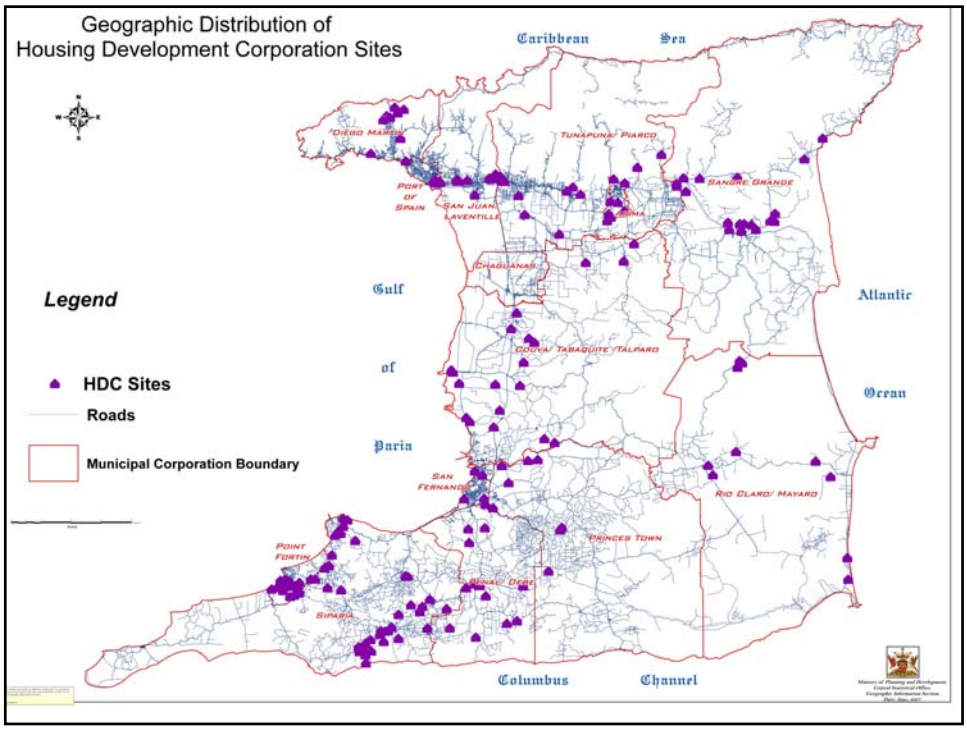


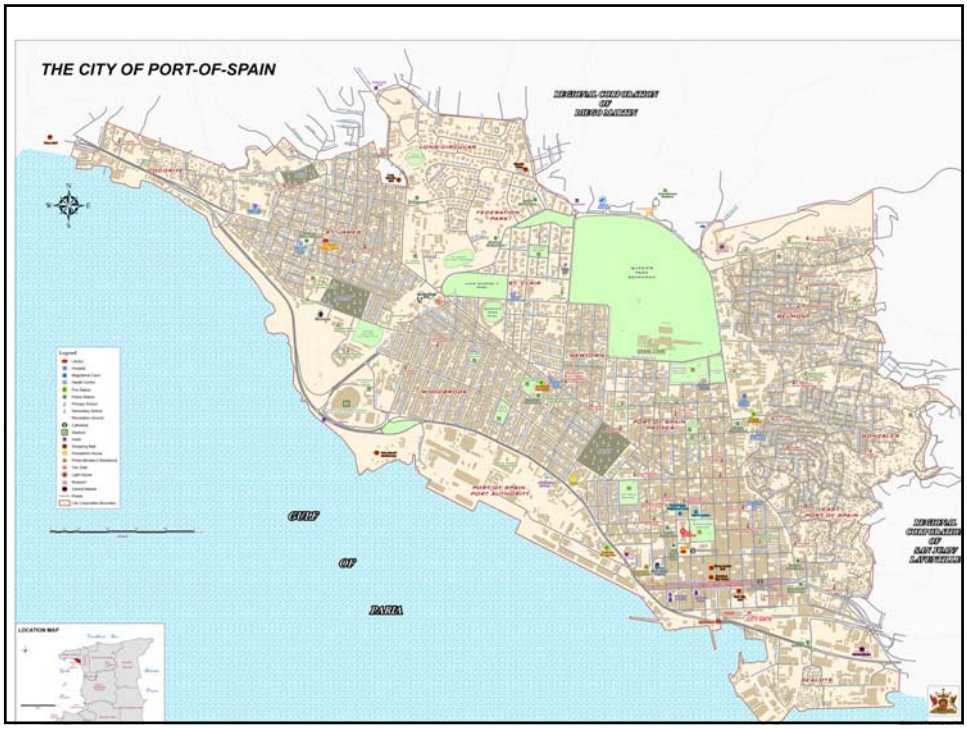


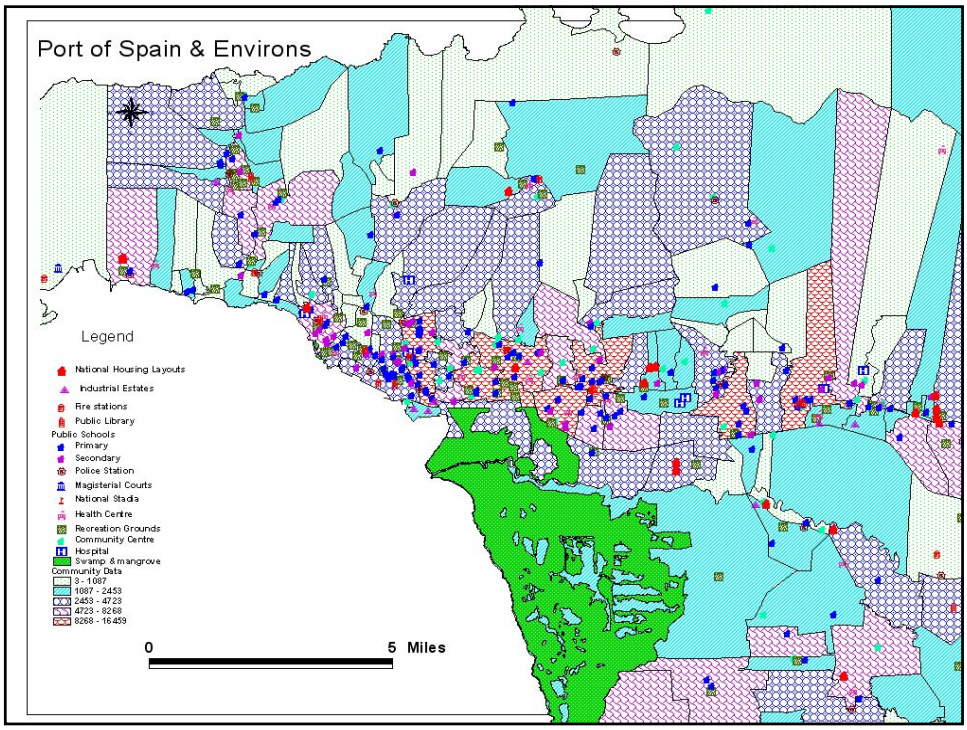

Crime Statistics
QUEENS PARK SAVANNAH
Cemetery
GULF OF PARIA
Burglaries
Grand Stand
Queens Park Oval
Schools
Primary
Secondary
Public Library
Republic Banks
Wounding
Larceny
Shooting
Robberies
Murders
Crime_lesson.shp
Attempted Murders
Manslaughters
Murders
Wounding s
Police Stations
Buildings
Clients
Jurisdiction boundaries
Major roads
New_lesson_rd s.shp
New_lesson_rd s.shp
Layer
15 - 4171
4172 - 9219
9220 - 19997
19998 - 40977
40978 - 85186
Junctions
0 - 1697
1697 - 2463
2463 - 4723
4723 - 8268
8268 - 16469

