



The Potential of Carbon Capture and Storage (CCS) in Trinidad and Tobago

Prof. Andrew Jupiter - University of the West Indies

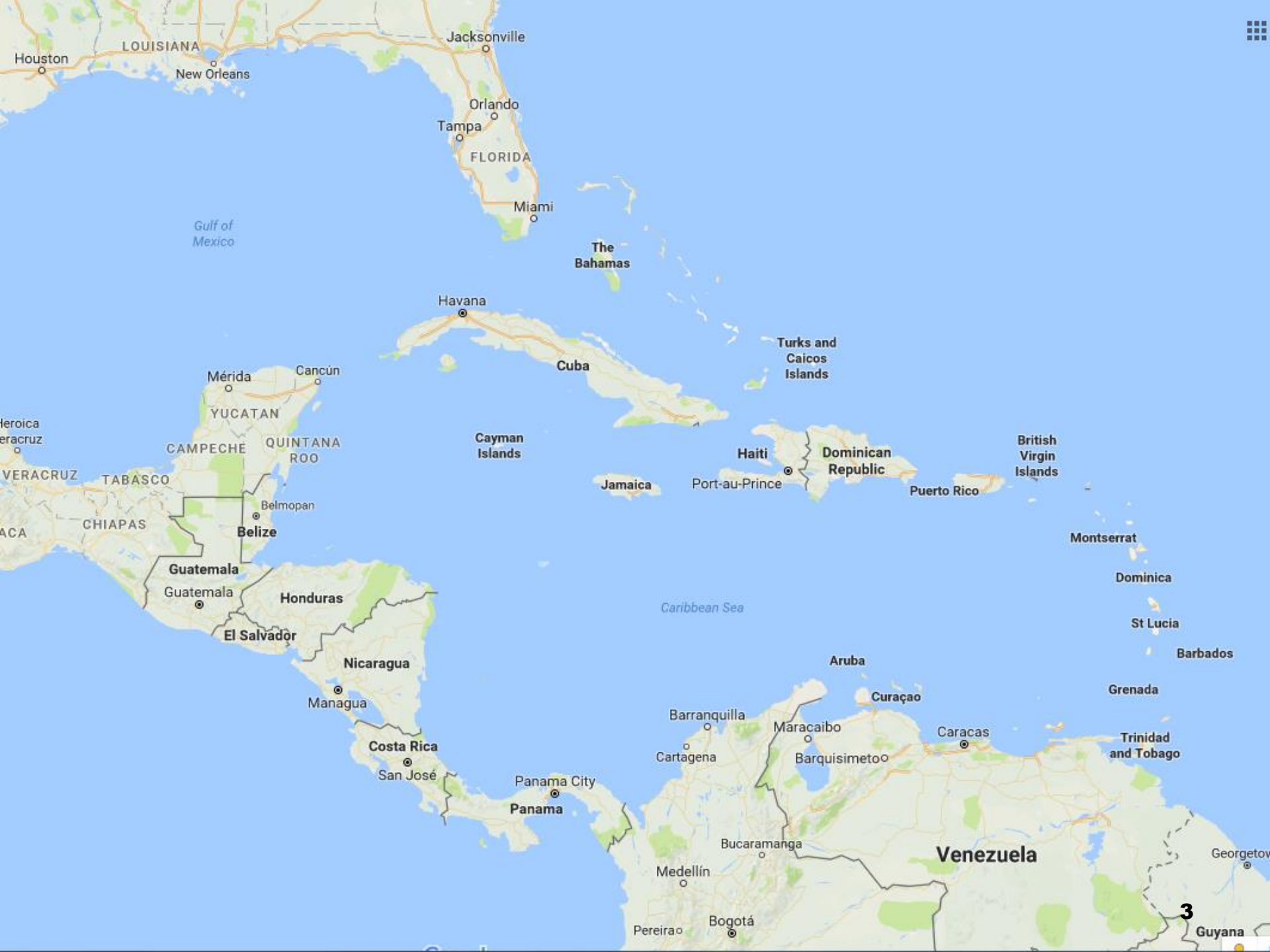
Dr. David Alexander - University of Trinidad and Tobago

