EMA
environmental
management
authority

2008 ANNUAL REPORT

MISSION STATEMENT

The Environmental Management Authority is committed to protecting and conserving the natural environment to enhance the quality of life by promoting:

- *Environmentally responsible behaviour*
- *Development and enforcement of environmental legislation*
- *Encouragement of voluntary compliance*
- *The use of economic and other incentives*

This is to be achieved in an atmosphere of mutual respect, professionalism, accountability, transparency, collaboration and social responsibility.

CHAIRMAN'S MESSAGE

Dr. Allan Bachan

Chairman

For the 2008 reporting period, the EMA's Board of Directors operated under the Chairmanship of Dr. John Agard.

On behalf of the existing Board of Directors I am pleased to present the 2008 Annual Report. This report reflects the ongoing commitment of the EMA in building awareness of our nation's environmental issues, while focusing on the EMA's role in preserving and conserving our environment.

This report addresses all facets of environmental management, highlighting our achievements and future targets as a nation. This report also features the EMA's role in executing environmental policies, monitoring developmental activities and establishing community partnerships, as well as the Authority's proposed schema of work for 2009.

As the EMA continues to forge ahead with its thrust toward environmental sustainability, a momentous decision to develop and implement a thorough restoration scheme for the Nariva Swamp Managed Resource Protected Area was launched in 2008. This five-year undertaking involves close partnerships with corporate and community stakeholders, with the objective of rehabilitating 1,339 hectares of altered forests, recreating a habitat for wildlife and demonstrating the carbon sequestration benefits of reforestation. The intended merits of this programme include a heightened awareness of environmentally sensitive areas and investment in sustainable livelihoods through economic developmental opportunities for the local agricultural community.

In addition, preparatory work commenced in 2008, for the designation of the Golden Tree Frog and the Ocelot as Environmentally Sensitive Species.

The EMA also continued its initiative to monitor air quality at the Point Lisas Industrial Estate in 2008 and sought to establish another Ambient Air Quality Monitoring Station (AAQM) within the vicinity of the Union Industrial Estate.

In furtherance of fulfilling its mandate of waste management under sections 55-60 of the Environmental Management Act, Chapter 35:05, the Authority drafted the Waste Management

Rules, 2008. The EMA along with other key stakeholders also actioned another lead remediation project (Demerara Pond) where 490 m^3 of lead contaminated soil was removed from the site, treated and disposed of at Forres Park landfill.

In 2008, significant attention was paid to the implementation of the permitting process under the Water Pollution Rules. Officers from the EMA and the Department of Natural Resources and the Environment (DNRE) in Tobago were trained at a permit writer's workshop, which was facilitated by two experts from the United States Environmental Protection Agency (USEPA).
The EMA also embarked on a Non-Point Source (NPS) programme. The (Caura/Tacarigua Watershed) project was aimed at raising awareness of the problems associated with NPS pollution and establishing the linkages of NPS pollution as it impacts on environmental water quality and the public health of recreational water users in Trinidad and Tobago. A NPS draft was also developed, in conjunction with the development of a vulnerability rating for watersheds for point and non point source pollution management.

There were several development-related activities occurring throughout the country in 2008 as the EMA received 346 CEC applications. While there was a lot of activity in the energy sector, the majority of development-related activities were seen to be related to the non-energy sector.

Globally, the year 2008 saw a series of catastrophic natural disasters unleashed in parts of Asia, Europe, Australia and South America. Unfortunately however, it may be that human induced activities exacerbated the impacts of these natural events. As reported by the United Nations Environment Programme (UNEP), the most widespread human impacts are extensive deforestation, land conversion and fragmentation, desertification, the disruption of freshwater systems, pollution and overexploitation of marine ecosystems, excessive nutrient loading, severe changes in species distribution and loss of biodiversity.

In Trinidad and Tobago (T&T), we endured our own dilemma as massive floods created an onset of landslides and tested the limits of our disaster preparedness. The vast economic and social impacts of such occurrences remind us of earth's vulnerability to natural forces, exacerbated by uncontrolled human activity.

This year the theme, '*CO2 Kick the Habit! Towards a Low Carbon Economy'*, as declared by the United Nations Environmental Programme (UNEP), focused on actions aimed at controlling the rate of global warming and climate change. As the lead environmental organisation within the country, the EMA played a key role in commemorating this day by providing guidance to a national committee in charge of World Environment Day. Leading up to this day, the EMA organised a host of activities which were aimed at building awareness of '*Kicking the Carbon Habit*'.

In 2008, countries came together to achieve a ninety-seven percent (97%) reduction in the consumption of ozone-depleting substances, and this was reported to have set a new precedent for international cooperation. Locally, the management of ozone-depleting substances continues to be successful, as this State of the Environment Report will verify, there was no importation of chlorofluorocarbons into T&T in 2008. That makes it two years that this measure has been fully implemented, thus representing a significant step towards reducing our country's carbon footprint.

As a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), the EMA has demonstrated its commitment, as a member of the international community, to playing an integral role in reducing the level of greenhouse gas emissions, and assisting in combating the looming environmental crisis of global warming.

Overall, the task of preserving the environment remains critical but not insurmountable. The Authority and other stakeholders must keep abreast of the rate of development to ensure that the environment is not overwhelmed by increased economic activity or industrialisation. Our vision to achieve sustainable development must always be in sight. This requires a robust legislative framework, enforcement by our protective services and a steadfast commitment from the general population. Education and awareness will always be our best tools.

The EMA in its mandate to protect and conserve our environment, is constantly exploring and initiating new mechanisms to aid in achieving the Authority's vision and mission. With an increased focus on strengthening collaborative efforts locally, regionally and internationally, while strategically investing in environmentally educating our youth, the EMA remains firmly entrenched in fulfilling its objective of achieving a more environmentally conscious future for Trinidad and Tobago.

In 2009 the EMA plans to pursue avenues to address the development of policies in tandem with the National Environmental Policy. Emphasis will also be placed on fostering community partnerships and strengthening our complement of environmental practitioners so as to effectively achieve our set goals and objectives.

Dr. Allan Bachan
Chairman
February 2014

ABOUT THE EMA

The Environmental Management Authority of Trinidad and Tobago was established by the Environmental Management Act Chap 35:05 (EM Act) in 1995 on World Environment Day (June 5th).

The Environmental Management Authority is committed to protecting, restoring and conserving the environment to improve the quality of life by promoting:

- Environmentally responsible development;
- A culture of care for the environment;
- Development and enforcement of environmental legislation;
- Use of economic, financial and other incentives;

This is to be achieved in an atmosphere of mutual respect, professionalism, accountability, transparency, collaboration and social responsibility.

One of the main tasks of the EMA to date has been the development and implementation of a comprehensive and cohesive package of (subsidiary) environmental regulatory legislation in accordance with the requirements of the EM Act. Yet, it should be noted that the role of the EMA goes beyond regulation.

The EMA has been investing resources in improving environmental awareness and education; reporting on the state of environment; coordinating environmental management functions performed by persons in Trinidad and Tobago; working with partner agencies, organisations and institutions, in the development and implementation of other relevant environmental policies and plans; lending support to the fulfillment of the country's obligations to a number of regional and international conventions and treaties.

The EMA is responsible for a wide range of activities, a responsibility which has become increasingly important over the last few years given the country's rapidly growing economy. To help guide the organisation's work, a five-year strategic plan, spanning the period 2003 to 2008 was developed, within which five strategic priority areas were identified:

- Clean Air;
- Clean Water;
- Waste Management;
- Noise Management;
- Healthy Ecosystems.

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ASESA	Aripo Savannas Environmentally Sensitive Area
AR4	IPCC Fourth Assessment Report: Climate Change 2007
ASOE	Assessment of the State of Environment Report
CBD	Convention on Biological Diversity
CDIAC	Carbon Dioxide Information Analysis Centre
CEC	Certificate of Environmental Clearance
CO_2	Carbon dioxide
EM Act	Environmental Management Act Chapter 35:05
EMA	Environmental Management Authority
ESA	Environmentally Sensitive Area
ESS	Environmentally Sensitive Species
GDP	Gross Domestic Product
GEO4	Fourth Global Environment Outlook Report
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GoRTT	Government of the Republic of Trinidad and Tobago
ha	Hectares
HWM	High Water Mark
ICC	International Coastal Clean-Up
IMA	Institute of Marine Affairs
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
km^2	Square kilometres
m	Metres
mm	Millimetres
MA	Millennium Ecosystem Assessment
MDGs	Millennium Development Goals Report
OECD	Organisation for Economic Co-operation and Development
THA	Tobago House of Assembly
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNWFP	United Nations World Food Programme
WASA	Water and Sewerage Authority
WPR	Water Pollution Rules 2001 as amended
WRA	Water Resources Agency
WSSD	World Summit on Sustainable Development
°C	Degrees Celsius
%	Percent

PART A: ASSESSMENT OF THE STATE OF THE ENVIRONMENT REPORT 2008

EXECUTIVE SUMMARY

A complete and comprehensive annual assessment of the state of the environment in Trinidad and Tobago continues to be constrained by a lack of systematic monitoring, evaluation and data collection. This 2008 Assessment of the State of the Environment Reports (ASOE) therefore focuses on updating key environmental datasets.

On the surface, and even without the application of empirical evidence, observations would generally indicate that key ecosystems throughout Trinidad and Tobago (e.g. forests) continue to be degraded, reducing their ability to provide important services such as flood regulation and freshwater provision. Several datasets also point to the persistence of negative trends. Consequently, there are very direct and severe impacts on human well-being.

Based on available data, past ASOEs have already established a negative trend or decline in the condition of most environmental services, and have pointed to the fact that although there are some success stories to be recognised – such as the reduction in the use of Chlorofluorocarbons and a few management strategies put in place – the balance sheet in terms of environmental condition and environmental management continues to be skewed in a negative direction.

Environmental datasets for 2008 indicate the need for greater enforcement of measures in coastal areas to reduce the disposal of garbage on account of recreational and other coastal activities. Data from the International Coastal Clean-Up (ICC) taken together with observations inshore would indicate that plastic bottles and other plastic waste are a serious environmental issue contributing to effects such as flooding and landfill problems. This would therefore give greater urgency to the need to revisit the Beverage Container Bill to determine what measures should be put in place to reduce the input of plastic waste into the environment.

1.0 INTRODUCTION

Given that a complete and comprehensive annual assessment of the state of the environment in Trinidad and Tobago continues to be constrained by lack of systematic monitoring, evaluation and data collection, the current report will focus on an update of key environmental data sets for the year 2008. It will also include a description of significant developments and/or issues in environmental management in Trinidad and Tobago over the same period where these are documented and available.

1.1 Global Trends

The Earth's ecosystems provide a range of benefits or services on which human well-being depends. Yet as reported by various international reports and studies – such as the Millennium Ecosystem Assessment (MA)[1], the Fourth Global Environment Outlook Report (GEO4), the Fourth Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC)[2], and the 2008 Millennium Development Goals (MDGs) Report[3] – most of the Earth's natural systems have been significantly modified by human activities over the last several decades resulting in an overall reduction in their capacities to deliver vital services. On a global scale, and as reported by the United Nations Environment Programme (UNEP), the most widespread human impacts are extensive deforestation, land conversion and fragmentation, desertification, the disruption of freshwater systems, the pollution and overexploitation of marine ecosystems, excessive nutrient loading, severe changes in species distribution and loss of biodiversity[4]. In 2008, the issue of climate change and its associated effects also remained at the centre of discussions at all scales – international to local.

Throughout the world, the results of changes to the environment on human well-being are evident. In 2008, there were a number of environmental disasters such as floods, landslides,

[1] Millennium Ecosystem Assessment (MA). 2005. Current State and Trends Assessment. Washington, DC: Island Press.

[2] Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp

[3] United Nations. 2008. The Millennium Development Goals Report 2008. United Nations Department of Economic and Social Affairs. 56 pp.

[4] United Nations. 2009. UNEP Year Book 2009: New Science and Developments in Our Changing Environment. 64 pp.

droughts and storms which affected millions of people on all continents[5]. The 2008 Atlantic hurricane season for example was reported as being the fourth most active season in the sixty-four years of comprehensive recording, affecting both the continental US and parts of the Caribbean[6]. It is now well established that trends in this part of the world point to more intense tropical cyclone activity than was experienced in the past.

In other regions of the world, northern India was reported to have suffered one of the worst flooding episodes in decades which affected over one million people[7]. The city of Venice in Italy suffered the worst flood it had seen in twenty years[8], and in Central and South America, several countries such as Brazil, Panama and Colombia suffered similar effects.

Droughts and reductions in biodiversity continued to affect issues such food security and human health, and they contributed to increasing food prices and growing poverty levels in many places. In Australia for example, extended drought resulted in the collapse of the rice farming industry, and this was reported to have affected exports to several countries[9]. In places such as Iraq and China, a lack of rainfall affected production of commodity crops such as wheat and barley, reducing yields in certain cases by as much as 50%[10]. These changes contributed to significant increases in food prices on a global scale, and impacts were most strongly felt by poor countries whose ecosystems and economies were already compromised due to human activities and climatic changes - such as those in eastern and sub-Saharan Africa; and Haiti in the Caribbean[11].

As reported by sources such as the Organisation for Economic Co-operation and Development (OECD), the costs associated with environmental disasters are generally very high[12]. For example, it was calculated that climate change can amount to as much as 14.4% of per capita consumption equivalents for countries[13]; floods and other natural disasters can impact the annual

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[5] See for example http://reliefweb.int/disasters?f[0]=field_disaster_date%3A[2008-01-01T00%3A00%3A00Z%20TO%202009-01-01T00%3A00%3A00Z] (accessed April 2010)

[6] National Oceanic and Atmospheric Administration (2008, November 30). *2008 Atlantic Hurricane Season Sets Records*. ScienceDaily. Retrieved April 2010, from http://www.sciencedaily.com/releases/2008/11/081129124902.htm

[7] http://www.guardian.co.uk/world/2008/aug/28/india.flooding

[8] http://www.guardian.co.uk/world/2008/dec/01/italy-venice-flooding

[9] http://www.nytimes.com/2008/04/17/business/worldbusiness/17iht-17warm.12077306.html

[10] http://www.pecad.fas.usda.gov/highlights/2008/05/Iraq_may2008.htm

[11] http://www.worldbank.org/foodcrisis/

[12] Organisation for Economic Co-operation and Development (OECD). 2008. Costs of Inaction on Key Environmental Challenges. OECD Publishing. 214 pp.

[13] Stern, N. 2007. Stern Review: The Economics of Climate Change, Cambridge: CUP.

Gross Domestic Product (GDP) of the poorest countries by as much as 13%[14]; and ineffective management of fish stock such as the East Atlantic bluefin tuna can result in losses amounting to billions of dollars every year[15]. In 2008, the United Nations World Food Programme (UNWFP) reported that it required US$400 million to prevent starvation in east African countries alone[16].

According to the 2009 Progress Report on the MDGs[17], it is clear that while there have been a few success stories in global environmental management – for example reductions in the use of ozone-depleting substances in both the developed and developing world, and slowing of deforestation with more forests being designated for biodiversity conservation - the balance sheet continues to be in favour of sustained degradation of most of the world's key ecosystems and their services.

The 2008 and 2009 MDG reports therefore highlighted the following priorities in going forward:

- Immediate action is needed to contain rising greenhouse gas emissions;
- Marine areas and land conservation need greater attention;
- Fish stocks require improved management to reduce depletion;
- Species extinction, which is rising rapidly, must be addressed;
- Freshwater scarcity, which affects almost half of the world's population, requires attention;
- Rising food prices, which could potentially push 100 million people deeper into poverty, cannot be overlooked.

[14] World Bank. 2006. Hazards of Nature, Risks to Development, World Bank, Washington D.C.

[15] Bjørndal, T and Brasão, A. 2005. The East Atlantic Bluefin Tuna Fisheries: Stock Collapse or Recovery. Institute for Research in Economics and Business Administration, Bergen, Working Paper SNF No. 34/05.

[16] http://news.bbc.co.uk/2/hi/africa/7520286.stm

[17] United Nations. 2009. The Millennium Development Goals Report. New York. 60 pp.

1.2 Local Trends

In 2008 in Trinidad and Tobago, there was evidence of trends which were similar to those reported at the global level. Several areas throughout the country experienced the effects of environmental disasters after periods of intense rainfall. Those which occurred in Trinidad in July and November were particularly memorable with floods and landslides occurring along much of the East-West Corridor, within valleys along the north western peninsula, along the North Coast, and in towns and other populated areas in central and southern parts of the island. These floods and landslides caused damage to property and infrastructure which amounted to millions of dollars[18] [19]. The capital city Port of Spain was crippled with businesses, schools and transportation services being brought to a halt[20]. In areas across Trinidad, damage to agricultural lands and loss of crops resulted in increases in the cost of local produce[21]. By all accounts, the 2008 floods and landslides were very costly, and it is clear that their effects went beyond purely financial.

Other driving forces of change and their impacts were also apparent. There continued to be a number of fires throughout the country affecting forests, savannahs and agricultural lands (Table 1.1). Savannas and grasslands were the ecosystem types most severely affected.

There were a number of reported oil spills both on land and at sea (Figure 1.1). Although the total number of reported spills for 2008 is lower than that of previous years, the number of land-based spills continued to exceed spills in the marine environment. These data represent spills that are reported to the authorities and there may well be a number of other incidents which go unreported.

[18] Trinidad and Tobago Newsday. 20 November 2008. http://www.newsday.co.tt/news/0,90199.html

[19] Trinidad and Tobago Newsday. 23 November 2008. http://www.newsday.co.tt/news/0,90428.html

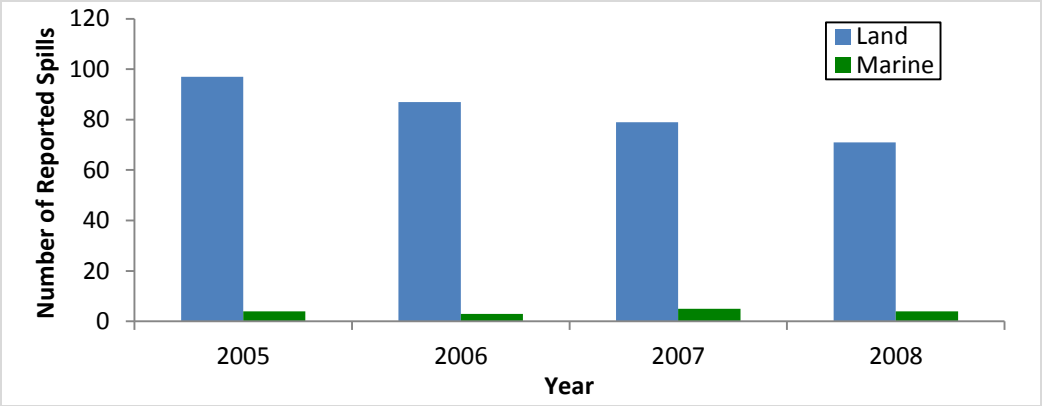
[20] Trinidad and Tobago Newsday. 20 November 2008. http://www.newsday.co.tt/news/0,90195.html

[21] Trinidad and Tobago Newsday. 16 July 2008. http://www.newsday.co.tt/news/0,82599.html

Table 1.1 Forest fire data by type for Trinidad and Tobago (1998 – 2008)

AREA BURNT BY LAND USE IN TRINIDAD 1998 - 2008																
Year	**Natural Forest**		**Shrub/Sec. Forest**		**Teak Plantation**		**Pine Plantation**		**Savannah / Grasses**		**Other**		**Agricultural Lands**		**Total**	
	No. of Fires	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**	**No. of Fires**	**Area burnt (ha)**
1998	21	248	96	845	100	5,467	51	584	327	1,732	49	182	118	1,225	**762**	**10,283**
1999	6	9	16	28	22	562	12	79	96	280	6	20	14	15	**172**	**993**
2000	-	-	8	18	19	717	8	23	39	136	3	9	15	24	**92**	**927**
2001	18	126	82	453	74	2,246	34	223	177	850	14	121	64	238	**463**	**4,257**
2002	-	-	7	15	4	9	2	10	41	85	4	10	4	5	**62**	**134**
2003	16	1,267	45	452	45	1,192	45	760	144	750	27	165	25	137	**347**	**4,723**
2004	-	-	13	175	19	968	3	18	76	276	17	32	8	16	**136**	**1,485**
2005	3	11	26	55	35	936	13	22	149	410	15	177	29	86	**270**	**1,697**
2006	1	15	21	55	16	606	13	153	106	338	53	79	0	0	**210**	**1,246**
2007	12	147	53	229	57	1,338	18	219	227	1,316	24	115	61	203	**452**	**3,567**
2008	2	8	23	43	18	402	16	135	83	704	10	28	74	216	**226**	**1,536**

Source: Forestry Division, 2009 (unpublished)



Source: Ministry of Energy and Energy Industry, HSE Measurement Division, 2009 (unpublished)

Figure 1.1 Reported oil spills in Trinidad and Tobago (2005 – 2008)

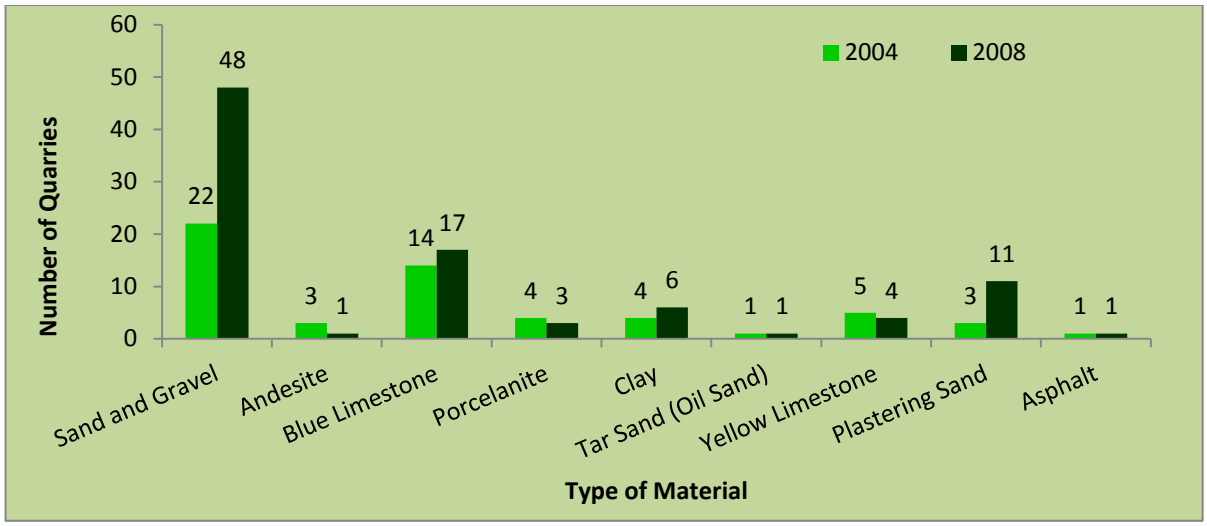
A projection of anticipated sea level rise in Trinidad (as a result of climate change) indicates that by 2050, sea level will rise approximately 0.05m above its recorded height in 2001 – a change of approximately 1mm per year[22]. In a more recently published paper[23], it was reported that over the period 1984 to 1992, sea level around Trinidad and Tobago rose by 1.6mm to 3.0mm. These two (2) sets of data seem to indicate an increase in the rate of sea level rise in the 21st century.

The numbers of quarries throughout the country also increased over the period 2004 to 2008 (Figure 1.2) with a total increase of 61% (92 in 2008 compared with 57 in 2004) across all materials[24]. The demand for certain materials such as sand and gravel, plastering sand and blue limestone seemed to have increased by the greatest factor reflecting the increase in demand for construction materials over the same period.

[22] Miller, K., 2005: Variations in Sea Level on the West Trinidad, Marine Geodesy 28, (3), 219-229.

[23] Sutherland, M., Dare, P. and Miller, K. 2009. Monitoring Sea Level Change in the Caribbean.

[24] Oliver, R. 2010. Quarry Operations Best Practice Ministry of Energy and Energy Industries. PowerPoint Presentation at Quarry Rehabilitation Workshop held by the University of Trinidad and Tobago O'Meara Campus, Arima, Trinidad.



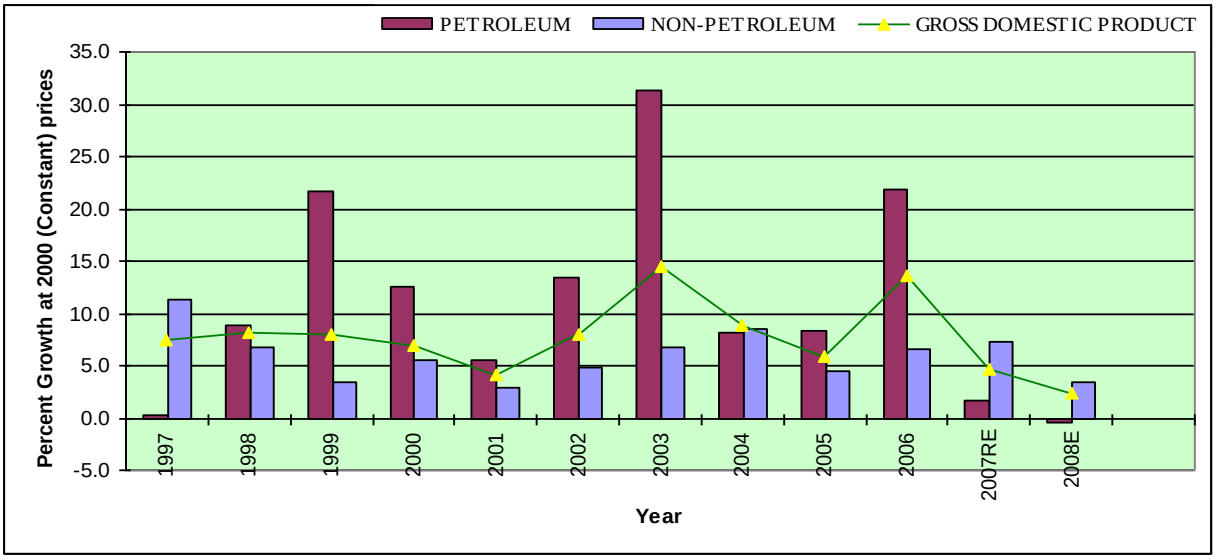
Source: Oliver 2010

Figure 1.2 Numbers of quarries throughout Trinidad and Tobago in 2004 and 2008

Data collected through the Certificate of Environmental Clearance (CEC) process by the Environmental Management Authority (EMA) indicates that there were several development-related activities occurring throughout the country, and while some of these were related to the energy sector, a greater majority were non-energy related (see Part B for more information on CECs and related statistics).

Alongside the increasing pressures of human-related activities on the environment and the effects of climate-related disasters, Trinidad and Tobago's GDP growth continued to decline into 2008 (Figure 1.3) with a negative percentage growth of 0.5 % experienced in the petroleum sector[25].

[25] Central Statistical Office (CSO). Selected Micro and Macro Indicators for Trinidad and Tobago 1979 to 2010. Government of the Republic of Trinidad and Tobago. http://cso.planning.gov.tt/content/selected-micro-and-macro-indicators-trinidad-and-tobago-1979-2010 (accessed 2009)

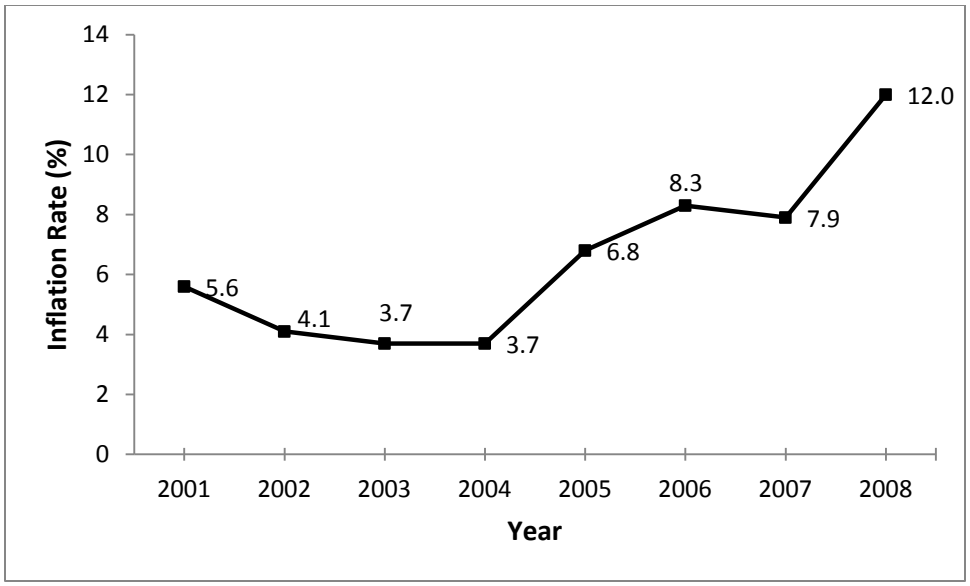


Source: Central Statistical Office (accessed)2009
E – estimate; RE – revised estimate

Figure 1.3 Real GDP Growth for Trinidad and Tobago (1997 – 2008)

The inflation rate for Trinidad and Tobago increased significantly in 2008 to 12% (Figure 1.4)[26]. This is compared with a rate of approximately eight percent (8%) in both 2006 and 2007. This most likely reflects both the increase in the cost of local produce on account of losses suffered during flooding, and it also mirrored increases in food and other commodity prices at a global scale. These trends are a clear indication that the country is not immune to or safe from the effects of environmental changes and disasters at a local, regional or global scale.

[26] Central Statistical Office (CSO). Selected Micro and Macro Indicators for Trinidad and Tobago 1979 to 2010. Government of the Republic of Trinidad and Tobago. http://cso.planning.gov.tt/content/selected-micro-and-macro-indicators-trinidad-and-tobago-1979-2010 (accessed 2009)



Source: Central Statistical Office 2009

Figure 1.4 Estimated inflation rates in Trinidad and Tobago (2002 – 2008)

2.0 ASSESSMENT OF MAIN ENVIRONMENTAL TRENDS FOR 2008

2.1 Atmosphere

Main messages

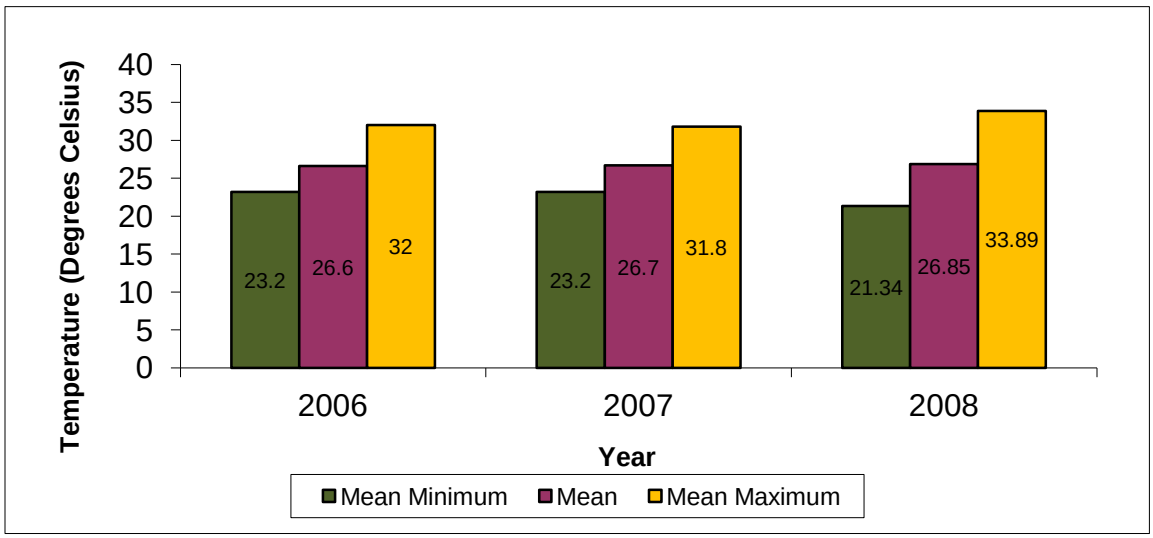
- Ambient temperatures in Trinidad and Tobago were relatively high in 2008 with average annual means of 26.85^{O}C in Trinidad and 27.57^{O}C in Tobago;
- Data indicate an increase of 1.7^{O}C in ambient air temperature in Trinidad and Tobago over the period 1961 to 2008;
- The number of vehicles on register in Trinidad and Tobago continued to increase in 2008 with the addition of approximately 30,000 vehicles. Analysis of this data since 1995 shows an almost linear increase in the number of vehicles on an annual basis;
- Data from the United Nations indicate that carbon dioxide emissions in Trinidad and Tobago more than doubled between 1990 and 2007;
- Further data from the United Nations Development Programme indicates that Trinidad and Tobago's carbon footprint is much higher than that of the average for developing countries;
- In 2008 the importation of CFCs into Trinidad and Tobago remained at zero.

The Ministry of Planning, Housing and the Environment, through the Environmental Management Authority, has commissioned the preparation of the Second National Communication of Trinidad and Tobago to the United Nations Framework Convention on Climate Change (UNFCCC), which includes the preparation of an updated Greenhouse Gas (GHG) Inventory. As at the end of 2008, this inventory was incomplete, but data from a number of sources is discussed in the following sections.

2.1.1 Ambient temperature

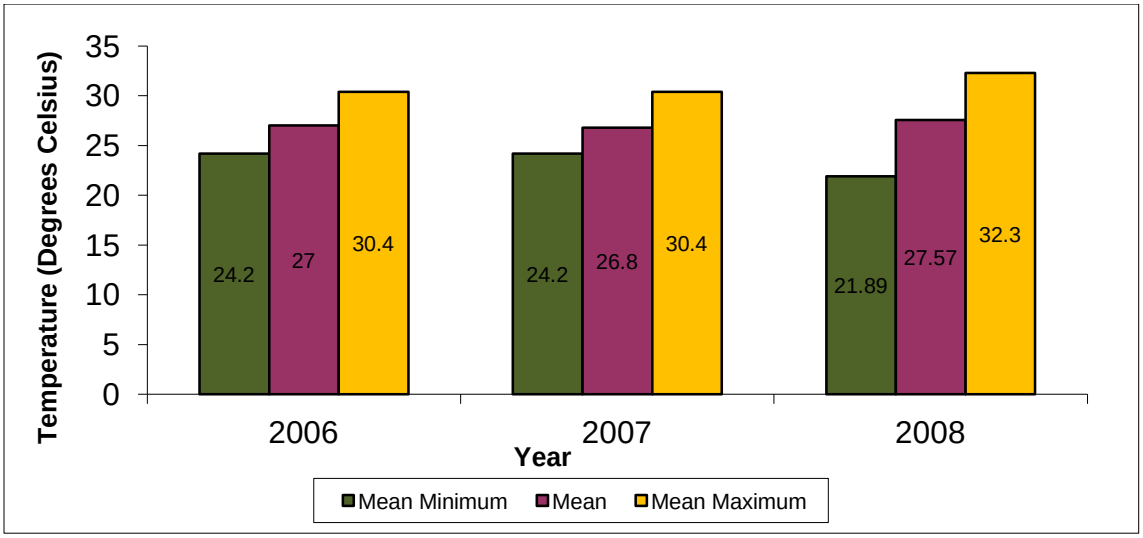
During the course of 2008, the highest recorded temperature in Trinidad was taken at Piarco in August and measured 35.6°C. In Tobago, the highest temperature was 38°C and was recorded in

June at Crown Point. Figures 2.1 and 2.2 show the mean temperatures (minimum, average and maximum) for Trinidad and Tobago for the period 2006 to 2008. Generally, mean maximum temperatures in Trinidad appear to be higher, while mean minimum temperatures in Tobago are higher.



Source: Meteorological Services, 2009 (unpublished)

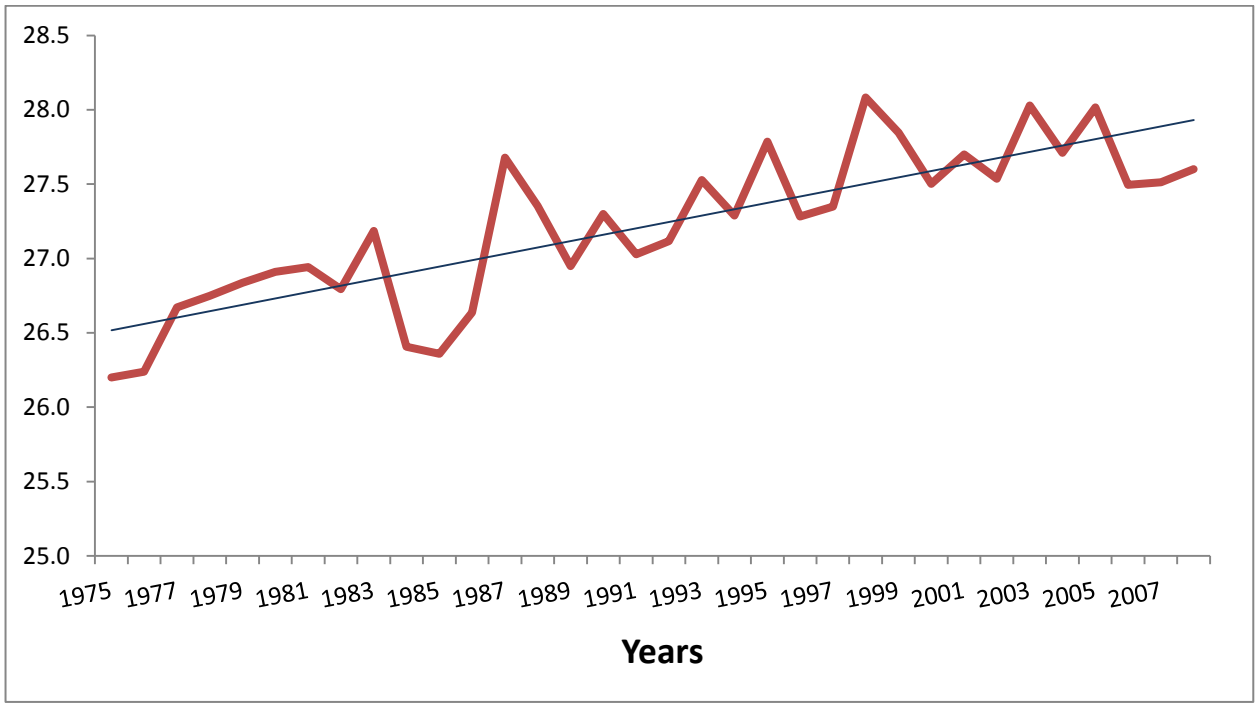
Figure 2.1 Air temperatures at Piarco, Trinidad (2006 – 2008)



Source: Meteorological Services, 2009 (unpublished)

Figure 2.2 Air temperature at Crown Point, Tobago (2006 – 2008)

Assessment of the longer-term pattern in air temperatures in Trinidad and Tobago indicates an increasing rate of warming. As reported by the Government of the Republic of Trinidad and Tobago (GoRTT) in its Draft Climate Change Policy[27], data indicates an increase of 1.7°C over the period 1961 – 2008.This is compared with an increase of 0.6°C over the period 1961 – 1990. The trend in annual air temperatures in Trinidad since 1975 is shown in Figure 2.3.



