Baseline Assessment of Nutrient Pollution in the Cunupia/New Guayamare Catchments

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Community and Ecosystem Connections

Improving Human Wellbeing Sustaining Livelihoods

Goal and Objectives of Study

Goal of Study

To provide baseline data on nutrient pollution in the Cunupia/New Guayamare area.

The objectives of the study are as follows:

Obtain physiochemical data and water samples for nutrient analysis at selected sites representative of the Cunupia/New Guayamare watersheds.

Analyze water quality data and link to land use activities to determine sources of nutrient pollution.

Sources of Nutrient Pollution

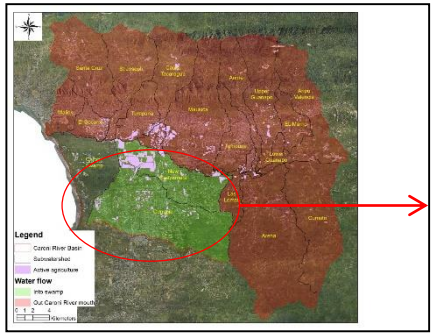
Industrial

Domestic

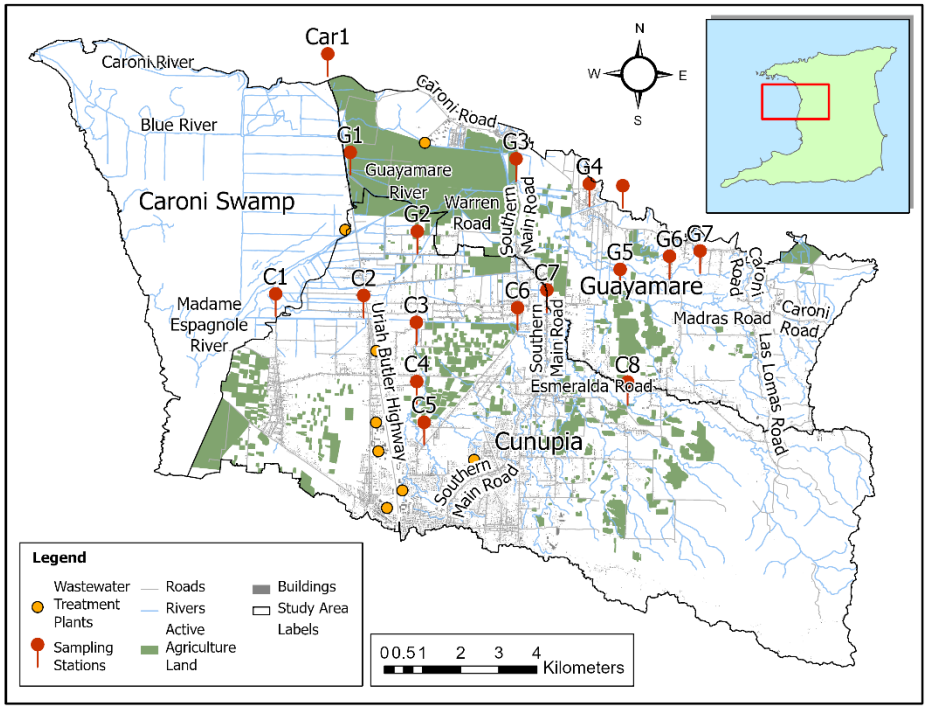
Agricultural

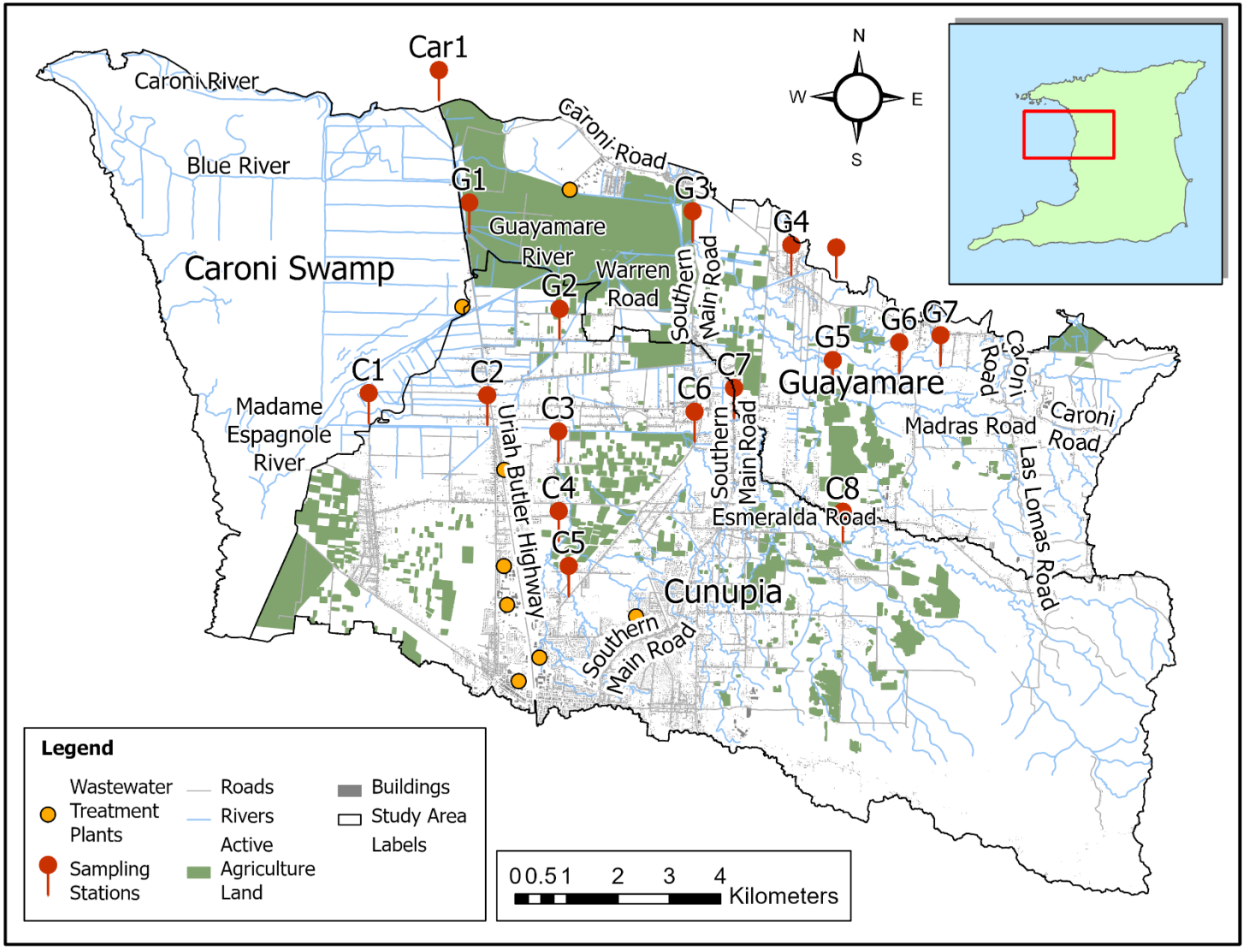
Study Site
Cunupia and New Guayamare

Caroni River Basin



17 stations sampled




Car1
Caroni River
Caroni Road
Blue River
G1
G3
G4
Guayamare River
Warren Road
Southern Main Road
Caroni Swamp
G2
G5
G6
G7
Caroni Road
C1
C2
C7
C6
Guayamare
Madame Espagnole River
Uriah Butler Highway
C3
Madras Road
Caroni Road
Las Lomas Road
C4
C8
Esmeralda Road
C5
Cunupia
Southern Main Road
N
W
E
S
Legend
Wastewater Treatment Plants
Sampling Stations
Roads
Rivers
Active Agriculture Land
Buildings
Study Area
Labels
0 0.5 1 2 3 4
Kilometers