December 6th 2018



Agenda

- Location of Trinidad and Tobago (T&T)
- Impact of Climate Change on the Caribbean
- Results on Carbon Capture in T&T
- Rationale for CCS in T&T
- Key finding from local studies
- Way forward for T&T





Impact of Climate Change on the Caribbean





Climate Change impacts in the Caribbean (Trinidad and Tobago)

Marooned residents swim through floods for help



Sharlene Rampersad

Desperate residents of Mafeking Village Mayaro have had to become their own first responders, as there is no one to bring food and other supplies through floodwaters into the most-heavily-hit areas. The Sunday Guardian visited the small fishing village yesterday and spoke to several residents who say even though help has been forthcoming, they have had to carry in supplies to their marooned families and neighbours themselves. "The corporation bring hampers and water but is we self carrying it to everybody," said Dale Mohammed, a 37-year-old resident of Chrysostom Trace, Mafeking. "Nothing can't go in there. Last night (Friday) it had six feet of water by my house. we swim to come out and we had a small raft we carry in the stuff with." "Is four of we doing everything, because it have plenty sick people and little children inside there who can't come out," said Shameeka Joseph, one of Mohammed's neighbours.



Dale Mohammed ventured into waist-high floodwaters to demonstrate the severity of the situation facing residents at Chrysostom Trace in Mafeking, Mayaro, yesterday. PHOTO: KRISTIAN DE SILVA

■ Catastrophic floods, and it could get worse

Carolyn Kissoon and Sandhya Santoo Oct 20, 2018 1 min to read



Residents of Kelly Village waited on their rooftop as the floods rose.

There has been a catastrophic level of flooding across many communities in Trinidad overnight.



Families are being evacuated from homes in east and central Trinidad as flood waters continue to rise following two days of persistent rainfall.



Climate Change impacts in the Caribbean (Trinidad and Tobago)





Climate change impacts in the Caribbean

Livelihoods Severely affected:

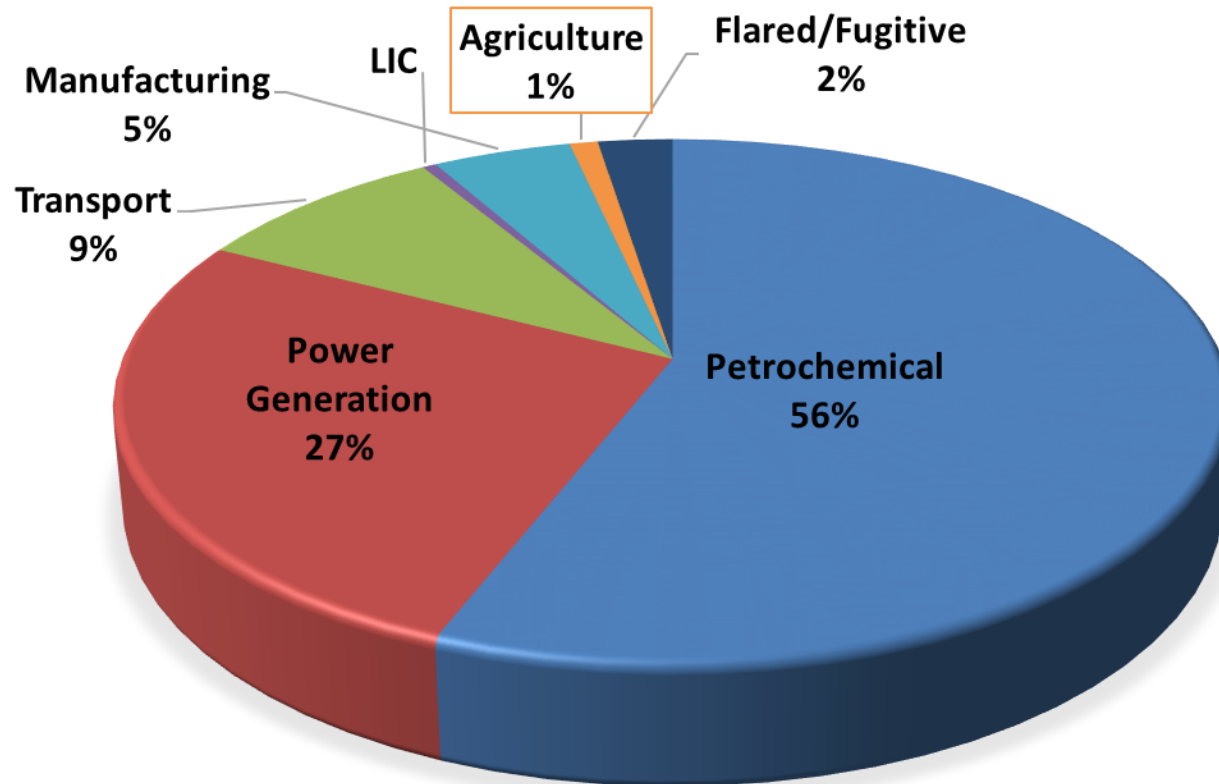
- Food Security
- Infrastructure
- Economic and financial impacts
- Coastal and marine resources
- Water Resources
- Health