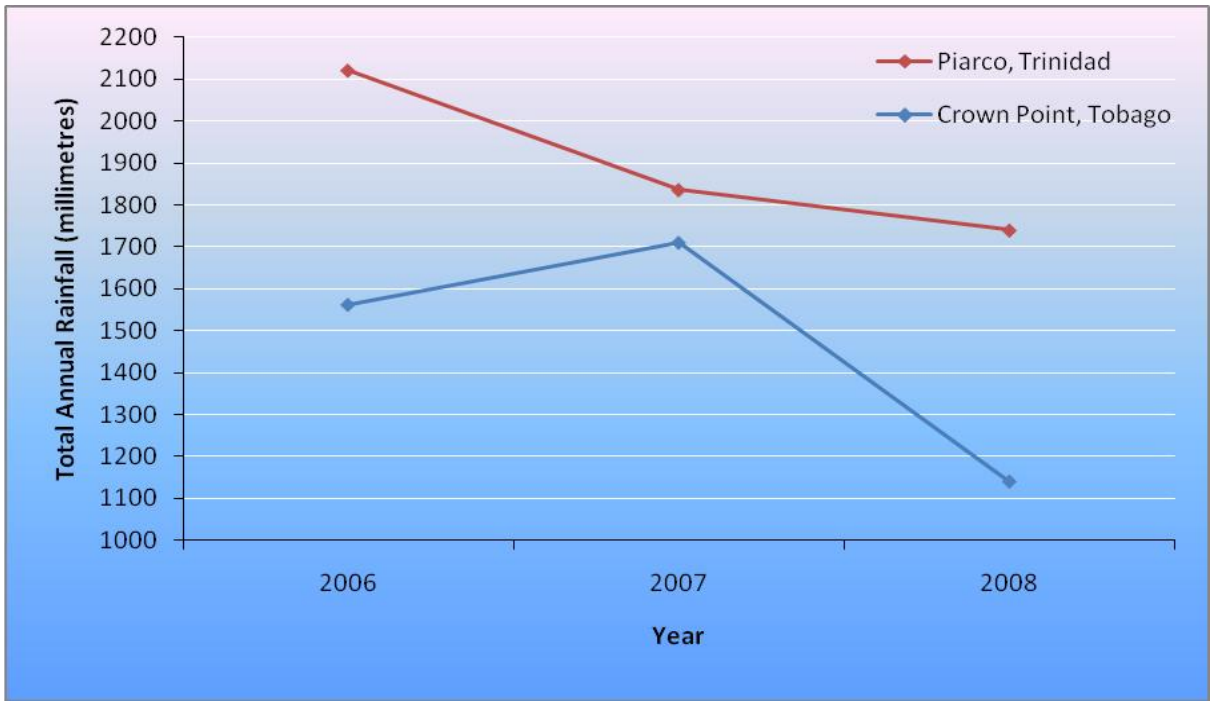
Source: Meteorological Services, 2009 (unpublished)

Figure 2.3 Mean annual air temperatures in Trinidad (1975 – 2008)

[27] Government of the Republic of Trinidad and Tobago. 2009. Draft Climate Change Policy.

2.1.2 Rainfall

Figure 2.4 shows variability in total annual rainfall in Trinidad and Tobago for the period 2006 to 2008. It should be noted that there have been apparent changes in wet season data (months of June, July and August) since the 1960s where average rainfall has fallen by 2.6% per decade[28].

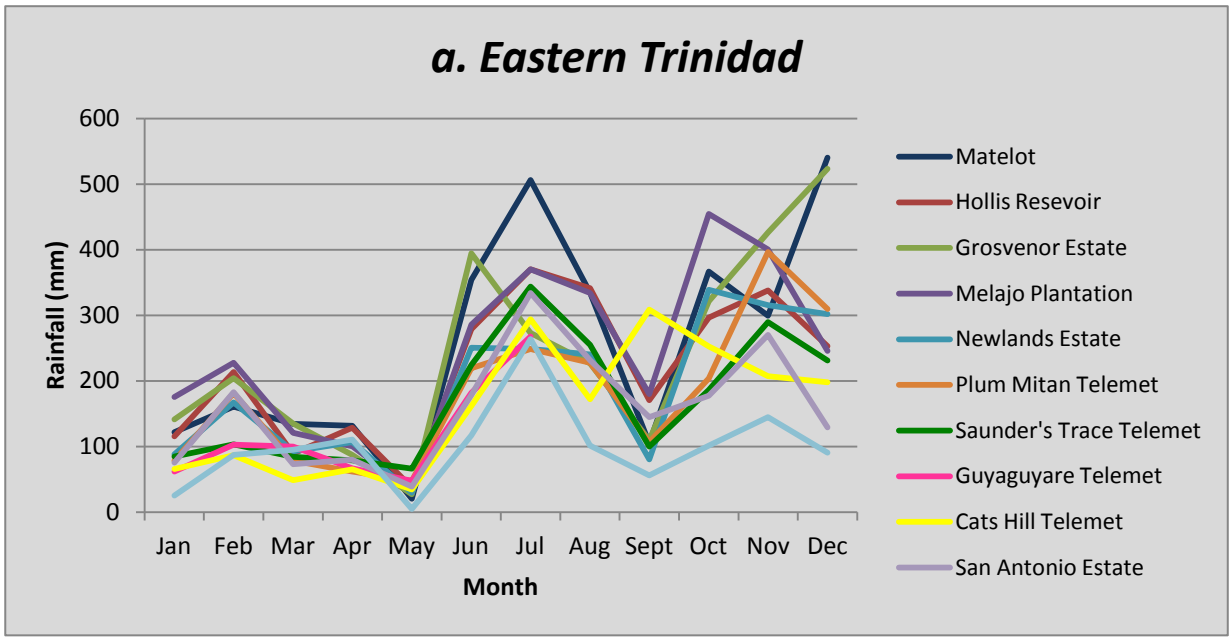


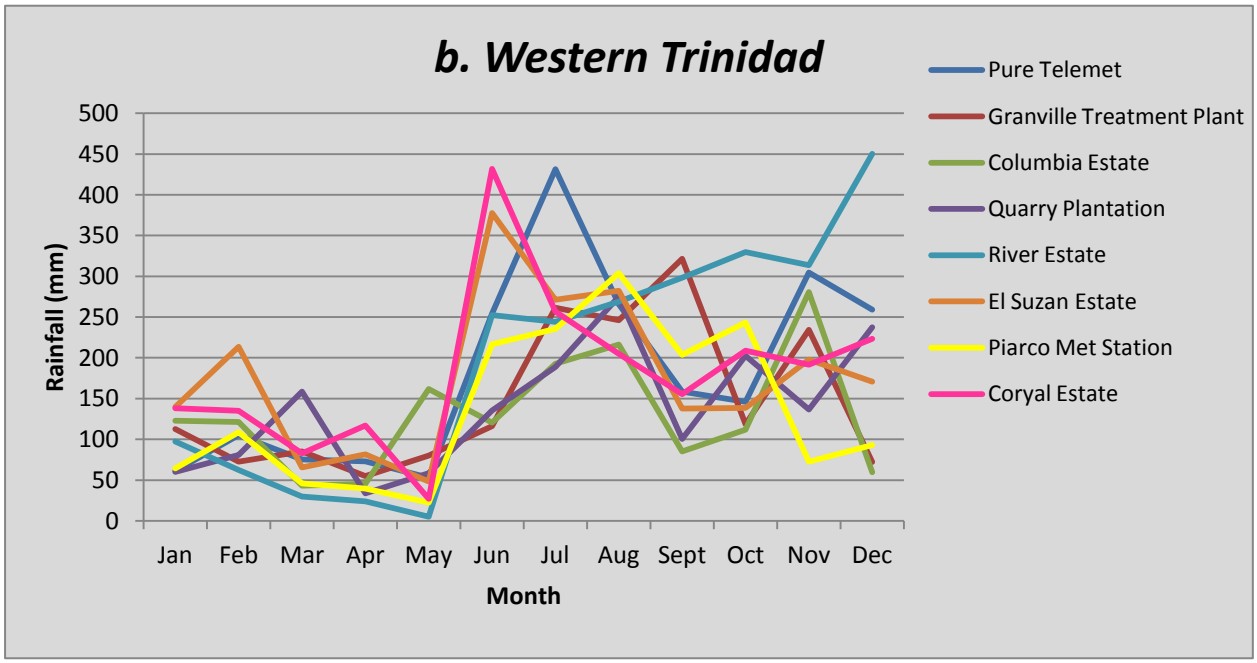
Source: Meteorological Services, 2009 (unpublished)

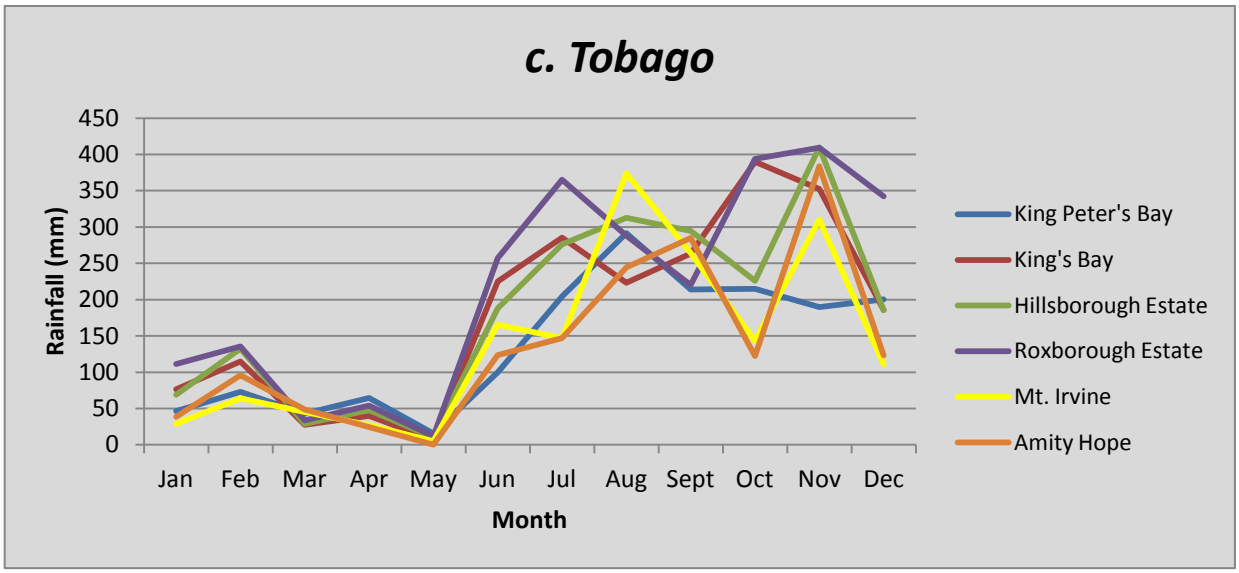
Figure 2.4 Total annual rainfall in Trinidad and Tobago (2006 – 2008)

Figure 2.5 (a, b and c) shows 2008 monthly rainfall data for various locations across Trinidad and Tobago collected by the WRA. These data indicate that rainfall is generally higher in the eastern parts of Trinidad when compared with the western parts of Trinidad. This is in keeping with already-established trends.

[28] Government of the Republic of Trinidad and Tobago. 2009. Draft Climate Change Policy.


a. Eastern Trinidad
Rainfall (mm)
600
500
400
300
200
100
0
Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
Month
Matelot
Hollis Resevoir
Grosvenor Estate
Melajo Plantation
Newlands Estate
Plum Mitan Telemet
Saunder's Trace Telemet
Guyaguyare Telemet
Cats Hill Telemet
San Antonio Estate


b. Western Trinidad
Rainfall (mm)
500
450
400
350
300
250
200
150
100
50
0
Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec
Month
Pure Telemet
Granville Treatment Plant
Columbia Estate
Quarry Plantation
River Estate
El Suzan Estate
Piarco Met Station
Coryal Estate



Source: Water Resources Agency, 2010 (unpublished)

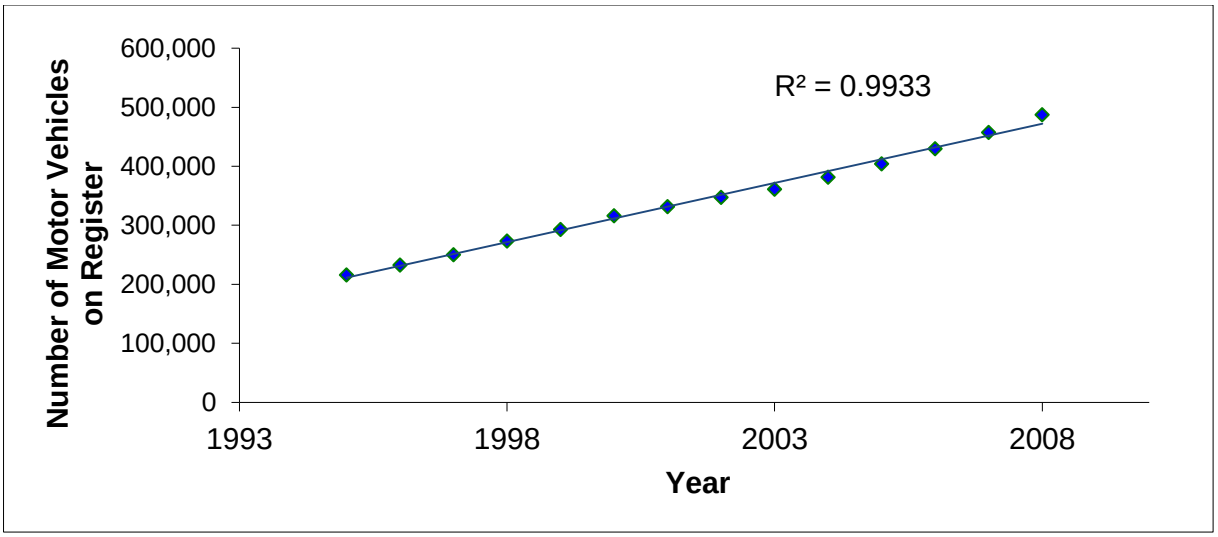
Figure 2.5 a, b and c Monthly rainfall data for selected sampling sites around Trinidad and Tobago (2008)

2.1.3 Sources of Greenhouse Gases

The Draft Climate Change Policy for Trinidad and Tobago [29] noted that carbon dioxide emissions from the transport sector doubled over the period 1990-2006, with a 100% increase in the number of vehicles over the same sixteen-year timeframe. During the course of 2008, the number of vehicles on register in Trinidad and Tobago increased by approximately 30,000[30]. Trend line analysis of motor vehicle data since 1995 (Figure 2.6) shows that there was an almost perfect linear increase in the number of motor vehicles on register between 1995 and 2008 (R^2 = 0.9933), indicating a sustained increase in carbon dioxide (CO_2) emissions from the transport sector into 2008.

[29] Government of the Republic of Trinidad and Tobago. 2009. Draft Climate Change Policy.

[30] Thomas, S.M. 2009. Impacts of Economic Growth on CO_2 Emissions: Trinidad Case Study.



Sources: Central Statistical Office 2007[31]; 2008[32] and Thomas 2009[33]

Figure 2.6 Number of motor vehicles on register in Trinidad and Tobago (1995 – 2008)

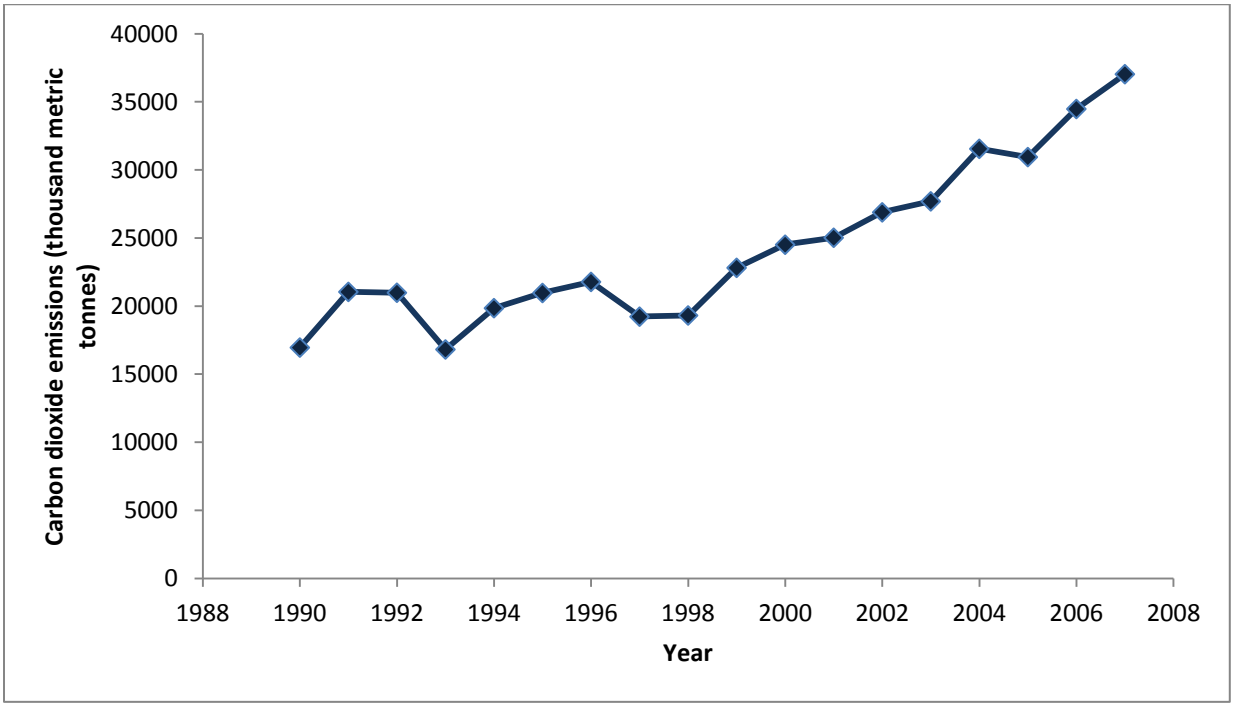
In addition to the transport sector, the GoRTT also reported increases in CO_2 emissions from power generation (43% over the period 1990 to 2006), and from industrial processes (86.7% over the period 1990 to 2006). When taken together, CO_2 emissions from the energy sector (which includes transport, power generation and industry) increased by 278% over the period 1990 to 2006. This increase is statistically significant.

[31] Central Statistical Office 2007(a). First Compendium of Environmental Statistics: Trinidad and Tobago. Central Statistical Office, Ministry of Planning and Development of the Government of Trinidad and Tobago. Port of Spain, Trinidad. 525pp. The First Compendium of Environmental Statistics for Trinidad and Tobago was published by the Central Statistical Office (CSO) of the Ministry of Planning and Development in 2007. This Compendium was the first effort of its kind in Trinidad and Tobago to bring together key agencies and institutions with a responsibility for the collection of environmental data, and publish a document which presented all major environmental datasets for the country for all years prior to 2005. The CSO is currently in the process of compiling the Second Compendium of Environmental Statistics which will cover the period 2005 to 2007. It was expected that this document would be published in early 2009, but it is not yet available. http://www.cso.gov.tt/cso/statistics/accounts.aspx

[32] Central Statistical Office 2008 (b) Pocket Digest. Central Statistical Office, Ministry of Planning, Housing and Environment of the Government of Trinidad and Tobago. Port of Spain, Trinidad. 24pp.

[33] Thomas, S.M. 2009. Impacts of Economic Growth on CO_2 Emissions: Trinidad Case Study.

Data available from the Carbon Dioxide Information Analysis Centre (CDIAC) through the United Nations MDG reporting process[34] indicates that, based on global monitoring, Trinidad and Tobago's CO_2 emissions have more than doubled over the period 1990 to 2007 (Figure 2.7). In 2007, CO_2 emissions in Trinidad and Tobago were estimated at 37,037 thousand metric tonnes.



Source: United Nations 2010[35]

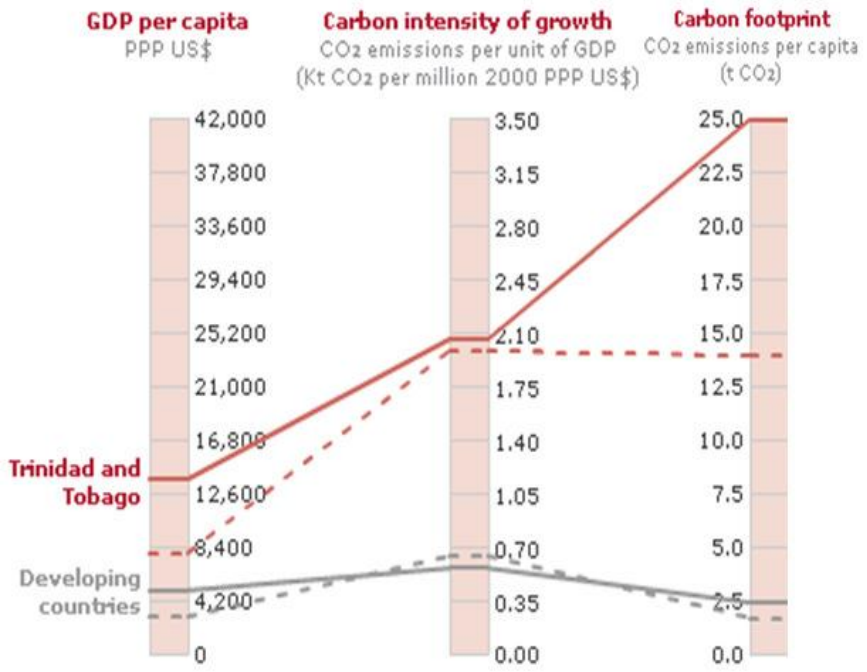
Note: No data available for 2008

Figure 2.7 Trinidad and Tobago's carbon dioxide emissions based on global monitoring data (1990 – 2007)

[34] United Nations 2010. http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=749

[35] ibid

Based on information published in the United Nations Development Programme (UNDP) 2008 Human Development Report[36] (Figure 2.8), the carbon intensity of Trinidad and Tobago's growth is far in excess of the average of other developing countries. Trinidad and Tobago's carbon footprint is also calculated to be significantly higher – by a factor of 1000%. These data can help to demystify some of the doubt and speculation which surround the climate change discourse here in Trinidad and Tobago. What the data in Figure 2.8 strengthens is an argument for more concerted actions to reduce our GHG emissions and lower our carbon footprint.



Source: Thomas, 2009[37]

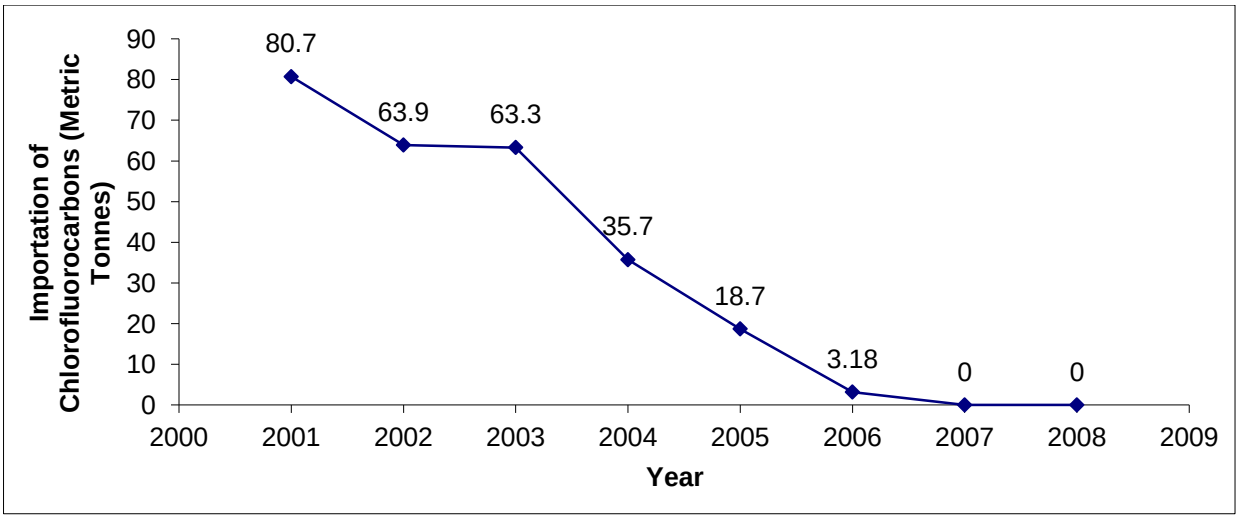
Figure 2.8 Carbon intensity of Trinidad and Tobago compared with other developing countries (2008)

[36] United Nations Development Programme (UNDP). 2009. Human Development Report 2007/2008. Fighting Climate Change: Human solidarity in a divided world. New York. 399 pp.

[37] Thomas, S.M. 2009. Impacts of Economic Growth on CO_2 Emissions: Trinidad Case Study.

2.1.4 Ozone-Depleting Substances

In 2008 at the global level, countries came together to achieve a 97% reduction in the consumption of ozone-depleting substances, and this is reported to have set a new precedent for international cooperation[38]. In Trinidad and Tobago, the management of ozone-depleting substances continued to be a success story. As is shown in Figure 2.9, there was no importation for chlorofluorocarbons into Trinidad and Tobago in 2008, making it two years that this measure was being fully implemented.



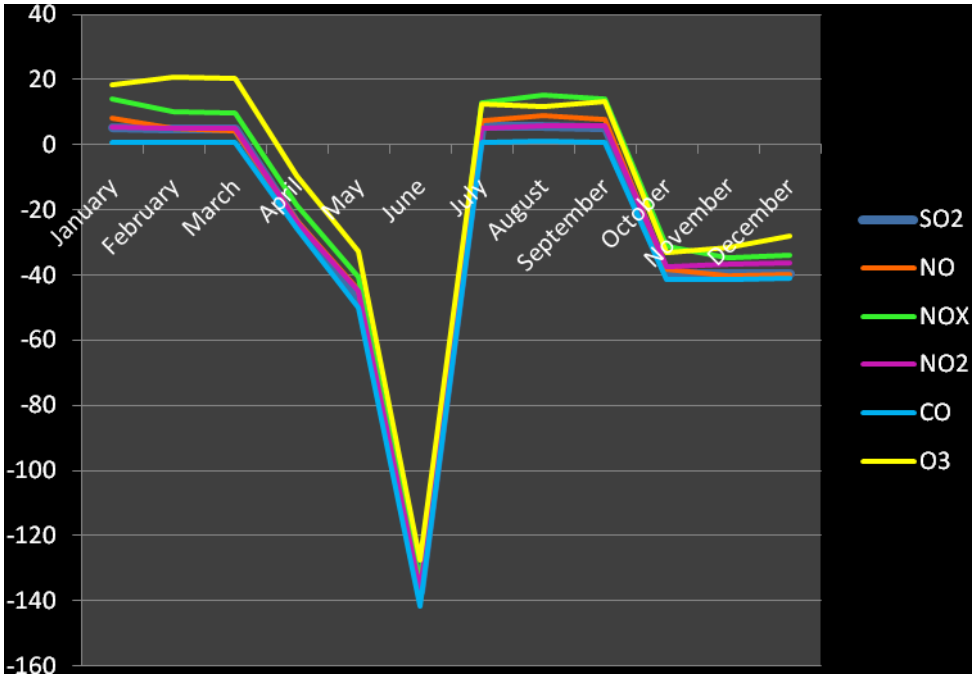
Source: Multilateral Environmental Agreements Unit, Ministry of Planning, Housing and the Environment, 2009 (unpublished)

Figure 2.9 Importation of chlorofluorocarbons into Trinidad and Tobago (2001 – 2008)

2.1.5 Air Quality

The EMA continued its initiative to monitor air quality at the Point Lisas Industrial Estate in 2008. Monthly data for the six (6) major gases monitored (ozone, nitrogen oxide, nitrogen dioxide, nitrogen oxides, carbon monoxide and sulphur dioxide) are shown in Figure 2.10. Gas concentrations were all negative and remained relatively constant until September, but then fell significantly in the last quarter of the year.

[38] United Nations (UN). 2009. The United Nations Regional Commissions and the Climate Change Challenges.



Source: Environmental Management Authority

Figure 2.10 Concentrations of air pollutants measured in the Point Lisas Industrial Estate (2008)

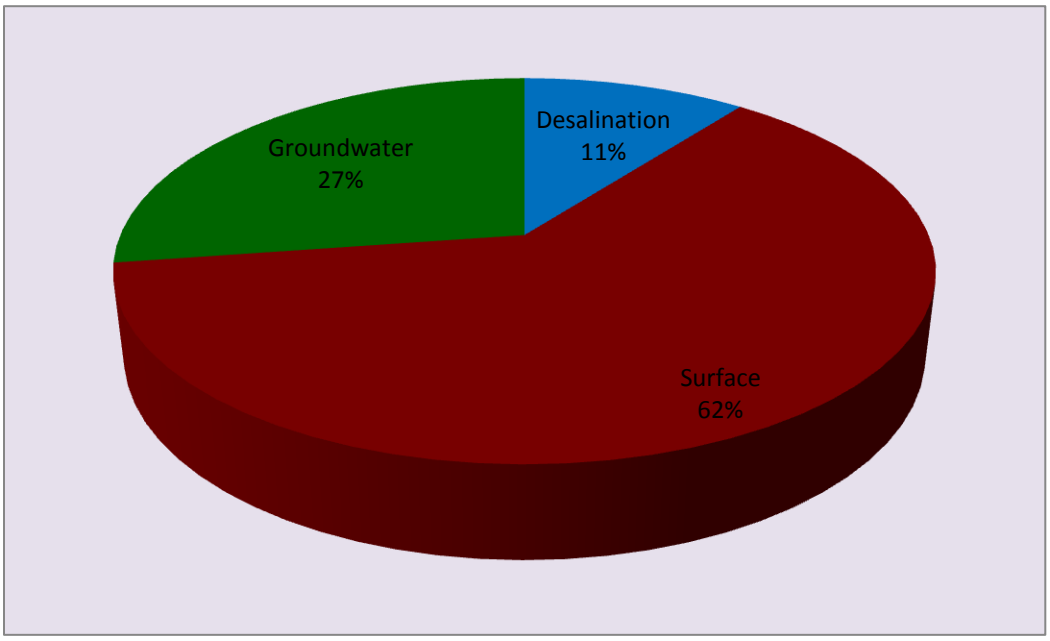
2.2 Water

Main messages

- Trinidad and Tobago is heavily dependent on natural sources for the provision of water, abstracting 89% of its water from a combination of surface waters and groundwater;
- Levels of abstraction from both surface and groundwater sources are generally high, indicating some degree of unsustainable use;
- Based on available data, the condition of Trinidad's water sources appear to be in a better condition than Tobago's, though only marginally so. The overall assessment of Trinidad and Tobago's water quality is fair;
- Data on coastal pollution reveals that in 2008, shoreline and recreational activities continued to contribute the greatest source of debris in the coastal zone with plastic bottles and other plastic items such as cups, plates, caps etc. being the most abundant items by count;
- There is need for more effective management of the country's water sources, including the need for more systematic research and monitoring.

Freshwater datasets for Trinidad and Tobago for 2008 provide useful information on the ways in which freshwater resources are used and impacted by human activities in the country. Because the Water and Sewerage Authority (WASA) and the Water Resources Agency (WRA) perform systematic monitoring on certain aspects of the condition and uses of surface and groundwater sources, it is possible to gain an understanding of selected status and trends in our freshwater systems.

As can be seen from Figure 2.11, water for human use in Trinidad and Tobago is largely derived from surface water sources (62% from rivers, streams and dams), but is also produced from groundwater sources (27%) and desalination (11%).

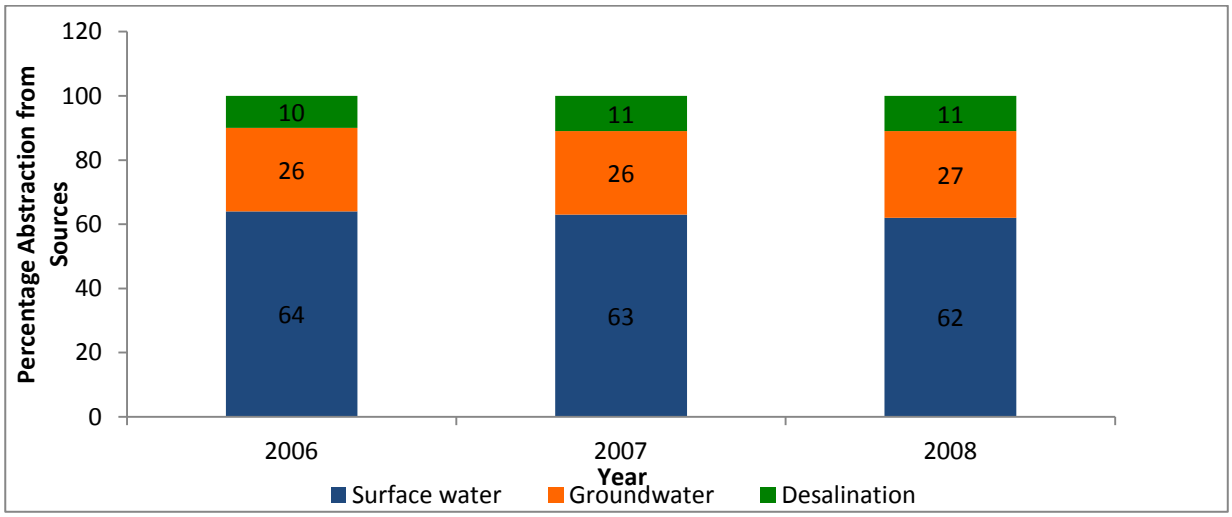


Source: Water and Sewerage Authority, 2009 (unpublished)

Figure 2.11 Freshwater abstraction from different sources as a percentage of total abstraction in Trinidad and Tobago

Based on a three-year dataset (Figure 2.12), it can be seen that there has been little change in the country's relative dependence on the three main sources of freshwater – surface, ground and desalination – since 2006. What cannot be argued is that Trinidad and Tobago remains heavily dependent on natural ecosystems for the provision of freshwater. So while the Government looks into the construction of additional desalination plants to meet a growing demand for freshwater locally[39], it must be remembered that such energy-intensive technology will not solve all of our water supply problems in the long-term. Alongside the construction of desalination plants therefore, there should also be emphasis placed on the protection and proper management of watersheds throughout the country to ensure a cost effective, sustainable supply.

[39] Trinidad Newsday 19 September 2008. http://www.caribdaily.com/article/84082/foreign-expert-for-desal-plants/

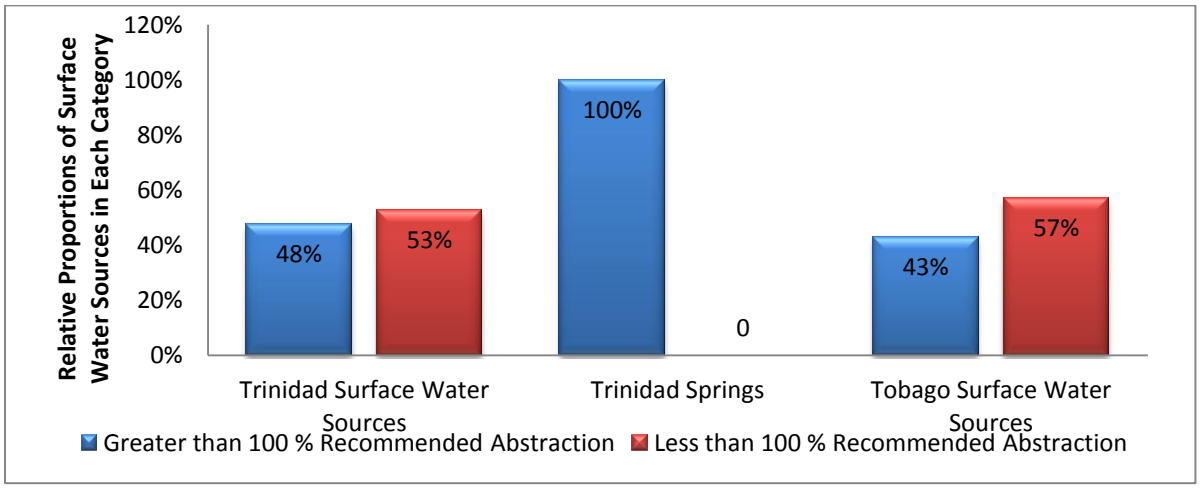


Source: Water and Sewerage Authority, 2008 and 2009 (unpublished)

Figure 2.12 Trends in freshwater abstraction from different sources in Trinidad and Tobago (2006 – 2008)

2.2.1 Surface waters

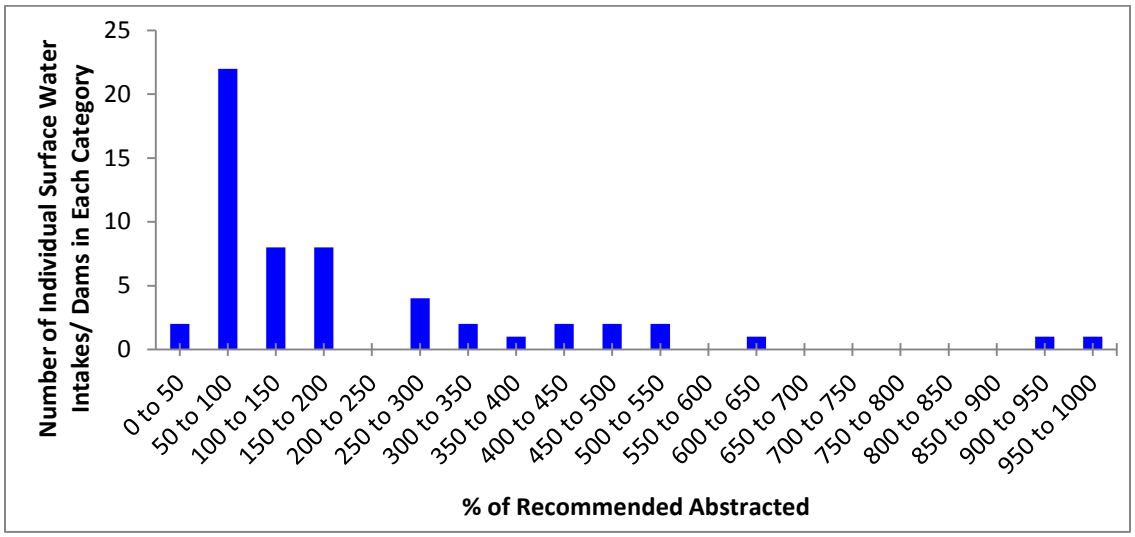
Recommended abstraction levels from surface water sources throughout Trinidad and Tobago (rivers, streams, and dams) are based mainly on a percentage of recharge rates. These levels attempt to protect and sustain ecological function in the water body by preserving 25% for purely ecological purposes. Datasets for 2008 indicate relatively high levels of drawdown from surface water sources and springs (Figures 2.13).



Source: Water Resources Agency, 2010 (unpublished)

Figure 2.13 Summary of abstraction levels from surface water sources throughout Trinidad and Tobago (2008)

When the data in Figure 2.13 is represented in a frequency distribution graph (Figure 2.14), it is evident that abstraction from most surface water sources fall in the 50 to 100% category (24 out of 56). However, several sources are being drawn down in excess of 100% (32 out of 56) and there are cases where recommended abstraction is as much as 900 to 1000%. This would indicate some degree of unsustainable use.

