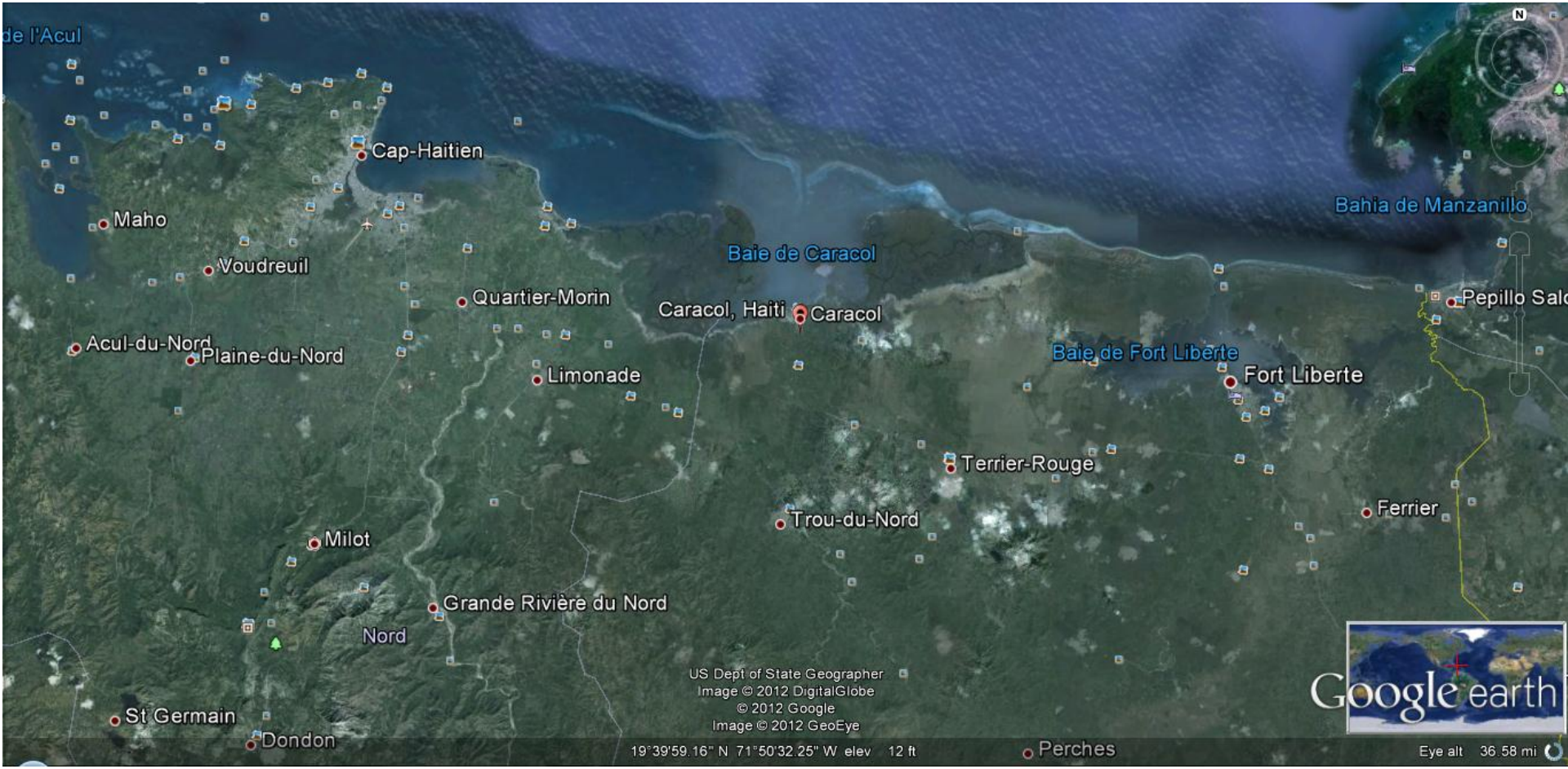
Cumulative Impact Assessment & Regional Planning in North-East Haiti: Managing Indirect and Cumulative Impacts on Natural Habitats.

Colin Rees, IDB.