Results on Carbon Capture in T&T



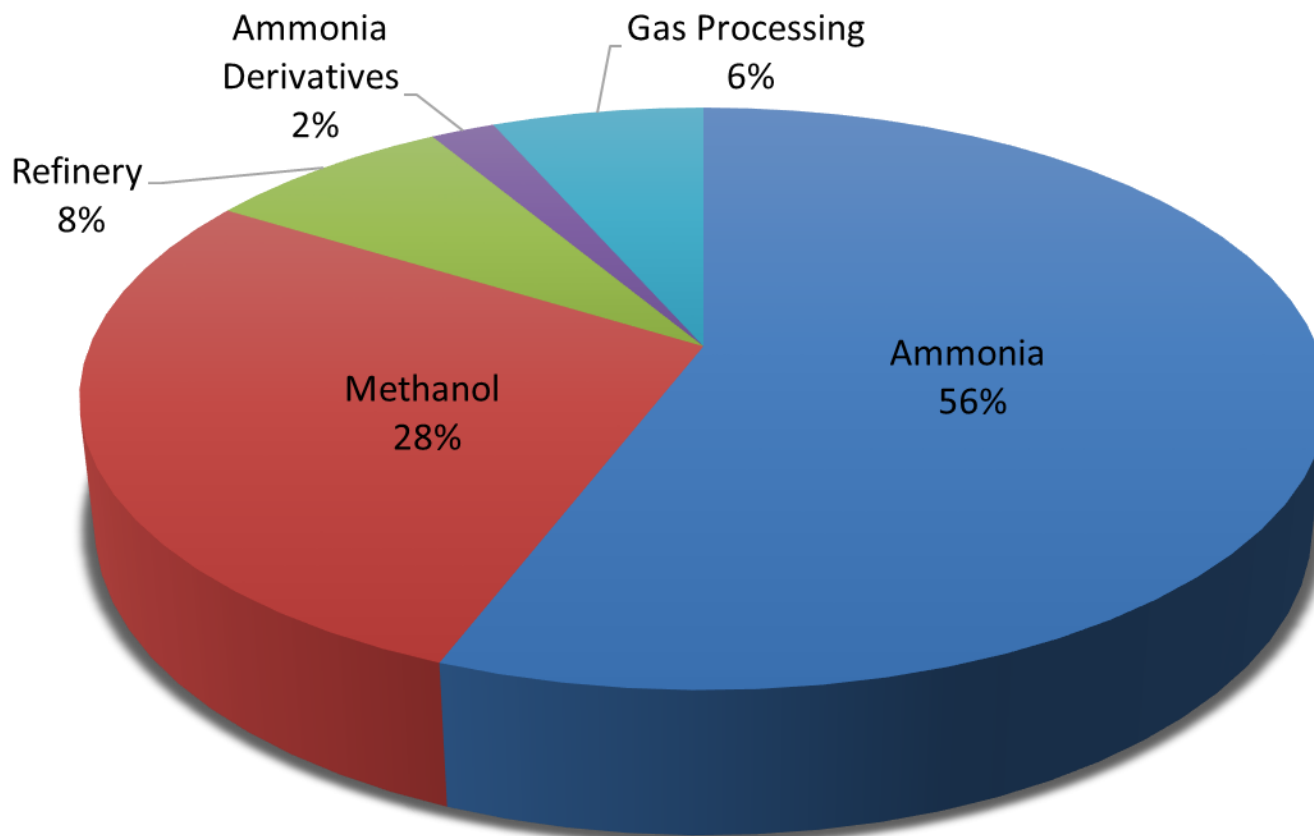
T&T's GHG Inventory - 2015



In 2015, **45** Million Tonnes of GHG emissions occurred in