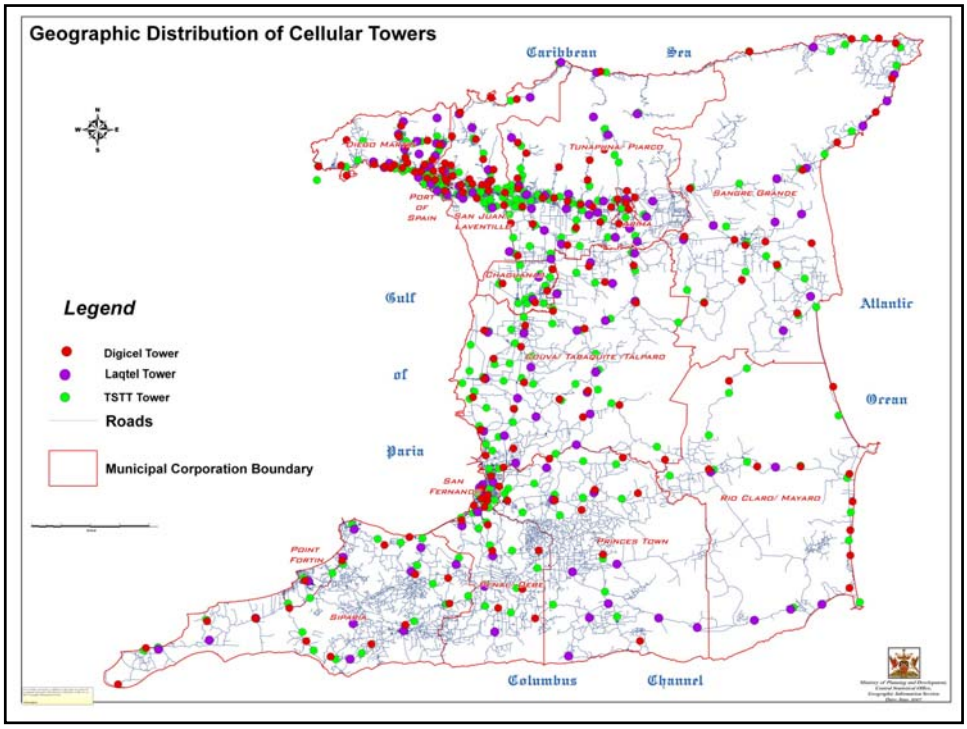

RANKING OF COMMUNITIES BY BASIC NEEDS STATUS - 2000 POPULATION AND HOUSING CENSUS
Caribbean Sea
Gulf of Paria
Atlantic Ocean
Columbus Channel
RANKING OF COMMUNITIES BY BASIC NEEDS STATUS - 2000 POPULATION AND HOUSING CENSUS - TOBAGO
Caribbean Sea
Atlantic Ocean