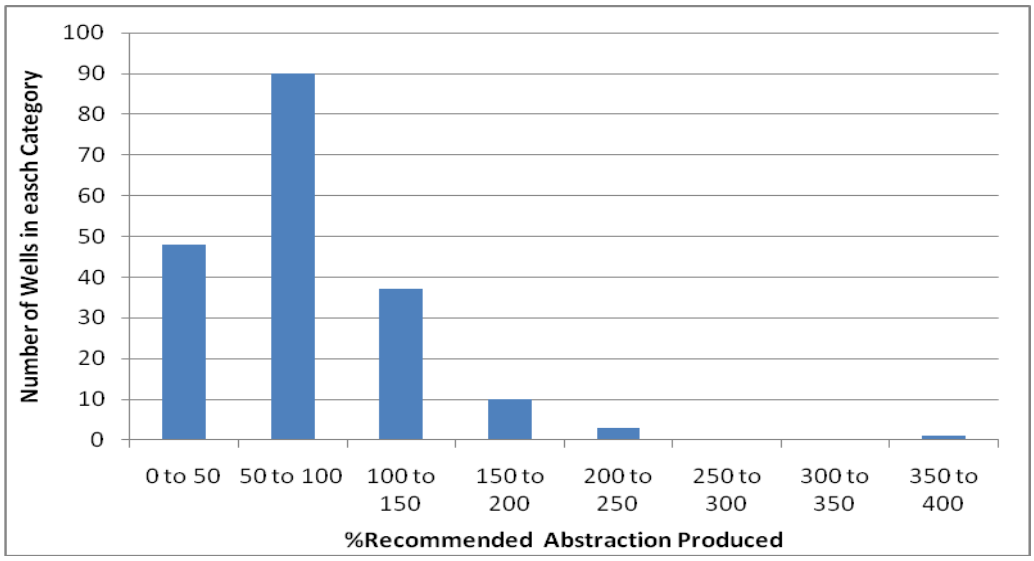


Source: Water Resources Agency, 2010 (unpublished)

Figure 2.14 Frequency distribution of abstraction levels from surface water sources throughout Trinidad and Tobago (2008)

2.2.2 Groundwater

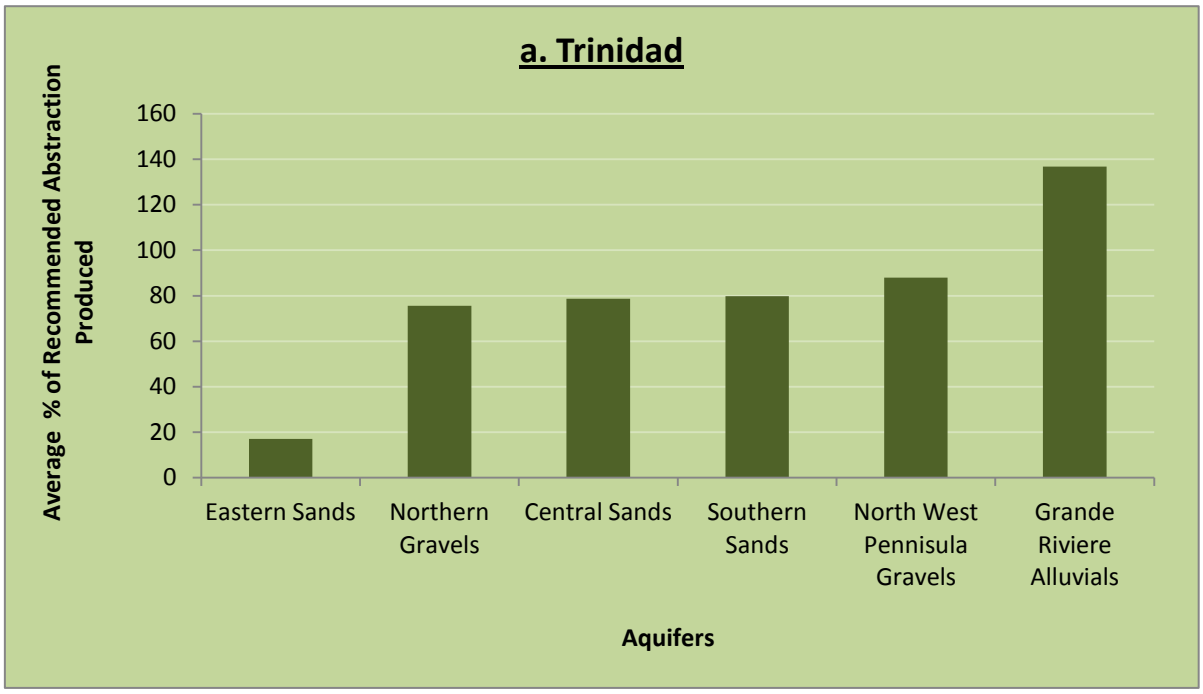
An examination of abstraction trends from groundwater sources generally indicates the same pattern seen in surface water sources, though the trends are not as drastic (Figure 2.15).

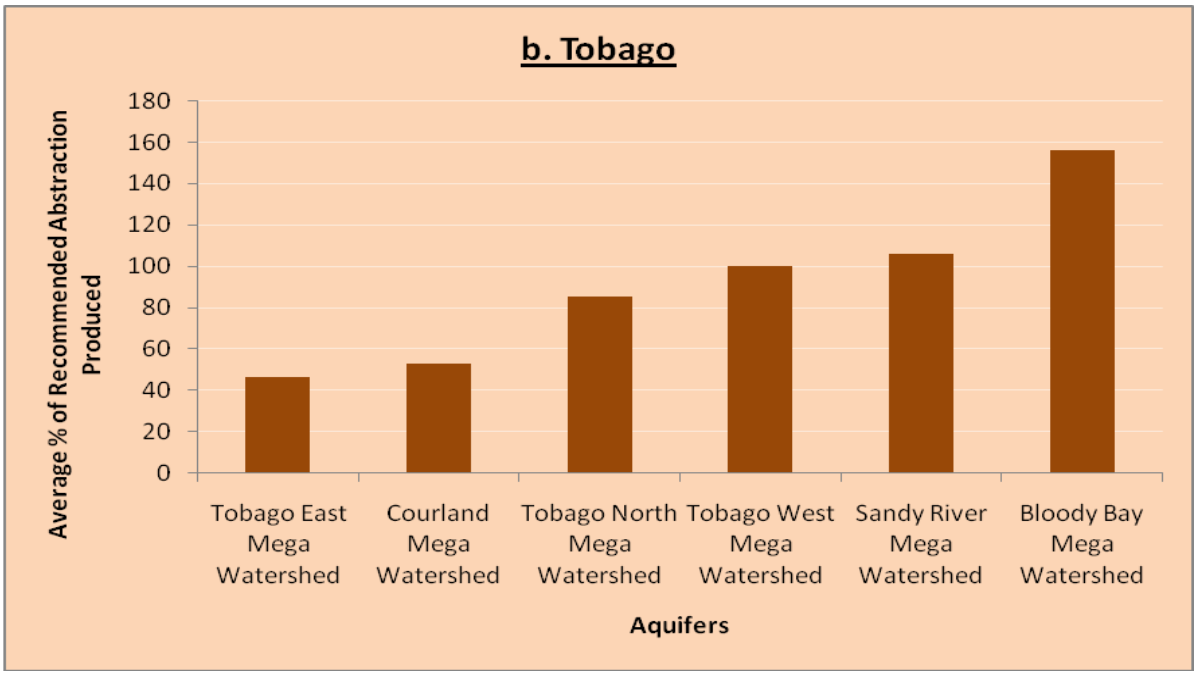


Source: Water Resources Agency, 2010 (unpublished)

Figure 2.15 Frequency distribution of abstraction levels from groundwater sources throughout Trinidad and Tobago (2008)

Several aquifers throughout the country are undergoing abstraction which is close to 100% recommended, but in some cases such as in the Grande Riviere alluvials in Trinidad and the Bloody Bay Mega watershed in Tobago, recommended abstraction is in excess of 100% (Figure 2.16 a and b). It should be noted that in the case of groundwater, recommended abstraction is equal to recharge rate and is in no way related to ecological function.



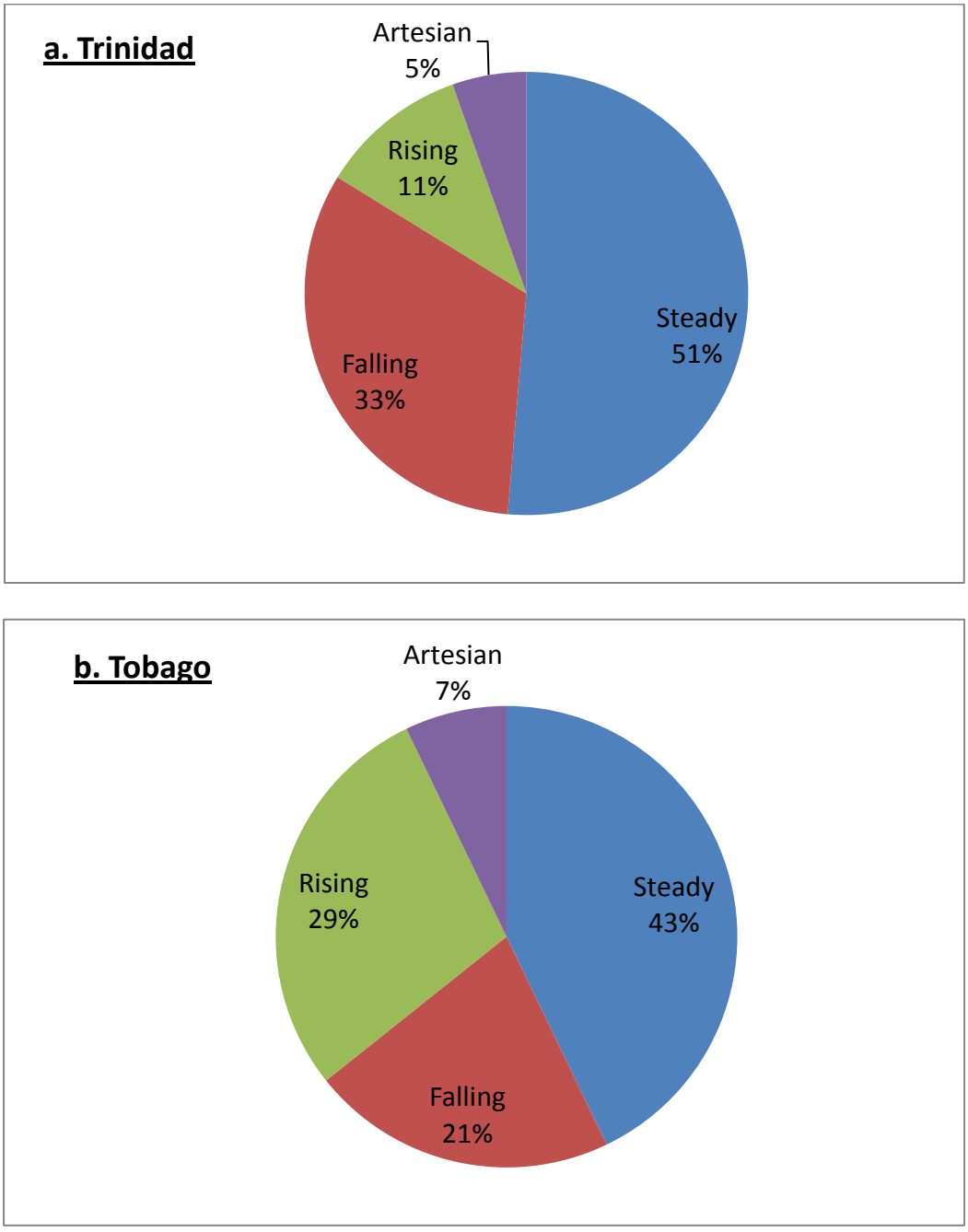


Source: Water Resources Agency, 2010 (unpublished)

Figure 2.16 a and b Average freshwater abstraction levels in aquifers throughout Trinidad and Tobago (2008)

Examination of the levels of groundwater sources throughout Trinidad and Tobago over the period 2001 to 2008 indicates that about half of all wells in Trinidad are steady, but one third are showing signs of falling levels (Figure 2.17 a). Only in a small percentage of wells (11%) in

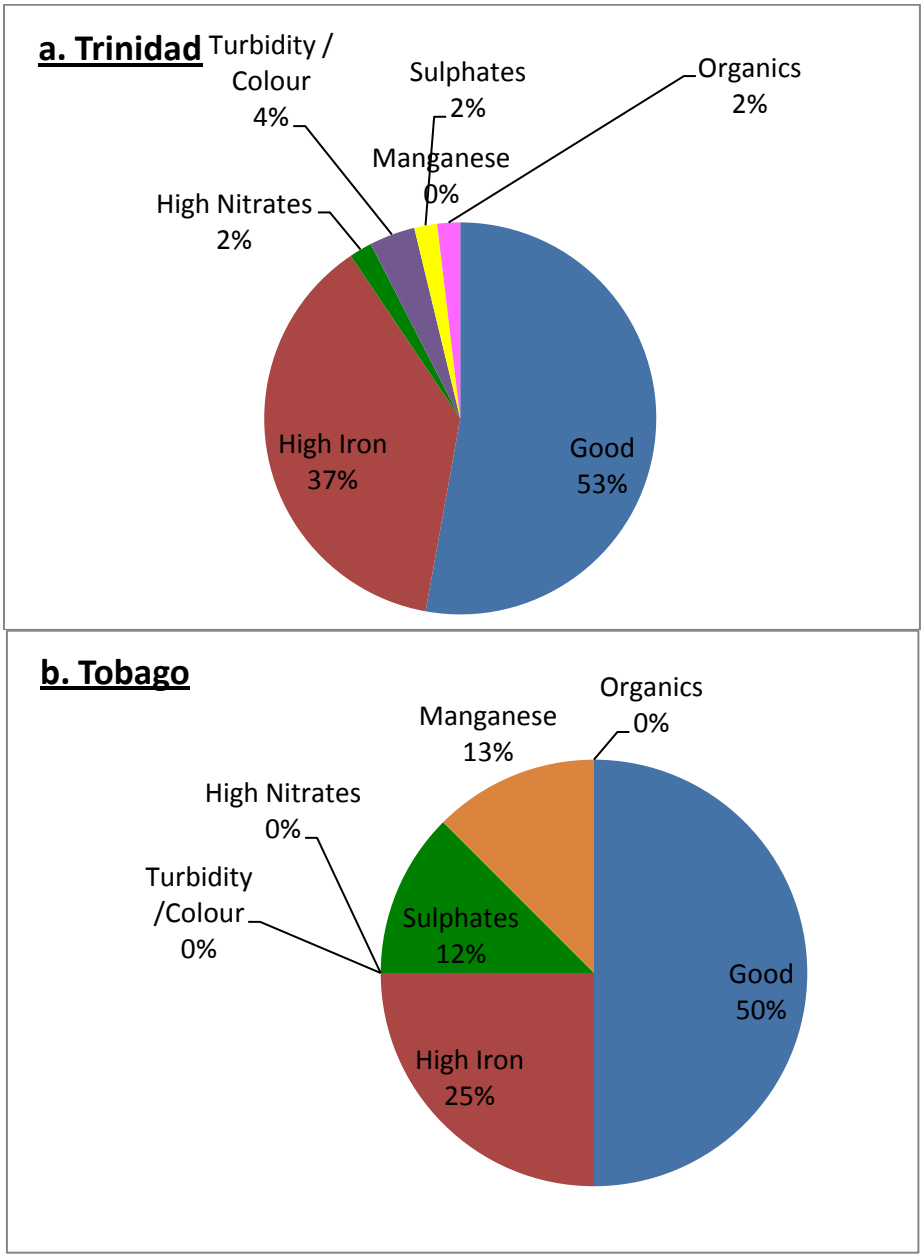
Trinidad are water levels rising. Data for wells throughout Tobago (Figure 2.17 b) indicate that 43% of wells are steady and that 21% are falling. When compared with Trinidad, a much higher percentage of wells in Tobago (29% versus 11%) are showing signs of rising levels.



Source: Water Resources Agency, 2010 (unpublished)

Figure 2.17 a and b Groundwater levels in Trinidad and Tobago (2001 – 2008)

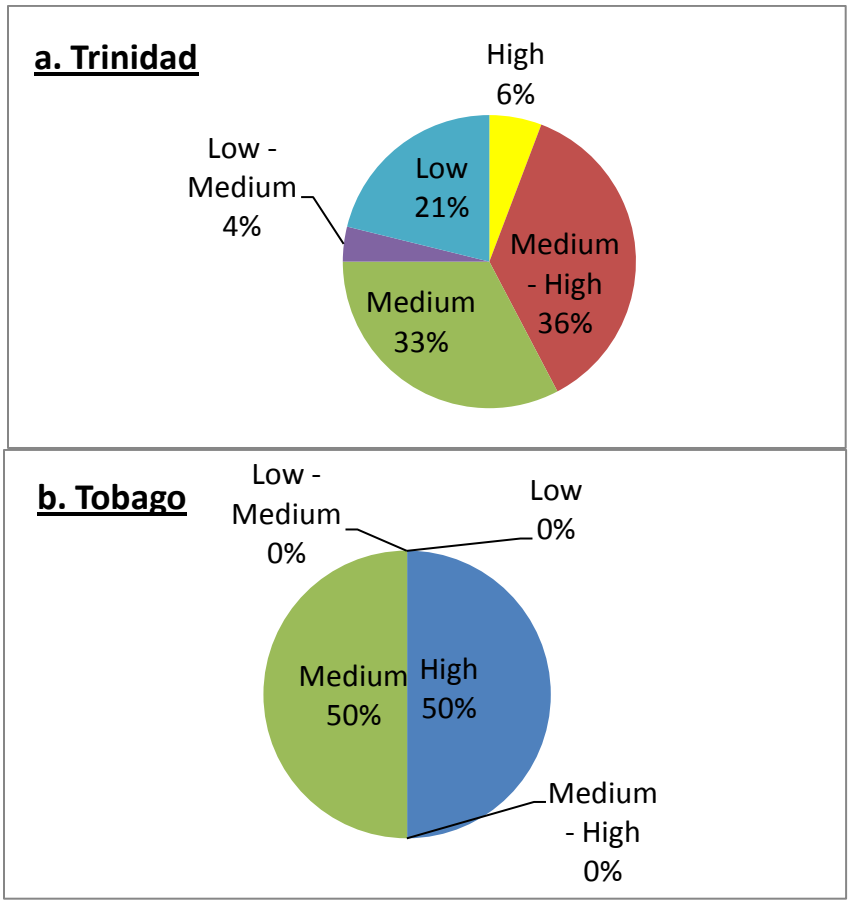
An assessment of the groundwater quality of wells throughout Trinidad and Tobago for 2008 shows that on both islands, the water in about half of all wells is of good quality (Figure 2.18 a and b). However, problems such as high iron content and to a lesser extent, elements such as manganese and sulphates are affecting water quality in some areas. The groundwater quality in Trinidad appears to be better than that of Tobago, though only marginally so.



Source: Water Resources Agency, 2010 (unpublished)

Figure 2.18 a and b Groundwater quality in Trinidad and Tobago (2008)

An assessment of the pollution susceptibility[40] of the aquifers throughout Trinidad and Tobago indicates that in Trinidad only about one quarter of all wells are relatively safe from pollution (Figure 2.19 a). Most wells however are at least moderately susceptible with highest susceptibility occurring in the northern and southern parts of the country. Wells in central Trinidad are reported to be of the best quality. In Tobago, all aquifers are either moderately susceptible or highly susceptible (Figure 2.19 b).



Source: Water Resources Agency, 2010 (unpublished)

Figure 2.19 a and b Assessment of pollution susceptibility of aquifers throughout Trinidad and Tobago (2008)

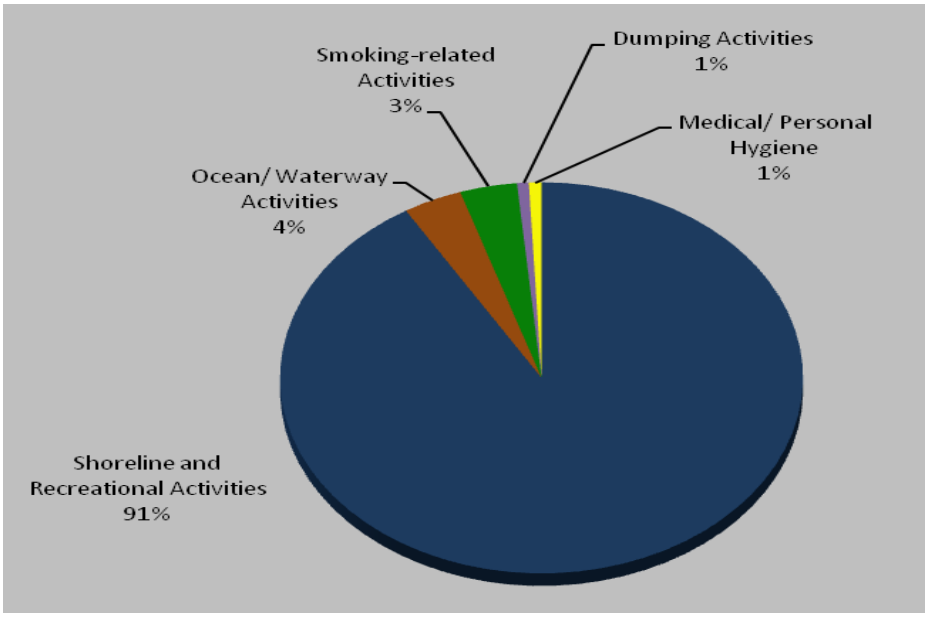
The data so far presented in this section on freshwater indicates two things – firstly that there is some form of monitoring of key aspects of water resources being undertaken in the country, and this is important because it is the first step to effectively managing the resources.

[40] Pollution susceptibility is a qualitative assessment based on expert opinion about how susceptible an aquifer is to pollution. It includes a consideration of the recharge rate of the aquifer, information on sources of pollution affecting the aquifer, soil type and human activities within the catchment area.

However, the second issue which is highlighted by the data is that there are continued indications of degradation of freshwater resources – both in terms of quality and quantity. It is therefore clear that, as called for in the 2004 Assessment of the State of Environment (ASOE) Report[41], more action is still required to ensure better management of freshwater resources. In this regard, freshwater resources are not much different from other aspects of the environment because their management is constrained by lack of legislation and absence of a coordinated approach to protect and maintain the integrity of watersheds.

2.2.3 Coastal Pollution

Figure 2.20, based on information collected through the International Coastal Clean-up (ICC) in 2008, shows that most pollution in the coastal region around Trinidad and Tobago results from shoreline and recreational activities (91%). The overall apportionment to different activities, as shown in the Figure, is generally the same as that seen in previous years.



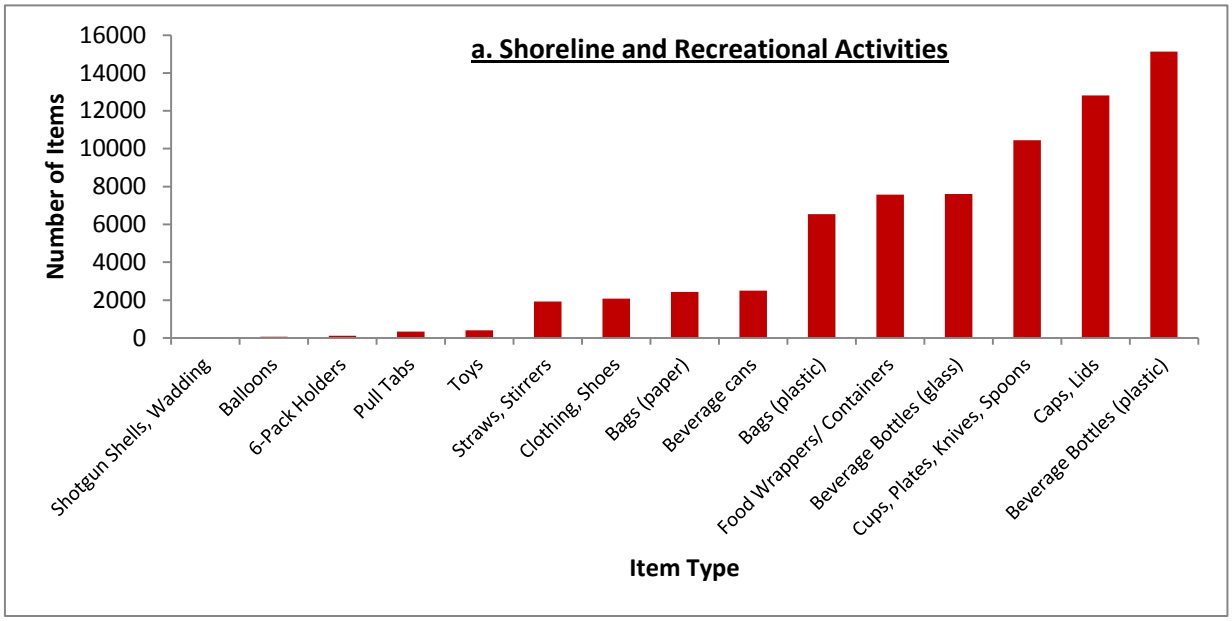
Source: ICC, 2009 (unpublished)

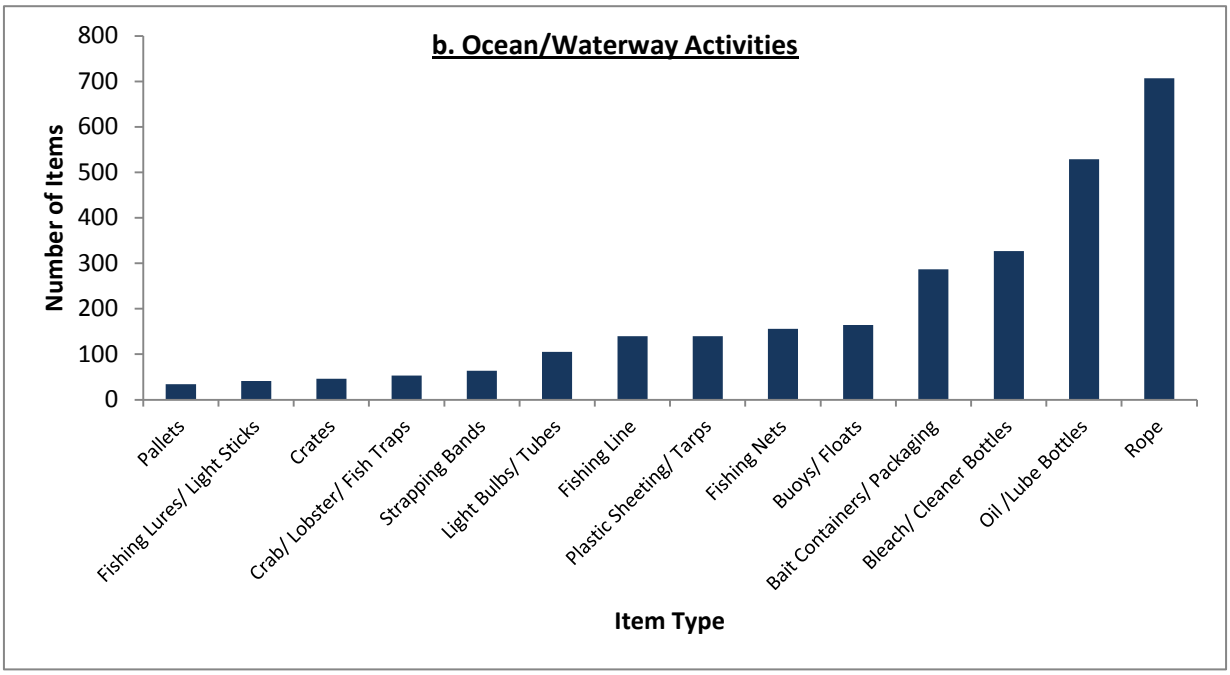
Figure 2.20 Summary of the sources of debris collected during the 2008 ICC exercise in Trinidad and Tobago

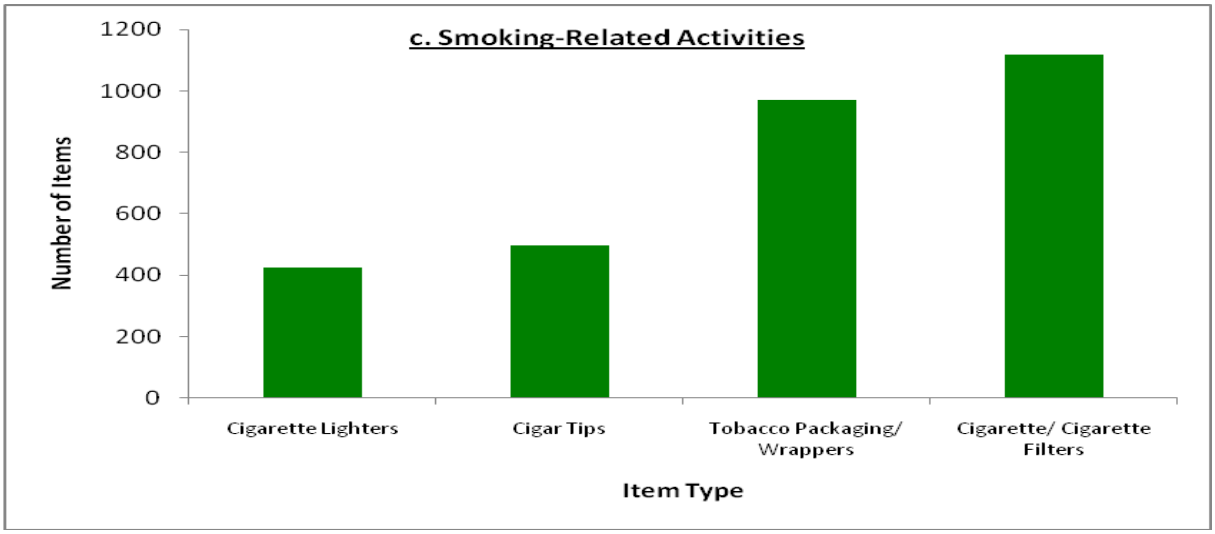
[41] Environmental Management Authority. 2005. State of the Environment Report 2004: Northern Range Assessment. Government of the Republic of Trinidad and Tobago. 184 pp.

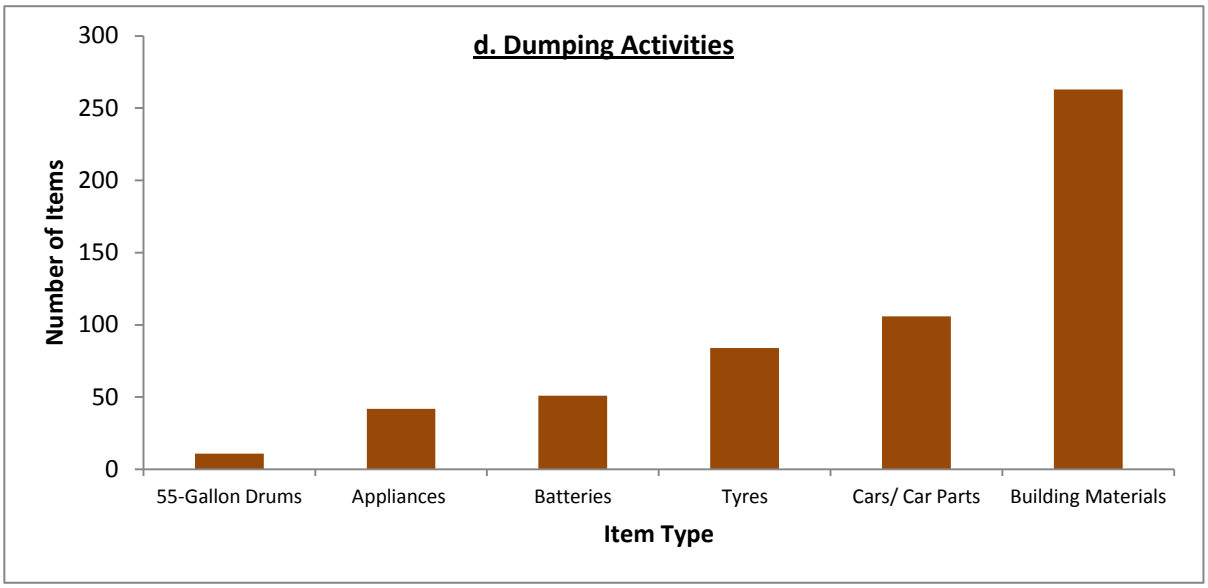
Figure 2.21 (a – e) which is presented in five parts shows a breakdown of the individual types of items collected on the coastline during the ICC 2008. Plastic bottles were by far the most abundant type of material with over 15,000 items collected in this category. Other nuisance items included waste such as plastic caps and lids, plastic cutlery, food wrappers and containers and plastic bags. It is well known that coastal pollution can have effects on human health and can impact the recreational quality of beaches. It can also lead to death and injury of coastal/ marine organisms such as sea turtles.

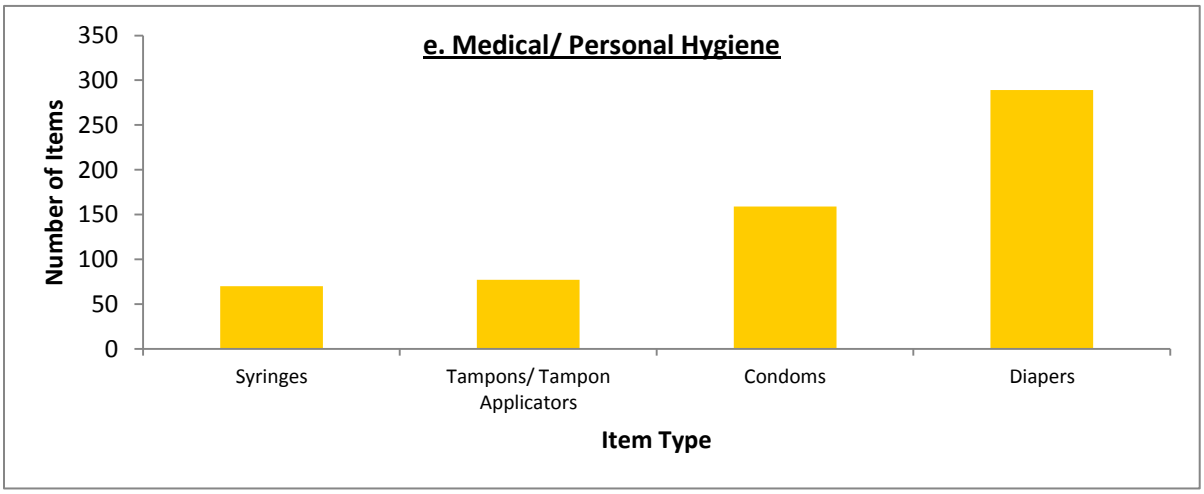
The data clearly indicate the need for greater enforcement of measures in coastal areas to reduce the disposal of garbage on account of recreational and other coastal activities. These data from the ICC, taken together with observations inshore, would indicate that plastic bottles and other plastic waste are a serious environmental issue contributing to effects such as flooding and landfill problems. This would therefore give greater urgency to the need to revisit the Beverage Container Bill to determine what measures could and should be put in place to reduce the input of plastic waste into the environment.




b. Ocean/Waterway Activities
Number of Items
800
700
600
500
400
300
200
100
0
Pallets
Fishing Lures/ Light Sticks
Crates
Crab/ Lobster/ Fish Traps
Strapping Bands
Light Bulbs/ Tubes
Fishing Line
Plastic Sheeting/ Tarps
Fishing Nets
Buoys/ Floats
Bait Containers/ Packaging
Bleach/ Cleaner Bottles
Oil /Lube Bottles
Rope
Item Type


c. Smoking-Related Activities
Number of Items
1200
1000
800
600
400
200
0
Cigarette Lighters
Cigar Tips
Tobacco Packaging/ Wrappers
Cigarette/ Cigarette Filters
Item Type



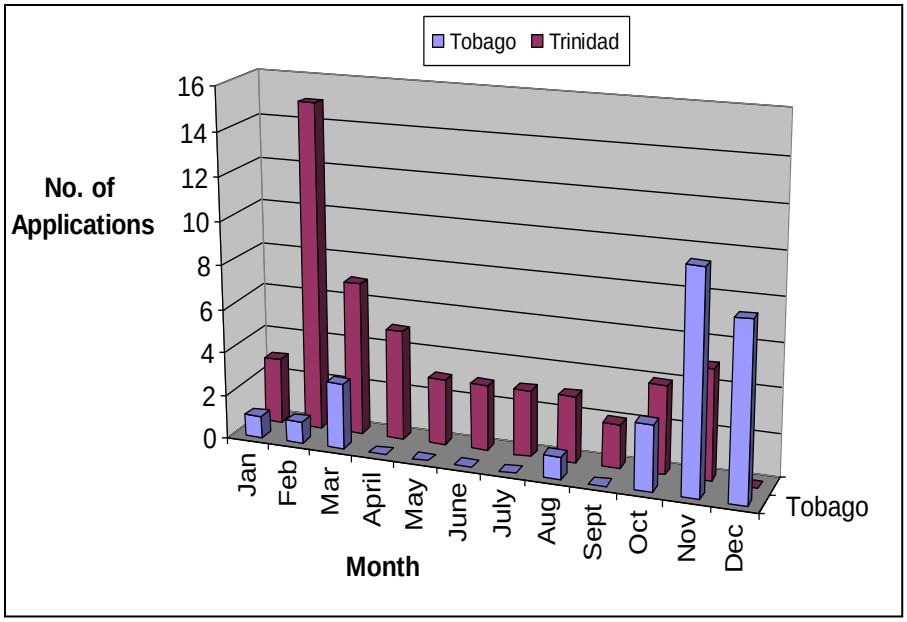


Source: ICC, 2009 (unpublished)

Figure 2.21 a – e Numbers of items collected during the 2008 ICC exercise in Trinidad and Tobago based on ICC categories

2.2.4 The Water Pollution Rules

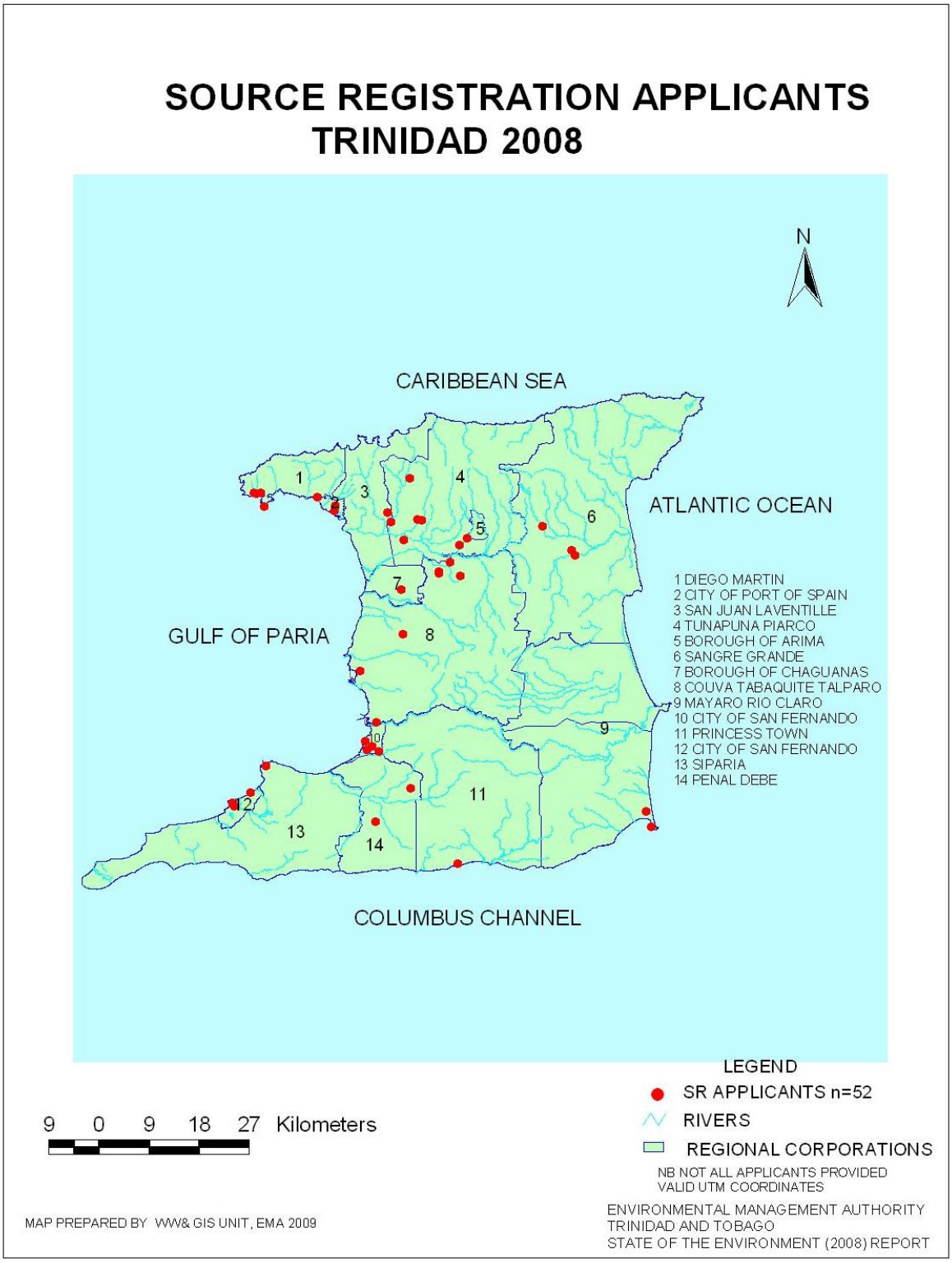
Under the Water Pollution Rules 2001 as amended (WPR), the EMA continued to regulate the impact of effluent from registrable facilities as defined in the WPR e.g. industrial, agricultural, and sewage treatment facilities, on the environment. In 2008, a total of 82 source applications were received – 52 in Trinidad and 30 in Tobago (Figure 2.22). In addition to this, a total of one 170 source registration certificates were issued 167 in Trinidad and three (3) in Tobago (EMA Database 2009).