T&T. More than **80%** emanated from the Petrochemical and Power Sectors.



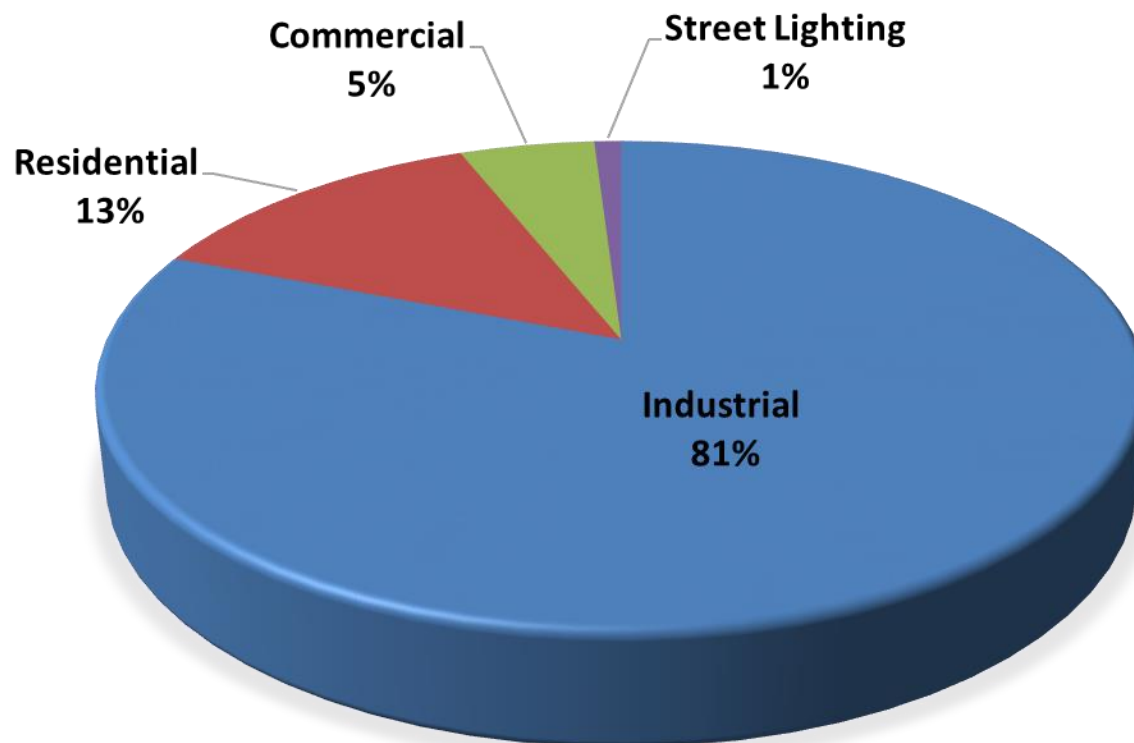
T&T's GHG Inventory - The Petrochemical Sector