Water Quality Parameters

Physiochemical Parameters

- Dissolved Oxygen, pH, Temperature, Salinity and Turbidity

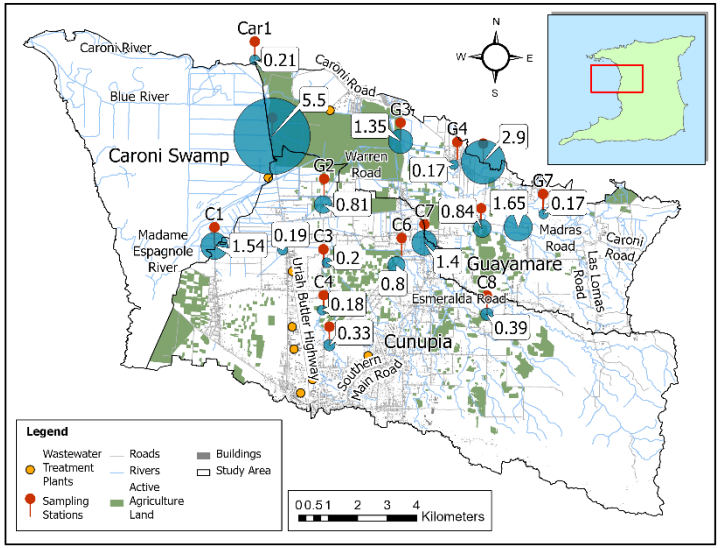
Nutrients

- Ammonia, Nitrites, Nitrates, Reactive and Total Phosphates

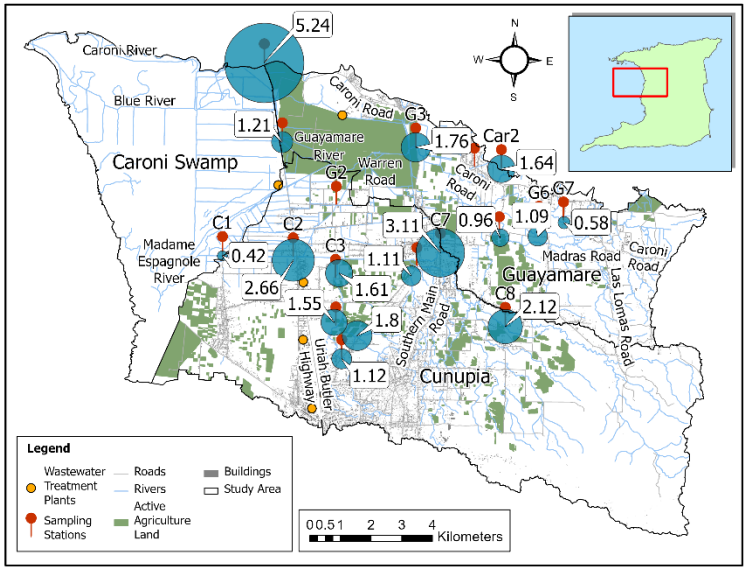
Ammonia ↔ Nitrites ↔ Nitrates

Major Findings - Dissolved Oxygen

Dry season



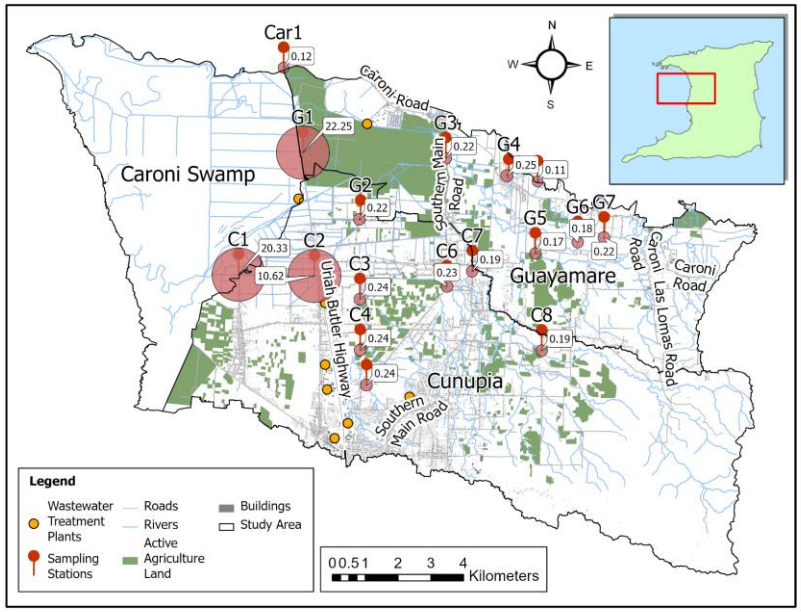
Wet season



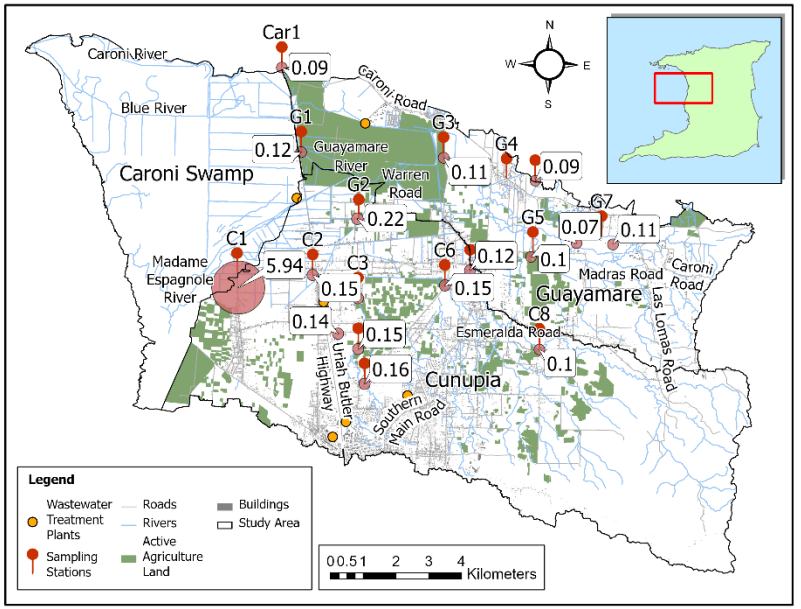