Source: Environmental Management Authority 2009

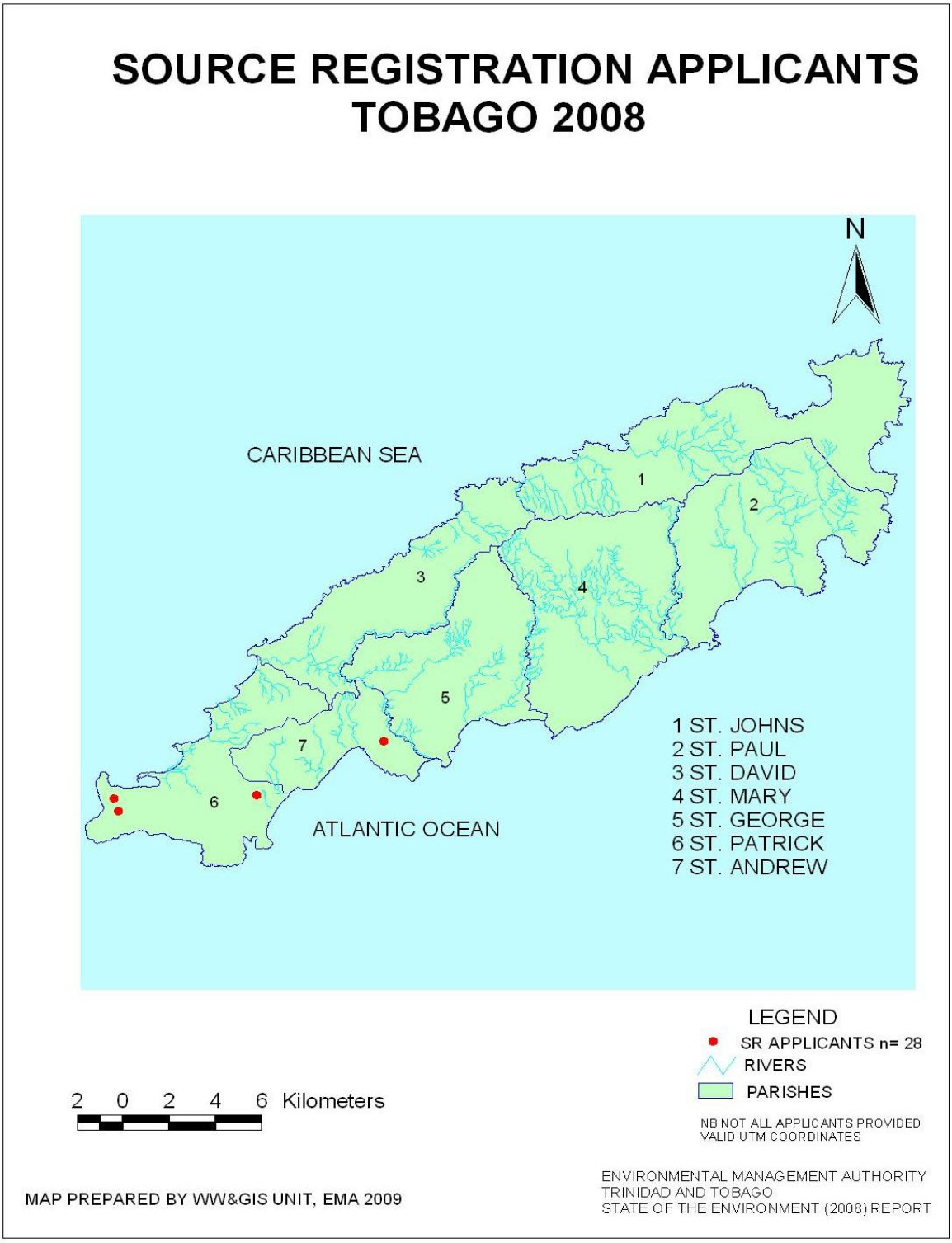
Figure 2.22 Number of source applications received by month for Trinidad and Tobago (2008)

Figures 2.23 and 2.24 shows the geographical distribution of source applications across Trinidad and Tobago. These data are mapped using Geographical Information Systems (GIS), and such monitoring may well allow for decision-making about water resources to go beyond the individual company level, and focus on watersheds or critical areas.



Source: Environmental Management Authority 2009

Figure 2.23 Map of Trinidad showing source applications received by the EMA as at December 2008



Source: Environmental Management Authority 2009

Figure 2.24 Map of Tobago showing source applications received by the EMA as at December 2008

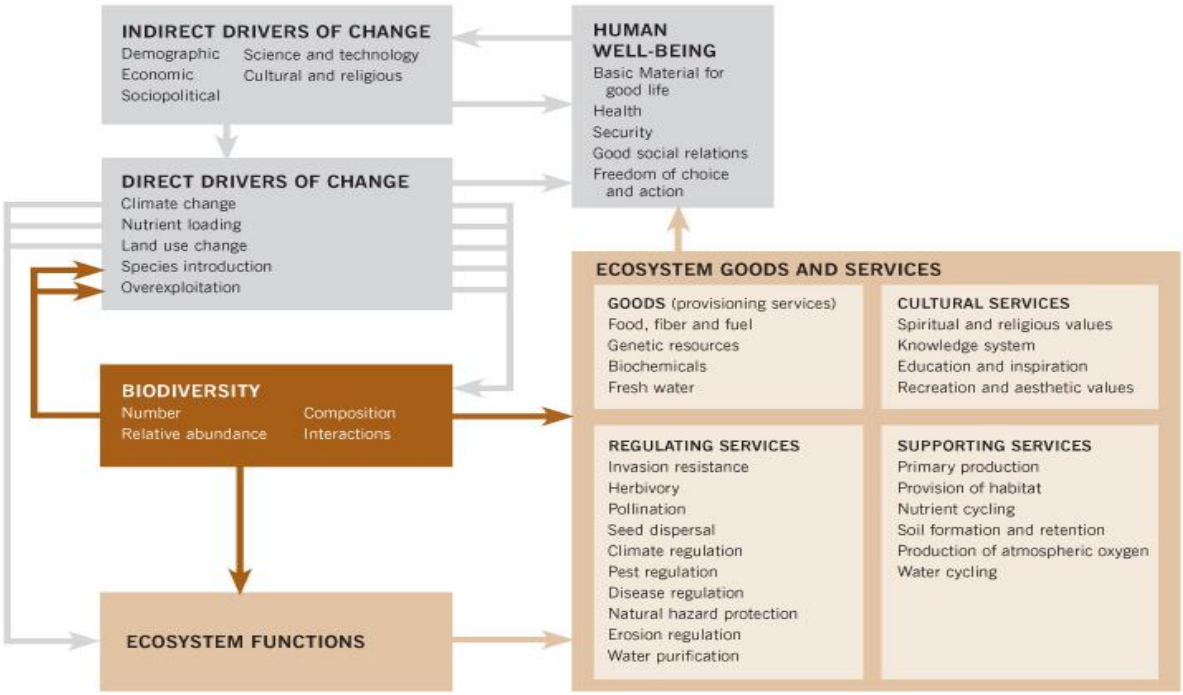
2.3 Biodiversity

Main messages

- Based on available data and information, Trinidad and Tobago's progress towards meeting the 2010 Biodiversity Target is slow indicating that much more effort is required to improve the management of the country's biodiversity;
- Driving forces such as housing, agriculture, industrial development, quarrying, and pollution are all affecting biodiversity;
- A relatively high percentage of species in Trinidad and Tobago is threatened;
- The number of wildlife animals being harvested every year is increasing;
- The dependence on natural forests for the provision of timber is higher than that on plantations;
- Based on available fisheries data, it would appear that between 2007 and 2008, there was an increase in fish landings in Trinidad and Tobago;
- In 2008, fish landing at sites across Trinidad were estimated to be worth TT$75,860,118;
- Coral cover continued to decline;
- There is no up to date information on the extent of forest cover in Trinidad and Tobago, but the GoRTT has commissioned a new forest inventory which is expected to be completed in 2011;
- No Environmentally Sensitive Areas (ESAs) or Environmentally Sensitive Species (ESSs) were designated in 2008, but the EMA continued work to advance implementation of the ESA and ESS Rules.

Biological diversity (or biodiversity) is defined as the *variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the*

ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.[42][43] Almost every ecosystem service on which human well-being depends, counts on the proper functioning of biodiversity. Such diversity (which exists at three major levels – ecosystem, species and genetic) is important for the provision of goods (food, fibre, clean water, genetic resources etc.), for regulation of erosion, water purification and natural hazard protection to name a few. Figure 2.25 is a diagrammatic representation of the relationship between biodiversity, ecosystem services, human well-being and drivers of change[44]. It is an iteration of the MA Conceptual Framework presented in the 2004 ASOE.



Source: Convention on Biological Diversity, 2006[45]

Figure 2.25 Relationship between biodiversity, ecosystem functioning and humans

[42] Secretariat of the Convention on Biological Diversity. 1992. Handbook of the Convention on Biological Diversity, 3rd Edition. Montreal. 28 pp.

[43] Ecosystem means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

[44] Secretariat of the Convention on Biological Diversity. 2006. Global Biodiversity Outlook 2. Montreal, 81 + vii pages

[45] For more information on the framework illustrated in Figure 2.25, please visit www.maweb.org.

On a global scale it has been recognized that biodiversity is on the decline because of a number of driving forces, often working in combination[4647]. These include:

- Habitat loss and degradation;
- Climate change;
- Excessive nutrient load and other forms of pollution;
- Overexploitation and unsustainable use;
- Invasive alien species.

In an effort to address the threats to biodiversity, the Parties to the Convention on Biological Diversity (CBD) in 2002 committed to "*achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth*"[48]. This commitment, which came to be known as the 2010 Biodiversity Target, was endorsed by both the World Summit on Sustainable Development (WSSD) and the United Nations General Assembly (UNGA), and has officially been incorporated as a Target under the Millennium Development Goal #7: Ensure Environmental Sustainability. Through efforts to conserve biodiversity, issues such as poverty and enhancement of human well-being are directly addressed.

In order to assess progress towards meeting the Target, a number of indicators have been developed in seven (7) focal areas as follows:

- Status and Trends of the Components of Biological Diversity:
  - Trends in extent of selected biomes, ecosystems and habitats;
  - Trends in abundance and distribution of selected species;
  - Changes in status of threatened species;
  - Trends in genetic diversity of domesticated animals, cultivates plants and fish species of major importance[49];
  - Coverage of Protected Areas.

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[46] Millennium Ecosystem Assessment (MA). 2005. Current State and Trends Assessment. Washington, DC: Island Press.

[47] Secretariat of the Convention on Biological Diversity. 2006. Global Biodiversity Outlook 2. Montreal, 81 + vii pages

[48] http://www.cbd.int/2010-target/

[49] This refers to socioeconomic importance.

- ❖ Ecosystem Integrity and Ecosystem Goods and Services:
  - Marine Trophic Index;
  - Connectivity-fragmentation of ecosystems;
  - Water quality of aquatic ecosystems.
- ❖ Threats to Biodiversity:
  - Nitrogen deposition;
  - Trends in invasive alien species.
- ❖ Sustainable Use:
  - Area of forest, agricultural and aquaculture ecosystems under sustainable management;
  - Ecological footprint and related concepts;
- ❖ Status of Traditional Knowledge, Innovations and Practices:
  - Status and trends of linguistic diversity and numbers of speakers of indigenous languages.
- ❖ Status of Access and Benefit Sharing:
  - Indicator of access and benefit-sharing (to be developed).
- ❖ Status of Resource Transfers:
  - Official development assistance provided in support of the Convention.

In 2005, the MA assessed that ecosystems around the world were undergoing rapid and extensive changes on account of human actions, and that sixty percent (60 %) of the world's ecosystem services were degraded[50]. The 2006 Global Biodiversity Outlook assessed that at 2006 most indicators were showing a negative trend, with the exception of Coverage of Protected Areas and Water Quality of aquatic ecosystems[51]. The 2009 MDG Report, which documents trends up to and including 2008 data, indicates that ecosystems continue to be under threat[52], and it is assessed by the CBD that habitat loss driven by agriculture and unsustainable

[50] Millennium Ecosystem Assessment (MA). 2005. Current State and Trends Assessment. Washington, DC: Island Press.

[51] Secretariat of the Convention on Biological Diversity. 2006. Global Biodiversity Outlook 2. Montreal, 81 + vii pages

[52] United Nations. 2009. The Millennium Development Goals Report 2009. United Nations Department of Economic and Social Affairs. 60 pp.

forest management pose the greatest threat to species. As at 2008, it was estimated that global forest loss stood at thirteen million hectares per year (*ibid*).

The most comprehensive assessment and global database on the status of species is maintained by the International Union for the Conservation of Nature (IUCN) in collaboration with a number of partners. Every year, the IUCN publishes a Red List which includes the most threatened species in the world. In 2008, a total of 44,838 species were assessed as a part of the Red List of which 38 % were found to be threatened (Table 2.1)[53]. As a group, plants were reported to have the greatest proportion of threatened species (70%) when compared with vertebrates (22%) and invertebrates (41%). The Red List continues to highlight is that we still have a lot to learn about biodiversity at all scales (local to global), and at all levels (genetic to ecosystem).

Table 2.1 Numbers and proportions of species assessed and species assessed as threatened on the 2008 IUCN Red List by major taxonomic groups (2008)

	Estimated Number of described species	Number of species evaluated	Number of Threatened Species	Number of Threatened as % of species described	Number of Threatened as % of species evaluated
Vertebrates					
Mammals	5,488	5,488	1,141	21 %	21 %
Birds	9,990	9,990	1,222	12 %	12 %
Reptiles	8,734	1,385	423	5 %	31 %
Amphibians	6,347	6,260	1,905	30 %	30 %
Fishes	30,700	3,481	1,275	4 %	37 %
Subtotal	**61,259**	**26,604**	**5,966**	**10 %**	**22 %**
Invertebrates					
Insects	950,000	1,259	626	0 %	50 %
Molluscs	81,000	2,212	978	1 %	44 %
Crustaceans	40,000	1,735	606	2 %	35 %
Corals	2,175	856	235	11 %	27 %
Arachnids	98,000	32	18	0 %	56 %
Velvet Worms	165	11	9	5 %	82 %
Horseshoe Crabs	4	4	0	0 %	0 %
Others	61,040	52	24	0 %	46 %

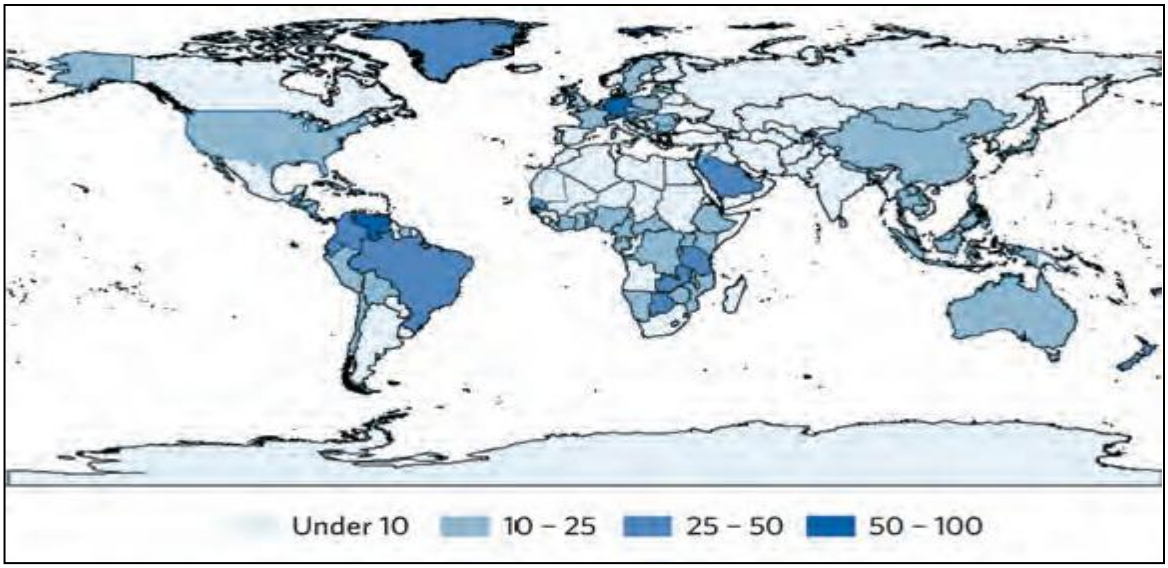
[53] Vié, C.J., Talyor-Hilton, C. and Stuart, N.S. 2008. Wildlife in a Changing World. An analysis of the 2008 IUCN Red List of Threatened Species. Red List.

	Estimated Number of described species	Number of species evaluated	Number of Threatened Species	Number of Threatened as % of species described	Number of Threatened as % of species evaluated
Subtotal	**1,232,384**	**6,161**	**2,496**	**0.20 %**	**41 %**
Plants					
Mosses	16,000	95	82	1 %	86 %
Ferns and Allies	12,838	211	139	1 %	66 %
Gymnosperms	980	910	323	33 %	35 %
Dicotyledons	199,350	9,624	7,122	4 %	74 %
Monocotyledons	59,300	1,155	782	1 %	68 %
Green Algae	3,962	2	0	0 %	0 %
Red Algae	6,076	58	9	0 %	16 %
Subtotal	**298,506**	**12,055**	**8,457**	**3 %**	**70 %**
Others					
Lichens	17,000	2	2	0 %	100 %
Mushrooms	30,000	1	1	0 %	100 %
Brown Algae	3,040	15	6	0 %	40 %
Subtotal	**50,040**	**18**	**9**	**0.02 %**	**50 %**
TOTAL	**1,642,189**	**44,838**	**16,928**	**1%**	**38 %**

Source: Vié et al, 2009

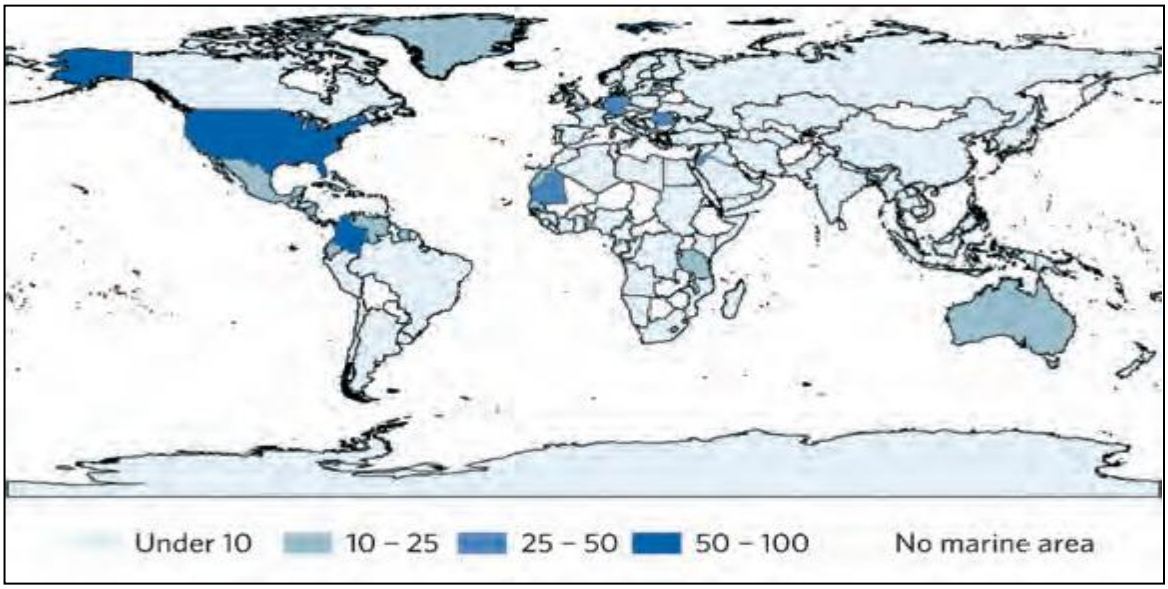
Protected areas have been described as "*the cornerstone of efforts to conserve the world's species and ecosystems as well as a key component in climate change mitigation*"[54]. As at 2008, it was estimated that only 12% of the Earth's surface was under protection – eighteen million square kilometres of protected land and over three million square kilometres of protected territorial waters (or less than 1% of marine waters). Figures 2.26 and 2.27 show the proportion of global protected terrestrial and marine areas respectively. It was noted by the United Nations that much more needs to be done to protect ecosystems both in terms of the extent of designation of protected areas, and the effectiveness of management of existing protected areas (*ibid*).

[54] United Nations. 2009. The Millennium Development Goals Report 2009. United Nations Department of Economic and Social Affairs. 60 pp.



Source: UN, 2009[55]

Figure 2.26 Map of the world showing proportion of terrestrial areas protected (2008)



Source: UN 2009 (*ibid*)

Figure 2.27 Map of the world showing proportion of marine areas protected (2008)

[55] United Nations. 2009. The Millennium Development Goals Report 2009. United Nations Department of Economic and Social Affairs. 60 pp.

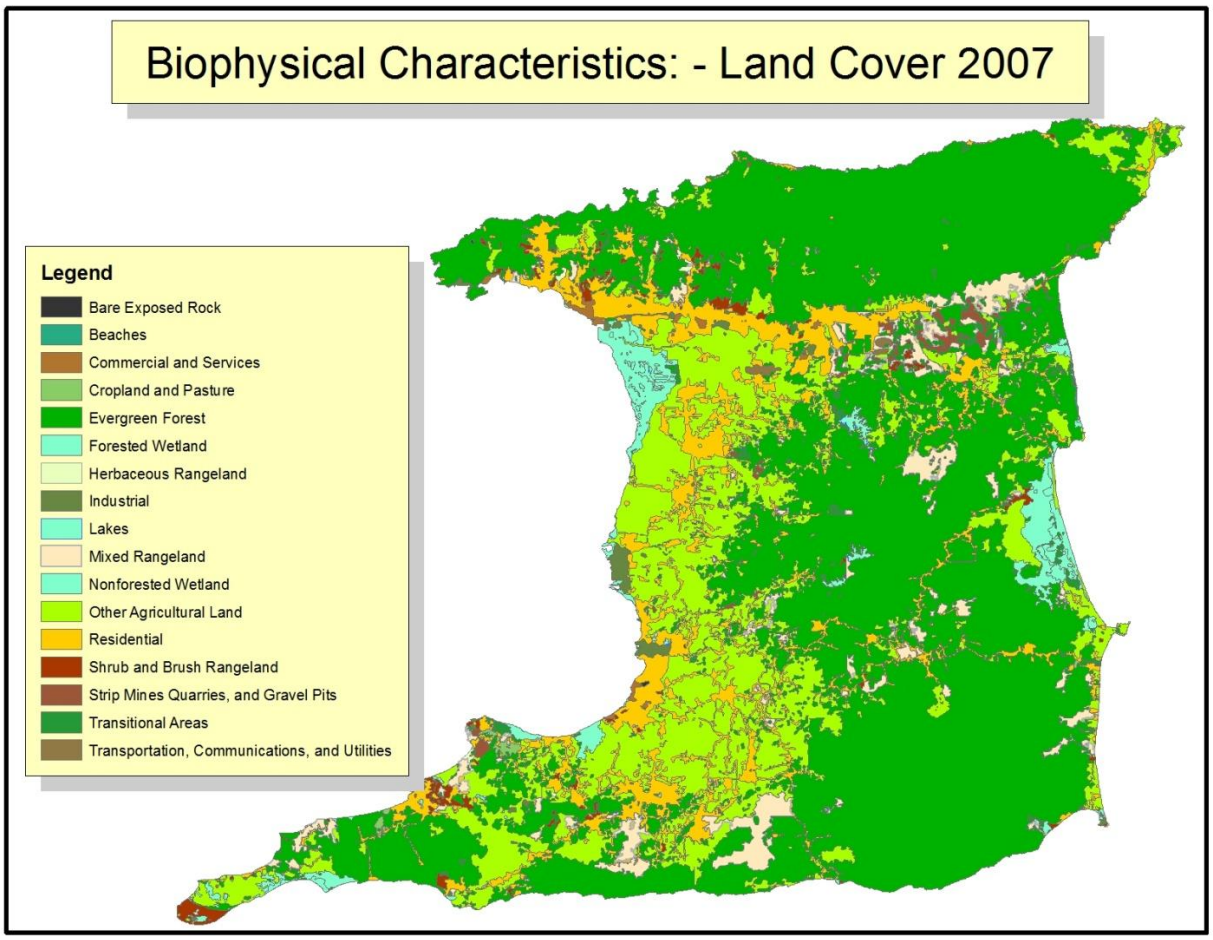
As a Party to the CBD, Trinidad and Tobago is committed to working towards meeting the 2010 Biodiversity Target. The country's naturally rich biodiversity[56] but high rate of development requires that emphasis be placed on the protection of our biological resources. The rest of this section draws on available data and information for Trinidad and Tobago in order to paint a picture of status of and trends in various aspects of the country's biodiversity, its use and management.

Trinidad and Tobago, but in particular Trinidad, has been undergoing extensive land conversion in order to accommodate the country's growing development needs[57]. Large tracts of the western part of the island have undergone conversion for agriculture and housing, and although not shown on this map in Figure 2.28[58], industrial development has also contributed to a changing landscape (see the 2007 ASOE for a map of industrial areas throughout Trinidad) as have quarrying and fires.

[56] Kenny, J. 2008. The Biological Diversity of Trinidad and Tobago: A naturalist's notes. Prospect Press. Port of Spain, Trinidad and Tobago. 265 pp.

[57] Baban, S.M.J., AL-Tahir, R. and Chinchamee, A. 2008. Meeting the needs of development in tropical mountainous environments: A methodology for mapping land use/cover using remote sensing. International Journal of Geoinformatics (In press).

[58] Opadeyi, J. 2010. Managing Our Land, Managing Our Future. Inaugural Professorial Lecture. University of West Indies.



Source: Opadeyi, 2010[59]

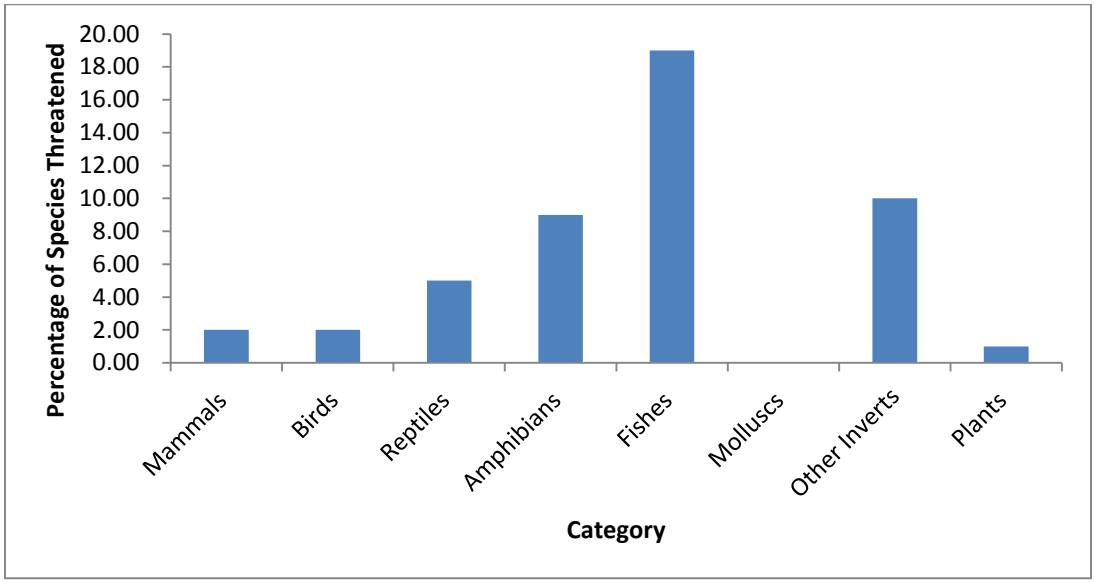
Figure 2.28 Land use/land cover map of Trinidad (2007)

[59] Opadeyi, J. 2010. Managing Our Land, Managing Our Future. Inaugural Professorial Lecture. University of West Indies.

2.3.1 Species Diversity in Trinidad and Tobago

Trinidad and Tobago has a rich biodiversity with 467 species of birds[60], over 600 species of butterflies[61]; 85 reptiles and 30 amphibian species[62], more than 100 species of mammals, 50 species of freshwater fishes[63]; and over 2,100 species of flowering plants[64]. It has also been reported that there are 59 species of endemic plants in the country – approximately 3 % of all plants in Trinidad and Tobago (*ibid*).

The IUCN Red List indicated that in 2008 several species in Trinidad and Tobago were threatened (Figure 2.29)[65]. As a group, fishes showed the highest percentage of threatened species (19%) while molluscs showed the lowest (0%).



Source: IUCN, 2010

Figure 2.29 Percentages of threatened species in Trinidad and Tobago in categories (2008)

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[60] White, G., Kenefick, M., and Murphy, L.W. 2007 .The Status and Abundance of Birds in Trinidad and Tobago.

[61] Barcant, M. 1970. Butterflies of Trinidad and Tobago . London, Collins. 314 pp.

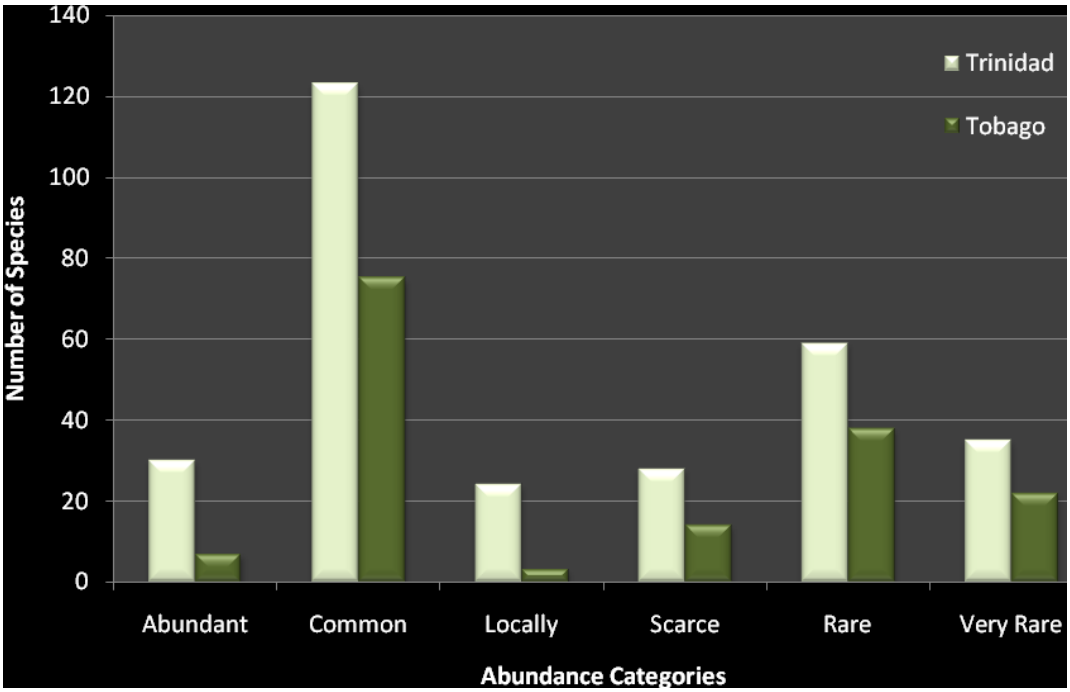
[62] Murphy, J. C. 1997. Amphibians and Reptiles of Trinidad and Tobago. Florida: Krieger Publishing Company.

[63] Kenny, J. 2008. The Biological Diversity of Trinidad and Tobago. A naturalist's notes. Prospect Press. Port of Spain, Trinidad and Tobago. 265pp.

[64] Van den Eynden, V., Oatham, M. and Johnson, W. 2008. How free access internet resources benefit biodiversity and conservation research: Trinidad and Tobago's endemic plants and their conservation status. Oryx, 42, pp 400-407.

[65] IUCN. 2010. A New Vision for Biodiversity Conservation. IUCN's emerging position on a new (post 2010) Strategic Plan for the Convention on Biological Diversity.

In 2007, an assessment of the status and abundance of the country's birds was completed and some of the data are presented in Figure 2.30[66]. Based on this information, it would appear that most bird species are common, but there are relatively high proportions of rare and very rare species in both Trinidad and Tobago.



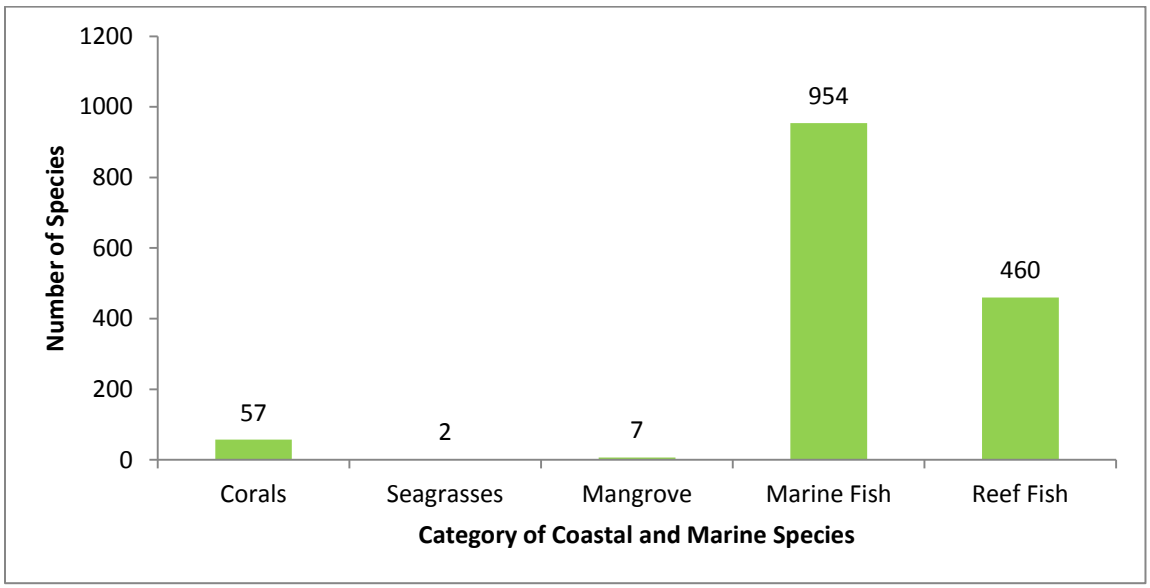
Source: White et al, 2007

Abundant – widespread and usually in some numbers in suitable habitat
Common – usually found in suitable habitat
Locally – distributed in restricted habitat, where it may be not uncommon.
Scarce – Very few (less than 5) records per year
Rare – not recorded annually
Very rare – less than 1 record per decade

Figure 2.30 Assessment of the abundance of birds in Trinidad and Tobago (2007)

[66] White, G., Kenefick, M., and Murphy, L.W. 2007 .The Status and Abundance of Birds in Trinidad and Tobago.

In 2008, Bouchon et al[67] reported that there were 57 species of coral, two (2) species of seagrasses and seven (7) species of mangroves found in Trinidad and Tobago. In addition to this, 460 species of reef fishes and 954 species of other marine fishes were also found around the islands (Figure 2.31).



Source: Bouchon et al, 2008

Figure 2.31 Numbers of coastal and marine species in Trinidad and Tobago (2008)

Bouchon et al also reported that as at 2008, and based on data from a total of 11 monitoring stations, the coral cover in Tobago's reefs ranged from twenty-six percent (26%) at Sisters Rocks on the Caribbean Sea side of the island to three percent (3%) in Bulldog Reef on the Atlantic side of the island. Mean coral cover in reefs in the north western region of the island at depths of seven (7) and 12m was found to have decreased from 21% in 2005 to 15% in 2008 – most likely attributable to a number of diseases which began to spread in the wake of the 2005 Caribbean bleaching event (related to elevated sea surface temperatures). In addition, in 2008, large swells caused damage to shallow reefs on the Caribbean Sea coastline. Coral reefs in Tobago therefore continue to show a decline.

[67] Bouchon, C., P. Portillo, Y. Bouchon-Navaro, M. Loius, P. Hoetjes, K. De Meyer, D. Macrae, H. Armstrong, V. Datadin, S. Harding, J. Mallela, R. Parkinson, J-W. Van Bochove, D. Lirman, J, Herlan, A. Baker, L. Collado and S.C. Isaac. 2008. Status of Coral Reef Resources of the Lesser Antilles: The French West Indies, The Netherlands Antilles, Anguilla, Antigua, Grenada, Trinidad and Tobago. In: Wilkinson, C. (ed.). Status of Coral Reefs of the World: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia. pp 265-280.

2.3.2 Exploited Resources

Forests

Forests are important for a number of extractive and non-extractive purposes, providing a wealth of ecosystem services to the country. These services have already been documented in depth in the 2004 and 2005 ASOEs, and the current report will not seek to repeat this information. What is included in this section are key datasets on forests which help to establish any trends and changes in status since the 2005 ASOE.

As at 2008, there was as yet no up-to-date information on the actual extent of forests in Trinidad and Tobago. Baban et al (2008 in press)[68] have noted that much of what is known about forests in T&T is based on a forest inventory map which was published in the 1980s based on 1969 aerial photography. At that time, forest cover was estimated to be over fifty percent (50%), but more recent estimates have indicated a loss of about 6% as at 2000[69]. Forest cover based on forest types has most recently been provided by Chalmers[70] in 1992 (Figure 2.32). In order to update our database and thereby improve decision-making, a project is currently being undertaken by the United States of America Forest Service, the International Institute of Forestry, the EMA and the Forestry Division to map forest cover in Trinidad and Tobago. This mapping, which is being done using remote sensing and will be submitted in a GIS system, will provide information on the extent and distribution of the following in both Trinidad and Tobago:

- Vegetative forest formations on both state and private lands;
- Wetlands;
- Plantations.

It is anticipated that the forest cover maps will serve as the first phase of an update National Forestry Inventory of Trinidad and Tobago, which is expected to be completed by February 2011.

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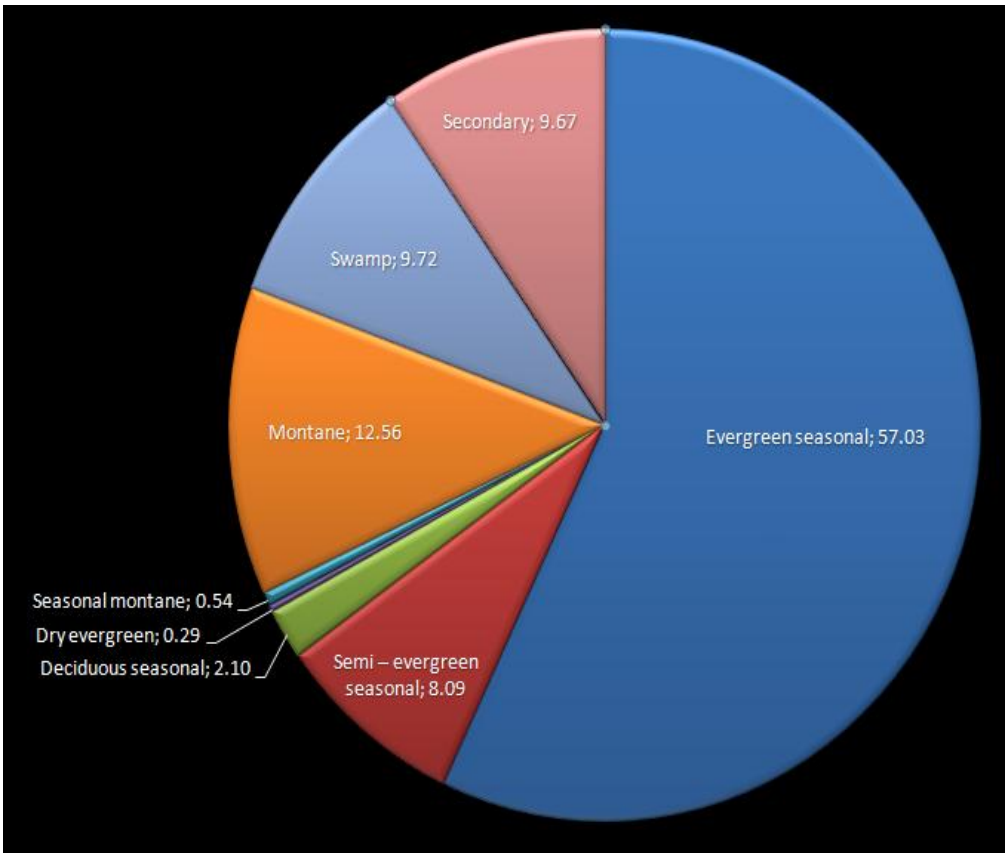
[68] Baban, S.M.J., AL-Tahir, R. and Chinchamee, A. 2008. Meeting the needs of development in tropical mountainous environments: A methodology for mapping land use/cover using remote sensing. International Journal of Geoinformatics (In press).