Sustainable development in the North-East Corridor



Attractions of the Corridor

- **Population density is significantly below other regions;**
- **Potential for increased agricultural productivity;**
- **Economic development will bring jobs and improve the standard of living; and,**
- **Local communities have strong socio-cultural traditions and sense of self.**

Projects to increase productivity

- **Regional agricultural development**
- **Tourism development**
- **Mining**
- **Upgraded highway**
- **Industrial development (Caracol Industrial Park) with an energy plant.**

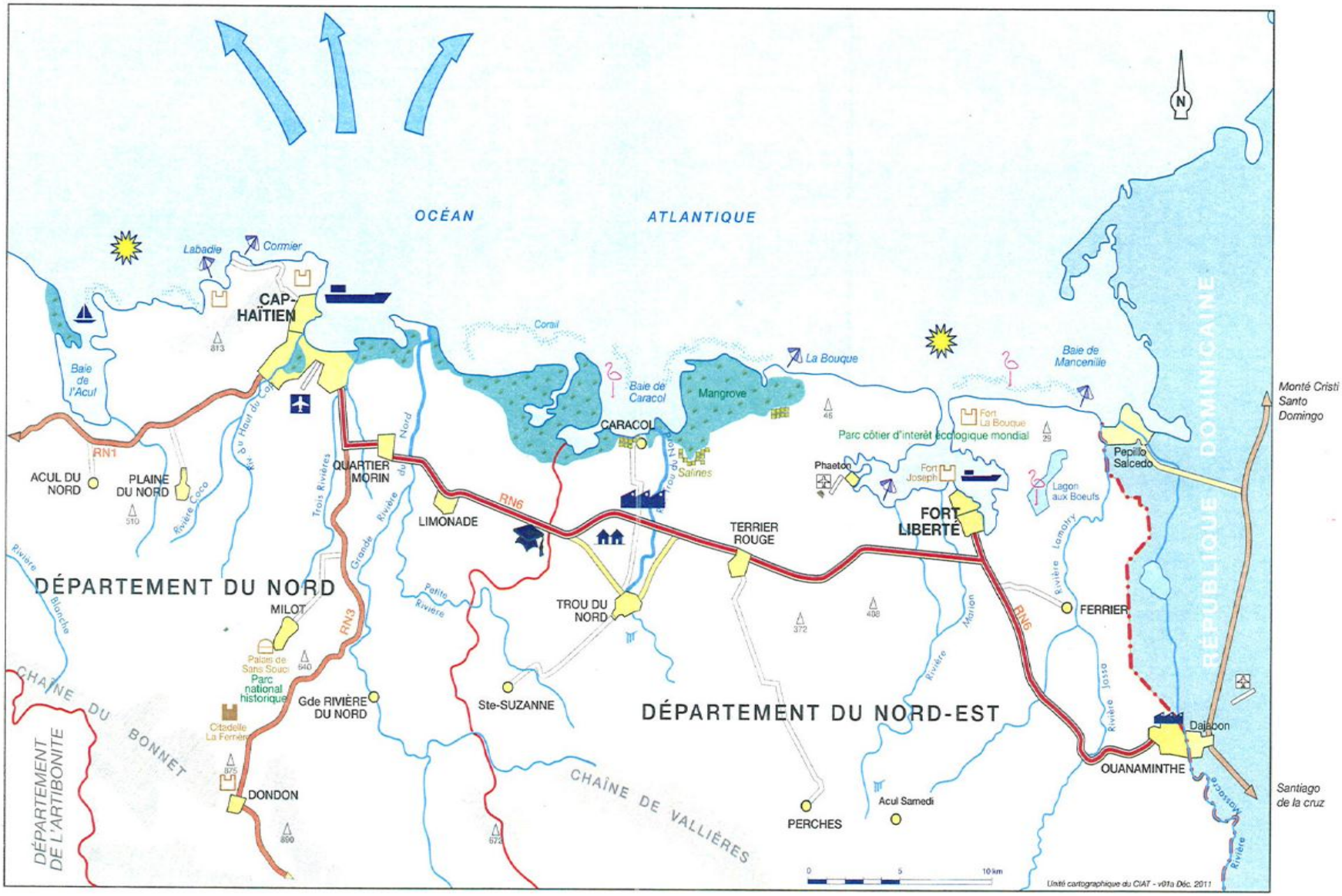
Projects to support growth

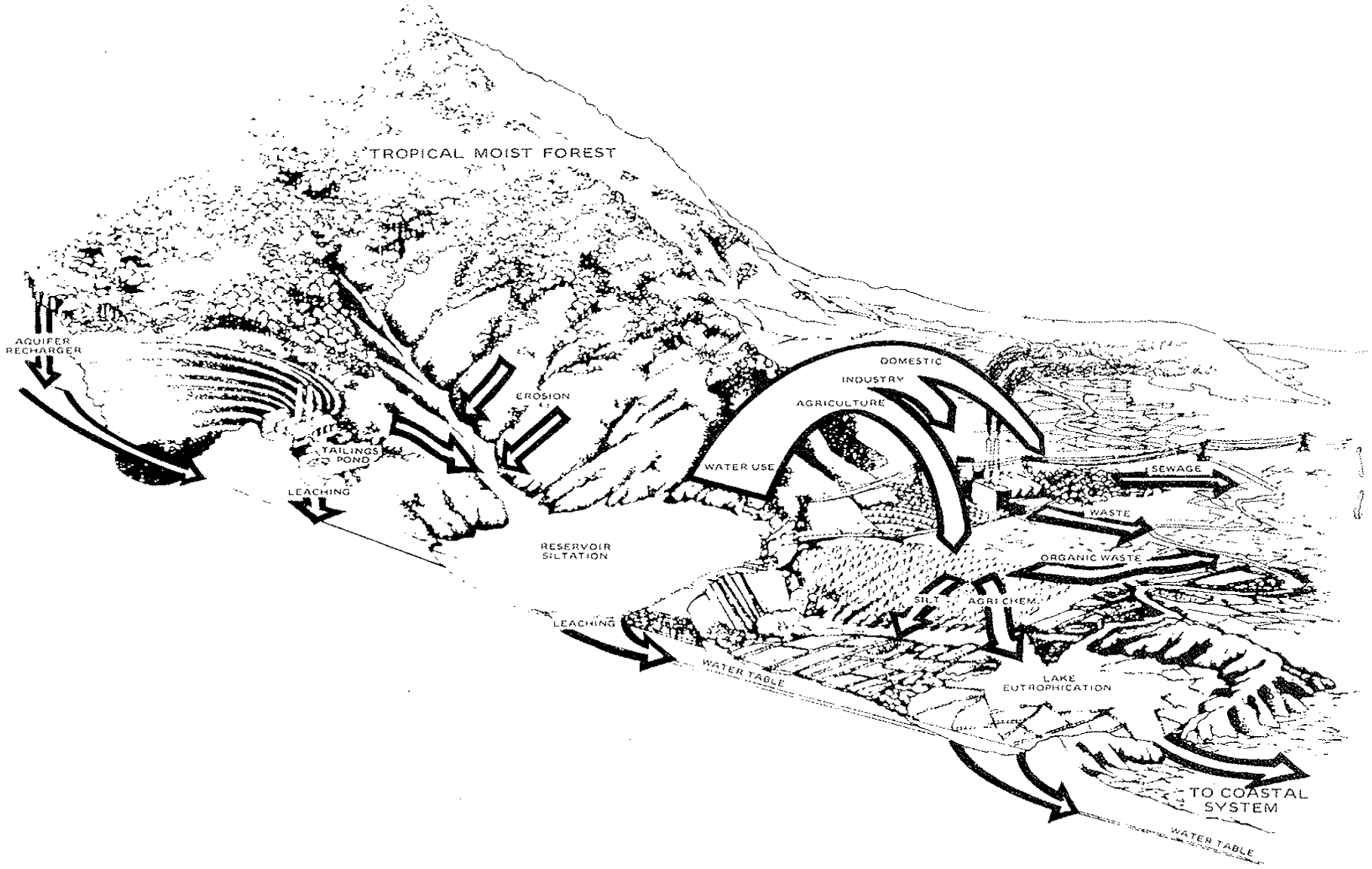
- **Roi Henri Christophe University**
- **5,000 houses for 30,000 people**
- **Solid waste plans**
- **Master plans for water and sanitation**
- **Fort Liberté port improvements**

Likely Trends in the Area

However, if not carefully planned corridor growth will create immense social and environmental degradation in the region:

- **Further degradation of watersheds, fisheries, mangroves, coral reefs, forests, underground and surface waters and soil);**
- **Uncontrolled population influx from surrounding rural areas and elsewhere;**
- **Increased settlement in areas facing high seismic events and flooding zones, and climate change; and,**
- **Further stress on municipal governance and weak institutional management**