Mostly below US EPA and T&T WPR of 5.0mg/L and 3.00mg/L respectively
Extremely poor water quality to support aquatic life
Lower levels were generally correlated with built up areas

Major Findings - Salinity

Dry season



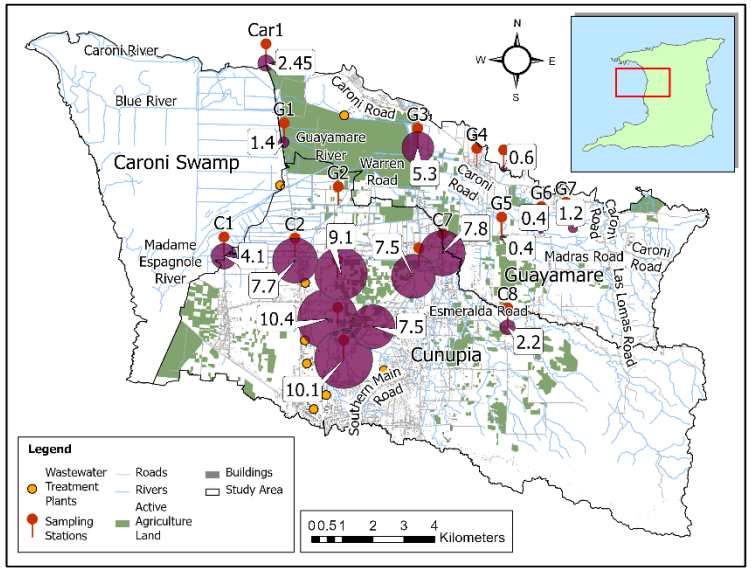
Wet season



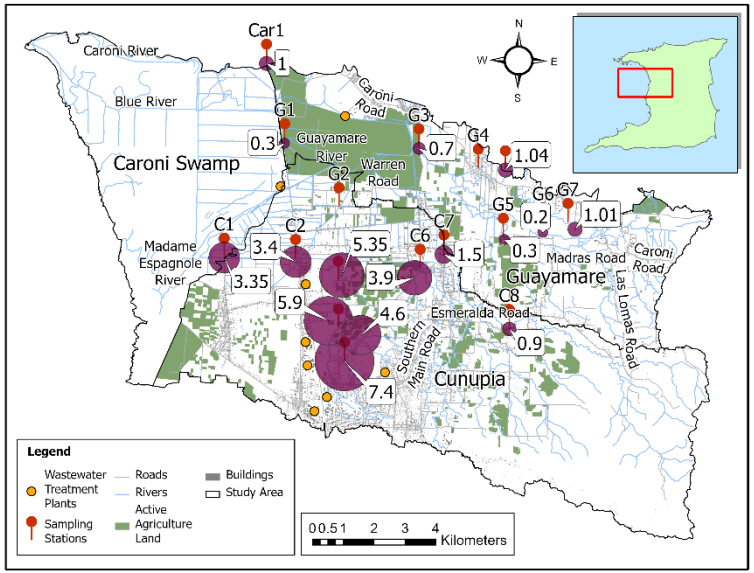
Salt water tidal flux at Cunupia and Guayamare in dry season.
Need for regulation by use of sluice gate.
Farmers at Guayamare expressed concern about using this water for watering crops