[69] Environmental Management Authority. 2005. State of the Environment Report 2004. Government of the Republic of Trinidad and Tobago. 184 pp.

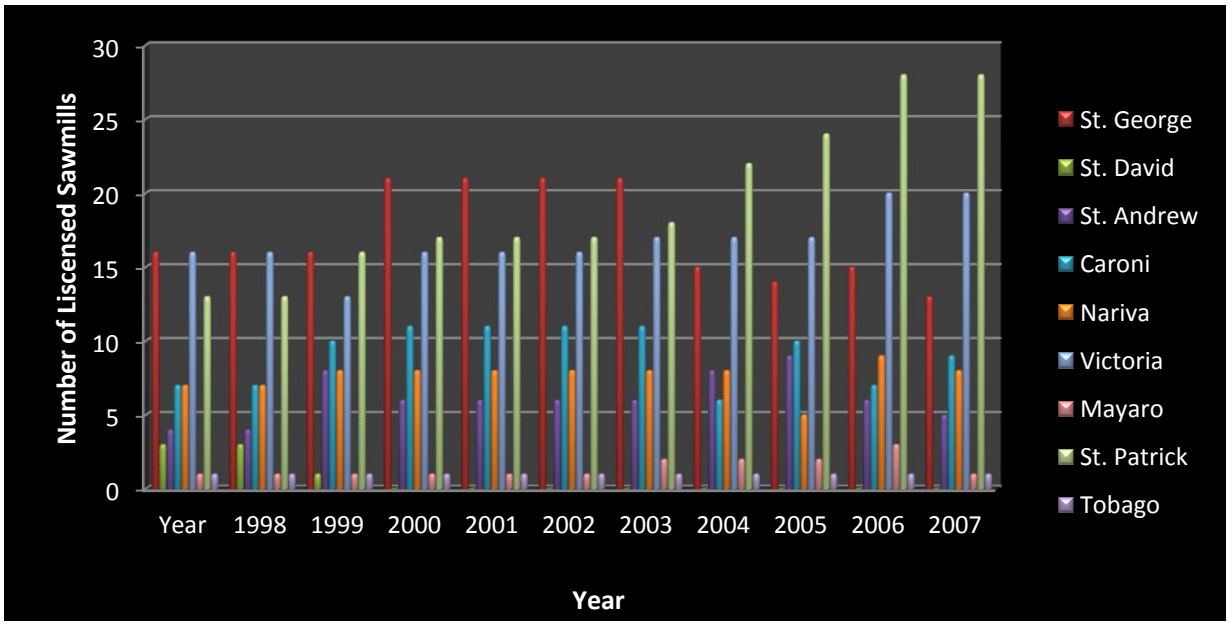
[70] Chalmers, W.S. 1992. Trinidad and Tobago National Forestry Action Programme. FAO/CARICOM. 295 pp.



Source: Chalmers, 1992

Figure 2.32 Extent of indigenous percentage forest cover in Trinidad and Tobago

Forestry is a source of livelihoods in the country and Figure 2.33 shows the number of licensed sawmill operators in T&T for the period 1998 – 2008. The data indicate that the total number of licensed operators increased from 68 in 1998 to 85 in 2008, and it also shows an increase in sawmill operations in the southern parts of Trinidad (counties of St. Patrick and Victoria).



Source: Forestry Division, 2009 (unpublished)

Figure 2.33 Number of licensed sawmill operators by major divisions in Trinidad and Tobago (1998 – 2008)

Table 2.2 shows a breakdown of forest outturn (or removal of sawn logs from forested lands) for the period 1998 to 2008. These data indicate that natural forests have been a more important source of timber than plantations since 2000.

Table 2.2 Forest outturn for Trinidad and Tobago (1998 – 2008)

	SAWN LOGS						POLES
			Plantations				
Year	Total	Natural	Sold By Conservancy		Sold By Tanteak		
		Forests	Teak	Pine	Teak	Pine	Teak
1998	50,289	17,355	3,356	11,798	9,705	7,167	906
1999	47,531	16,222	8,617	11,204	7,124	4,167	197
2000	71,956	46,336	6,915	8,160	8,502	1,898	145
2001	63,151	58,503	4,558	90	-	-	
2002	60,344	48,699	3,818	4,194	-	-	-
2003	70,028	54,550	6,706	5,005	-	-	-
2004	50,208	38,868	4,525	4,679	-	-	-
2005	64,513	45,330	2,259	14,597	-	-	-
2006	52,244	40,494	6,368	4,333	-	-	-
2007	44,949	37,405	5,802	676	-	-	-
2008	46,781	38,606	3,632	2,420	-	-	-

*From 2000 the sawnlog outturn (Natural Forests) included 66 species from Private Lands
*Total includes teak and pine sold from private lands

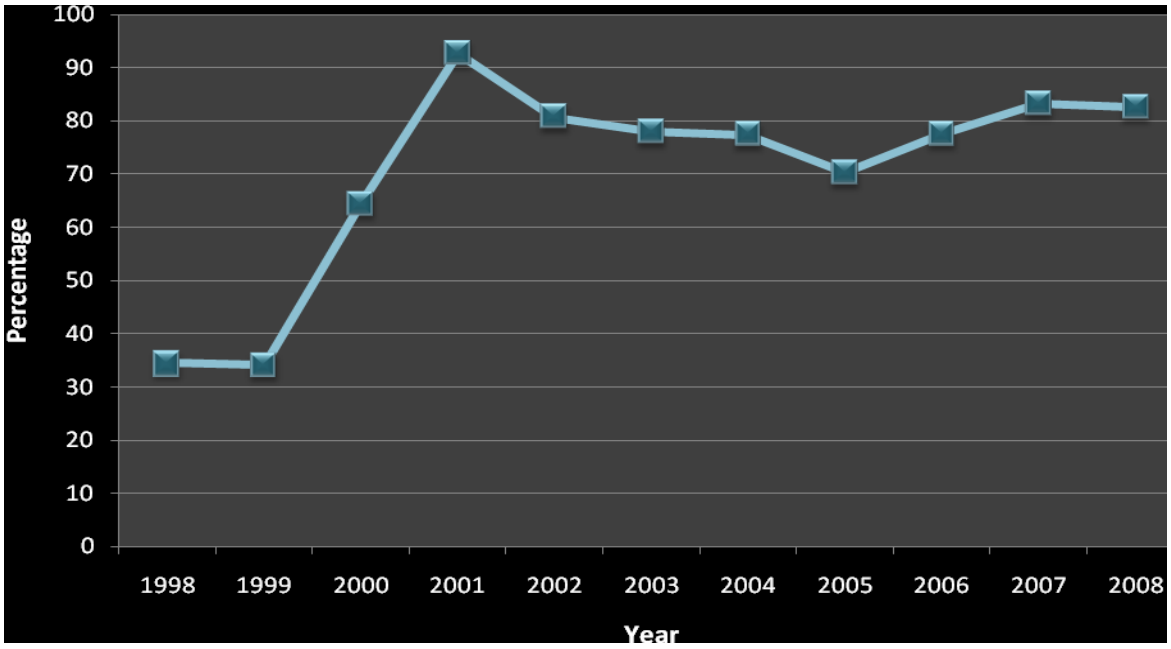
Table 2.3 shows a breakdown of the sawnlog outturn from natural forests by species since 1999. Species such as Hog Plum (*Spondias mombin*) and Cedar (*Cedrela odorata*) appear to be the most popular. Figure 2.34 shows the percentage removal of sawn log from natural forests throughout Trinidad and Tobago for the period 1998 to 2008. As is evident from the data, there is a high level of extraction from natural forest which has been sustained for several years. This indicates that forestry is a driving force affecting natural forest cover in the country although it has not been assessed as the most pressing one. Other activities such as housing, agriculture, quarrying and industrial development play a more significant role.

Table 2.3 Forest outturn (m^3) from natural forests (Forest Reserve, State Lands and Class I Species from Private Lands) in Trinidad and Tobago by species (1999 – 2008)

Local Name	**Botanical Name**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Angelin	*Andira inermis*	98	285	299	265	304	175	249	136	154	162
Balata	*Manilkara bidentata*	142	161	168	150	92	76	92	83	19	90
Blackheart	*Clathrotropis brachypetala*	253	369	308	155	248	199	297	205	159	243
Bois D'orme	*Guazuma ulmifolia*	191	426	723	700	538	247	312	249	215	209
Cajuca	*Virola surinamensis*	583	2079	2847	2381	2820	1833	1510	1861	1485	1857
Cedar	*Cedrela odorata*	7497	6864	9004	5835	6433	3620	4983	4506	4140	6254
Chenet	*Melicoccus bijugatus*		4	3	5	3					1
Crappo	*Carapa guianensis*	645	1759	1871	1028	1481	788	949	780	608	994
Figuier	*Ficus tobagensis*	69	594	808	810	1186	1039	903	761	848	770
Galba	*Calophyllum lucidum*	21	76	62	53	51	27	41	10	29	15
Gommier	*Protium insigne*	34	157	230	129	203	43	114	43	62	46
Guatecare	*Eschweilera subglandulosa*	35	95	77	68	155	69	98	48	13	25
Hog Plum	*Spondias mombin*	881	6649	7993	8319	10703	8363	9553	6810	5268	6266
Jiggerwood	*Bravaisia integerrima*	36	1086	2024	410	1443	994	1165	997	791	1045
Jereton	*Schefflera morototoni*	42	366	340	1527	404	314	275	273	206	221
Laurier	*Ocotea* and *Nectandra* spp.	97	333	317	406	230	147	96	63	130	66
L'Epinet	*Fagara martinicensis*	50	727	901	864	852	607	729	581	366	428
Mahoe	*Sterculia caribaea*	316	1564	1438	1363	1666	835	877	807	1698	754
Mangue	*Symphonia* and other spp.	33	113	111	1155	56	33	35	1	59	6
Mora	*Mora excelsa*	851	974	2083	62	1666	1395	765	1376	1698	1726
Moussara	*Brosimum alicastrum*	24	63	103	1692	117	50	39	35	32	39
Olivier	*Terminalia & Buchenavia* spp.	1454	2834	1554	1726	2214	1880	1925	2063	1136	1229
Pois Doux	*Inga* spp	669	1498	1892	31	1693	1044	1141	1103	691	784
Purpleheart	*Peltogyne porphyrocardia*	7	31	35	2101	13	2	15	13	51	46
Sandbox	*Hura crepitans*	48	1729	3818	537	1391	961	1617	784	429	913
Serrette	*Byrsonima coriacea*	61	623	460	796	564	260	303	240	119	169
Silk Cotton	*Ceiba pentandra*	116	951	1351	354	1191	903	1208	947	767	926
Tapana	*Hyeronima caribaea*	89	669	491	718	438	247	327	339	302	272
Toporite	*Hernandia sonora*	206	839	967	87	830	396	497	286	208	467
All other (bet 7 and 90 species)		**1,647**	**12,418**	**16,225**	**14,970**	**15,565**	**12,324**	**15,215**	**15,094**	**10,035**	**13,008**
Total		**16,222**	**46,336**	**58,503**	**48,699**	**54,550**	**38,868**	**45,330**	**40,494**	**31,720**	**39,035**

Source: Forestry Division, 2009 (unpublished)

Notes: Up to 1999 the sawnlog outturn included Class 1 species ONLY; From 2000 the sawn log outturn included 66 species from Private Lands; The 2007 figures does not include South West conservancy

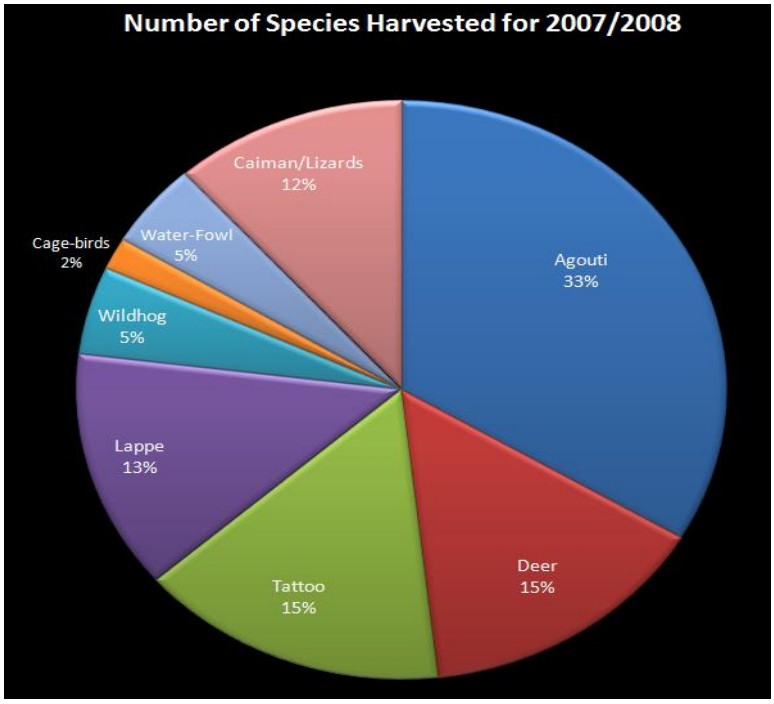


Source: Forestry Division 2009 (unpublished)

Figure 2.34 Removal of sawn log from natural forests in Trinidad and Tobago (1998 – 2008)

Wildlife Resources

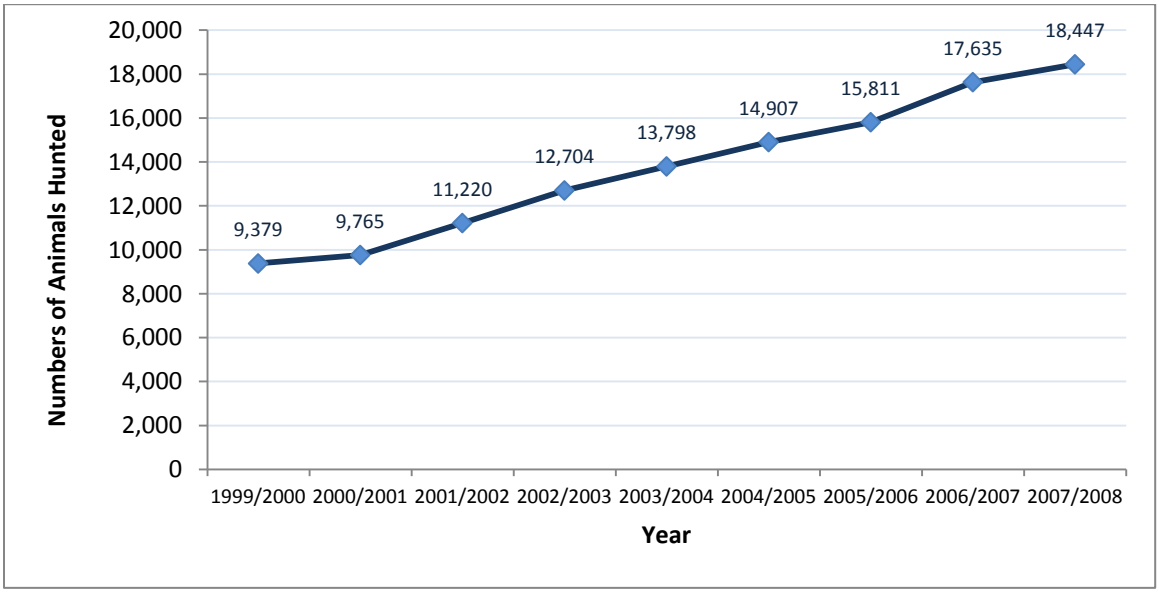
Wildlife is an important source of income and food especially for rural communities, and it also serves as a source of recreation for local people especially through hunting. In 2008, a total of 18,447 animals were hunted. Figure 2.35 shows the number of animals of each species harvested as a percentage of total number of animals harvested in Trinidad and Tobago in 2007/2008. What the data show is that the agouti (*Dasyprocta leporine*) was the most popular species accounting for one third of all animals hunted. Deer (*Mazama americana*), tattoo (*Dasypus novemcintus*), lappe (*Cuniculus paca*) and lizards (including the Caiman – *Caiman crocodilus*) were also popular.



Source: Forestry Division, 2009 (unpublished)

Figure 2.35 Proportions of species harvested in Trinidad and Tobago (2007/2008)

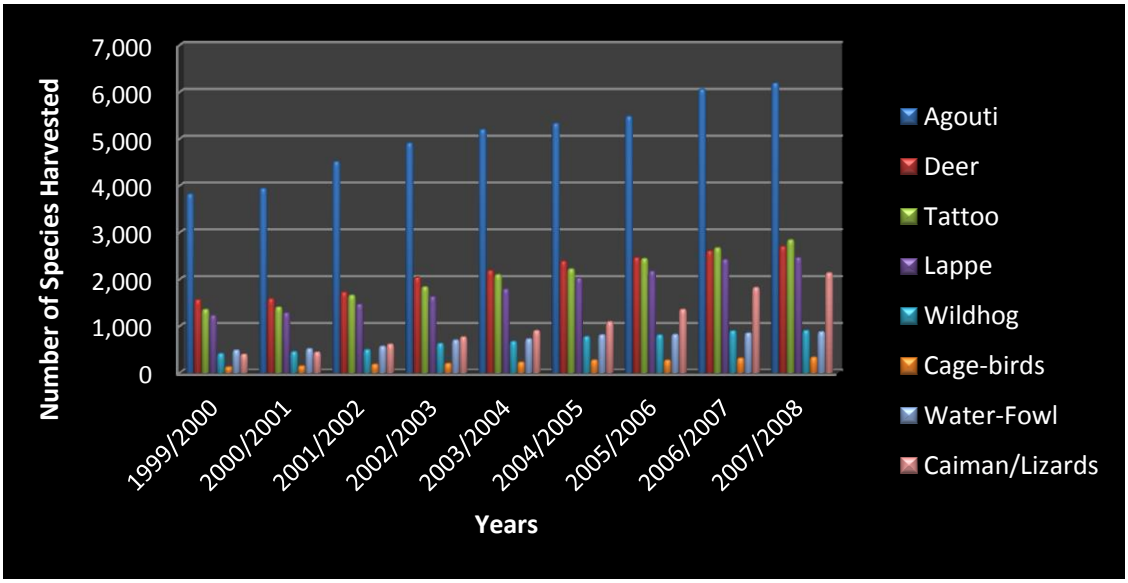
Figure 2.36 shows data on animals hunted since 1999. These data indicate that the numbers of individuals being harvested have been increasing over the years.



Source: Forestry Division, 2009 (unpublished)

Figure 2.36 Total numbers of animals hunted annually in Trinidad and Tobago (1999 – 2008)

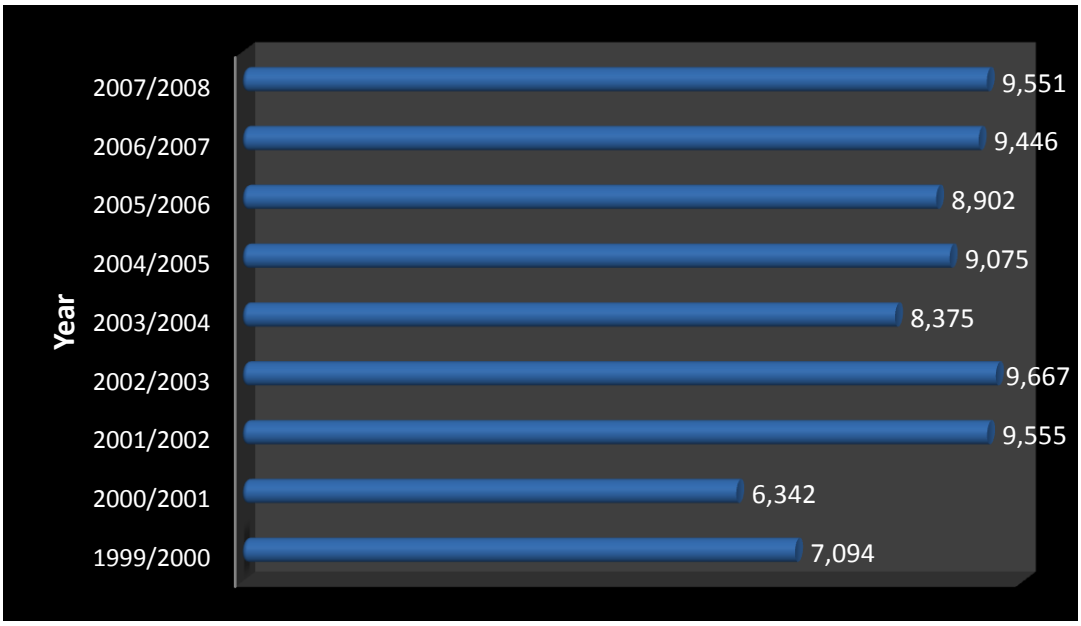
Figure 2.37 shows a breakdown of the numbers of animals hunted since 1999 by species. From this data, it is clear that the Agouti has always been the most popular hunted animal, followed by the deer (*M. americana*), tattoo (*D. novemcintus*) and lappe (C. *paca*).



Source: Forestry Division, 2009 (unpublished)

Figure 2.37 Numbers of wildlife species harvested annually in Trinidad and Tobago (1999 – 2008)

Figure 2.38 shows an overall increase in the total number of hunters in the country since 1999, although there have been years (2001 – 2003) where the numbers of hunters exceed the 2007/2008 figure. It is worth pointing out that in 2008, there were twice as many hunters as fishermen recorded in Trinidad and Tobago.

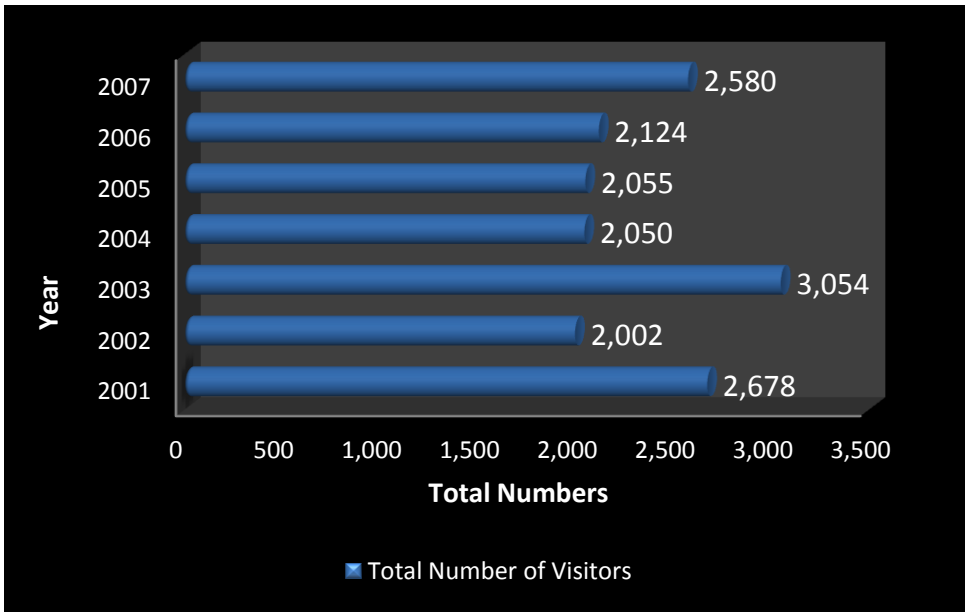


Source: Forestry Division, 2009 (unpublished)

Figure 2.38 Number of hunters in Trinidad and Tobago (1999 - 2008)

Marine Turtles

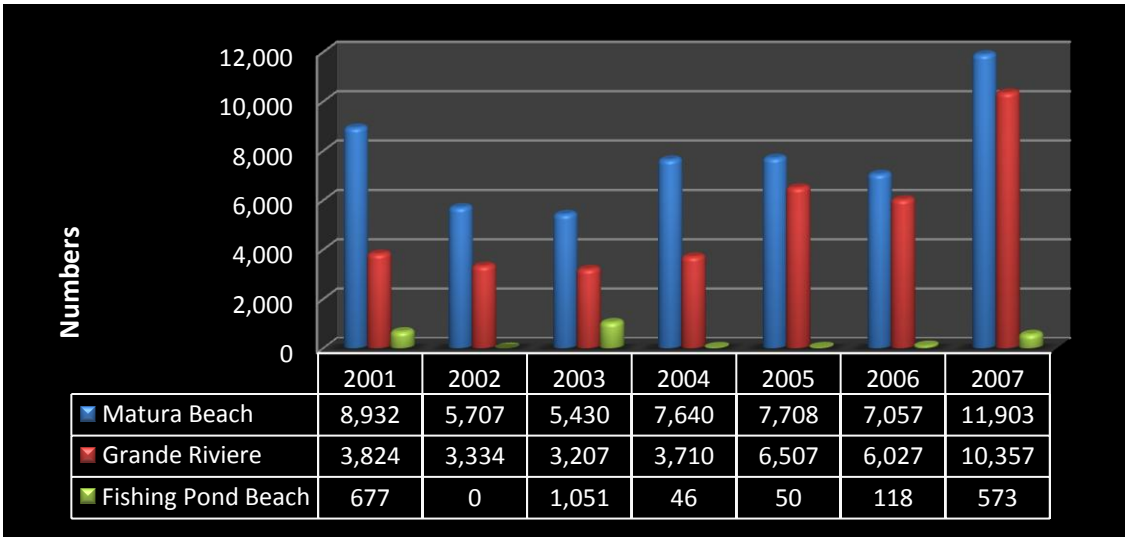
Marine turtles are important to the livelihoods of coastal communities mainly in north eastern Trinidad because turtle viewing is a local form of recreation and a source of tourism income. Although 2008 data are unavailable, Figure 2.39 shows total numbers of turtle viewing visitors to Trinidad on an annual basis between 2001 and 2007. This figure shows that number of visitors was highest in 2003, and subsequently fell in 2004. Since 2004 however, number have gradually been increasing but as at 2007, had not reached as high as 2003 figures.



Source: Forestry Division, 2009 (unpublished)
Note: No data available for 2008

Figure 2.39 Total numbers of visitors for turtle viewing in Trinidad (2001 – 2007)

Figure 2.40 shows a breakdown of visitors by site for three sites in north eastern Trinidad for the period 2001 to 2007. No data are available for 2008. It is evident from these data that Matura Beach is the most popular site for turtle viewing, followed by Grande Riviere then Fishing Pond.

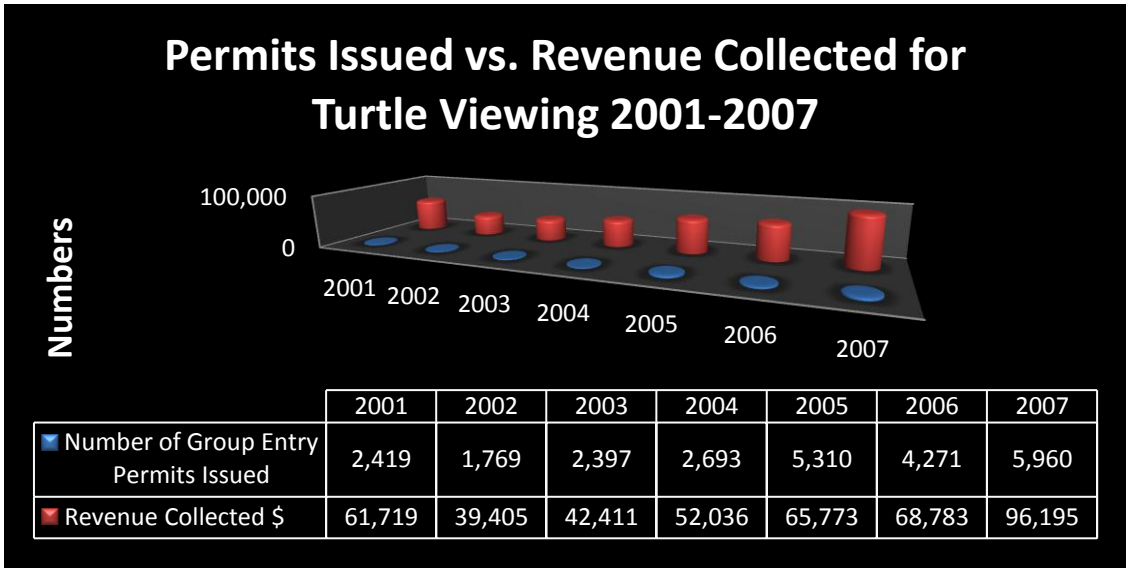


	2001	2002	2003	2004	2005	2006	2007
Matura Beach	8,932	5,707	5,430	7,640	7,708	7,057	11,903
Grande Riviere	3,824	3,334	3,207	3,710	6,507	6,027	10,357
Fishing Pond Beach	677	0	1,051	46	50	118	573

Source: Forestry Division, 2009 (unpublished)
Note: no data available for Fishing Pond Beach for 2002

Figure 2.40 Number of visitors for turtle viewing by site in Trinidad (2001 – 2007)

Figure 2.41 shows the number of permits issued and revenue collected on an annual basis from turtle viewing in Trinidad. It is clear that both permits and revenue have been increasing over the years indicating the growing importance of this activity to the country and the communities who depend on it.



	2001	2002	2003	2004	2005	2006	2007
Number of Group Entry Permits Issued	2,419	1,769	2,397	2,693	5,310	4,271	5,960
Revenue Collected $	61,719	39,405	42,411	52,036	65,773	68,783	96,195

Source: Forestry Division, 2009 (unpublished)
Note: No data available for 2008

Figure 2.41 Permits issued and revenue collected from turtle viewing in Trinidad (2001 – 2007)

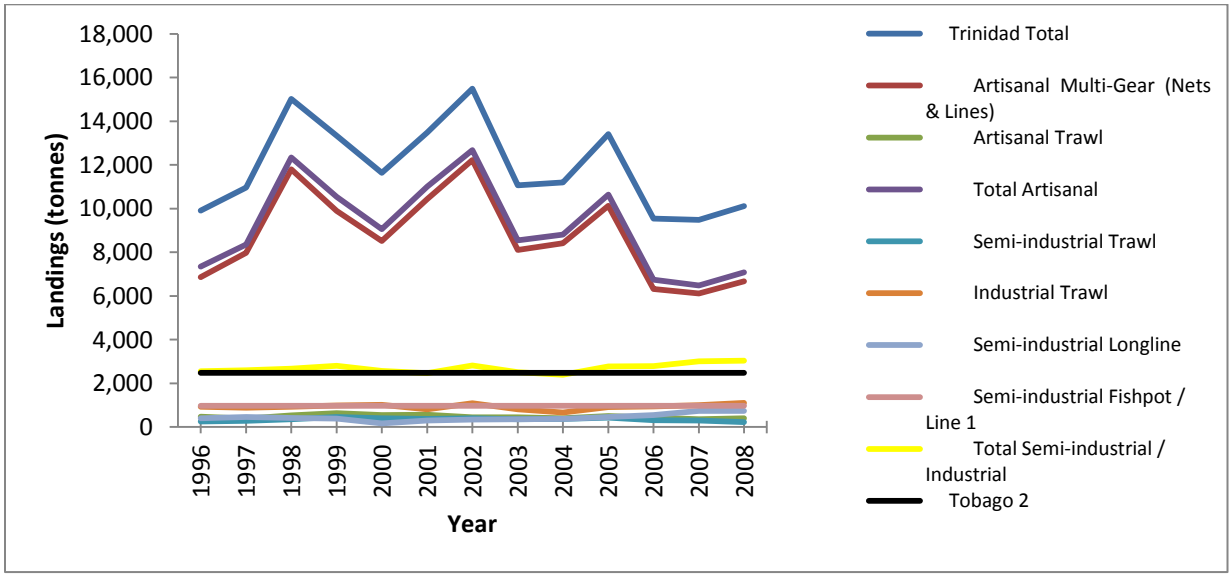
Fisheries

Based on data provided by the Fisheries Division (2009 unpublished), fishing in Trinidad and Tobago was estimated to employ approximately 9,000 persons in 2008. Of these, 5,800 were employed in the harvesting section, including 4,500 fishermen. In 2008, it was also estimated that there were 2,000 fishing vessels in operation. Altogether, while fishing is not a major contributor to national GDP, it remains very important to a number of coastal communities around the country.

In the 2006[71] and 2007[72] ASOEs, data on fisheries were presented in three categories – by fleet, by species and by site. In the current (2008) report, data are only available by fleet and by site.

[71] Environmental Management Authority. (in press). Assessment of the State of the Environment 2006. Government of the Republic of Trinidad and Tobago.

Figure 2.42 shows the estimated commercial landings by fleet for Trinidad and Tobago for the period 1996 – 2008. What is evident is that landings generally decreased after 2005, but there was a slight recovery seen in the artisanal fleets between 2007 and 2008.



Source: Fisheries Division, 2010 (unpublished)

Note: The landings by fleet for Trinidad is broken down into individual fleets. Tobago is given as an amalgamated figure for all fleets.

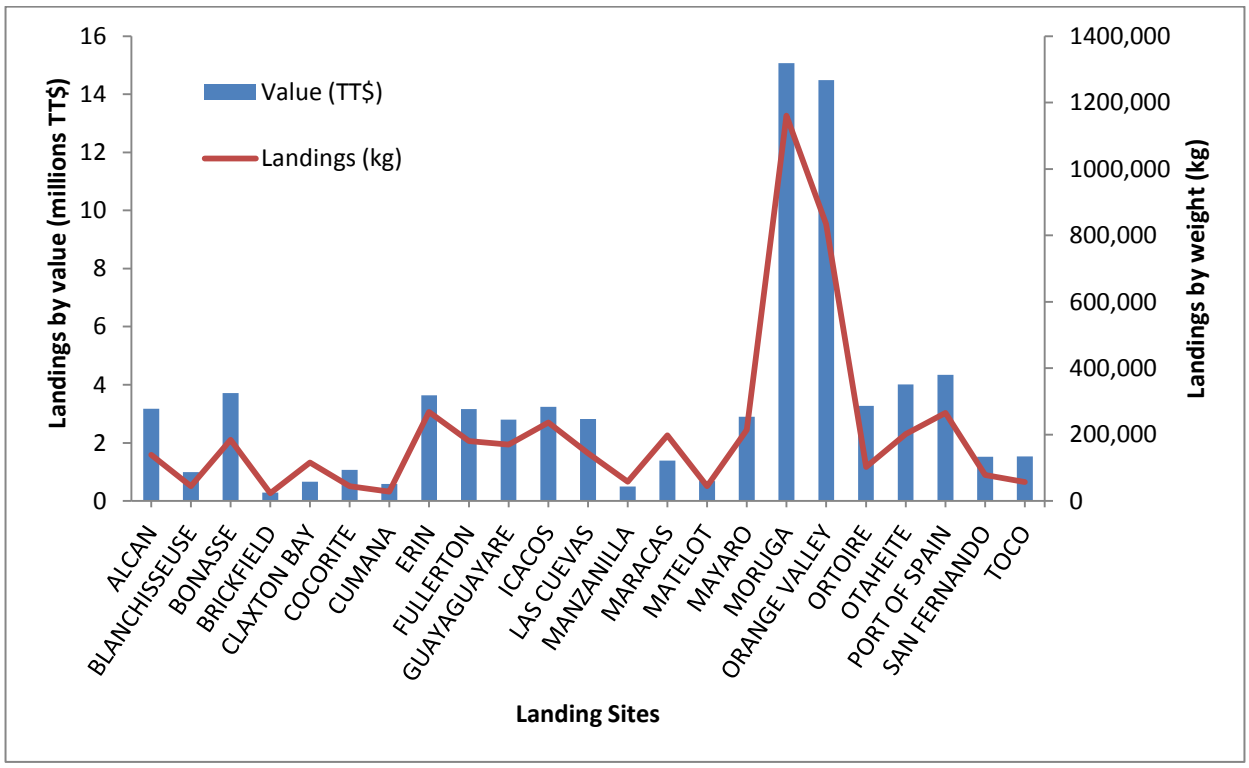
Figure 2.42 Estimated landings by fleet from the marine capture fisheries in Trinidad and Tobago (1996 – 2008)

Data are also available on landings from part-time recreational fishing and from game tournaments for the period 1996 to 2008. As reported by the Fisheries Division (2010 unpublished), values of landings for recreational fishing remained unchanged at 1,231 tonnes per year, and landings from game tournaments also remained relatively unchanged ranging between 2 and 3 tonnes per year. For 2008, landings from game fishing stood at three (3) tonnes.

Data on landings (by weight and by economic value) are also collected from a number of landing sites around Trinidad. Data for Tobago are not available. For 2008, there were a total of 23 sites for which this information is available. An estimated total of 4,793,712 kilograms of

[72] Environmental Management Authority. (in press). Assessment of the State of the Environment 2007. Government of the Republic of Trinidad and Tobago.

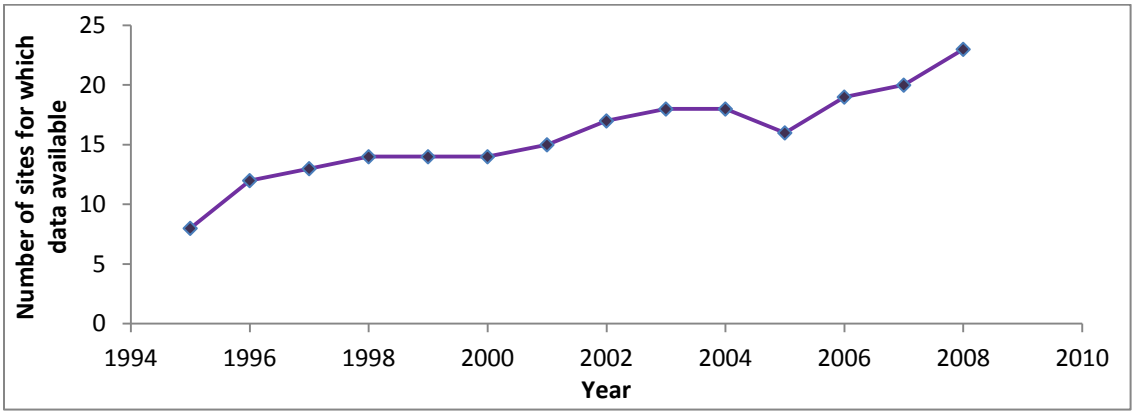
fish were landed across all 23 sites, worth an estimated TT$75,860,118. Figure 2.43 shows the weight and value of landings by site for each of the 23 sites, with Moruga and Orange Valley accounting for the highest landings (and values). Other sites such as Port of Spain, Otaheite, Bonasse and Erin also show relatively high landings. Sites such as Brickfield and Manzanilla account for the lowest landing values.