OCÉAN ATLANTIQUE
RÉPUBLIQUE DOMINICAINE
N
Labadie
Cormier
CAP-HAÏTIEN
Corail
Baie de l'Acul
Baie de Caracol
Mangrove
La Bouque
Baie de Mancenille
Fort La Bouque
Parc côtier d'interêt écologique mondial
Gonaïves
Port au Prince
RN1
ACUL DU NORD
PLAINE DU NORD
Rivière Coco
Rivière du Haut du Cap
Trois Rivières
QUARTIER MORIN
Rivière du Nord
CARACOL
Salines
Trou du Nord
RN6
LIMONADE
TERRIER ROUGE
Phaeton
Fort Joseph
Lagon aux Boeufs
FORT LIBERTÉ
Pepillo Salcedo
Monté Cristi
Santo Domingo
DÉPARTEMENT DU NORD
Rivière Blanche
MILOT
RN3
Grande Rivière
Petite Rivière
TROU DU NORD
Rivière Lamotry
FERRIER
Rivière Morion
Palais de Sans Souci
Parc national historique
Citadelle La Ferrière
Gde RIVIÈRE DU NORD
Ste-SUZANNE
DÉPARTEMENT DU NORD-EST
Rivière Josso
Dajabon
OUANAMINTHE
Massacre
Rivière
Santiago de la cruz
CHAÎNE DU BONNET
DÉPARTEMENT DE L'ARTIBONITE
DONDON
CHAÎNE DE VALLIÈRES
PERCHES
Acul Samedi
0 5 10 km
Unité cartographique du CIAT - v01a Déc. 2011


TROPICAL MOIST FOREST
AQUIFER RECHARGER
EROSION
TAILINGS POND
LEACHING
RESERVOIR SILTATION
DOMESTIC
INDUSTRY
AGRICULTURE
WATER USE
SEWAGE
WASTE
ORGANIC WASTE
SILT
AGRI CHEM.
LEACHING
WATER TABLE
LAKE EUTROPHICATION
TO COASTAL SYSTEM
WATER TABLE

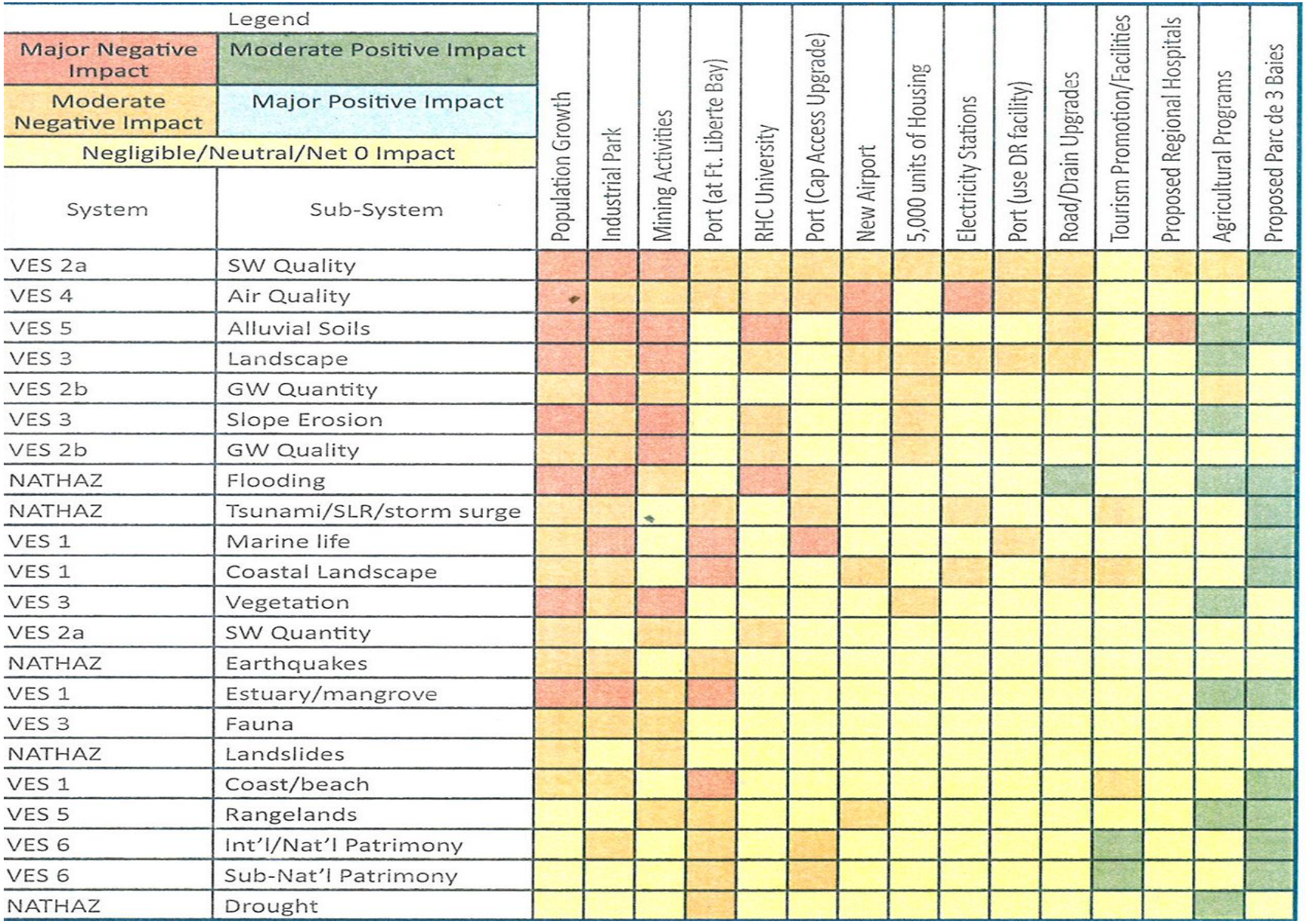
Sustaining Environmental Values in Face of Impacts