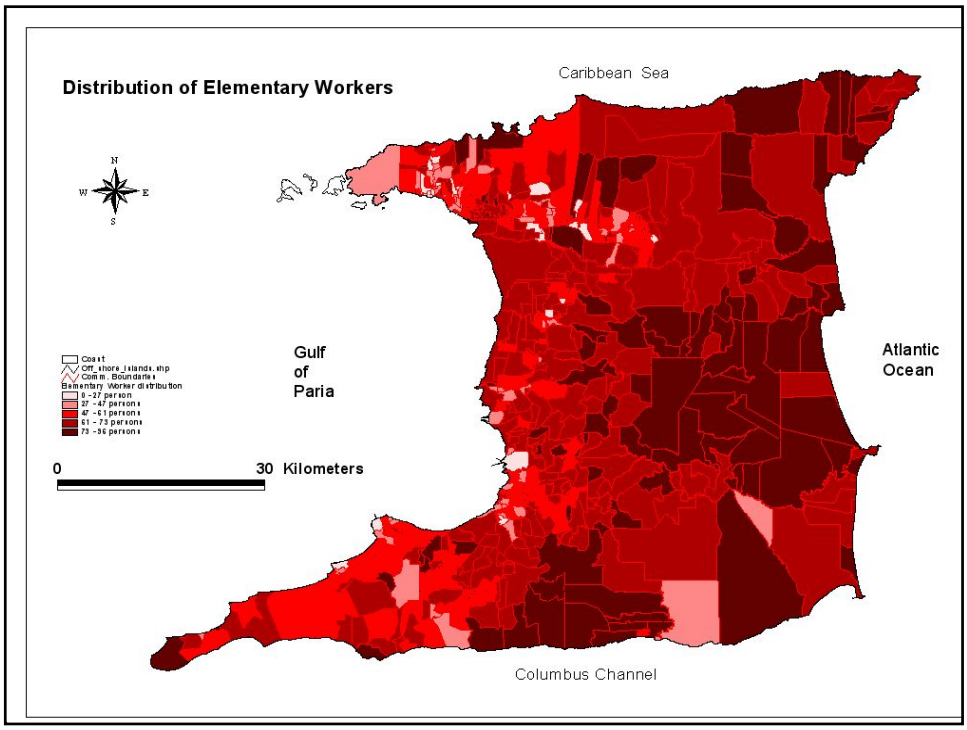

Trinidad Social Infrastructure
Caribbean Sea
Legend
National Housing Layouts
Industrial Estates
Fire stations
Public Library
Public Schools
Primary
Secondary
Police Station
Magisterial Courts
National Stadia
Health Centre
Recreation Grounds
Community Centre
Hospital
Swamp & mangrove
Community Data
3 - 1087
1087 - 2453
2453 - 4723
4723 - 8268
8268 - 16459
0
20 Miles
Gulf of Paria
Atlantic Ocean
Columbus Channel