Source: Fisheries Division, 2010 (unpublished)

Figure 2.43 Estimated landings by weight and value for sites around Trinidad (2008)

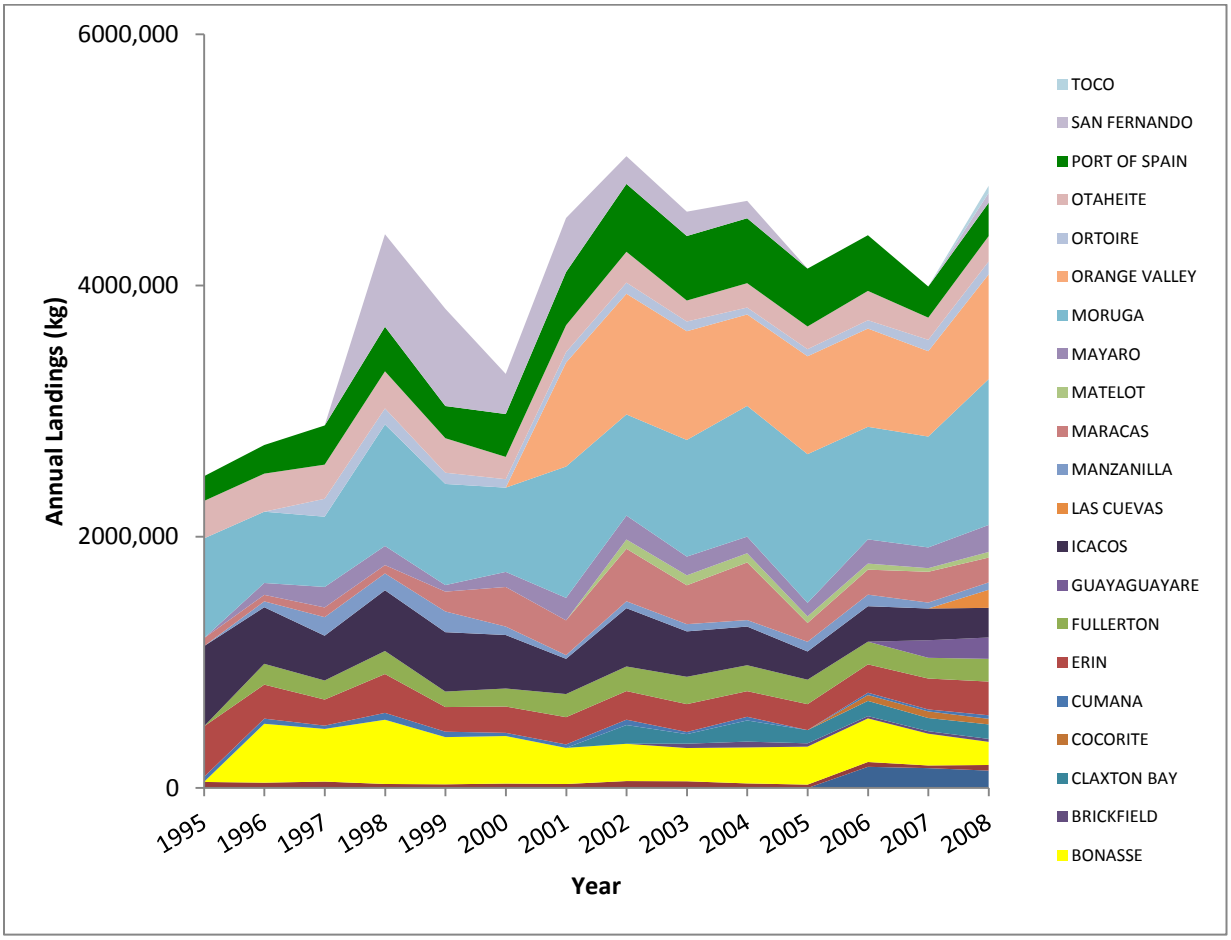
In examining trends in data collected by sites around Trinidad since 1995, it is clear that certain sites have more complete datasets than others. Coastal landing sites such as Blanchisseuse, Erin, Icacos, Maracas, Moruga, Otaheite and Port of Spain have complete annual datasets since 1995, while data for sites such as Alcan, Cocorite, Guayaguare, Las Cuevas and Toco are only available for the last year or two. Figure 2.44 show that the number of sites for which data is available has generally increased over the 1995/2008 period.



Source: Fisheries Division, 2010 (unpublished)

Figure 2.44 Availability of fisheries data for landing sites around Trinidad (1995 – 2008)

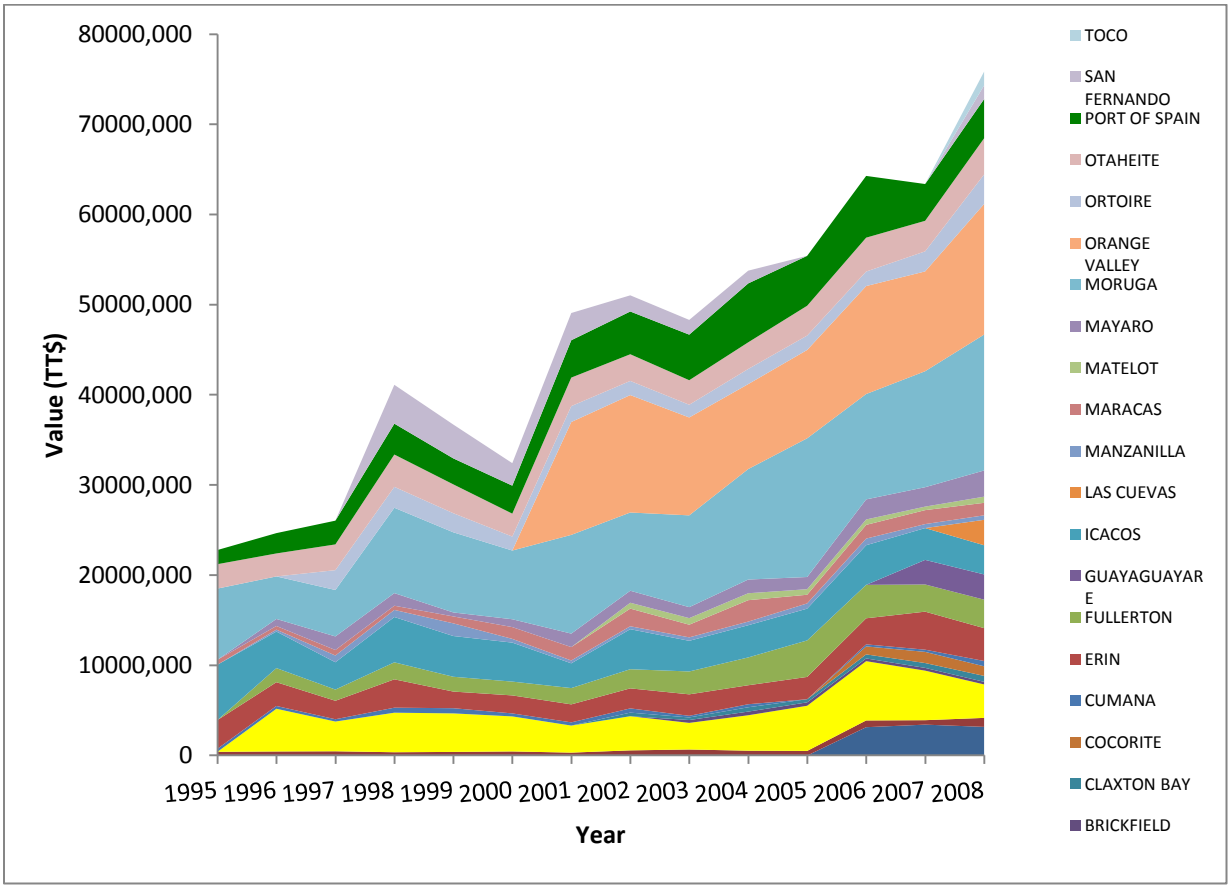
Landings by site in Trinidad since 1995 are shown in Figure 2.45. There has been an overall increase in landings over the thirteen-year period, although it is evident that this increase has not been consistent from year to year.



Source: Fisheries Division, 2010 (unpublished)

Figure 2.45 Estimated annual landings by site in Trinidad (1995 – 2008)

Based on the data presented in Figure 2.46, it is clear that fisheries have been generating millions of dollars in revenue since 1995, and the values have shown a general increase since 1995.



Source: Fisheries Division, 2010 (unpublished)

Figure 2.46 Estimated value of landings (TT$) by site in Trinidad (1995 – 2008)

When Figures 2.45 and 2.46 are compared, it would appear that the shapes of the graphs differ. Between 1995 and 2003, both graphs generally follow the same pattern – as landings increased, the value of the landings increased in a fairly proportional manner; and as landings decreased, the value of the catch mirrored the decrease. Between 2003 and 2008 however, the overall shapes of the graphs differ. Landings appear to have generally decreased between 2003 and 2007 with a slight recovery seen in 2008. The value of the landings however show an almost consistent rise between 2003 and 2008 save a slight decrease in 2007. What these data indicate are increasing fish prices in Trinidad over the last few years. Such increases may be driven by greater scarcity of the resource and greater fishing effort. This general conclusion would support recent Caribbean-wide findings[73] which indicate a decline in fisheries due to over harvesting

[73] CARSEA 2007. Caribbean Sea Ecosystem Assessment (CARSEA). A sub-global component of the Millennium Ecosystem Assessment (MA), J. Agard, A. Cropper, K. Garcia, eds., Caribbean Marine Studies, Special Edition, 2007.

and other changes resulting in more effort by fishermen to catch the same weight of fish when compared with years gone by – known in scientific terms as a lower catch per unit effort.

2.3.3 Protection of Trinidad and Tobago's Biodiversity

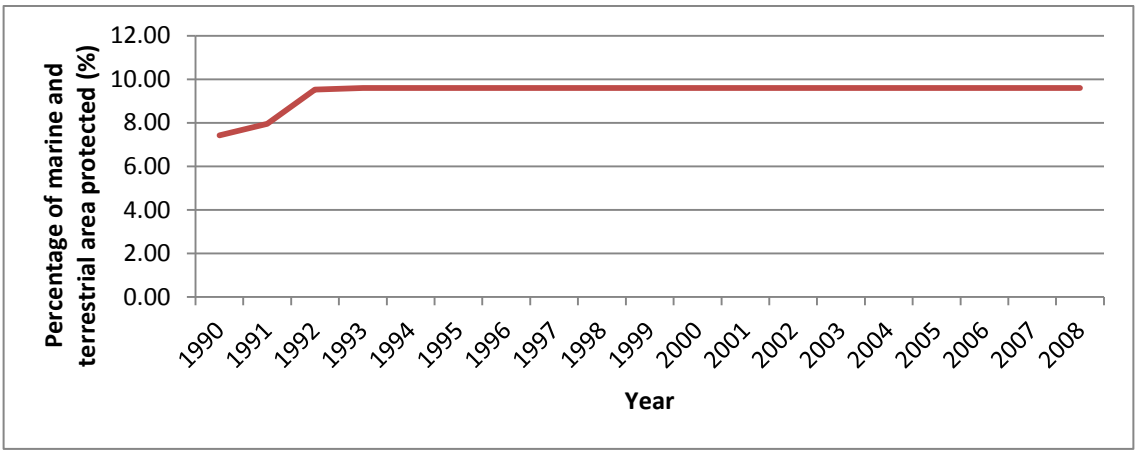
There are a number of Protected Areas throughout Trinidad and Tobago. Table 2.4 shows a breakdown of these by category.

Table 2.4 Protected areas in Trinidad and Tobago

Category of Protected Area	Area (ha)	Purpose of Protected Area
Watersheds	8,334	Protection of soil and water
Nature reserves	458	Conservation of biological diversity
Wildlife Sanctuaries	19,004	Conservation of biological diversity
National Parks	5,002	Social Services
Production forests	75,875	Production
Protective forests	42,986	Protection of soil and water
Total reserve and unproclaimed reserve	143,324.7	-

Source: Forestry Division, 2009 (unpublished)

Figure 2.47 shows that there has been only a small percentage change (less than 10%) in the extent of marine and terrestrial protected areas in Trinidad and Tobago since 1990[74]. It also shows no change to the extent of protected areas has occurred since 1992.



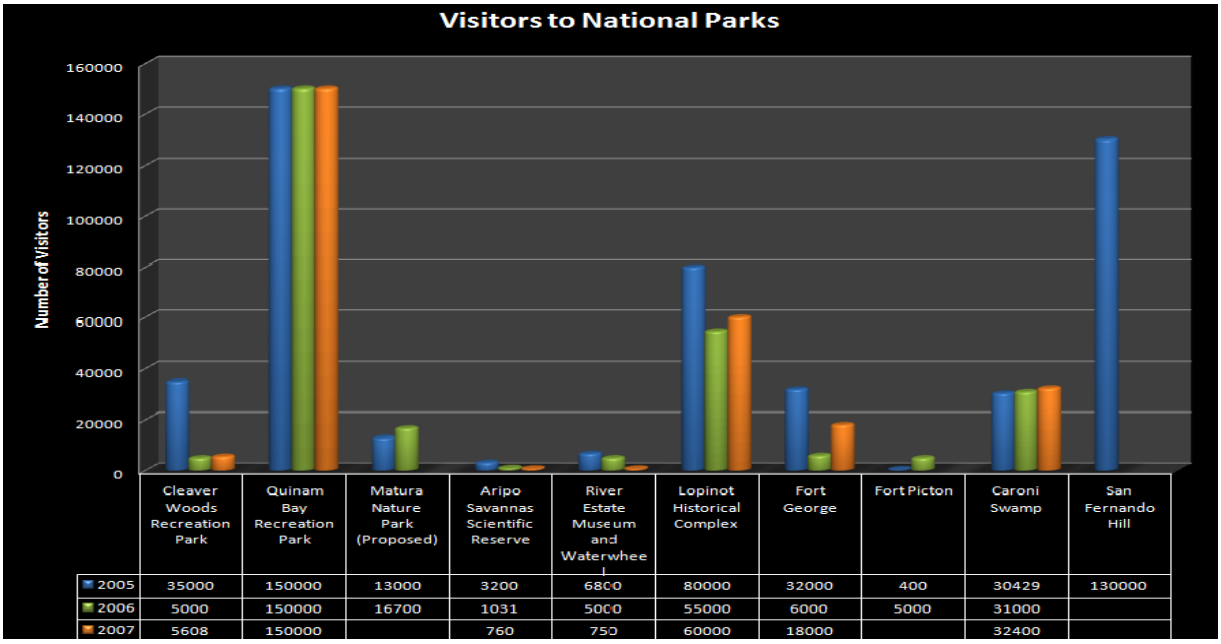
Source: UNEP-WCM, 2010

Note: This includes territorial waters up to 12 nautical miles, and does not include ESAs under the ESA Rules 2001.

Figure 2.47 Proportion of marine and terrestrial areas protected in Trinidad and Tobago (1990 – 2008)

[74] UNEP-WCMC. 2010. Data Standards for the World Database on Protected Areas, UNEP-WCMC.

It is important to note that protected areas are not created to exclude human access and use, but are meant to allow for more effective management of areas for various purposes. Figure 2.48, for example, shows the numbers of visitors to National Parks over the 2005 – 2007 period.



	Cleaver Woods Recreation Park	Quinam Bay Recreation Park	Matura Nature Park (Proposed)	Aripo Savannas Scientific Reserve	River Estate Museum and Waterwhee l	Lopinot Historical Complex	Fort George	Fort Picton	Caroni Swamp	San Fernando Hill
2005	35000	150000	13000	3200	6800	80000	32000	400	30429	130000
2006	5000	150000	16700	1031	5000	55000	6000	5000	31000	
2007	5608	150000		760	750	60000	18000		32400	

Source: Forestry Division, 2009 (unpublished)

Note: No data available for Matura Nature Park (2007); Fort Picton (2007); San Fernando Hill (2006 and 2007)

Figure 2.48 Visitors to National Parks in Trinidad (2005 – 2007)

Under the Environmental Management Act Chapter 35:05 (EM Act), significant emphasis is placed on the protection of biodiversity. Two pieces of subsidiary legislation under the EM Act are especially important in this respect – the Environmentally Sensitive Areas Rules 2001 and the Environmentally Sensitive Species Rules 2001.

Environmentally Sensitive Areas

The first ESA, the Matura National Park, was declared in 2004. In 2006, the Nariva Swamp Managed Resource Protected Area was declared an ESA, and in 2007, the Aripo Savannas Scientific Reserve was declared an ESA. Prior to 2008, boundary descriptions towards the declaration of two other ESAs, both of which are located in Tobago – the Main Ridge National Park, and the Buccoo Reef National Park - were initiated. In 2008, no ecosystems/areas were declared under the ESA Rules but efforts continued to ensure effective implementation of the already designated areas.

As one aspect of the management of the Nariva Swamp Managed Resource Protected Area, the EMA undertook to develop and implement a comprehensive restoration scheme for Nariva

which considered not only improved or restored ecological conditions, but also socio-economic outcomes for the local communities and the country as a whole. Through consultations on the matter, it was found that concerns and expectations for restoration of the Nariva area varied across the range of stakeholders. The main concern expressed by all stakeholders was that of the swamp's altered hydrology on account of human activities, and there was a strong consensus that all hydrological alterations should be a priority for any restoration initiative.

The overall objective of the Nariva Restoration Scheme is to restore forest cover in the Nariva Swamp to address the issue of hydrology while maximising the capacity of this cover for carbon sequestration and as a wildlife habitat. The specific objectives of the Scheme are:

- To reforest one thousand three hundred and thirty-nine (1,339) hectares of altered forest cover through the planting of ecologically compatible species at the rate of approximately 268 ha per year for five (5) years;
- To demonstrate the carbon sequestration benefits of reforestation;
- To provide a habitat for wildlife through the planting of appropriate species;
- To maintain viable community-based enterprises around the propagation of plants and the establishment and care of the re-created forest;
- To conserve the soil of the forest;
- To reduce the incidence of wildfires through preventive community action.

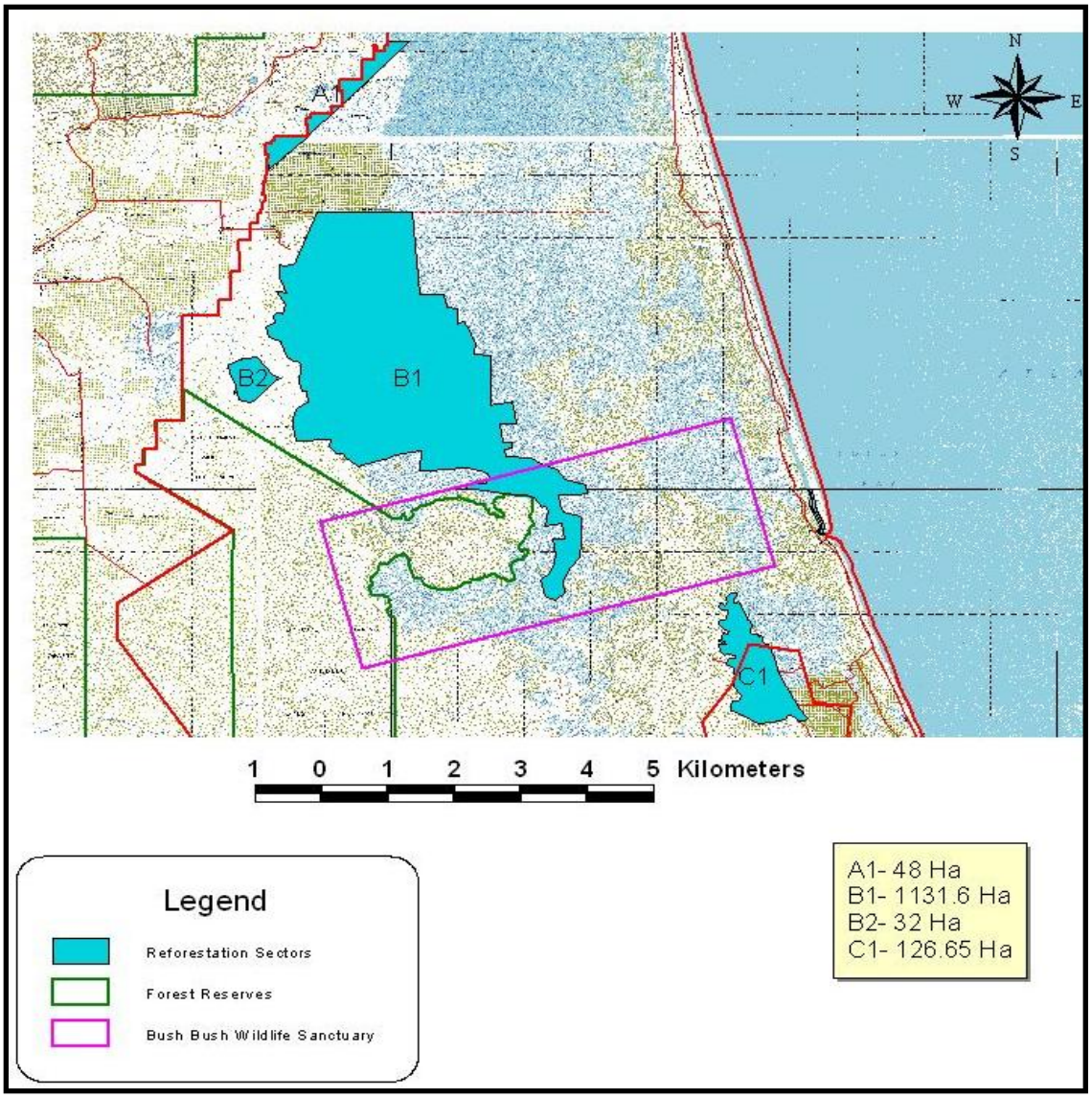
A list of the species recommended for restoration in the Nariva Swamp is given in Table 2.5, and the restoration sectors of the swamp are shown in Figure 2.49.

The pilot phase to begin replanting began in June 2008. Reforestation will begin in those areas where farmers do not need to be relocated. The principal criterion to indicate that a forest plantation has been successfully established will be a survival rate of healthy planted trees of at least 80%. At the end of the period, the restored forest will be managed by the Forestry Division as part of their normal recurrent operations.

Table 2.5 Species recommended for Nariva Swamp restoration

Botanical Name	Common name	Silvicultural Characteristics
A. Swamp Forest		
Acnistus arborescens	Wild Tobacco	fruit source for frugivorous species
Andira inermis	Angelin	food source for howler monkeys
Clusia rosea	Matapal	food source for birds and monkeys
Crudia glaberrima	Water Locust	clay soils; edge of upland forest
Erythrina fusca	Swamp Immortelle	robust pioneer species
Guazuma ulmifolia	Bois D'Orme	fast-growing light demander
Laetia procera	Bois Toucan	food source for unspecialised frugivores
Mauritia flexuosa	Moriche Palm	nesting sites for macaws
Miconia spp.	Sardine	food source for several species of birds
Pachira insignis	Wild Chataigne	clay and sands; slow growth
Platymiscium trinitalis	Roble	clay soils; surface roots
Pterocarpus officinalis	Swamp Bloodwood	fast growing light demander
Rollinia exsucca	Wild Cashima	food source for monkeys
Schefflera morototoni	Jereton	fast growing light demander
Spondias mombin	Hog Plum	rich clays; very rapid growth; surface roots
Virola surinamensis	Cajuca	food source for monkeys
B. Upland Forest		
Bravaisia integerrima	Jiggerwood	rich clay soil;rapid growth; stilt root
Carapa guianensis	Crappo	sand and clay soils; surface roots
Cedrela odorata	Cedar	rich soils; rapid growth, surface roots
Clathrotropis brachypetala	Blackheart	rapid growth
Clusia rosea	Matapal	food source for birds and monkeys
Eschweilera subglandulosa	Guatecare	sand & clay soils; slow growth, deep rooted
Guazama ulmifolia	Bois D'orme	fast-growing light demander
Laetia procera	Bois Toucan	food source for unspecialised frugivores
Miconia spp.	Sardine	food source for several species of birds
Myrcia stenocarpa	Wild Guava	food source for unspecialised frugivores
Nectandra surinamensis	Laurier Mattack	sand & clay soils; rapid growth
Rollinia exsucca	Wild cashima	food source for monkeys
Spondias mombin	Hog Plum	rich clays; very rapid growth; surface roots
Vismia laxiflora	Kiskidee	fast growing light demander
Zanthoxylum martinicensis	L'Epinet	clay soils; rapin growth

Source: Environmental Management Authority



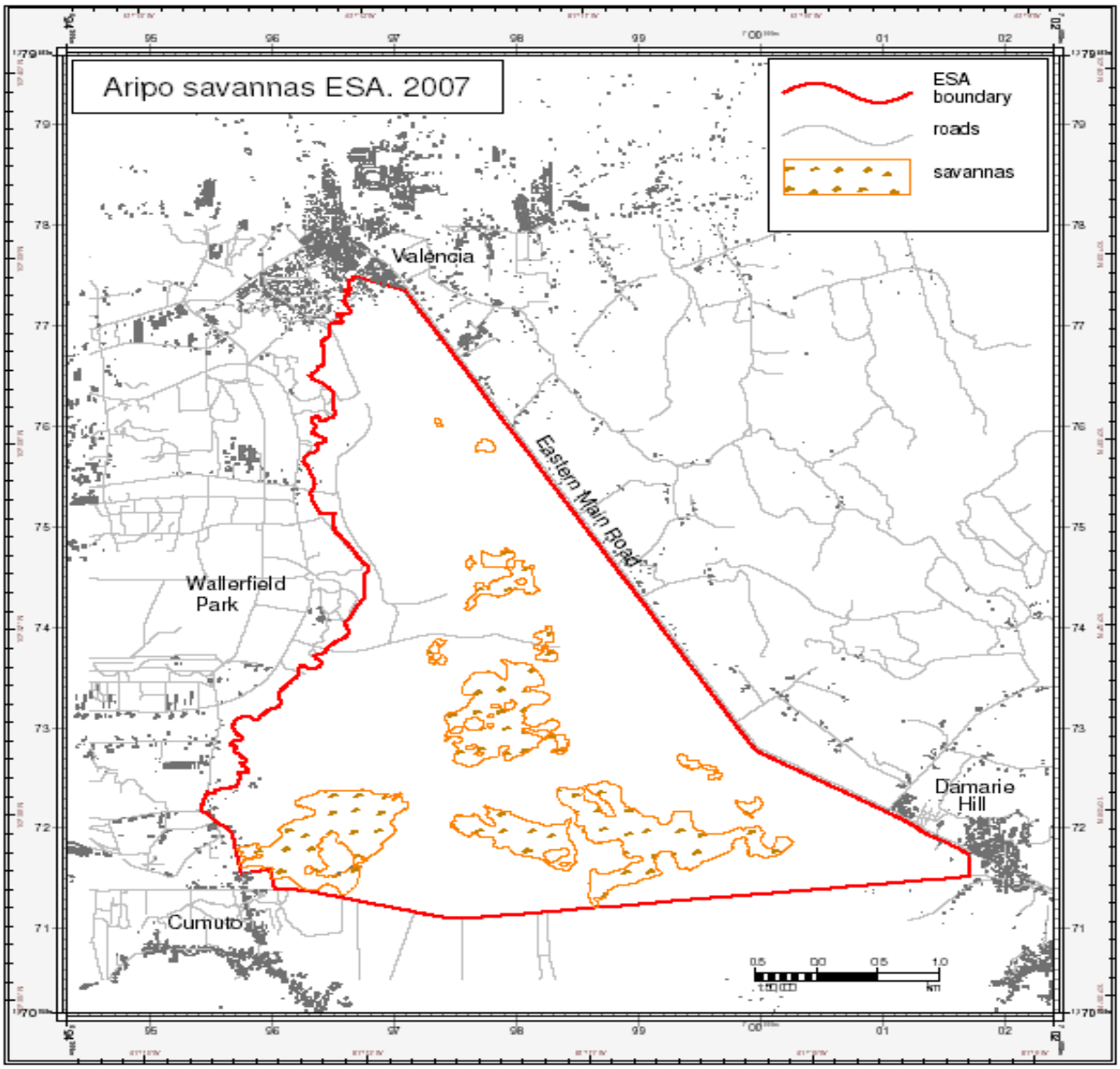
Source: Environmental Management Authority 2009

Figure 2.49 Restoration sectors of the Nariva Swamp

Work also continued on the Aripo Savannas Environmentally Sensitive Area (ASESA) – see Figure 2.50 for a map of the area. An Aripo Savannas Stakeholder Management Committee was convened to function as a multi-stakeholder advisory body for management of the area. The overall management goals for the ASESA are to:

- Equitably and effectively involve stakeholders in the management of the ASESA;
- Preserve the unique ecosystems and protect its biodiversity, historical and cultural values, while promoting research, education and the development of sustainable livelihoods, particularly for local people.

The proposed management model for the ASESA promotes a system of governance that is based on decentralisation, devolution, participation and co-management.

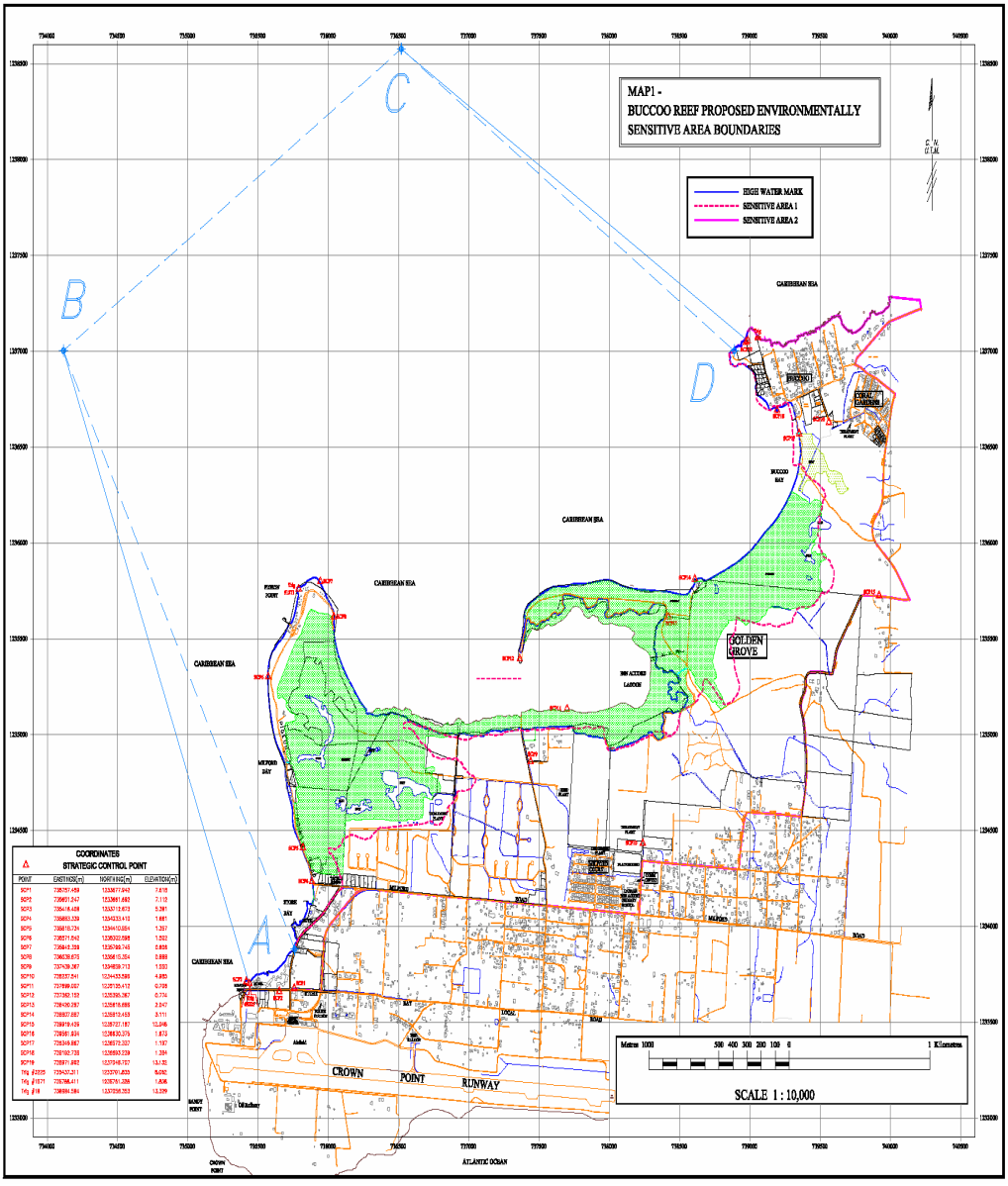


Source: Environmental Management Authority 2009

Figure 2.50 Designated boundaries of the Aripo Savannas ESA

Although the Buccoo Reef is not designated as an ESA under the ESA Rules 2001, efforts have been underway by a number of stakeholders to improve the understanding and management of this ecosystem. It was designated a Protected Area in 1973 under the Marine Areas (Preservation and Enhancement) Act No.1 of 1970. In 1994, the Institute of Marine Affairs (IMA) completed a management plan for the area, which was commissioned by the Tobago House of Assembly (THA). In 2005, Buccoo Reef was declared a Ramsar site. In 2007, the

EMA began work on the reef to define its boundaries based on the scientific High Water Mark (HWM). These boundaries are shown in Figure 2.51. The definition of the boundary is an important step in efforts to advance discussions about the declaration of this site as an ESA, but the ability to define static boundaries is affected by factors such as climate change, which can result in effects such as sea level rise.



Source: Environmental Management Authority 2009

Figure 2.51 Proposed Environmentally Sensitive Area boundaries for Buccoo Reef

Environmentally Sensitive Species

In 2005, three species were declared environmentally sensitive under the Environmentally Sensitive Species Rules 2001. They are the:

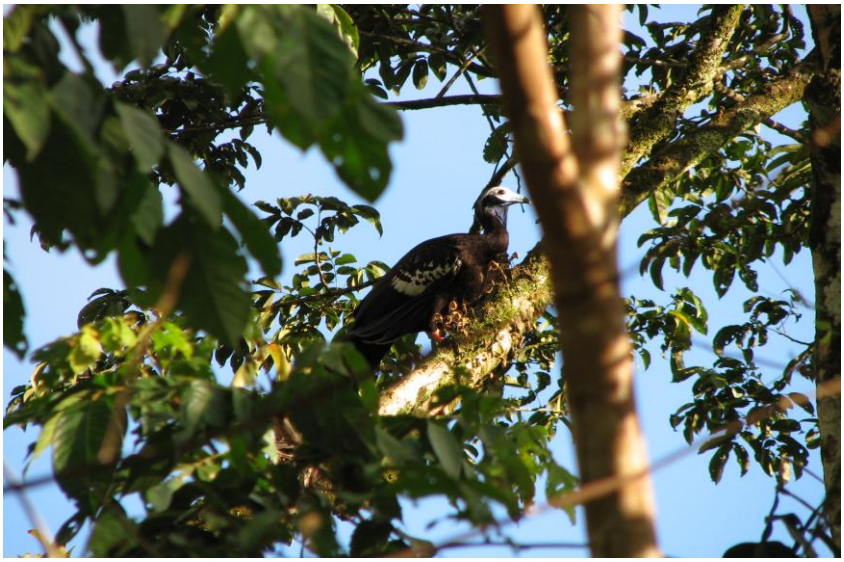
- Pawi (Trinidad Piping-Guan*) Pipile pipile;*
- Manatee *Trichechus manatus manatus*;
- White-tailed Sabrewing humming bird *Campylopterus ensipennis*.

Over the period 2006 to 2008, no species were declared as environmentally sensitive, but the EMA held stakeholders consultations to identify species of concern, and to determine a priority listing of species that would direct its work programme of work. Preparatory work was started on two species – the Ocelot *(Leopardus pardalis)* and the Golden Tree Frog *(Phyllodytes auratus).* In addition, the EMA was heavily involved in several outreach and awareness activities throughout the country, and has undertaken research on the Pawi and the Sabrewing.

The Pawi (Figure 2.52) is one species which deserves special mention because it has been categorised on the IUCN List as Critically Endangered since 1994. Over the 14 year period since then, there has been no change to this status. The population decrease of this endemic bird may be attributed to several factors:

- Illegal hunting;
- Habitat disturbance and destruction;
- Predation;
- Pollution;
- Disease;
- Natural disasters.

Much of the bird's remaining habitat has been designated as a national park, under the protection of the Matura Environmentally Sensitive Area (MESA). Through ongoing public awareness, research, and monitoring, it is hoped that this species will begin to recover in the wild.



Source: Environmental Management Authority 2009

Figure 2.52 Photograph of the Pawi (Trinidad Piping Guan)

2.3.4 Assessment of Trinidad and Tobago's Progress towards meeting the 2010 Biodiversity Target

Based on data and information presented so far in this ASOE and what is generally known and accepted, Table 2.6 shows a qualitative assessment of Trinidad and Tobago's progress towards meeting the 2010 Biodiversity Target. This assessment is based on expert judgment. As is evident, much more effort is needed at a national level in order to promote more effective management of the country's biodiversity.

Table 2.6 Assessment of Trinidad and Tobago's progress towards meeting the 2010 target

INDICATOR	STATUS	TREND	DEGREE OF CERTAINTY
Status and Trends of the Components of Biological Diversity			
❖ Trends in extent of selected biomes, ecosystems and habitats	Fair	Negative changes	**
❖ Trends in abundance and distribution of selected species	Fair	Negative changes	**
❖ Changes in status of threatened species	Fair	Negative changes	**
❖ Trends in genetic diversity of domesticated animals, cultivated plants and fish species of major importance	Fair	Positive changes	**

INDICATOR	STATUS	TREND	DEGREE OF CERTAINTY
❖ Coverage of Protected Areas	Poor	Positive changes	**
Ecosystem Integrity and Ecosystem Goods and Services			
❖ Marine Trophic Index	Poor	Negative changes	**
❖ Connectivity-fragmentation of ecosystems	Fair	Negative changes	**
❖ Water quality of aquatic ecosystems	Fair	Negative changes	**
Threats to Biodiversity			
❖ Nitrogen deposition	Fair	Negative changes	**
❖ Trends in invasive alien species	Fair	Negative changes	**
Sustainable Use			
❖ Area of forest, agricultural and aquaculture ecosystem under sustainable management	Fair	Positive changes	***
❖ Ecological footprint and related concepts	Poor	Negative changes	**
Status of Traditional Knowledge, Innovations and Practices			
❖ Status and trends of linguistic diversity and numbers of speakers of indigenous languages	N/A	N/A	N/A
Status of Access and Benefit Sharing			
❖ Indicator of access and benefit-sharing (to be developed)	N/A	N/A	N/A
Status of Resource Transfers			
❖ Official development assistance (ODA) provided in support of the Convention	N/A	N/A	N/A

Key: Status (Poor, Fair, Good); Trends (Negative changes, Positive changes); Degree of Certainty (*Low, **Medium, ***High).

3.0 CONCLUDING REMARKS

Environmental datasets up to and including 2008 which are presented throughout this report would lend themselves to the overall conclusion that most ecosystem services in Trinidad and Tobago are showing a negative or declining trend. It remains clear that environmental management in the country is not keeping pace with development – in fact we know that no new environmental legislation was passed since 2001 – and this is a source of concern.

Trinidad and Tobago also seems not to be keeping pace with its obligations to international conventions. As at the end of 2008, the Second National Communication of Trinidad and Tobago to the United Nations Framework Convention on Climate Change (including an updated GHG inventory) had not yet been completed; passage of legislation to give effect to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal is still outstanding; and work had not yet started on the preparation of the Fourth National Report of T&T to the Convention on Biological Diversity due on March 30th 2009. In addition, there were few efforts, if any, which were put in place to ensure that Trinidad and Tobago was working towards meeting the 2010 Biodiversity Target.

Available data for 2008 presented throughout this report provide information on the following:

- Driving forces – quarrying, oil spills, fires, hunting, water pollution, coastal pollution, sawn log removal, transport, economic trends;
- Links between environmental changes and human well-being – flooding and landslides;
- Freshwater – abstraction levels from both surface and groundwater sources; water quality assessment of groundwater sources;
- Coastal and Marine Resources – fisheries data; coastal pollution;
- Climate and Air – air temperatures for Trinidad and Tobago for 2008; rainfall in Trinidad and Tobago; trend in ambient air temperature for Trinidad; GHG emissions; air quality monitoring data from the Point Lisas Industrial Estate;
- Noise – noise complaints received by the EMA;
- Biodiversity – wildlife hunting; forestry; turtle viewing; coastal diversity; protected areas
- Environmental management measures – Certificates of Environmental Clearance; enforcement of the Water Pollution Rules; implementation of the Environmentally Sensitive Areas and Environmentally Sensitive Species Rules.