These impacts and risks produce cumulative effects and need to be assessed to:

- identify interactions of the project components and resulting impacts on **valued ecosystem components**, e.g., water resources, mangroves, terrestrial vegetation, watersheds, etc.; and**,**
- help define sustainable development options.

Assessment

- Identify valued ecosystem components (VECs);
- Consult stakeholders on VECs and determine likely issues;
- Define spatial and temporal scales;
- Determine possible scenarios and assess impacts; and,
- Identify mitigation/management requirements.


Legend
Major Negative Impact
Moderate Positive Impact
Moderate Negative Impact
Major Positive Impact
Negligible/Neutral/Net 0 Impact
System
Sub-System
Population Growth
Industrial Park
Mining Activities
Port (at Ft. Liberte Bay)
RHC University
Port (Cap Access Upgrade)
New Airport
5,000 units of Housing
Electricity Stations
Port (use DR facility)
Road/Drain Upgrades
Tourism Promotion/Facilities
Proposed Regional Hospitals
Agricultural Programs
Proposed Parc de 3 Baies
VES 2a SW Quality
VES 4 Air Quality
VES 5 Alluvial Soils
VES 3 Landscape
VES 2b GW Quantity
VES 3 Slope Erosion
VES 2b GW Quality
NATHAZ Flooding
NATHAZ Tsunami/SLR/storm surge
VES 1 Marine life
VES 1 Coastal Landscape
VES 3 Vegetation
VES 2a SW Quantity
NATHAZ Earthquakes
VES 1 Estuary/mangrove
VES 3 Fauna
NATHAZ Landslides
VES 1 Coast/beach
VES 5 Rangelands
VES 6 Int'l/Nat'l Patrimony
VES 6 Sub-Nat'l Patrimony
NATHAZ Drought

Coastal and marine systems

Valued ecosystem component

- Key Biodiversity Area
  - 3,900 Ha of mangrove (18% of country)
  - 40 km of coral reefs
  - *Lagon aux boeuf* IBA
- Caribbean biological corridor
- Salt pans, fisheries, and mangrove extraction

Cumulative impacts

- Wastewater affecting corals, wetlands, and rivers
- Increased demand for firewood and charcoal
- Demand for construction materials
- Salinization along coast
- Solid wastes

Water and soil systems

Valued ecosystem component

- Transboundary aquifer
- Rivers, riparian habitat, watersheds, and
- Agricultural lands

Cumulative impacts

- Aquifer reduced, salinization, and contamination
- Surface water reduced and contaminated
- Agricultural lands urbanized
- Soils eroded