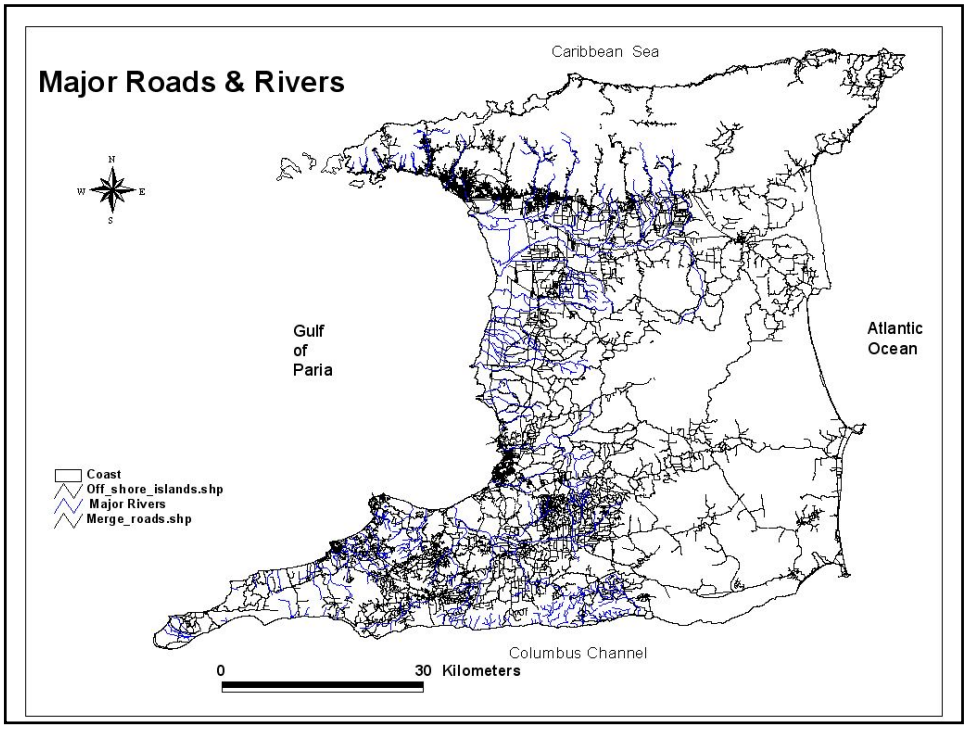

Geographic Distribution of
Housing Development Corporation Sites
Caribbean Sea
Legend
HDC Sites
Roads
Municipal Corporation Boundary
Gulf of Paria
Atlantic Ocean
Columbus Channel
DIEGO MARTIN
TUNAPUNA/ PIARCO
PORT OF SPAIN
SAN JUAN LAVENTILLE
SANGRE GRANDE
CHAGUANAS
COUVA/ TABAQUITE /TALPARO
SAN FERNANDO
RIO CLARO/ MAYARO
PRINCES TOWN
POINT FORTIN
SIPARIA