The main findings for each sub-section have already been crystallized throughout the text, but some of the main take-home messages are as follows:

- ❖ Ecosystem services are important for supporting human well-being in Trinidad and Tobago:
    - Natural freshwater sources are important for water provision providing 89 % of the water produced by WASA in 2008;
    - Fisheries provide a source of income for coastal communities contributing TT$75,860,118 in revenue in 2008;
    - Forests provide a source of income through hunting and forestry-related activities.
- ❖ There were a number of direct driving forces which continued to be persistent into 2008:
    - Deforestation as a result of agriculture, housing, industrial development, quarrying, logging and fires;
    - Carbon dioxide emissions resulting from the transportation sector and industrial processes;
    - Pollution of groundwater sources and coastal waters;
    - High levels of drawdown on both surface and groundwater sources.
- ❖ An assessment of the country's progress towards meeting the 2010 MDGs Target highlights that most indicators show a negative trend, and it is clear that much more is needed to effectively manage Trinidad and Tobago's biodiversity.

As we look towards 2009, it is imperative that the country continues to work towards the national environmental priorities set out in the 2006 National Environmental Policy. The environment and its effective management must not be seen as a hindrance to development but rather as a means to promote economic growth and human well-being. Until environmental considerations are fully incorporated into development planning, it is unlikely that we will see a reversal of many of the negative trends which are now apparent. Opportunities to address deficiencies lie in efforts now being initiated by the GoRTT to develop a National Physical Development Plan, a Forest Policy, a Protected Areas Policy, a Climate Change Policy, a Fisheries Policy and a Policy for hillside development.

PART B: ACTIVITIES, ACCOMPLISHMENTS AND GOALS OF THE EMA

ORGANISATIONAL STRUCTURE

The Authority is governed by a Board of Directors comprising a Chairman and nine (9) other members, appointed by the President of the Republic of Trinidad and Tobago. The Managing Director/CEO, who is appointed by the Board, is an *ex-officio* member of the Board. The Board must appoint a Corporate Secretary who must be an employee of the EMA. The Manager of Corporate Services within the EMA currently serves as the Corporate Secretary.

The Chairman and the Board of Directors report to the Minister with responsibility for the Environment. The Members of the Board and Board Committees are detailed in Appendix 1.

The Authority itself is organized into five responsibility centres:

CEO's Office

The Office of the Managing Director is responsible for coordinating and managing all aspects of the work of the EMA. Some specific areas include:

- The fulfilment by the EMA of the objectives detailed in the National Environmental Policy and the EM Act;
- The implementation and enforcement of the subsidiary legislation arising out of the EM Act, including monitoring conditions in permits and licenses granted pursuant to legislation;
- The development of environmental awareness among the citizenry of Trinidad and Tobago;
- The development of an organisational image that projects a strong, professional organization and engenders confidence in the Authority by members of the public;
- Maintenance of the focus on sustainable development while engaging in environmental enhancement and preservation activity;
- To lead, guide, coach and inspire a team of managers towards the achievement of the highest level of performance;
- To promote a productive work atmosphere that would elicit high standards of performance from staff;
- Ensuring that the programmes and projects of the authority are implemented, consistent with budgetary allocations;
- Developing and delivering on EMA's overall strategic and operating plans;
- Advising the Board of Directors on all matters relating to the operations of the Authority;
- Advancing the work of the Authority through meaningful interaction with the political directorate, and other similar regional and international bodies;
- Developing mutually beneficial relationships with participating national agencies that perform various environmental management functions so that the coordination function is effectively achieved;
- Ensuring that the day-to-day operations of the Authority are effectively managed;

The Environmental Police Unit

The EMA's Environmental Police Unit (EPU) also falls under the CEO's Office. Formed in 1999, the EPU comprises Special Reserve Police officers from the Trinidad and Tobago Police Service. Their responsibilities include patrolling highways, serving Notice of Violations and monitoring noise variations. They also police environmentally sensitive areas and monitor the protection of environmentally sensitive species designated under the EM Act. According to the EPU's 2006 statistics, 2463 tickets were issued for offences ranging from vehicular emissions, transporting garbage and goods without a secured cover, defective fittings (e.g. lights, wipers etc.) and unnecessary discharge of lubricant. Ticket fines for 2006 totalled $492,600.

These officers are appointed as Environmental Inspectors under the EM Act and have the power to enforce legislation outside the EM Act (Motor Vehicles and Road Traffic Act, Minerals Act, Litter Act,) in addition to pollution monitoring and responding to environmental complaints. The Unit falls under the jurisdiction of the Commissioner of Police but, as facilitated by the EMA, they receive day-to-day work assignments from, and submit reports to the EMA.

The Human Resource Unit

The Human Resource Unit falls under the CEO's office and is responsible for the following:

- Manpower Planning;
- Succession Planning;
- Recruitment / Selection;
- Performance Management;
- Training;
- Industrial Relations;
- Compensation and Benefits;
- Employee Relations .

Legal Services

A full range of legal services are provided to the Authority, these include, but are not restricted to, the following:

- Drafting and development of subsidiary legislation under the EM Act;
- Enforcement of the EM Act and its subsidiary legislation;
- Litigation/representation at the Environmental Commission, Court of Appeal, High Court and other Courts in this jurisdiction;
- Provision of timely and sound legal advice and opinions on the applicability of environmental law to issues affecting the Authority, other governmental entities and the general public;

- Formulation and review of internal policies to ensure that the Authority's activities and operations are consistent with its legislative mandate , national policies and programmes, international environmental law and best practices;
- Resolution of matters using non-litigious methods, e.g. Alternative Dispute Resolution (ADR)/ Mediation;
- Drafting, reviewing, negotiating, and providing advice on the implementation of all legal documents, agreements, contracts and other formal arrangements for operational activities of the Authority with other governmental and non-governmental entities;
- Working in conjunction with Technical Services for the granting of Certificates of Environmental Clearance and Noise Variations.

Corporate Relations and Public Education

The Corporate Relations and Public Education (CR/PE) Department is responsible for ensuring that the Authority establishes itself as a continuing presence and influences national consciousness.

CR/PE has the responsibility within the EMA to "promote educational and public awareness programmes on the environment" as well as to assist with fulfilment of the mandate to "establish and co-ordinate institutional linkages locally, regionally and internationally.

One of the ways in which the EMA executes its mandate involves making the public more aware and cognisant about environmental concerns. In focusing on environmental improvement, the EMA develops special education initiatives to change attitudes and behaviours towards a range of issues including: Air Pollution, Water Pollution, Noise Pollution, Waste Disposal and Ecosystem conservation.

In collaboration with the Ministry of Education, the EMA coordinates two school competitions: the Primary Schools' Hands-On Environmental Programme and the Secondary Schools' Dramatic Envirologue.

The EMA delivers lectures, conducts workshops and develop programmes on environmental issues for the benefit of Government Agencies and Ministries, Community Groups and Non-Governmental Organisations, Corporate and Industrial Sector entities, Civic society groups, Faith Based organisations and Educational Institutions.

The EMA also supports the creation of environmental clubs in primary and secondary schools, as well as in communities.

The Authority is also a clearing house for environmental information. The Information Center houses a specialised environmental reference collection that includes journals, environmental science texts, copies of legislation and newspaper clippings on environmental issues.

The National Registers for the Certificate of Environmental Clearance and Noise Pollution Control Rules are also available at the Information Centre.

The EMA also collaborates with other governmental agencies and statutory bodies in the execution of their environmental education campaigns.

The Corporate Relations function remains critical as it is responsible for:

- Creating awareness of the EMA's mandates;
- Generating a body of public opinion favourable to the EMA and its mandates;
- Building and maintaining a sound corporate image/identity;
- Fostering good relationships with internal and external publics ;
- Creating a mutually beneficial relationship with the Media.

Technical Services

The Technical Services Department is responsible for the implementation of the technical and administrative processes relating to the following:

- Certificates of Environmental Clearance (CECs);
- Water Pollution Management;
- Waste Management;
- Management of Hazardous substances;
- Emergency Incidents Response;
- Complaints Investigation;
- Site Remediation;
- Biodiversity Protection and Conservation;
- Market Based Instruments;
- Environmental Monitoring and Research;
- Inspection and Compliance Monitoring;
- Noise Pollution Management;
- Strategic Environmental Management.

The EMA is charged with the responsibility of implementing subsidiary legislation under the Environmental Management Act, Chapter 35:05 (EM Act) This includes the Noise Pollution Control Rules (2001), the Environmentally Sensitive Species Rules (2001), the Environmentally Sensitive Areas Rules (2001), the Certificate of Environmental Clearance Rules (2001) and

most recently the Water Pollution Rules (2001 (amendments to which were prepared on December 18, 2006 and submitted to Parliament for consideration)

In addition to implementation of the foregoing, the EMA designs the framework and provides legal and technical instructions for proposed legislation.

Corporate Services

The Corporate Services Department is responsible for the following functions:

- Financial Accounting;
- Fund/Treasury Management;
- Procurement and Asset Maintenance;
- Information Technology;
- Secretarial Services to the Board;
- General Administration;
- Health, Safety and the Work Environment.

Corporate Services serves to ensure the implementation of good governance and accountability. It has the primary responsibility for providing logistical support to the organisation and making available, timely, accurate and complete information on the financial performance and status of the Authority for sound decision making.

The EMA is responsible for a wide range of activities, a responsibility which has become increasingly important over the last few years given the country's rapidly growing economy. To help guide the organisation's work, a five-year strategic plan spanning the period 2003 to 2008 was developed, and within the plan five strategic priority areas were identified:

- Clean Air;
- Clean Water;
- Waste Management;
- Noise Management;
- Healthy Ecosystems.

The strategic objectives for the EMA are congruent with that section of Vision 2020, which focuses on the environment and sustainable development. The execution of which, will, in fact, assist in achieving the mission.

Our strategic objectives, are very clear, since they define the most relevant environmental and human health goals that will have the most profound impact on our population. They are Clean Air, Clean Water, Healthy Ecosystems, Less Noise and Improved Waste Management. The

EMA will provide effective leadership in attaining an environmentally healthy Trinidad and Tobago while conserving ecosystems for present and future generations. The Authority's success however, is predicated upon certain key and critical factors.

We recognise too, that in this pursuit, it will be necessary to engage in activities which cross departmental boundaries and single managerial responsibility. We have identified these as Enabling Strategies:

- Communication;
- Networking;
- Organisation Development;
- Systems/Legislative Review;
- Coordination /Government Relations.

However, beyond the enabling strategies, certain basic assumptions must be made in any plan whose success depends on the political and socio-economic vagaries of the country. Three assumptions which underpin the EMA's operations are as follows:

- Continued support from government;
- Enactment of proposed environmental legislation;
- Independence of the EMA in policy implementation.

We believe that closer collaboration and more effective communication with our internal and external stakeholders are crucial to the delivery of the environmental targets we have established for ourselves. The achievement of these targets will also be predicated upon access to the best available scientific and technological information, to help us determine which problems pose the most immediate and critical risks to our natural environment, human health and ultimately the quality of life available to citizens.

ACCOMPLISHMENTS & ACTIVITIES FOR 2008

1.0 STRATEGIC PRIORITIES

1.1 CLEAN AIR

Clean air is necessary for having a healthy and productive population. The provision of clean air is a right, not a privilege and we must strive towards clean air to ensure a healthy existence and a productive future for us all. That notwithstanding, air pollution is the most widespread form of pollution in Trinidad and Tobago, affecting the entire population, especially children.

The EMA has made some progress in the pursuit of its clean air objective for 2008.

- Establishment of an Ambient Air Quality Monitoring Station (AAQM)

The EMA received a Certificate of Environmental Clearance (CEC) application (CEC 1033/2005) on 25th April, 2005 for the construction and operation of an aluminium complex (Alutrint Ltd) at Union Industrial Estate, La Brea. A project was therefore initiated in May 2008 to identify, shortlist, evaluate and select possible locations most suited for the deployment of the EMA's AAQM Mobile Unit.

Vessigny Government Secondary School was the most appropriate site for monitoring the quality of ambient air against non-point source standards of Trinidad and Tobago's draft Air Pollution Rules 2005. Rose Environmental Limited was contracted to provide, deliver and install the Ambient Air Monitoring equipment. In 2008, the EMA began negotiations with the Ministry of Education on the use of a small area of the school grounds to install the station.

1.2 CLEAN WATER

Trinidad and Tobago experiences much of the full range of water problems from widespread pollution of its waterways and coastal waters to chemical spills, illegal dumping, and deforestation.

The most serious factors affecting water quality are related to the following:

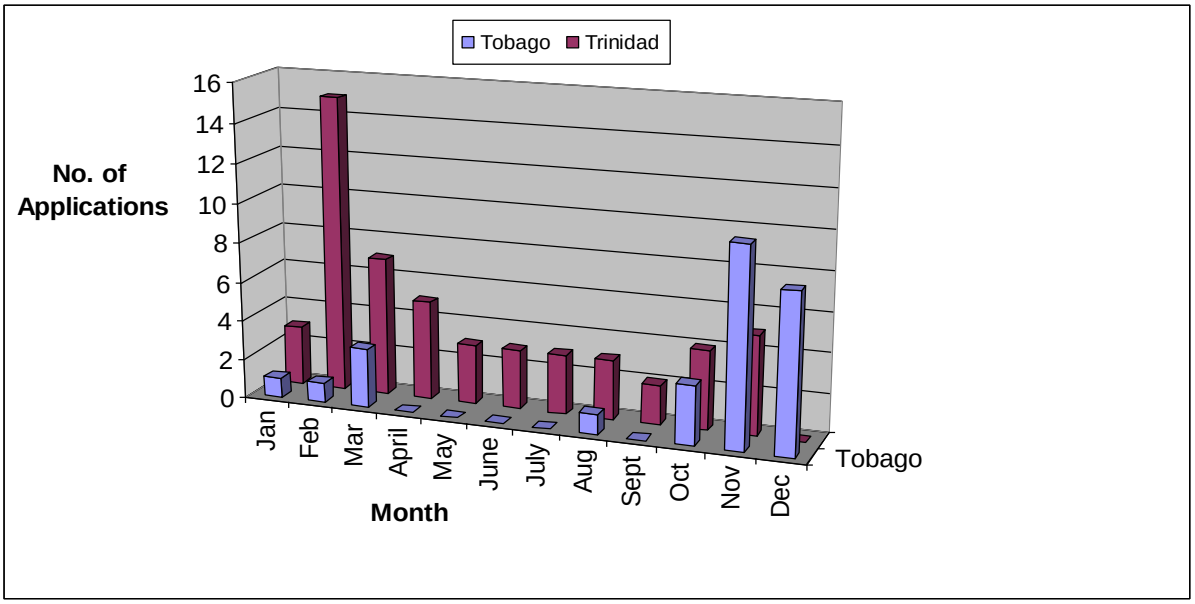
- Direct discharges of industrial effluent (including mining);
- Leacheate from landfills;
- Leakage from service station underground storage tanks (UST);
- Direct and indirect discharge of sewage effluent (including seepage from septic tanks and pit privates);
- Oil production;
- Deforestation;
- Direct and indirect discharges of waste;
- Dumping of domestic refuse and other solid wastes and;
- Agricultural and domestics chemicals.

The primary objective of the EMA's clean water strategy is to control, reduce and prevent water pollution from point and non-point source discharges into the waters of Trinidad and Tobago. The benefit to be derived from meeting this long-term objective would be the preservation and maintenance of good quality water that would support present and future generations. Specifically, the country should see a reduction in the rate of water borne diseases like gastroenteritis and prevent the occurrence of others like cholera. A reduction in the cost of treatment of water for industrial and residential users will also be a benefit of this objective.

The EMA has achieved several targets with respect to developing and implementing a Water Pollution Permit System. The Water Pollution Rules, 2001 (WPR) include the requirement for a registration and permitting system. Forms, procedures, staffing and education programs need to be developed to implement these rules. To accomplish this, a Water Pollution Permit system will be developed and used to control and reduce point source discharges.

- THE WATER POLLUTION RULES, PERMITTING PROCESS

Under the WRP, it is stipulated that once a facility is releasing liquid effluents into the environment, the facility should apply to the EMA for a Source Registration Certificate. The following graphs show the numbers of source applications received as at the end of 2008.



Graph 1: Source Applications received by Month over the period Jan 08 – Dec 08

In 2008, attention was paid to the implementation of the permitting process under these Rules. The North Oropouche Watershed, National Quarries Limited Carib Glassworks Limited and Ready Mix Limited made applications to the EMA in 2008.

The permitting process involves negotiations between the EMA and the permissible party to arrive at a mutually beneficial resolution of compliance to specific issues and problems.

From the 21st-25th April 2008, a permit writer's workshop was conducted for officers from the EMA and the Department of Natural Resources and the Environment (DNRE) in Tobago. It was facilitated by two experts from the United States Environmental Protection Agency (USEPA). The workshop targeted staff of the EMA as well as environmental officers from the Tobago House of Assembly's Department of Natural Resources and the Environment (DNRE) in Tobago.

This workshop and training was seen as a critical step as the EMA progresses with the implementation of the Water Pollution Rules, 2001. The grant of a permit is the main mechanism by which the EMA will effect an improvement in the quality of our inland and coastal waters.

The permitting process involves negotiations between the EMA and the discharger to arrive at mitigation measures to ensure that effluent water quality standards are met and human health and the environment are protected. Permit conditions and mitigation requirements then become environmental requirements, the breach of which carries significant penalties under the EM Act.

❖ *Environmental Officers of the EMA and Tobago's Department of Natural Resources and the Environment pose with workshop facilitators O'Brien and McFadden outside the EMA's head office*

- <u>Non-Point Source Pollution (NPS) Programme – Caura/Tacarigua Watershed</u>

Non-point source (NPS) pollution, unlike point source pollution (industrial and sewage treatment facilities), comes from many diffuse sources. Developing legislation that ensures state lands are properly managed during land farming, mining, logging, as well as, developing

legislation that protect watershed and groundwater resources can prevent and control NPS pollution.

In 2008, the EMA's NSP programme (Caura/Tacarigua Watershed) project aimed to raise awareness about the problems associated with NPS pollution and establish the linkages of NPS pollution as it impacts on environmental water quality and the public health of recreational water users in Trinidad and Tobago. A NPS draft was developed in 2008. Also, the development of a vulnerability rating for watersheds for point and non point source pollution management commenced in 2008.

1.3 WASTE MANAGEMENT

In keeping with the National Environment Policy and the EMA's mandate in the Environmental Management Act 2000, the EMA continues to identify, rank and clean up contaminated sites throughout Trinidad and Tobago:

- Lead Remediation at Demerara Road Community Pond Area

As a result of high levels of contamination at the Demerara Road Community Pond Area, the EMA took steps to restore the area to its original condition to safeguard human health and protect the local and regional environment. The EMA along with other key stakeholders embarked on another lead remediation project (Demerara Pond) that remained outstanding from the 2000 clean up in the Demerara Road Community area. Part of this work involved the establishment of an ad hoc steering committee with direct oversight during the entire project cycle. Key stakeholders involved in the project included the Demerara Community, Tunapuna/Piarco Regional Corporation, Ministry of Health, Ministry of Social Development, East/West Corridor Area Councillor, SWMCOL and the Ministry of Works and Transport.
Green Engineering was utilised to conduct lead-contaminated soil remediation works at the site. The site remediation activities began on 18th May 2008, and backfilling and compaction were completed on 3rd June, 2008. During this period, 490 m^3 of lead contaminated soil was removed from the site, treated and disposed of at Forres Park landfill.

Before the start of the project, the EMA held a community meeting to inform the residents of the DRC about the project as well as to address any arising concerns. Soil sampling and in situ (on site) testing was done to ascertain the extent of lead contamination and zones of lead concentration. The remediation works involved clearing and reestablishment of drains to facilitate draining of the pond, clearing of vegetation and other solid debris and temporary relocation of a severely affected resident. In order to facilitate the movement of heavy vehicles to transport the contaminated soil, a makeshift road was constructed. One particular resident who was under direct threat from the lead-based soil was temporarily relocated and all other residents were screened from excavation activities as well as fugitive dust emissions in an exclusion zone.

- **Lead batteries buried by the pond**

- **A portion of the wetland was contaminated with lead batteries.**

- **Bags being filled with the contaminated soil.**

- **Based on XRF determinations the bags were labelled appropriately i.e. lead contaminated soil <1000ppm and those > 1000 ppm.**

❖ **Post-rehabilitation. All of the lead-based soil was removed and replaced with clean (uncontaminated) soil.**

- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1992 (Basel)

Basel was negotiated under the auspices of the United Nations Environment Programme (UNEP) in the late 1980s, to combat the indiscriminate and illicit dumping of hazardous wastes, especially in developing nations.

As the Competent Authority of the convention, the EMA is responsible for:

– Receiving, processing and responding to any notification of a Transboundary movement of hazardous waste.
– Involvement in the preparation of the National Hazardous Waste Inventory to satisfy the Annual Reporting obligation of the convention.

The EMA achieved several objectives in 2008, a formalised system for processing and recording notifications was developed; internal training to develop capacity for processing Basel documents was undertaken; and a National Hazardous Waste Inventory for the period 2004-2008 also commenced. During 2008, the EMA recognised that procedures for the processing of notifications under different scenarios (Export, Import and Transit) had to be formalised. In addition, protocols needed to be developed to address the issue of "Illegal Shipments." For example, on 13th May 2008, there was a shipment of hazardous waste from Barbados to Trinidad and Tobago, which occurred without consent.

DATE	COUNTRY OF FINAL DISPOSAL	NOTIFICATION TYPE	TYPE OF WASTE	STATUS
25-Jan-2008	CANADA	Export	DDT (Dichlorodiphenyltrichoroethane 100%)	Consent Granted
28-Feb-2008	FRANCE	Export	Materials containing PCB's (Polychlorinated Biphenyls)	Awaiting Consent from Venezuela (Transit Country)
29-Feb-2008	VENEZUELA	Export	Scrap Lead and Used Lead Acid Batteries	Consent Granted
13-May-2008	TRINIDAD	Import (Illegal Shipment)[75]	Ethylene Glycol, Hydroxy Ethyl Cellulose, Lignite and Asphalt	Exporting Country (Barbados) to Re-Import
11-Sep-2008	GERMANY	Transit	Polychlorinated Biphenyl (PCB), Polychlorinated Terphenyl (PCT), Polychlorinated Naphthalene (PCN) or Polybrominated Biphenyl (PBB) or any other Polybrominated Analogues	Consent Granted

❖ *Table: Summary of Notifications received by the EMA in 2008*

- ***Waste Management Rules 2008***

In furtherance of fulfilling its mandate of waste management under sections 55-60 of the EM Act, the Authority drafted the Waste Management Rules, 2008.

The Waste Management Rules were specifically developed to define hazardous wastes, establish standards and criteria for hazardous waste generating, hazardous waste handling and disposal facilities and to establish licensing and permitting requirements regarding such wastes. The Rules also seek to give effect to the obligations of the Government of Trinidad and Tobago (GORTT) under the Basel Convention concerning the import, export, transit and illegal traffic of wastes.

The Waste Management Rules, 2008 was submitted for public and stakeholder comment during the period August 11, 2008 to September 12, 2008. In the interest of receiving all pertinent public and stakeholder comments regarding the Rules, comments were accepted for consideration and review by the EMA until December 12, 2008.

Consequently and in accordance with Section 27 of the EM Act, the EMA is engaged in a comprehensive review and consideration of all the comments received. Based on those comments, the EMA is currently revising the Rules to incorporate and/or amend provisions of the Rules where relevant.

1.4 NOISE MANAGEMENT

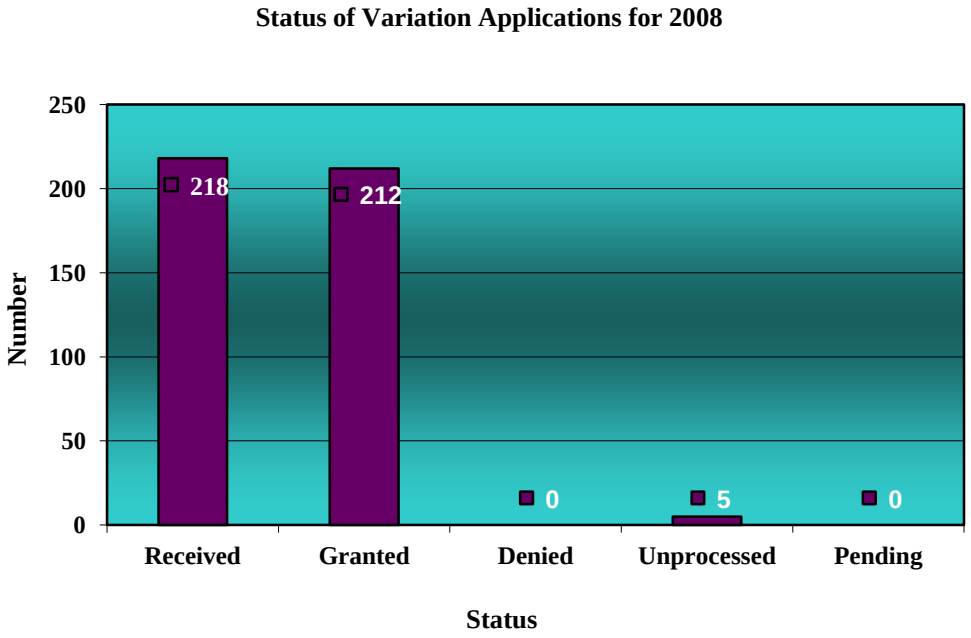
This Strategy is geared towards achieving the ultimate objectives of protecting human health and the environment from the effects of noise and, maintenance of the fundamental right of the individual to enjoyment of property, whilst still allowing reasonable social, cultural and economic activity. Further, the Strategy is guided by the principles outlined in the National Environmental Policy.

This Strategy takes cognisance of the EMA's legal mandate to establish an effective regulatory regime to protect, enhance and conserve the environment, and to co-ordinate, facilitate and oversee the execution of national environmental strategies and programmes. In this regard, an essential element for the implementation of the programmes is the co-operation of many organisations, such as other public authorities and agencies, the industrial sector, non-governmental organizations and educational establishments.

As one aspect of its work, the EMA deals specifically with Noise complaints and Noise variation applications for events (under the Noise Pollution Control Rules 2001).

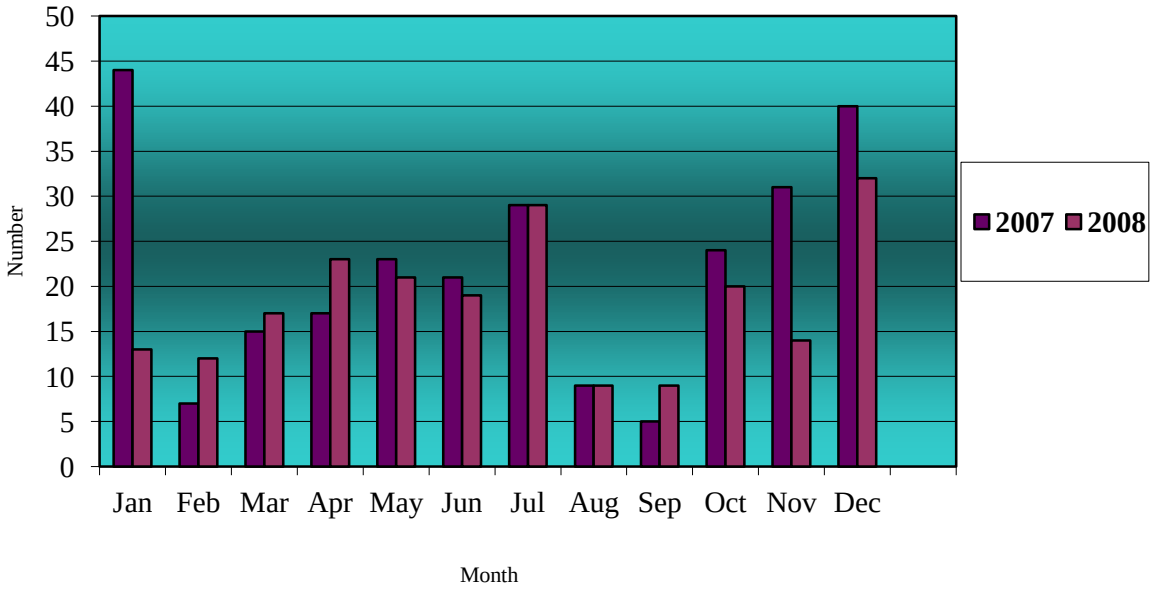
The graph below summarises the noise pollution variations that were reviewed at the EMA in 2008. The graph shows that of the two hundred and eighteen (218) applications or noise variations received, two hundred and twelve (212) were granted and five (5) applications remain unprocessed. The unprocessed applications were received from applicants who have not

completed the application process or have cancelled the events which required the variation applications.

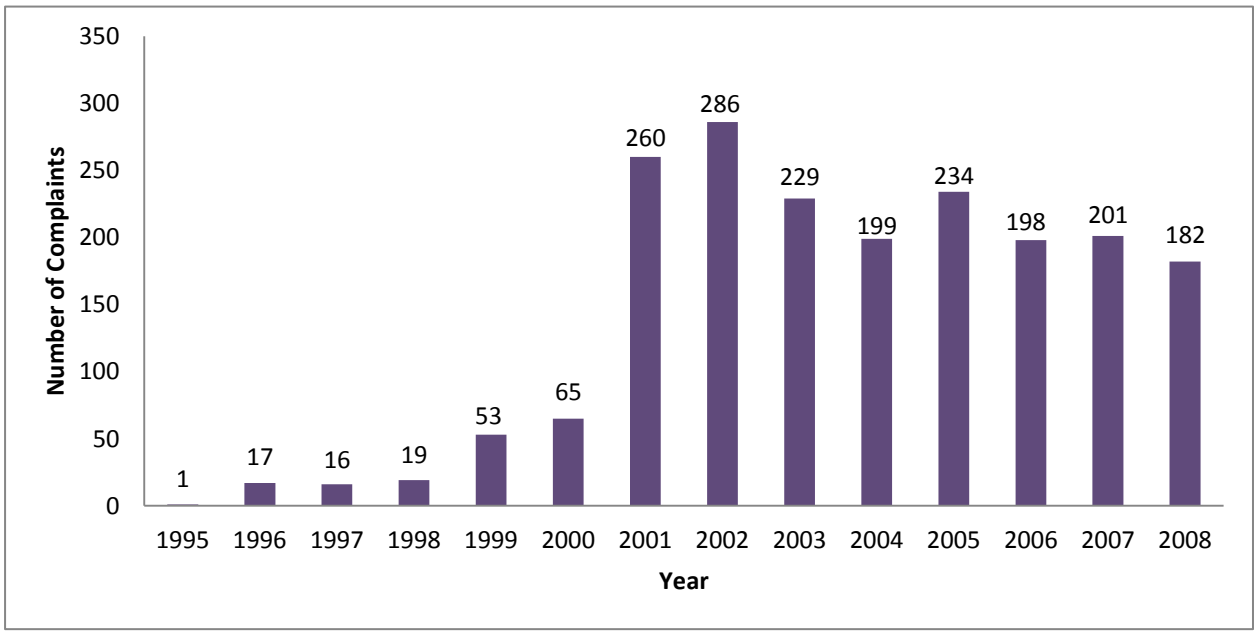


The graph below shows a comparison of the number of variations received in 2007 and 2008. However, in January 2007 and 2008, there was a noticeable difference in variation applications received. This may be due to the large number of Carnival celebrations occurring in January 2007.

Status of Variation Applications received in 2007 and 2008



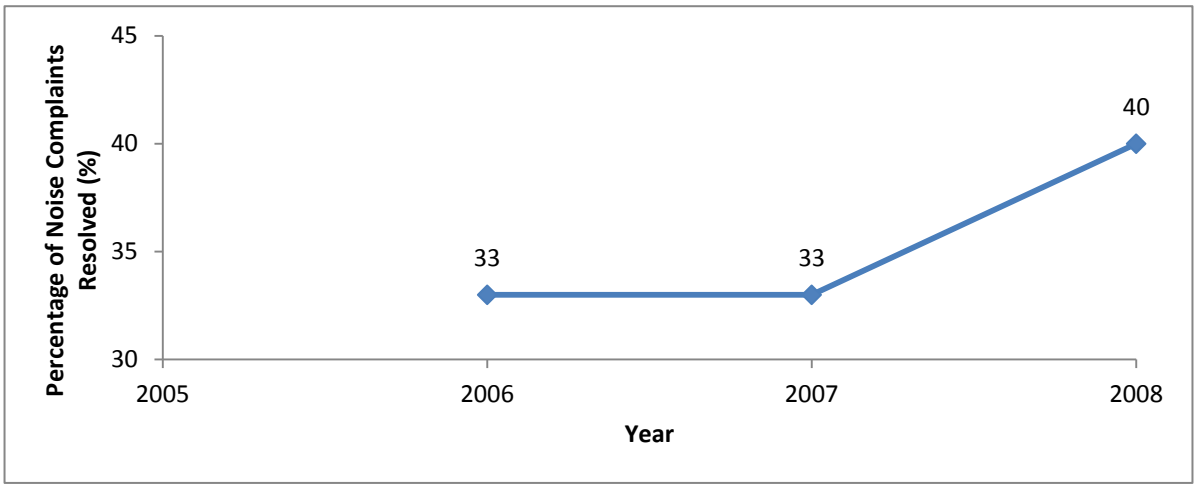
In 2008, a total of 182 noise complaints were received. This is the lowest number received on an annual basis (under the Noise Pollution Control Rules 2001) since 2000



Source: Environmental Management Authority

Number of noise complaints received by the EMA for Trinidad and Tobago (1995 – 2008)

In 2008, there was a slightly higher rate of resolution of noise complaints (40 %) as compared with the two years previous – 2006 and 2007



Source: Environmental Management Authority

Percentage of noise complaints resolved by the EMA (2006 – 2008)

1.5 HEALTHY ECOSYSTEMS

While Trinidad and Tobago has a rich biological diversity, the country stands as the most industrialised nation of the Commonwealth Caribbean, and is undergoing a population growth. These factors combine to place demands on our natural resources, in order to sustain larger populations, and the receiving environment faces growing threats from the industrial sector due to pollution of land, air, marine and freshwater systems. Chemical spills, deforestation, and the overexploitation of fisheries, wildlife and forest resources also threaten our ecosystems.

The continuation of these threats to the fragile ecological integrity of our tropical ecosystems will hold grave implications to our country, because our economies and livelihoods are closely tied to our biodiversity and natural resources.

Ultimately, in recognition of this, it is the EMA's Strategy to allay these threats by taking a holistic approach, whereby, protection of entire ecosystems are bestowed by the provisions for protection of biodiversity and natural resources as expounded in the National Environmental Policy.

This Strategy has taken into consideration, the EMA's legal mandate to declare areas and species as "environmentally sensitive" under the Environmental Management Act (2000), and the

subsidiary Rules made under it. Acknowledgment of the importance of participatory management also forms a pivotal role in the achievement of the strategic objectives for healthy ecosystems.

Here are some of the EMA's achievements under its Healthy Ecosystems Strategy.

- Survey of Buccoo High Water Mark

The Buccoo Reef area was designated a protected area in 1973 under the Marine Areas (Preservation and Enhancement) Act No.1 of 1970. In 2008, after several consultations Milford Road was decided upon as the preferred landward boundary for Buccoo Reef.

The drafting of the Survey Order by the Lands and Surveys Division commenced in 2008.

- Nariva Reforestation Project

The Nariva Swamp Restoration and Carbon Sequestration Initiative is a collaborative project being undertaken by the Forestry Division- Ministry of Agriculture, Lands and Marine Resources the EMA and the University of the West Indies. The World Bank, between 2006 and 2008, funded the preliminary work on this project, the purpose of which was to determine the potential for carbon sequestration and the mitigation of greenhouse gases (GHG) through the restoration of wetlands located in the Nariva Swamp.

The Scheme, in the first instance, covers a period of five (5) years which began in June 2008 with plantings from an outside nursery. The establishment of the project nursery commenced at the same time to ensure that plants will be available from 2009.

The Nariva Restoration and Carbon Sequestration project was launched on August 15th 2008 in collaboration with the Ministry of Planning Housing and the Environment, the Ministry of Agriculture, Land and Marine Resources as well as the University of the West Indies. This revolutionary project will see the replanting of 1,300 hectares of the Nariva Swamp in areas that were formerly deforested by large-scale rice farmers more than a decade ago.

Nariva has been declared an Environmentally Sensitive Area under the Environmentally Sensitive Area Rules, 2001 and has the most varied vegetation of all wetlands in Trinidad and Tobago, with distinct zones of swamp forest, palm swamp, herbaceous swamp and mangrove woodlands.

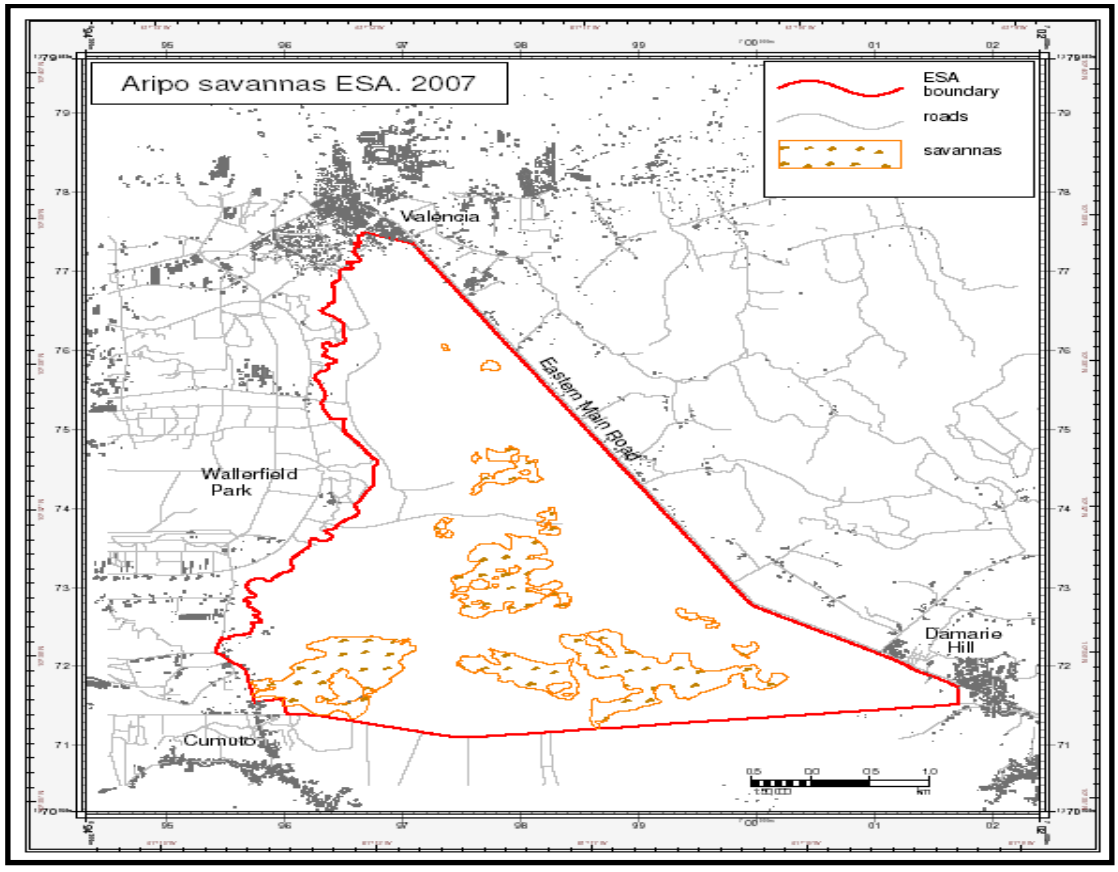
The Forestry Division, Ministry of Agriculture, Land and Marine Resources have spearheaded the long process to have the threats to Nariva Swamp removed and the ecology of the area restored. Restoration and management plans were drawn up with the assistance of Canadian

NGO Ducks Unlimited and the Institute of Marine Affairs. Today, the Nariva Restoration and Carbon Sequestration project is a collaborative effort of the Forestry Division, the EMA and the University of the West Indies.

- Designation of Environmentally Sensitive Areas- Aripo Savannas Management Plan

The Aripo Savannas is one of only two remaining natural savanna ecosystems found in Trinidad and Tobago. It was designated an Environmentally Sensitive Area (ESA) in June 2007 under the Environmentally Sensitive Areas (ESA) Rules of 2001.