In 2015, within the Petrochemical Sector in T&T, more than **80% of GHG emissions originated from Ammonia and Methanol Synthesis.**



T&T's GHG Inventory - The Power Sector



In 2015, within the Power Sector in T&T, more than **80% of GHG emissions originated from Industrial consumption.**



Best CO₂ Sources in T&T

- Process Emissions from Ammonia Synthesis
 - We need to take into account volumes that are already re-used
 - When this is incorporated, at least 4 million metric tonnes per annum are still available for CO₂ sequestration projects
- Process Emissions from Atlantic (1 million metric tonnes per annum are available)

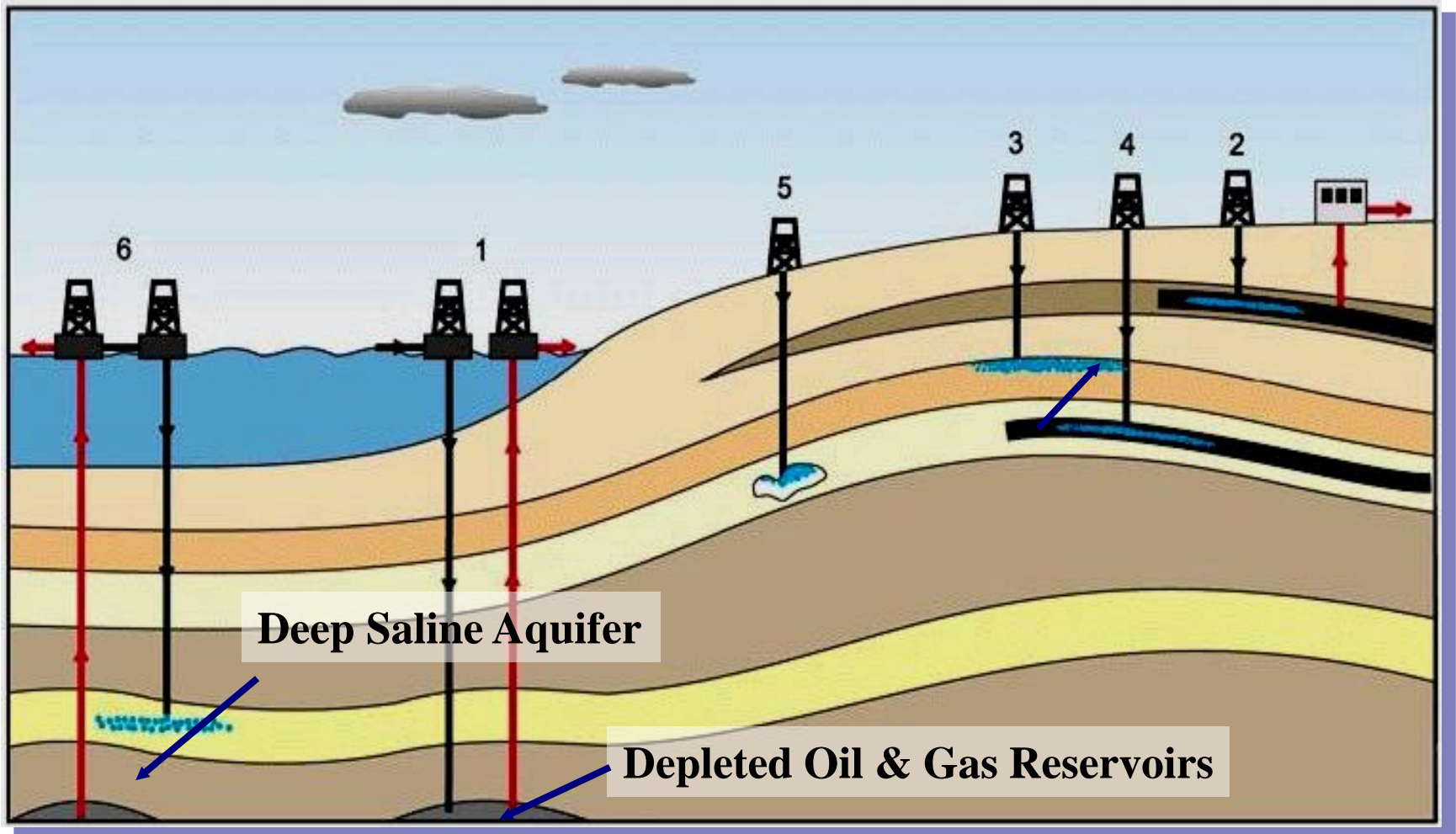


Rationale for CCS in T&T



Why not Ocean and Terrestrial Sequestration?

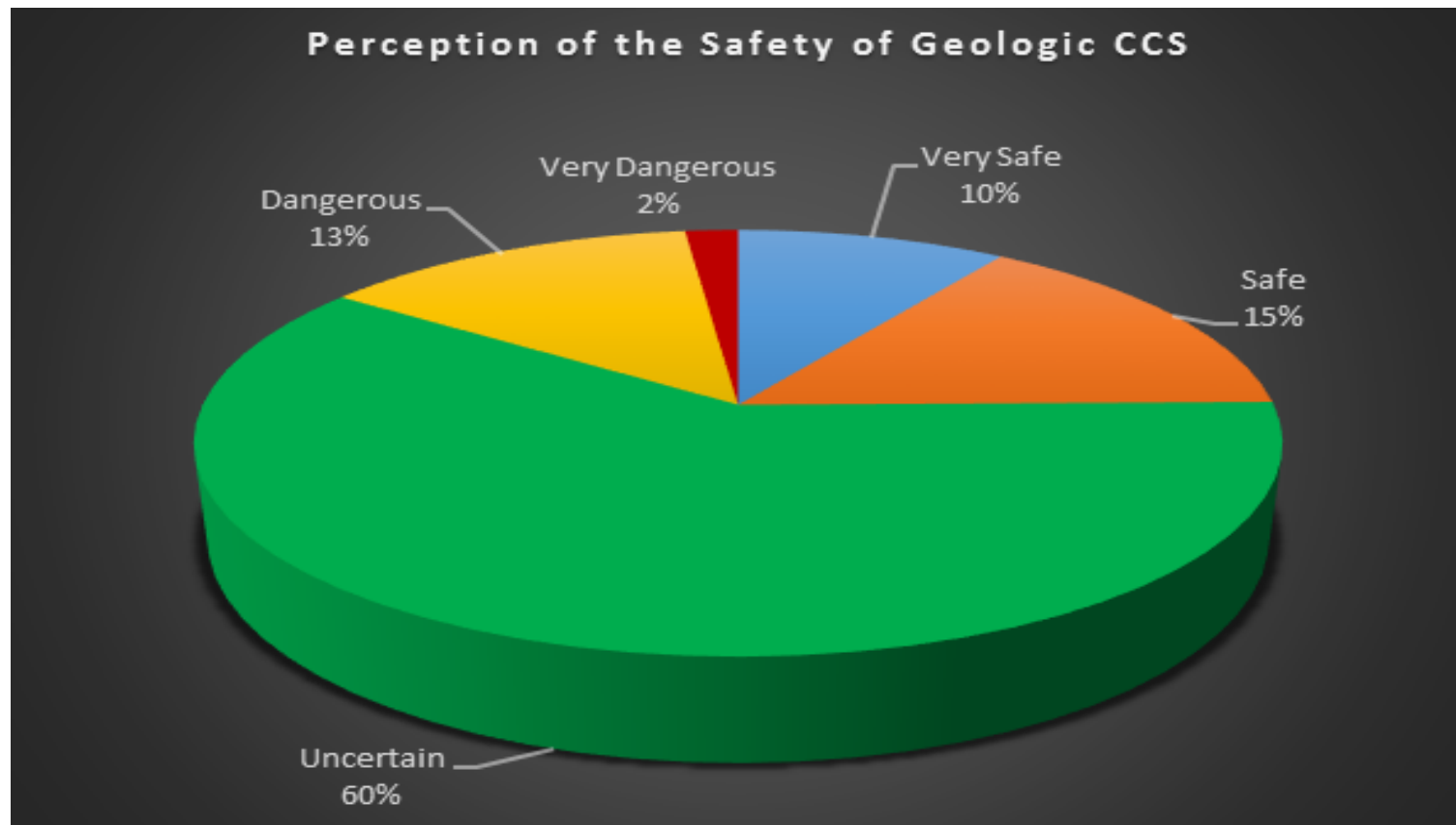
- Ocean sequestration is unsafe and unreliable
- Trinidad is $5000 \text{ km}^2 = 500,000$ hectares
- Eleven tonnes/hectare of tropical forest per year can be sequestered. (IPCC, 2006)
- $500,000 \times 11 = 5.5$ million tonnes would be the maximum amount of emitted CO_2 that could be captured by natural sinks





