IPReM

Greater Caribbean 2023

IDENTIFICATION | PROTECTION | RESTORATION | MANAGEMENT

JUNE 28th-30th, PANAMA

Science and technology for sustainablebeaches in a climate change scenario

ACS AEC
ASSOCIATION OF CARIBBEAN STATES
ASOCIACION DE ESTADOS DEL CARIBE
ASSOCIATION DES ETATS DE LA CARAIBE

CARIBBEAN SEA COMMISSION
Preserving what connects us

KOICA
Korea International Cooperation Agency

CITMA
MINISTERIO DE CIENCIA TECNOLOGIA Y MEDIO AMBIENTE

REPÚBLICA DE PANAMÁ
GOBIERNO NACIONAL
MINISTERIO DE AMBIENTE

IPReM
Greater Caribbean 2023
IDENTIFICATION | PROTECTION | RESTORATION | MANAGEMENT
JUNE 28th-30th, PANAMA

Coastal Erosion In Manzanilla, Trinidad

By Angelina Pacheco

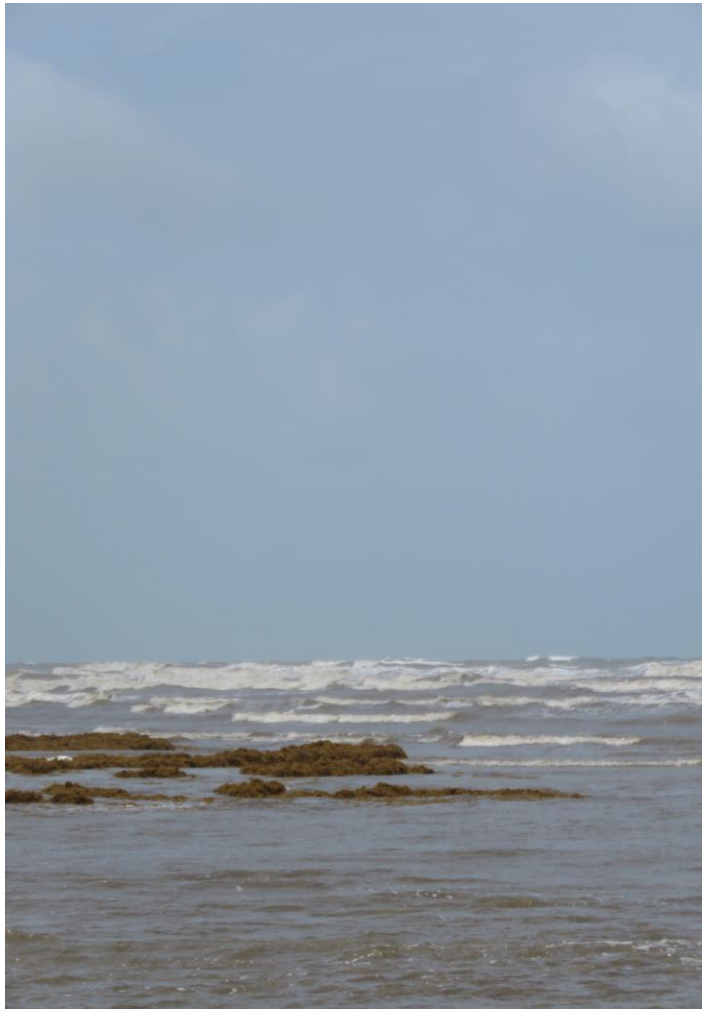
Manzanilla in Trouble!

Manzanilla/Mayaro magic disappearing

By Kim Boodram

Sinking into Paradise: Climate Change Worsening Coastal Erosion in Trinidad

By Rajiv Jaleem



Trinidad's Eastern Coastline is prone to coastal erosion as a result of its easily erodible sediment type. There are factors which accelerate erosion such as:

- Rising Sea levels
- High wave energy from the Atlantic Ocean
- Inclement Weather
- Deforestation/ Built Development
- Water Management Challenges

The Cost of Coastal Erosion

- Lost homes and displaced persons
- Loss of tourism infrastructure and obstacles in further development
- Loss of coastal ecosystems
- Increased flooding in coastal areas
- Damaged roadways

Trinidad and its Rocks

Clifton Hill

Mosquito Creek

Mayaro

What can we do to protect our coastlines?

Developing an efficient solution must take into consideration factors such as cost and sustainability. Sea walls, revetments and even boardwalks have been used along the eastern coast, these methods are expensive and they neither aid in rebuilding the coast nor can generate income to replenish investments. We must approach coastal erosion with three dimensional solutions, these solutions must:

- Eradicate/mitigate the existing problem
- Rejuvenate coastal areas by rebuilding lost beaches
- Generate income to replenish investments and create job opportunities within coastal communities

.

My proposed solution employs the partnership between artificial oyster reefs and vetiver grass.

Oyster Reef

Vetiver Grass

Why Oyster Reefs?