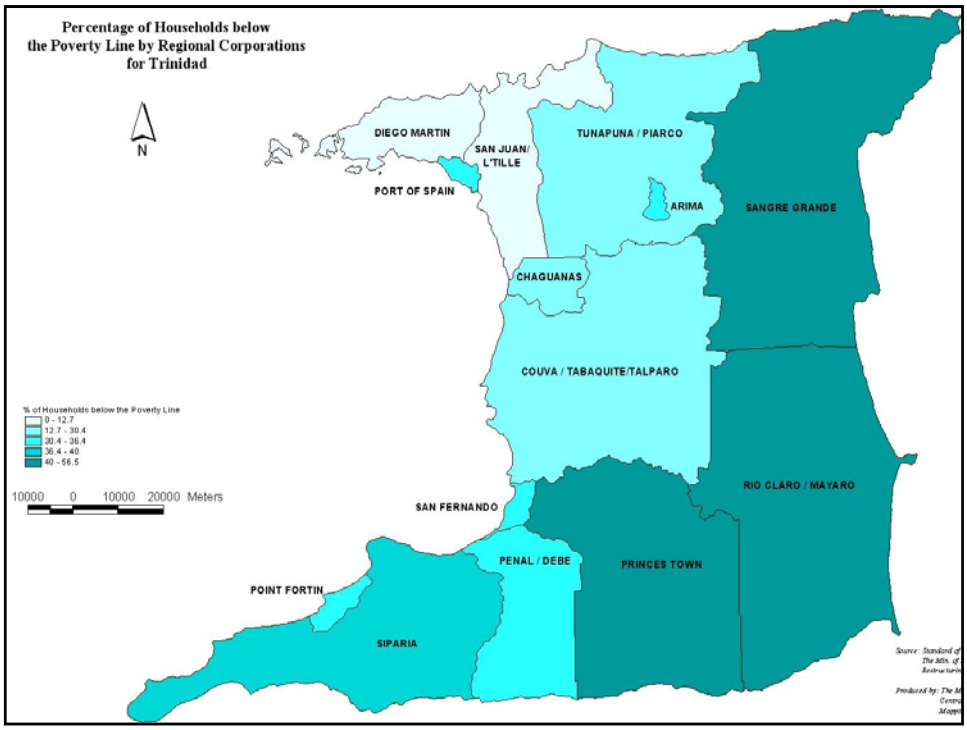

THE CITY OF PORT-OF-SPAIN
GULF
OF
PARIA

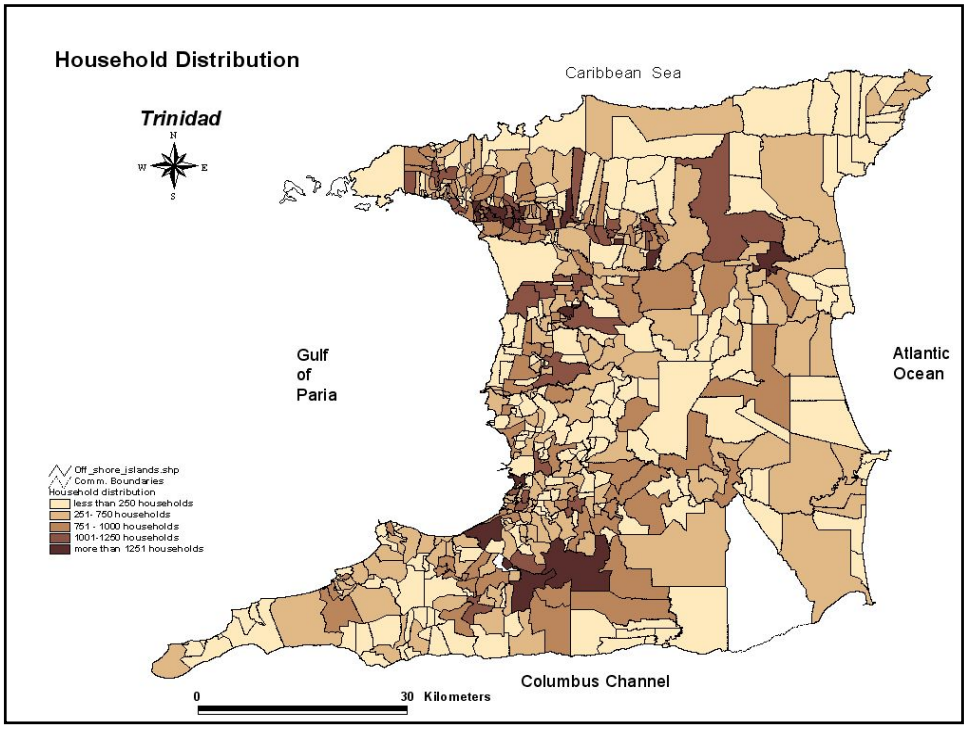

Port of Spain & Environs
Legend
National Housing Layouts
Industrial Estates
Fire stations
Public Library
Public Schools
Primary
Secondary
Police Station
Magisterial Courts
National Stadia
Health Centre
Recreation Grounds
Community Centre
Hospital
Swamp & mangrove
Community Data
3 - 1087
1087 - 2453
2453 - 4723
4723 - 8268
8268 - 16459
0
5 Miles