Major Findings -Ammonia-nitrogen

Dry season



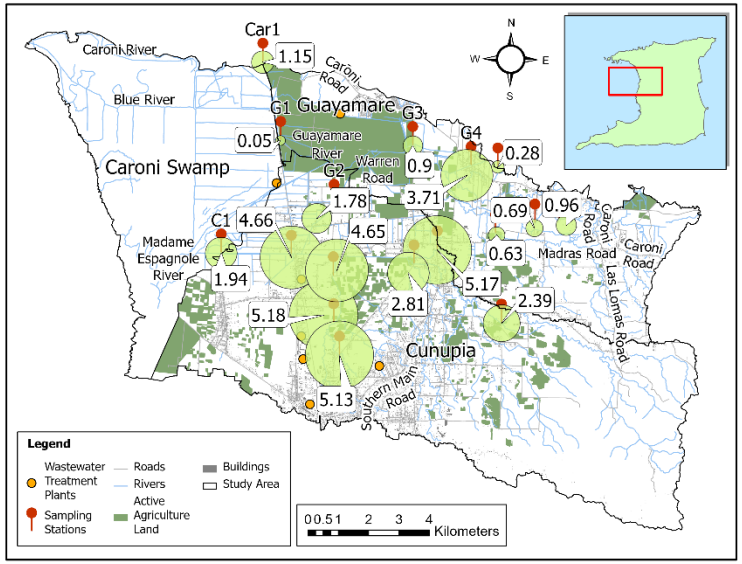
Wet season



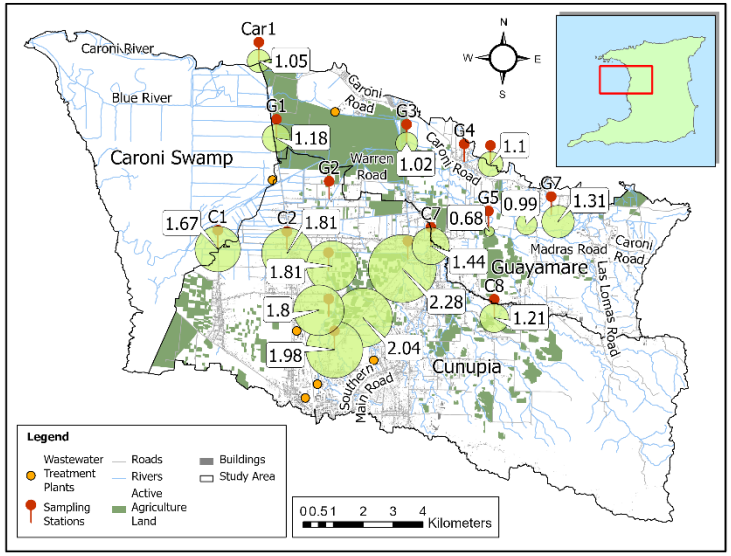
Excessive levels found at built up areas suggestive of domestic sources
Cunupia catchment has higher level compared to Guayamare catchment
Majority of sites exceeded the TTWPR guideline of 0.32 mg/L for the protection of aquatic life.