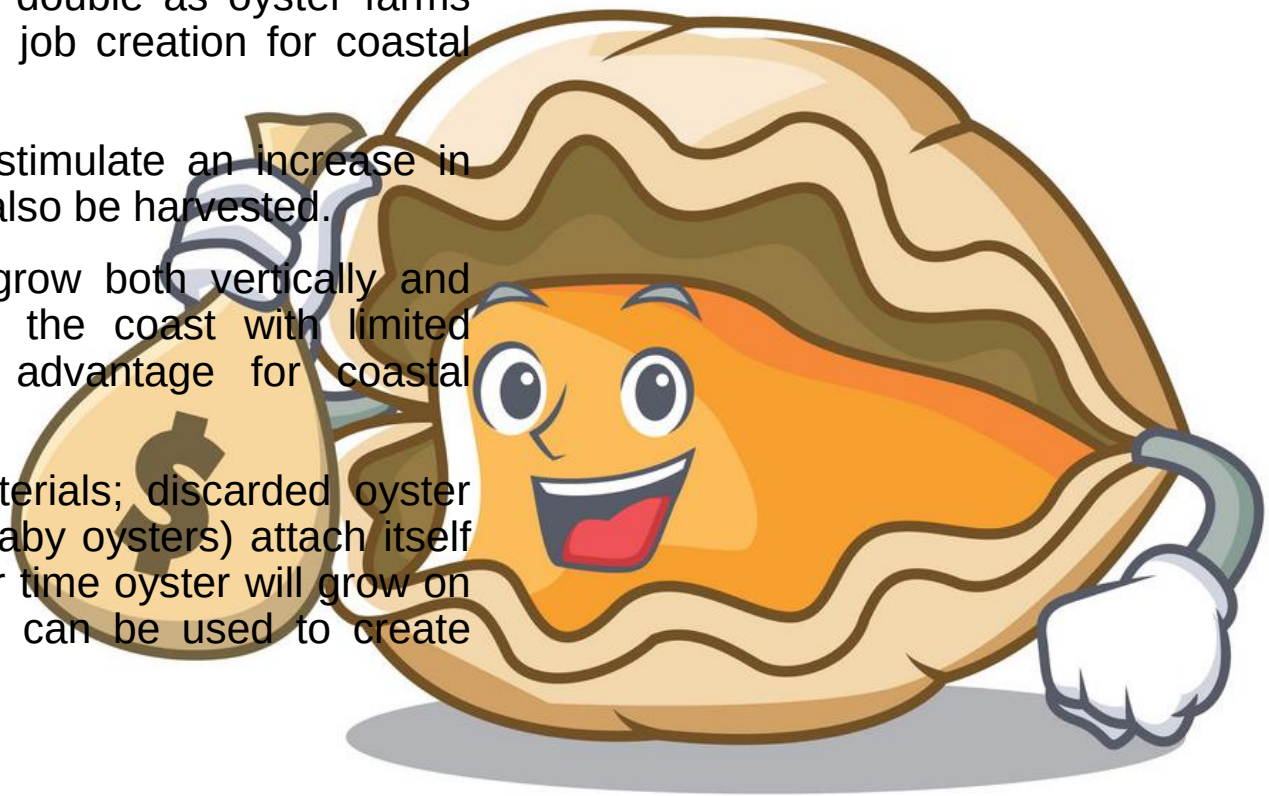
Oyster reefs are a natural method of protecting coastlines; the creation of an artificial oyster reef spanning high-risk locations along the eastern coast can act as a catalyst for coastal protection.

These reefs:

- reduce the rate of coastal erosion
- intensifies sedimentation thus helping to rebuild the coast
- aids in dissipating wave energy
- act as a storm breaker
- create habitat for sea life such as crabs, nursery for fish and other bivalves
- improve water quality

How Oyster reefs can benefit the economy?

- Around 85% of The worlds oyster population have been lost, this has lead to greater demand. Man made oyster reefs can double as oyster farms making way for potential income generation and job creation for coastal communities.
- When the oyster reef is matured it is likely to stimulate an increase in population of crabs and other shellfish which can also be harvested.
- Unlike traditional seawalls, an oyster reef will grow both vertically and horizontally thus protecting greater portions of the coast with limited expenditure. Its vertical growth provides an advantage for coastal protection as sea levels rise.
- Oyster reefs can be created from recycled materials; discarded oyster shells can be collected from restaurants. Spat (baby oysters) attach itself to the shells of dead oysters in order to grow over time oyster will grow on the shells of the matured oyster. Recycled wire can be used to create cages for oyster shells.



Anchoring artificial oyster reefs

The following strategies can be used to anchor oytser reefs

Reef balls made from cement, sand and crushed oyster shells

Creating a wall which interchanges gabion baskets and oyster cages

Creating a living wall of oysters

Why Vetiver Grass?

Vetiver grass can thrive in sandy soils, it can tolerate salinity and has roots that can reach 3-4m in depth in the span of a year. This allows for a rapid approach at stabilizing the existing shoreline reducing its susceptibility to erosion.

The implementation of this grass strengthens coastal soils in the short run, allowing time to reintroduce native species of trees such as mangroves and sea almond. The Vetiver would also act as a shelter for the seedlings of native plants to mature protecting them from external forces.

The Benefits of Vetiver Grass

- Due to Vetiver's swift growth rate, it will require maintenance, this means persons will need to be employed landscape these areas. The excess grass can be composted to create fertilizer for local agriculture.
- Vetiver grass is an excellent investment into the restoration of soil health. Its roots have been shown to accumulate high levels of heavy metals, removing them from soil.

Making it happen

- Partnering with local fisherman to manage reefs.
- Trade with other caribbean countries to import oyster shells
- Partner with restaurants, for oyster shells/ funding in exchange for cheaper oysters when the reef is matured

- Partner with initiatives such as Flying Tree Environmental to rapidly plant Vetiver Grass
- Partner with local communities to plant and landscape the Vetiver grass.

By partnering these methods of coastal conservation the development of Trinidad's eastern coastline receives a much needed boost. Avenues for job creation are formed, the coastline is protected, habitat for marine life is created all through a sustainable approach in the management of coastal erosion.

Thank You