Systems supporting quality of life

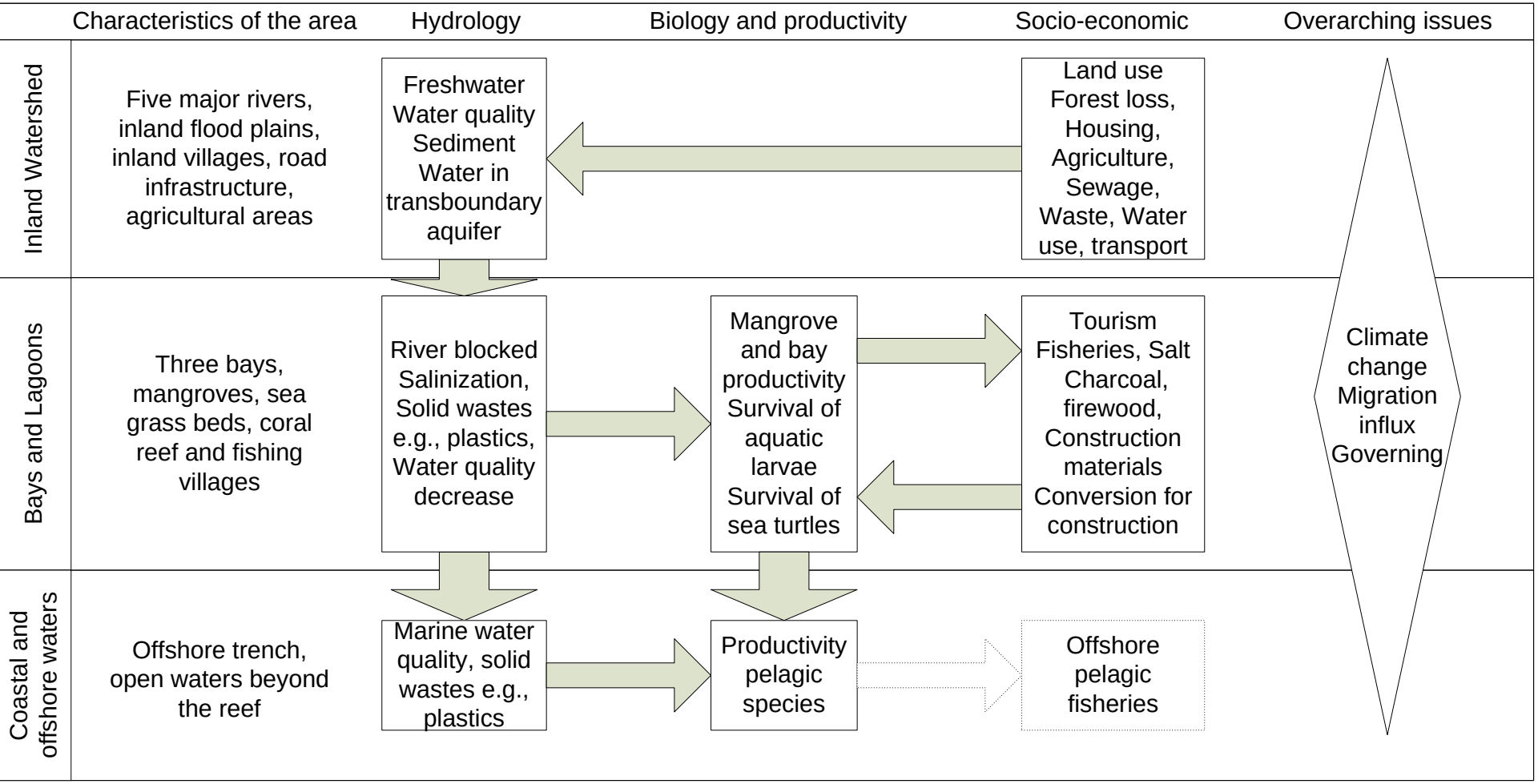
Valued ecosystem component

- Domestic water needs
- Air quality
- Cultural sites

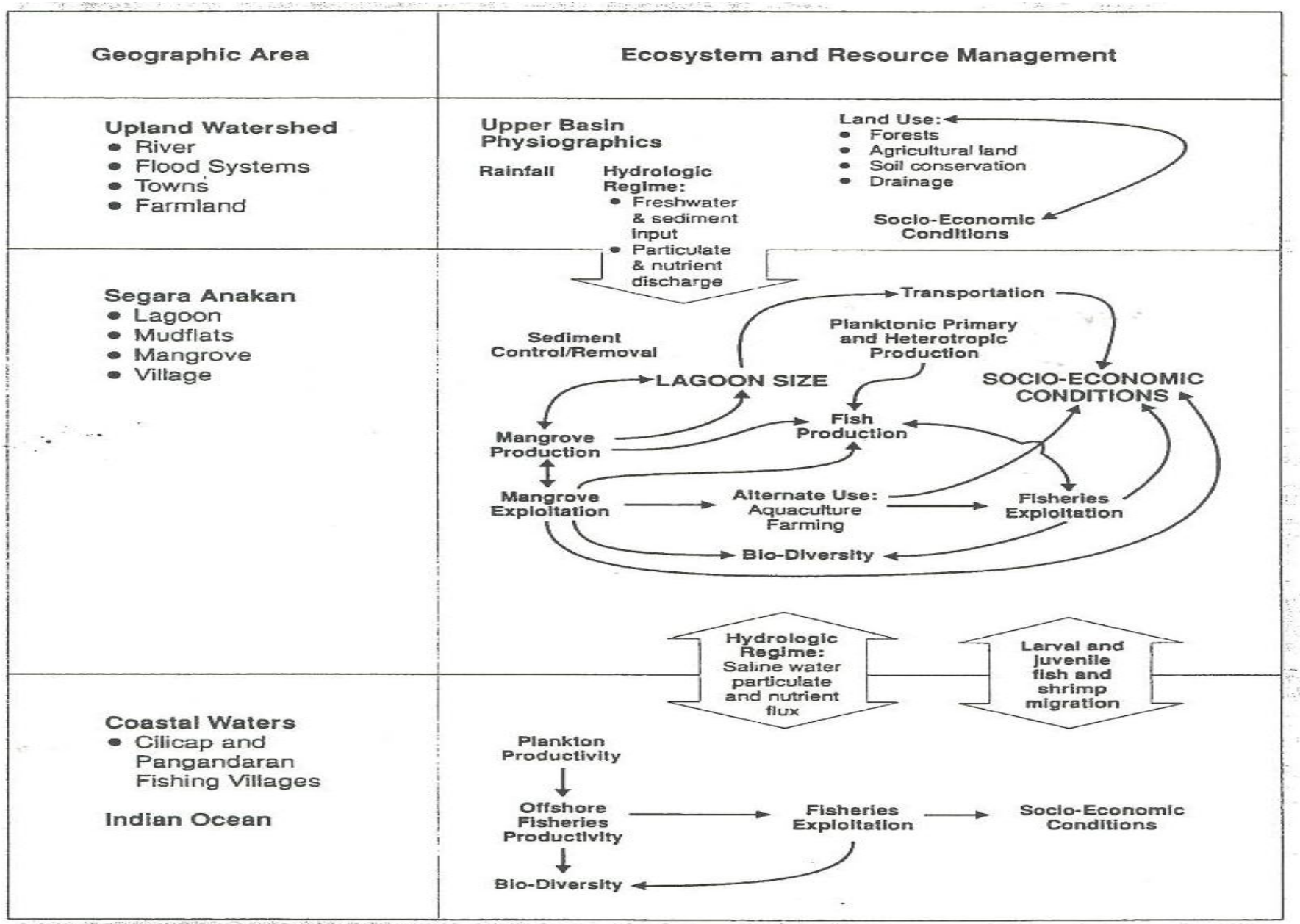
Cumulative impacts

- Reduced water quality and availability
- Air quality reduced in towns and along corridor road
- Cultural sites affected or lost

Complicated relationships



Complex Interactions



VEC	Issues of Concern	Cumulative Impacts	Indicators
Aquatic resources	Increased pollutant loading: contamination of aquatic life and pressures on fish populations; potential threats to endangered species; impacts upon natural habitats, e.g., mangroves. Fragmentation/isolation of mangrove and riverine habitat; overfishing; demand for charcoal and salt basin expansion.	Mangrove and fish loss ; loss of species/habitats; economic impacts upon local communities; loss of potential tourism.	Health and status of targeted species, incl. endangered species; water/sediment /benthos indices; fish catch levels/trends; effectiveness of management measures for the Bay and associated rivers. • *Mitigation & management measures* • *Responsibilities*

Outcome

- Moved from footprint of the Industrial Park to a regional context;
- Obtained ownership of “vision” by stakeholders;
- Kept commitment through technical assistance, e.g., protected area management, institutional strengthening; and,
- Attached findings to a Regional Master Plan.