Major Findings - Total Phosphates

Dry season



Wet season



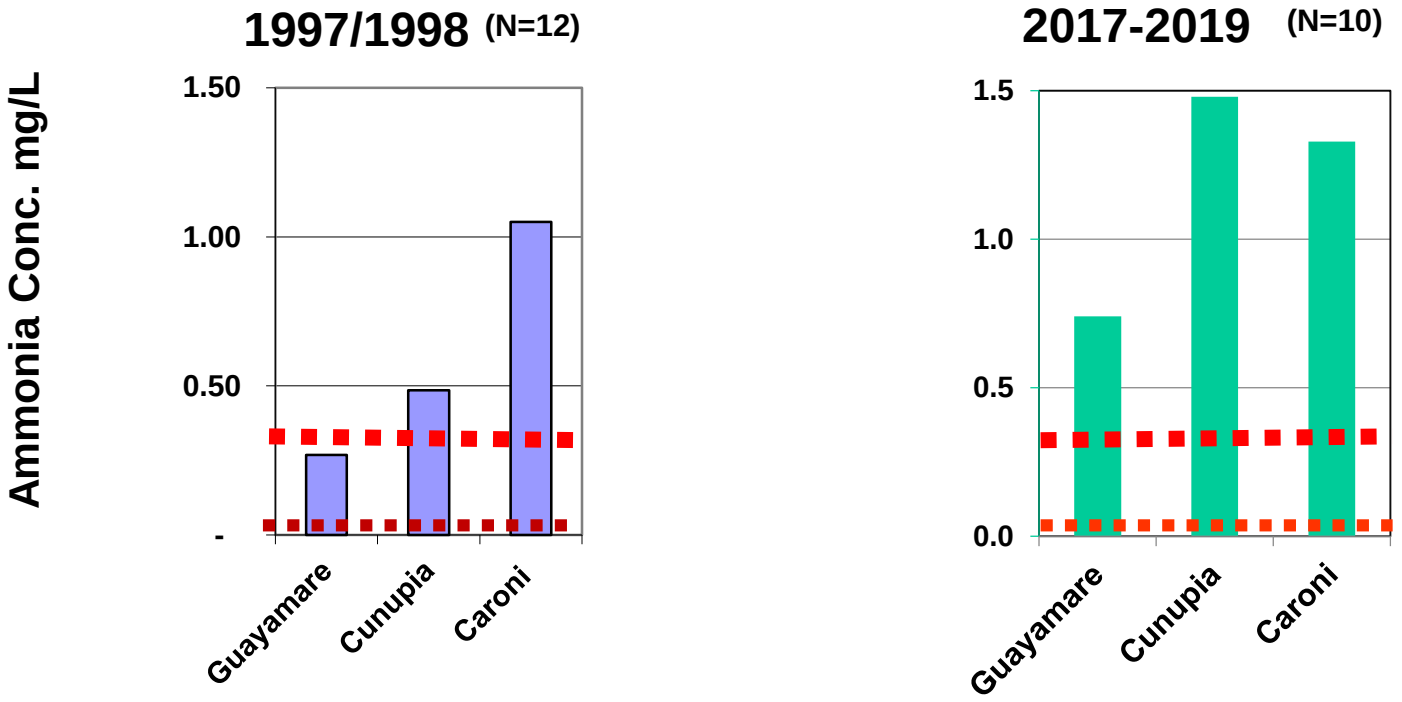
Excessive levels found at built up areas suggestive of domestic sources.
Higher levels in the dry season compared to the wet.
All sites with exception at G1 exceeded the TTWPR guideline of 0.5 mg/L which indicates a poor environment for the protection of aquatic life.

CUNUPIA RIVER, FELICITY

CARONI RIVER, SOUTH BOUND LANE H' WAY

CUNUPIA RIVER, NORTH BOUND LANE H' WAY

Comparison with data from 20 years ago



Need for Nutrient Reduction Strategy

T&T Water Pollution Rules (Aquatic life) - 0.32 mg/l

Canadian (Aquatic life) - 0.02 mg/l

Key Factors Relating to Elevated Nutrient/Pollution levels in T&T

Factor	Concern
Low % sewerage coverage	30 % of population centrally sewered. 70% of population sewered by septic tanks and pit latrines.
Malfunctioning sewer treatment plants, poor maintenance	Untreated effluents enter environment.
Poor agricultural practices	Excessive fertilizers/ manure usage, increased surface run-off of nutrients, siltation, habitat alteration.
Untreated industrial effluents	Some wastewater plants may not be designed for type and capacity of wastes.
Inadequate policies, lack of enforcement, information and awareness.	Environmental policies not effective in lowering levels of **Nutrient** pollution. Uninformed public- lack of awareness of environmental matters.

Way Forward

Solution – Need for implementing Nutrient Pollution Reduction Strategy!

1. Action Plan for waste- waters. Implementation of treatment technologies, innovative low cost solution to wastewater management, water -reuse,
2. Implementation of discharge criteria of Nitrogen and Phosphorous in wastewater treatment plants.
3. Integrated water and wastewater management strategy.
4. Need for Centralize Data Base on Environmental Data and Information.
5. Demonstration project (use of treatment technologies)

Thank You!

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