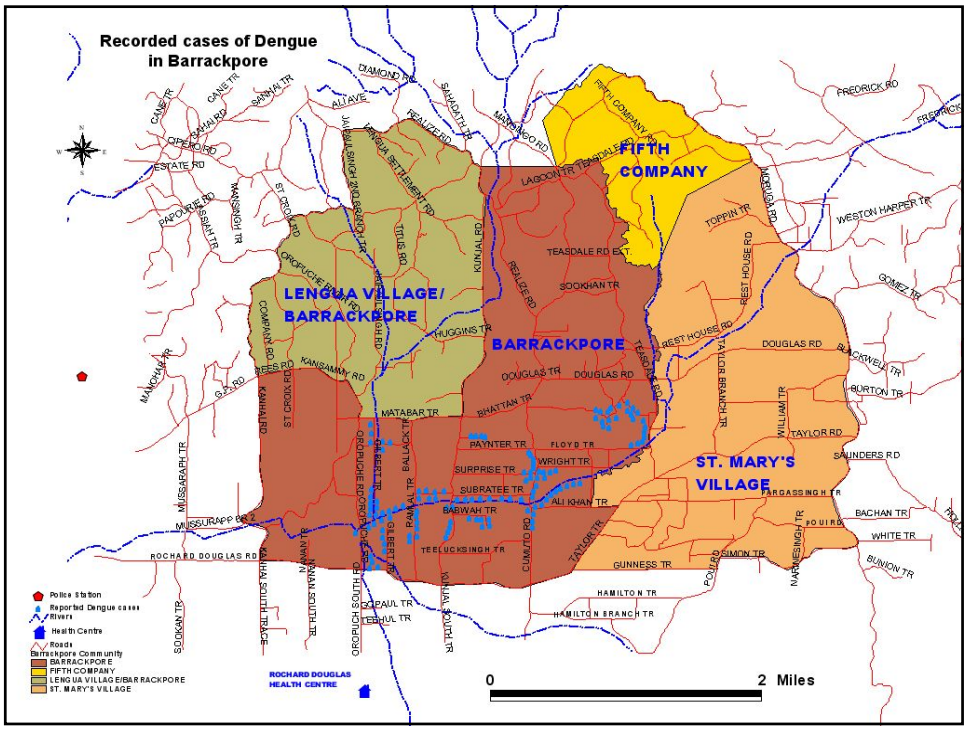

Geographic Distribution of Cellular Towers
Caribbean Sea
Legend
Digicel Tower
Laqtel Tower
TSTT Tower
Roads
Municipal Corporation Boundary
Gulf of Paria
Atlantic Ocean
Columbus Channel
Port of Spain
San Juan/ Laventille
Tunapuna/ Piarco
Sangre Grande
Chaguanas
Couva/ Tabaquite/ Talparo
San Fernando
Rio Claro/ Mayaro
Princes Town
Point Fortin


Distribution of Elementary Workers
Caribbean Sea
N
W
E
S
Coast
Off_shore_Islands.shp
Comm. Boundaries
Elementary Worker distribution
0 - 27 persons
27 - 47 persons
47 - 61 persons
61 - 73 persons
73 - 96 persons
0
30 Kilometers
Gulf of Paria
Atlantic Ocean
Columbus Channel


Major Roads & Rivers
Caribbean Sea
N
W
E
S
Gulf
of
Paria
Atlantic
Ocean
Coast
Off_shore_islands.shp
Major Rivers
Merge_roads.shp
Columbus Channel
0
30 Kilometers


Percentage of Households below
the Poverty Line by Regional Corporations
for Trinidad
N
DIEGO MARTIN
SAN JUAN/
L'TILLE
TUNAPUNA / PIARCO
PORT OF SPAIN
ARIMA
SANGRE GRANDE
CHAGUANAS
COUVA / TABAQUITE/TALPARO
% of Households below the Poverty Line
0 - 12.7
12.7 - 30.4
30.4 - 36.4
36.4 - 40
40 - 56.5
10000 0 10000 20000 Meters
SAN FERNANDO
RIO CLARO / MAYARO
PENAL / DEBE
PRINCES TOWN
POINT FORTIN
SIPARIA


Household Distribution
Trinidad
Caribbean Sea
Gulf of Paria
Atlantic Ocean
Columbus Channel
Off_shore_islands.shp
Comm. Boundaries
Household distribution
less than 250 households
251- 750 households
751 - 1000 households
1001-1250 households
more than 1251 households
0
30 Kilometers


Recorded cases of Dengue in Barrackpore
FIFTH COMPANY
LENGUA VILLAGE/ BARRACKPORE
BARRACKPORE
ST. MARY'S VILLAGE
Police Station
Reported Dengue cases
Rivers
Health Centre
Roads
Barrackpore Community
BARRACKPORE
FIFTH COMPANY
LENGUA VILLAGE/BARRACKPORE
ST. MARY'S VILLAGE
ROCHARD DOUGLAS HEALTH CENTRE
0
2 Miles

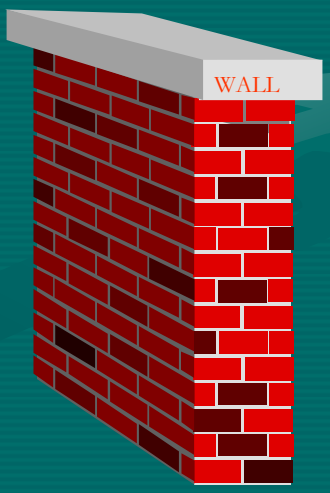
CONCLUSION

- The challenge of designing, building, implementing, and maintaining a Spatial Data Infrastructure draws on many different disciplines and requires examination of a large number of factors and issues.
- However, current research shows that despite considerable interest and activities, the development of an effective and comprehensive RSDI is hampered in most cases by a lack of support from some stakeholders, which results in this initiative remaining just an innovative concept.

CONCLUSION

- SO, IT IS NOT TECHNOLOGY THAT DELIVERS IT'S GOOD LEADERSHIP

THANK YOU



Harold