Cap Haitien - Ouanaminthe Development Corridor
Regional Comprehensive Plan

Review Draft 4 November 9, 2012

Confidential

AIA Legacy
American Institute of Architects

AIA

Plan with all stakeholders

- Urban plans
- Waste water, sanitation, and other systems
- Conservation of natural resources – 3 bays

Manage the use of resources

- Extraction of construction materials
- Fisheries and salt
- Charcoal and firewood use
- Salinization and contamination effects

Manage the risks

- Natural hazards, including climate change risks
- Replacing lost agricultural lands
- Who does what?

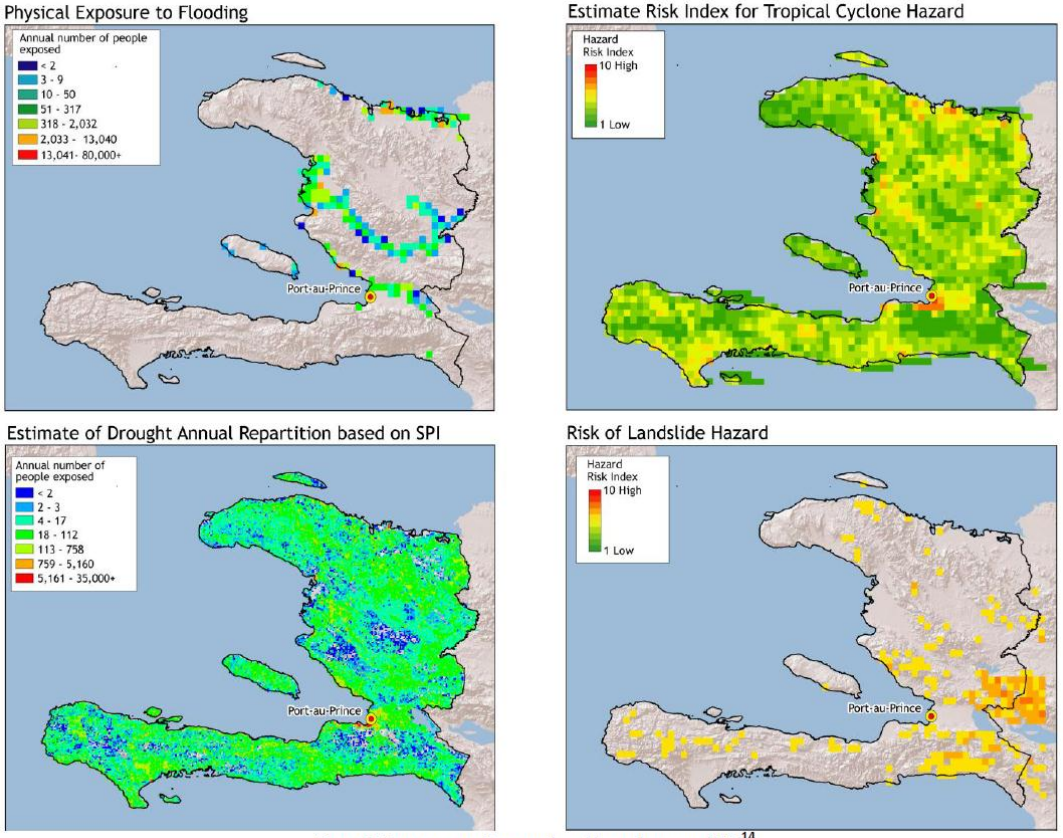


Figure 1: Exposure to climate-related hazards across Haiti[14]

Climate Risk and Adaptation Country Profile April 2011

Caveats

- Go for essentials ("perfection the enemy of the good") – what really counts;
- Need for sufficient data;
- Ensure ownership;
- Link the CIA with an effective vehicle for implementation;
- Have supportive activities to get things started and demonstrate benefits, e.g. TA; and,
- Bolster institutional arrangements.