Critical Factors to Geologic Sequestration

- Costs
- Public acceptance



Alexander et al., 2018



Key finding from local studies



Key finding from local studies



- CO₂ can be trapped for thousands of years once fault and cap rock is sealing.



Way forward for T&T

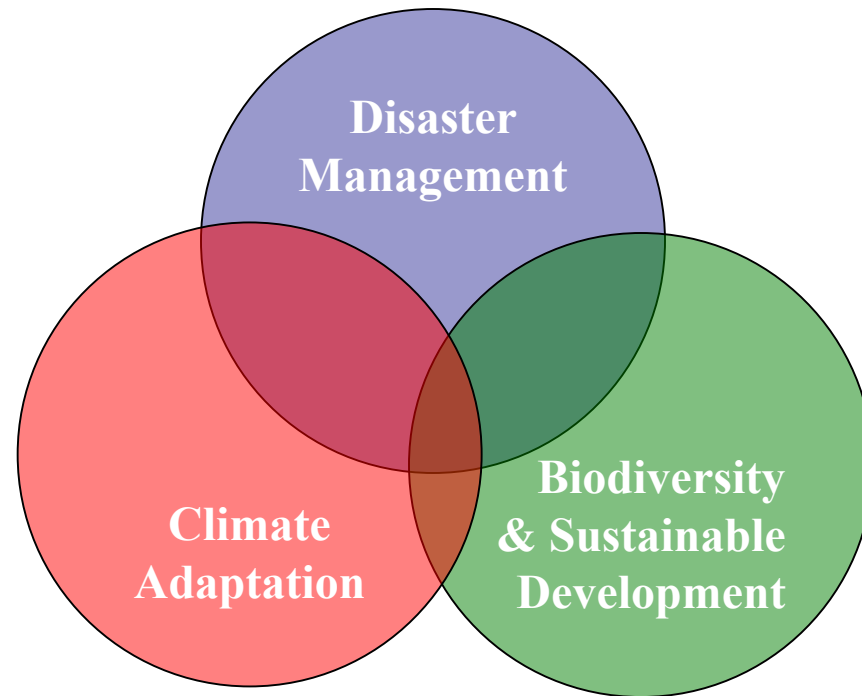


Way forward for T&T

- Capacity Building at the Educational Institutions
- National climate change workshops
- Public Awareness
- International Partnerships
- Conducting local research
 - Storage Capacity
- Demonstration projects



Meeting Multiple Objectives through Adaptation





How can the CCS Project reduce CO₂ emissions?

1. Provide an opportunity for Trinidad and Tobago to sequester CO₂ using existing infrastructure
2. Provide the necessary detail for sound CCS investment decisions
3. Build local expertise with a new generation of geoscientists and engineers to design, operate and optimize CCS in Trinidad.
4. Overall reduction in carbon footprint

ANY QUESTIONS?



SOURCE: SMITH 2007

CCS