Work on this project was initiated in the 2006 - 2007 fiscal year. An outline Management Plan was prepared for the Aripo Savannas 26 years ago and in 2006 CANARI was contracted to undertake a comprehensive management planning exercise for the Aripo Savannas. This management plan was submitted by CANARI in September 2008.



❖ *Map2: Designated Boundary of the Aripo Savannahs*

- *Environmentally Sensitive Species designations*

Under section 41 of the EM Act and further to the Environmentally Sensitive Species Rules 2001, the Authority is vested with the power to designate any species of living plant or animal as an environmentally sensitive species (ESS).

In accordance with this power, the EMA received Cabinet's approval to proceed with the designation of the Golden Tree Frog and the Ocelot as environmentally sensitive species. In compliance with section 27-28 of the EM Act, the Golden Tree Frog and Ocelot legal notices were submitted for public and stakeholder comments during this year.

The Golden Tree Frog is endemic to Trinidad and is small-medium sized frog. The distribution of this species appears to be restricted to three areas: the summits of El Tucuche, Aripo and Morne Bleu Ridge. Its distribution is severely fragmented and the quality and extent of its habitat continues to decline.

The Ocelot is the only wildcat species in Trinidad. The ocelot is a keystone and umbrella species and a top predator for most of the island. As top predator, they are able to control the size of several species such as rodents and snakes. It is reported that there are less than 400 ocelots in Trinidad and is thus considered to be an endangered species.

Once these species are designated, there will be limitations on uses and prohibited activities regarding the species and their habitats. These designations will also increase the conservation of biological diversity and protection of the environment, logistic support for environmental education and information sharing and non-destructive scientific research.

❖ *Golden Tree Frog*

❖ *Ocelot*

2.0 ENABLING STRATEGIES

2.1 COMMUNICATION

The Communication Strategy is aimed at maintaining and increasing the Authority's presence and influence in the nation's consciousness, changing attitudes and behaviours through innovative and exciting education and public awareness programmes. This was done in many and diverse ways by the Authority by means of the EMA's commemoration of World Environment Day and the activities associated with this world wide celebration; through its Schools competitions and programmes; its lectures and workshops across the country and its continued presence in the media via print articles and radio and television interviews.

- *World Environment Day* - 'CO2: Kick the Habit! Towards a Low Carbon Economy'.

World Environment Day (WED), commemorated each year on 5 June, is just one of the principal vehicles through which the EMA stimulates nation-wide awareness of the environment and enhances political attention and action.

For 2008, the WED slogan was '*CO2:* ***Kick the Habit! Towards a Low Carbon Economy*****'**. As lead organisation, the EMA plays the key role in commemorating this day and in so doing provides guidance to the committee in charge of WED. Leading up to this day, the EMA organised a host of activities that aimed to build awareness on 'Kicking the Carbon Habit'. WED Committee Meetings started in February, 2008 and was held weekly at the EMA until post-WED activities in June, 2008.

Spearheaded by the EMA, the Committee comprised of representatives from the following organisations: Ministry of Planning, Housing and the Environment; Ministry of Public Utilities; Ministry of Works & Transport; Ministry of Health; T&TEC; WASA; SWMCOL; T&T Chamber of Industry & Commerce (TTCIC); Town and Country Planning Division (TCPD); Institute of Marine Affairs (IMA); Department of Natural Resources & the Environment (DNRE); National Institute of Higher Education, Research, Science & Technology (NIHERST); United Nations Information Center (UNIC) and the Ministry of Agriculture, Land and Marine Resources - Forestry Division.

The World Environment Day Steering Committee hosted a series of educational exhibitions at the three major malls in Trinidad and Tobago. The WED Conference was held at UWI's School of Continuing Studies, Gordon Street campus, St. Augustine. A total of nine speakers presented over a period of three days of the conference. This opportunity allowed them to highlight resources and initiatives that promote low carbon economies and life-styles, such as improved energy efficiency, alternative energy sources and eco-friendly consumption.

The EMA advertised its Green Leaf Competition and received dozens of nominations which the steering committee reviewed and judged according to the 2008 WED theme. The Green Leaf Awards recognise those who have made significant and positive contributions to good environmental practice over the past year.

These awards are designed to highlight substantial environmental issues and encourage national action towards notable environmental concerns.

This year the EMA gave five Green Leaf Awards in the categories of Audio/Visual, Youth Group, Individual, Community and the traditional Best (Exhibition) Booth Award.

The Green Leaf Awards ceremony was held at the Trinidad Hilton on June 5th (World Environment Day). It was also the EMA's 13th birthday.

The annual 16-page WED Supplement was successfully published on June 5th containing information and advertisements about World Environment Day.

- (L-R) Professor Agard and Dr. McIntosh stand with the Green Leaf Winners- Jeannette Redhead of the Lisas Gardens Welfare Council with the Community Award; Minister of Planning, Housing and the Environment, Senator, Dr. the Honourable Emily Gaynor Dick-Forde; Individual category winner-Aphizal Baksh; Representative of South-West Peninsula 4H Club, Monica Lessey; Director of the Tobago's Dept. of Natural Resources and Environment - Neila Bobb-Prescott who collected the Audio/Visual Award on behalf of Dr. Owen Day of the Buccoo Reef Trust and Conservator of Forests, Antony Ramnarine who collected the Best Booth Award for the Forestry Division.

- Media Activities

The EMA also conducted many on-air radio and television interviews regarding Noise Pollution; the Kyoto Protocol; Regulatory day; World Forestry day; Climate Change; World Environment Day and the International Coastal Clean-up in collaboration with the respective steering committees.

- Publications

Two external newsletters were published and distributed to its stakeholders over the course of the year. It was also placed on the EMA's website to ensure a better readership. The EMA also published its annual Calendar for 2009 which, apart from featuring breathtaking photos, served as an educational tool to highlight vanishing species in Trinidad and Tobago such as the Golden Tree Frog, the Howler Monkey, the Pawi, Corals (due to coral bleaching), Aquatic & Insect species, Turtles, Wetlands, and the Sabrewing Hummingbird.

The EMA also gained exposure from its written articles in the press as the Authority continued to receive support from all leading newspapers in T&T. The EMA was therefore able to educate via the press on environmental issues such as Noise Pollution; World Wetlands Day; Climate Change and Dengue; World Environment Day; EMA's Water Pollution Permit Writers Training Workshop; EMA's Green Leaf Awards; EMA's Schools competition; Lead Pollution in Demerara Road; the Nariva Swamp Reforestation and Carbon Sequestration Project; Youths & the Environment; and the Water Pollution Rules.

- Advertisements

The EMA is mandated to educate the public and in some instances alert clients about certain issues and concerns regarding the compliance of environmental legislation. The EMA produced and published magazine and press advertisements to raise awareness of Vehicle emissions; Noise Pollution; How to apply for a Noise variation; World Ozone Day, Flooding; World Environmental Day and the winners of the EMA's Green Leaf Awards. Of special note is the corporate advertisement welcoming its new Managing Director.

- Schools' Programmes

The year 2008 marked the tenth year of competition for both the Primary Schools' "Hands-on" and the Secondary Schools' Competitions. Primary school students developed projects around the theme, '*Climate Change – A Call to Action'* while students from Forms 4 to 6 spoke on issues such biodiversity, sustainable development, water resources, as well as climate change for the Secondary Schools' Dramatic Envirologue Competition.

Students from Forms 1 to 3 also had an opportunity to participate in the Eco-Song Competition which was staged for the first time in 2008. The EMA continues to partner with the Ministry of Education on these programmes.

The EMA also partnered with Caribbean New Media Group (CNMG) to broadcast features on these schools' competitions on its television station.

- 'Talking Green' Radio Series

"Talking Green", a series of 24 half-hour programmes on the work of the EMA, was aired on Talk City 91.1 FM, a subsidiary of Caribbean New Media Group (CNMG). The "Talking Green" radio series was designed to give members of the public an insight into the work of the EMA. Each 30-minute programme included an interview with EMA personnel on a specialised topic, as well as environmental news and tips. Among the topics discussed on the radio interviews were: - Environmental Education role of the EMA; the Technical Services of the EMA; Recycling at Christmas; Noise Pollution; the importance and benefits of a Certificate of

Environmental Clearance; Biological Diversity; Department of Natural Resources and the Environment (DNRE) and Climate Change.

- Anti-Litter Campaign

The EMA continued its campaign to sensitise the population about proper waste disposal. Advertising was done on both radio and television, particularly during key festive periods, such as Carnival, Easter and Christmas, when more waste was generated.

- Youth Programme

The first Youth Summer Camp was held in July, 2008 at Mt Plaisir Estate, Grande Riviere. This week-long camp attracted 18 students from secondary schools in Trinidad and Tobago and was centred on the theme, "People and the Northern Range". The youths produced a documentary, an environmental theatrical presentation as well as a newsletter on the Northern Range which highlighted their creativity and hands-on experiences.

- Lectures and Displays

Throughout 2008, the EMA delivered more than 211 lectures and mounted more than 35 displays for the nation's schools, NGOs, CBOs, Faith-Based Organisations (FBOs) and other civil society groups.

- Information Centre

The Information Centre continued to act as a clearinghouse for environmental information. The Centre contains a specialized environmental collection that includes journals, environmental science texts, copies of environmental legislation and information files gathered from newspapers clippings.

The National Registers for the Certificate of Environmental Clearance (CEC) Rules and the Noise Variation applications were also viewed by members of the public. A total of 897 CEC files were viewed by members of the public and extracts were taken from 351 CEC files. Six files were requested from the Noise Variation register and extracts were taken from one of these files.

Both the Source Registration Register and the Water Polluters Register under the Water Pollution Rules were activated in September, 2008. Between September and December seven files from the Source Registration Register were requested by members of the public.

In 2008, a total of 1,370 persons visited the Information Centre. The Centre received 2,013 external queries and 844 internal queries.

2.2 NETWORKING

- EMA celebrates Regulatory Day 2008

In celebration of World Consumer Rights Day (March 15th), the EMA joined the Regulatory Day Steering Committee which was headed by the Regulated Industries Commission. Eight local regulators combined forces to stage this inaugural event in an effort to educate and enlighten the public on the role and function of independent regulators and to foster an appreciation of the importance of the regulatory process. The one-day exhibition focused on the theme, *"Regulators: Empowering You and Protecting Your Interests"* and took place on Saturday 15th March 2008 at the Trincity Mall.

An informal Regulatory Authorities Partnership was formed with Central Bank of Trinidad &Tobago, Environmental Management Authority, Office of the Ombudsman, Occupational Safety and Health Authority and Agency, Regulated Industries Commission, Securities and Exchange Commission, the Telecommunications Authority of T&T and the Consumer Affairs Division, all participating in this venture.

❖ EMA's Regulatory Day Exhibition at Trincity Mall.

- Dengue Awareness and Prevention

The EMA continued its partnership with the Ministry of Health on a Dengue Awareness and Prevention Media Campaign. The goal of this collaborative initiative was to sensitise the nation to this life-threatening disease through the print and electronic media.

2.3 ORGANISATIONAL DEVELOPMENT

2.4 SYSTEMS/LEGISLATIVE REVIEW

- Enhancing Institutional Capacity in Geographic Information Systems

The Environmental Management Authority (EMA) is developing its Geographic Information Systems (GIS) capacity for more efficient management/decision making through institutional-wide data information access and subsequent analysis. EMA's GIS development began in 2004 with the completion of ArcView 3.2 training for technical staff; this was followed by a Needs Assessment Study (NAS) in 2006 and acquisition of some digital data themes and satellite imagery in September 2008 by GISCAD.

- Compliance Assistance Program

The EMA is developing a Compliance Assistance Program (CAP) to improve the efficiency and effectiveness of the Certificate of Environmental Clearance (CEC) process.

The CAP documents include:

- Oil and Gas;
- Coastal;
- Agriculture;
- Land Clearing;
- Automotive;
- Bio-diversity.

Work continued on these documents in 2008.

- Cumulative Impact Assessment (CIA) Practitioners Guide

The objective of this exercise was to ensure that the guidelines promote transparency, consistency, technically sound decisions by the EMA, and submission of relevant, quality information by applicants to facilitate a more efficient CEC process.

In 2008, Mind Alliance Limited was contracted to develop two internal technical guideline documents for the EAU:

1. Environmental Impact Assessment (EIA) Practitioners Guide
2. Cumulative Impact Assessment (CIA) Practitioners Guide

In 2008 the Final CIA Guide was delivered, reviewed and finalized. The implementation and communication of these guideline documents to external stakeholders will be incorporated into the wider Implementation and Communication Plan for the Compliance Assistance Programme (CAP) since the targeted stakeholders are the same.

- Risk Assessment Guidelines

The EMA uses risk assessment studies as an important tool in its decision-making process for Certificate of Environmental Clearance (CEC) applications. In 2008, Jacques Whitford Limited was contracted to develop an EAU Internal Risk Assessment Guideline document to provide assistance to EAU officers who, on receipt of a CEC application, must make decisions regarding the need for a risk assessment to be conducted. A workshop was held from the 20th to 24th October 2008. This project will continue in 2009.

2.5 CO-ORDINATION/GOVERNMENT RELATIONS

Through the implementation of the Coordination/Government Relations Strategy the Authority would be able to work towards effectively achieving the mandate of the EM Act by building sound relationships with all entities with the potential to impact on the state of the environment.

The Authority has identified the need for mechanisms for consultation and partnering with Government Ministries, Industry, and policy and decision makers.

- International Coastal Clean-up (ICC)

The EMA also participated in the annual International Coastal Clean-up at its adopted beach, Salybia. In 2008, 390,881 volunteers from 104 countries, including T&T, collected an astonishing 6.8 million pounds of debris from our oceans and waterways. Worldwide, volunteers collected 1,377,141 plastic bags and 714,892 plastic bottles as a result of the clean-up.

The ad hoc National Planning Committee which is spearheaded by the Caribbean Network for Integration and Rural Development (CNIRD); comprises of government ministries, NGOs, CBOs and private organizations. These include: - the EMA; Water & Sewerage Authority (WASA); Atlantic LNG; Piranha International Ltd; Community Environmental Protection & Enhancement Programme (CEPEP); West Indian Tobacco Company Limited (WITCO); Institute of Marine Affairs (IMA); Tourism Development Company of Trinidad and Tobago

(TDC); Trinidad & Tobago National Petroleum Marketing Company Limited; Yacht Services Association of Trinidad and Tobago (YSATT); Chaguaramas Development Authority (CDA); Forestry Division; Protectors of the Environment; Girl Guides Association; Ministry of Planning, Housing & The Environment (MPH&E); The Trinidad & Tobago Solid Waste Management Company Limited (SWMCOL) and The Heroes Foundation.

On that third Saturday of September, the EMA together with its 100 volunteers collected 73 bags of garbage weighing 1,078 pounds, over a distance of 1.3 miles in just two hours.

While on the surface the ICC is about cleaning marine debris and leaving behind cleaner, healthier, waters, the real impact is felt much deeper. The clean-up has become a powerful tool to advance important marine debris issues in government and help our leaders understand that cleaner water is directly tied to better governance of our ocean.

In 1998, the EMA commissioned a study to evaluate the economic feasibility of introducing a Deposit Refund System (DRS) for Beverage Containers (BC) in T&T.

The study identified benefits ranging from a reduction in pollution whether aesthetic or atmospheric, resulting from a reduction in litter or BC production. In the case of production, lower energy costs are incurred from reused or recycled BC as opposed to virgin material. Obvious benefits like a decline in costs of cleaning up of underground drainage, roads and waterways and a large reduction in flooding due to BC pollution and congestion.

This is the idea behind the drafting of The Beverage Container Bill. The Bill seeks to provide for the regulation of the sale of beverages in sealable containers, the payment of a deposit on prescribed classes of beverage containers, the refund of the deposit on the return of reusable and recyclable containers, and other administrative and fiscal measures to encourage the reuse and recycling of beverage containers and reduce the disposal of beverage containers into the environment.

The objects and purposes of this Bill are –

- to ensure that the bottlers, importers, vendors and consumers pay the external costs of the sale and consumption of beverages in beverage containers;
- to create incentives for the manufacturers, vendors and consumers of beverages to reuse or recycle beverage containers;
- to reduce the generation of solid wastes, waste disposal and recycling costs;
- to reduce litter and litter related costs and hazards;
- to conserve natural resources; and
- to preserve the amenity of the environment and enhance the quality of life.

It states that every reusable or recyclable beverage container sold or offered for sale in Trinidad and Tobago shall have a refund value. Glass, plastic, aluminium and other metal beverage containers containing 0.6 litres or less will have a standard refund value per container, while those same containers measuring more than 0.6 litres will have a greater refund value per container.

Saving the environment through recycling is made easy once the proper infrastructure is put in place. This intervention is sure to reduce the disposal of beverage containers into the environment, especially our rivers and beaches. When implemented, it is hoped that both adults and school children will be excited and motivated to recycle thus initiating a sense of social and environmental responsibility.

- EMA staff and clean-up volunteers at Salybia Beach.

❖ Rubbish being taken away for recycling

OTHER ACTIVITIES

ENFORCEMENT MATTERS

- Enforcement matters related to section 35(2) of the EM Act and the CEC Rules 2001

During this fiscal year, the Authority was actively engaged in enforcing the CEC Rules 2001 and addressing the problem of increasing development projects which required a CEC but which proceeded without the developer having obtained the requisite CEC.

One such notable enforcement matter included Blue Waters Product Limited.

In this matter, the EMA served an Administrative Order- AO/NV/CEC 85 of 2008 against Blue Waters Products Limited (Blue Waters) arising out of a Notice of Violation NV/EC 85 of 2008 regarding Blue Waters' failure to obtain a CEC before it proceeded to conduct designated activities requiring the grant of an CEC. This matter related to the establishment of a water treatment plant located at Orange Grove Estate, Tacarigua.

The activities engaged in by Blue Waters were consistent with activities listed in the Schedule to the CEC (Designated Activities) Order 2001 (as amended), namely: Activity 8(a)-the clearing,

excavation, grading or land filling of an area of more than 2 hectares during a two year period and; Activity 38(a)- the establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a facility for the catchment, abstraction or treatment of potable or process water.

In June 2008, the EMA applied to the Environmental Commission to enforce the Administrative Order. In September 2008, by Consent Order granted in the Environmental Commission, the EMA successfully obtained a substantial monetary penalty for costs and damages related to the breaches committed by Blue Waters.

- *Enforcement matters related to Noise Pollution Control Rules 2001*

In October 2008, the EMA successfully resolved noise violations with the Ministry of Sport and Youth Affairs with respect to loud noise from entertainment events which were held at the Hasely Crawford Stadium and the Jean Pierre Complex. The resolution of these matters achieves the agreement and co-operation of the Ministry to manage and monitor these facilities to ensure that noise levels emitted are within the legal limits as prescribed in the Noise Pollution Control Rules. In this agreement, the EMA also mandates the Ministry to take steps to ensure that its facilities are designed and capable to host events and activities in which the noise level can be contained and mitigated to reduce any noise nuisance and disturbance which may occur. This is a notable development in that the EMA can safeguard that large capacity entertainment events especially, have a minimal impact on residents in and around these venues.

There were also several enforcement matters taken against owners/operators of bars which were engaged in playing loud music in excess of the maximum prescribed limits set out in the Noise Pollution Control Rules.

LITIGATION

ALUTRINT - CV 2007 - 02263

1) Application for Judicial Review brought by People United Respecting the Environment (PURE) and Rights Action Group (RAG) against the Environmental Management Authority (EMA), Alutrint Limited and The Attorney General.

2) Application for Judicial Review between Smelta Karavan against the Environmental Management Authority (EMA), Alutrint Limited and the Attorney General.

3) CV 2007- 02272 Application for Judicial Review brought by Chatam/Cap-de-Ville Environmental Protection Company against the Environmental Management Authority (EMA), Alutrint Limited and The Attorney General.

On April 2, 2007, the EMA granted CEC 1033/2005 to Alutrint Limited to carry on at Union Industrial Estate, Main Site 'B', La Brea, designated activity 21 listed in the Schedule to the CEC Designated Activities Order 2001. The application was made by Alutrint Limited in 2005 for the establishment of an Aluminium Smelter Complex with a target capacity of 125, 000 metric tonnes per annum.

Activity 21 relates to the establishment of a facility for the production and reforming of metals or related products.

On June 29, 2007, several claimants filed applications for leave to apply for judicial review of the decision of the EMA to grant a CEC1033/2005 to Alutrint Limited for the construction of the Aluminium Smelter at Union Village, La Brea.

On September 13, 2007 the Court granted leave to all the intended Claimants to proceed for judicial review in the terms of the relief sought and upon the grounds stated in their respective Notices of Application. On the same date, the Court further granted special leave to the Attorney General to participate in the actions and further directed that "the EMA be named as the Defendant and Alutrint Limited and the National Energy Corporation be named as the Interested Parties."

As the named defendant, the EMA prepared its submission in response the judicial review application which was heard before Justice Mira Dean-Armorer during the period spanning October- December 2008. The Court reserved its judgment.

- *Fishermen and Friends of the Sea v The Minister of Planning, Housing and the Environment – CV 04593 of 2008*

On August 21, 2008, a Pre-Action Protocol letter was sent to the Honourable Minister of Planning, Housing and the Environment by Narinesingh, Ramlogan and Company, Attorneys-at-Law on behalf of Fishermen and Friends of the Sea (FFOS), giving notice of its intention to initiate legal proceedings with respect to the alleged failure to consider and/or apply the polluter pays principle in fixing the fee structure for the Water Pollution (Fees) (Amendment) Regulations 2006 (WPFR). Subsequently, on November 21st, 2008, an application for leave to apply for judicial review was filed by FFOS and granted by the Court.

The WPFR are regulations made under the Water Pollution Rules 2001 (as amended) which are administered by the EMA.

The hearing of the judicial review application will be heard in 2009.

CERTIFICATE OF ENVIROMENTAL CLEARANCE (CEC) APPLICATIONS

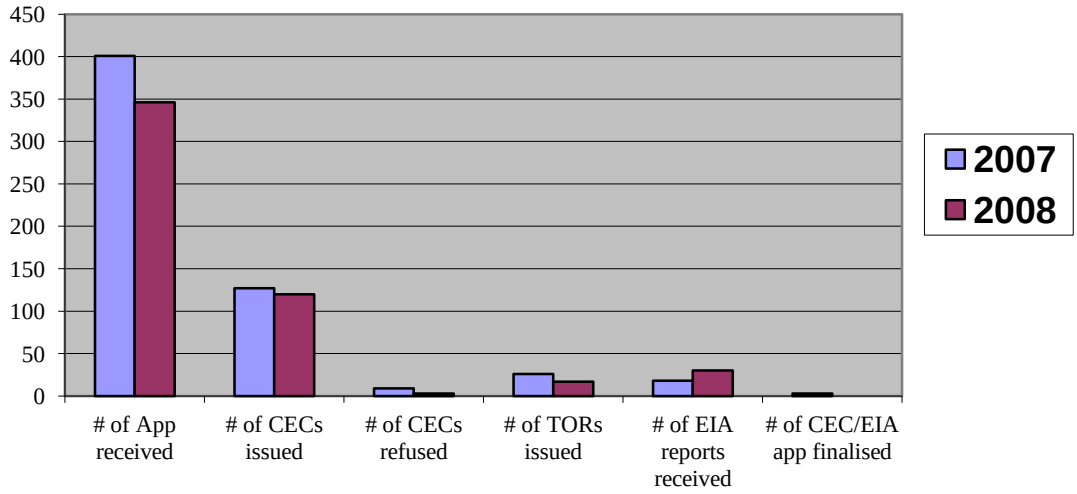
In 2008, three hundred and forty-six (346) CEC applications were received, of which three were refused and one hundred and twenty certificates were issued. The CEC statistics for 2008 are shown in the table below.

CEC Status	TOTAL
Number of applications received in 2008	**346**
Number of CECs issued in 2008	**120**
Number of CECs refused to date	**3**
Number of applications received in 2008 requiring EIAs	**17**
Number of TORs issued in 2008	**17**
Number of EIA Reports received in 2008	**30**

❖ *Table: CEC Status for 2008*

Between 27 August 2001 and 31 December 2008, the EMA received a total of 1,308 CEC applications, of these 914 CECs were granted. Of the remaining 394 applications, some are being processed, in some instances, CECs were not required, in others, the applicants failed to continue the process and in some cases the EMA is awaiting the delivery of EIAs by applicants. The graph below exhibits a decrease in the number of CEC applications received from 2007 to 2008. There was however an increase in the number of EIA reports received and this may be a result of the EMA receiving EIAs requested from previous years, as well as an increase in the number of complex CEC applications received during the year 2008.

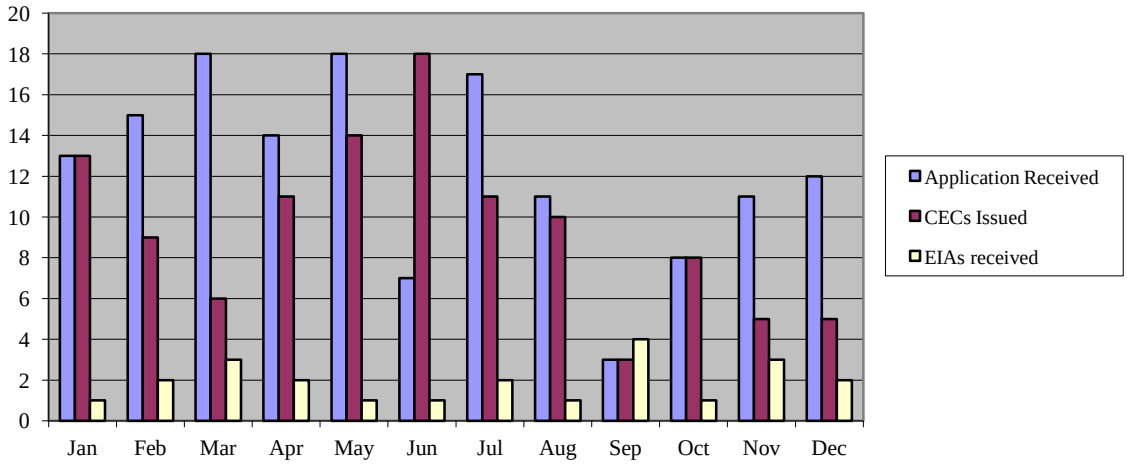
CEC statistics for 2007 and 2008



❖ ***Graph: Comparison of CEC statistics for 2007 and 2008***

The Energy-related CEC statistics for 2008 are shown in the graph below. A total of one hundred and forty-seven (147) applications were received, of which one hundred and thirteen (113) CECs were issued and thirteen (13) EIAs were received. For the period July 2008 to December 2008, sixty-two (62) energy-related applications for a Certificate of Environmental Clearance (CEC) were received.

Energy Related CEC Applications in 2008



❖ *Graph: Energy Related CEC Applications in 2008*

The graph above also shows a decrease in the number of CEC applications received between the first and second half of 2008. From January to June 2008, eighty-five (85) CEC applications and from July- December 2008 a total of sixty-two (62) applications were received. This decrease may in part be attributed to the onset of the global economic crisis and the accompanying alarming drop in the price of oil. It is worth noting however, that from October to December 2008, there was a gradual increase in applications received.

- Significant CEC applications processed in 2008

Some of the more significant CEC applications received and processed in 2008 included the following:

Processing of CEC1263/2005 - NEC - Point Lisas Industrial Estate South and East Expansion

The EMA received a CEC application on November 29, 2006 for the Clearing and Infrastructural Works associated with the Expansion of the Point Lisas South and East Industrial Estate

The EIA was submitted with several deficiencies mainly related to determining the size of the proposed site and its location within the study area. The Review and Assessment Report was issued on August 08 2008 - the determination date of the application. A delay letter was also issued informing NEC of an extension of the CEC determination date to December 3, 2008. The CEC determination date was extended to February 2, 2009, that is a further forty days to provide NEC with sufficient time to submit a response to the review and assessment report.

Processing of CEC1283/2005: NEC

The EMA received an application from NEC on December 12, 2005 for the Establishment of a Marine Terminal/Port Facility and Fishing Port at Galeota. An EIA was requested and final TOR was issued on March 27, 2007. The EIA was submitted on September 08, 2008. The review and Assessment Report was issued on December 23, 2008 and a decision is due on January 26, 2009.

Processing of CEC1743/2006: Carisal

The EMA received an application from Carisal Ltd on September 25, 2007 for the establishment of a Calcium Chloride facility at the proposed Point Lisas South East Industrial Estate. The EMA determined that an EIA would be required and a final TOR was issued on August 16, 2007. The EIA was submitted by Carisal on June 18, 2008 and it was rejected based on the

illegibility of several key maps in the report. The report was resubmitted addressing these issues and officially accepted on August 04, 2008.

A determination on the application has been delayed from November 24, 2008 to January 22, 2009 pending the submission of Carisal's response to the Review and Assessment Report (RAR).

Processing of CEC1761/2007: NEC- Port of Point Lisas

The EIA for this application was received by the EMA on February 15, 2008. The EIA was submitted with several deficiencies and was therefore rejected on the basis of the absence of Quality Assurance and Quality Control (QA/QC) procedures, illegible maps, raw baseline data and a risk assessment. The EIA was resubmitted and again rejected on the basis of the exclusion of a valid risk assessment and datasets along with the QA/QC procedures for sampling and analyses conducted. It should be noted that an HSE plan template was submitted and in its response the applicant indicated that a proper risk assessment could not be conducted without the final engineering designs. The EIA was therefore finally accepted on April 15, 2008.

Processing of CEC 1766/2007: NEC

The EMA received an application from NEC on January 16, 2007 for the Capital and Maintenance Dredging of the Brighton Harbour, La Brea. It was determined that an EIA was required and the final TOR was issued on April 26, 2007.

The EIA was submitted with several deficiencies and rejected on the basis of absence of QA/QC procedures, illegible maps, absence of ambient water quality data and reference to material in another EIA. The EIA was resubmitted and again rejected on the basis of the exclusion of a map and a discrepancy in the turning basin radius. The EIA was finally accepted on October 06, 2008.

Processing of CEC1982/2007: NEC

The EMA received an application from NEC on July 31, 2007 for the Erection of a Temporary Work Camp to accommodate approximately 1500 workers for the Construction of the ALUTRINT Aluminium Smelter Complex at the Union Industrial Estate, La Brea.

NEC submitted responses to further clarifications requested by the EMA, which have all been satisfactorily addressed. The determination date for this application is January 26, 2009.

Processing of CEC2085/2007 Alutrint Power Plant

The EIA was submitted with several deficiencies mainly regarding stack emissions, particularly the NO_x emissions, the resolution of which required lengthy discussions between applicant and the EMA's consultants. The CEC was issued on October 16, 2008.

Processing of CEC 2129/2007 Caribbean Quarries Limited for the Clearing and Grading of 7.48ha of land at Acono Road in Maracas Valley, St. Joseph.

The Final Terms of Reference (ToR) was issued April 11, 2008.

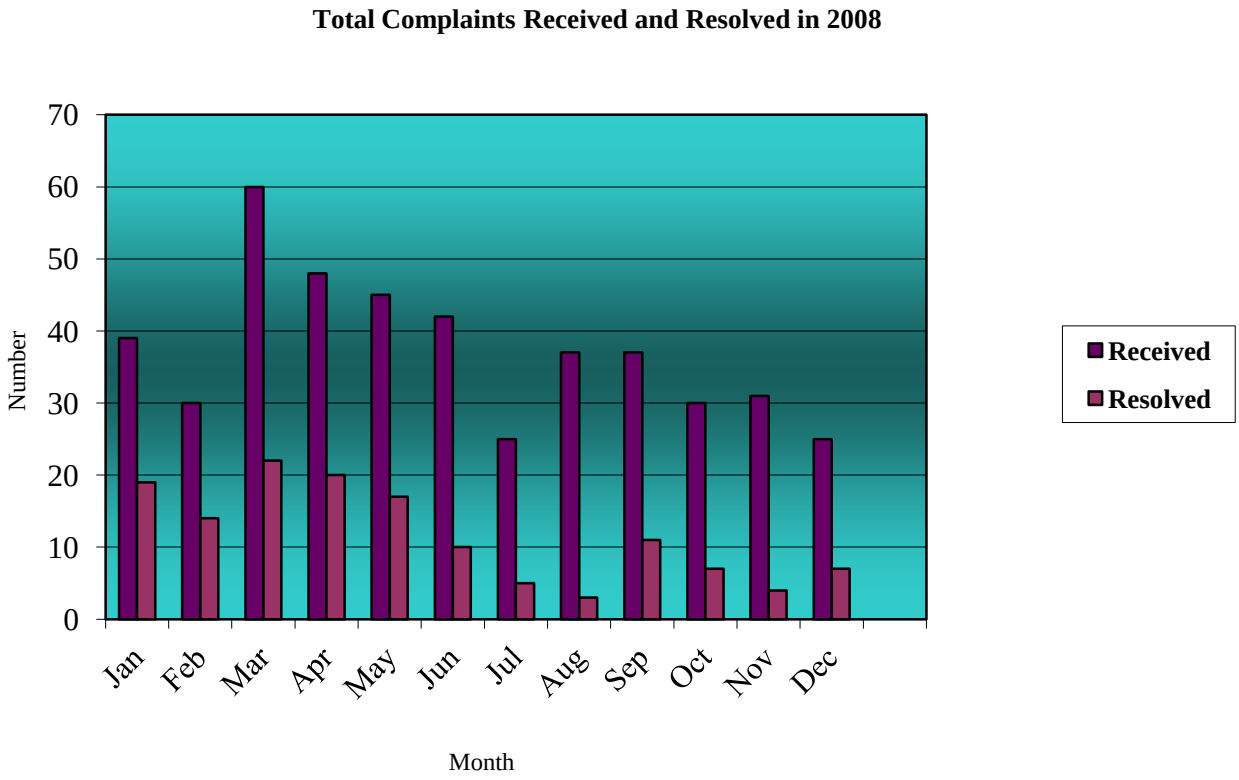
Subsequently, the Maracas Action Valley Committee (MVAC) filed a Notice of Appeal after unsuccessful mediation with the EMA. MVAC stated they were denied the opportunity to comment on the Draft ToR (they were not consulted during the 28-day period) and as such were seeking to have the EMA review their comments, provide justification on analysis of comments, withdraw the Final ToR, and re-issue the Final ToR. The EMA drafted a response to the appeal. The appeal was filed and a hearing date was scheduled for September 2008. Subsequently the hearing was stayed.

Processing of CEC2394/2008: Canadian Superior Trinidad and Tobago Limited

The EMA received an application for a CEC from Canadian Superior Trinidad and Tobago Limited (CSEI) on August 14, 2008 for the drilling of up to four (4) exploratory wells - two gas and two oil wells - located between three and seven kilometres (2 - 4 miles) from the high water mark along the east coast of Trinidad between Point Radix and Gran Cayo Point within the Mayaro-Guayaguayare (M-G) Block. This activity was being conducted to evaluate the hydrocarbon potential of the M-G Block.

COMPLIANCE ISSUES

In 2008, The EMA received 449 complaints which included general complaints (171), noise complaints (166) and CEC complaints (112). The EMA resolved 139 of these complaints or 30% in 2008. This information is illustrated in the graph below.



❖ *Graph: Total Complaints Received and Resolved in 2008*

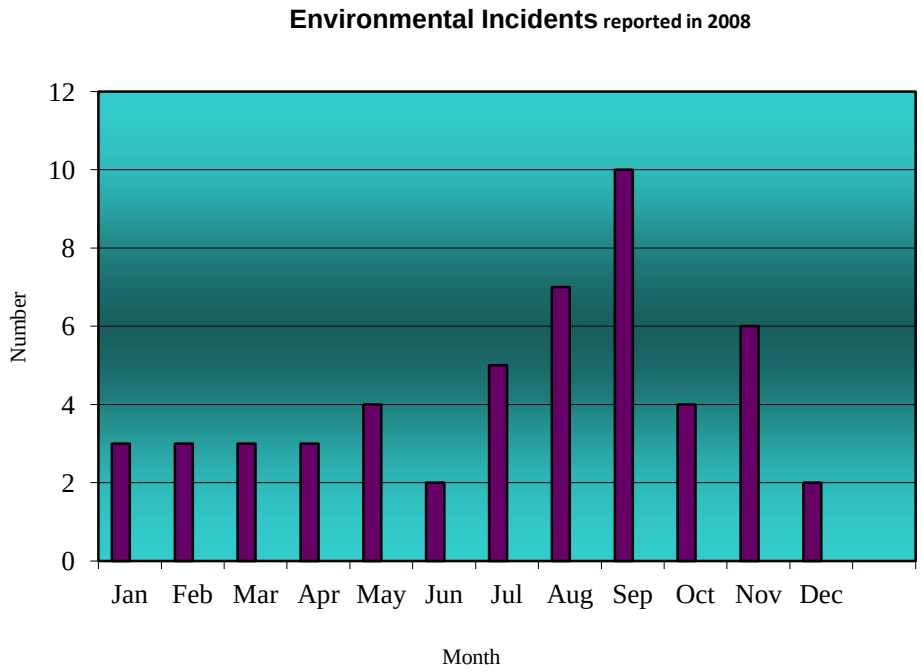
The EMA is also responsible for responding to environmental incidents such as oil spills and fish kills. In 2008, the Authority responded to incidents that included oil spills in Barrackpore, Forest Reserve, Fyzabad, Guapo, Los Bahos, Oropouche, Palo Seco, Penal, Plaisance Park, Pointe-a-Pierre, Point Fortin and Santa Flora. The EMA also investigated reports of Lignite[76] burning in Sangre Chiquito on August 29th, 2008.

The lignite burning incident occurred in the vicinity of the "At Home Retirement Care INC" on Caigul Street, Sangre Chiquito. Interviews with residents of the area revealed that the site had been smoking for approximately one year and the site in question was the only one in the area. Some residents approximately ½ mile away from the site complained that quite often they could smell the pungent smoke from the site at their homes.

[76] Lignite can be referred to as young coal or brown coal. It is burnable, softer than coal, and has the texture of the original plant fragments preserved.

- *Close up of Lignite burning. Note the white smoke, yellow mottled soil, and evidence of charring.*

The graph below shows the number of environmental incidents reported in 2008.



1.0 STRATEGIC PRIORITIES

1.1 WASTE MANAGEMENT

- Lead Remediation at Guayaguayare

Site investigations conducted in early 2008 revealed significant volumes of lead contaminated soil at Food Crop and Nurse Trace, Guayaguayare. The EMA will undertake the removal of lead contamination at this site in 2009. The removal of lead in any community will undoubtedly result in a positive social and economic impact.

1.2 HEALTHY ECOSYSTEMS

- Implementation of the updated Management Plan for the Aripo Savannas

The objective of this project is to begin implementation of the updated management plan for the Aripo Savannas ESA, with the hiring of a Project Coordinator to manage implementation.

To achieve the project objectives, park management staff will be hired to implement the management plan. This will entail:

- Education and awareness programmes for the Aripo Savannas ESA to targeted publics;
- Park management staff hired;
- Terms of Reference for project implementation;
- Architectural drawings, quantity surveys and tender documents for the visitor center for the Aripo Savannas.

- Production of Nariva Swamp Interactive Resource CD

This project seeks to provide relevant local information to supply the environmental components of the Caribbean Examinations Council (CXC) and Caribbean Advanced Proficiency Examinations syllabi (CAPE). In addition it also seeks to aid in mainstreaming the topics/themes of local biodiversity into various aspects of the school curriculum. The project hopes to promote the use of local environmental examples in explaining indirectly related subject areas. This ability to apply environmental issues to a variety of subject areas would show its integrated nature and relevance in all sectors of life and society.

- Developing a Communications strategy for the International Year for Biodiversity 2010

In response to the recommendation adopted by the eighth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD), 2010 has been proclaimed as the International Year of Biodiversity. 2009 will be utilised as a planning year in preparation of a

communication strategy to be implemented in 2010. The development of this strategy should be guided by best practices and tried and tested measures from around the world (CBD, CEPA and others), to produce a comprehensive communications and public education plan for T&T to be implemented in 2010.

In 2009 the EMA will undertake the planning for the 2010 opportunity for enhancing Communication, Education and Public Awareness (CEPA) on biodiversity issues affecting the country and the Environmentally Sensitive Species and Areas.

2.0 ENABLING STRATEGIES

2.1 COMMUNICATION

- Communicating via Website & Social Media

The EMA will continue its beneficial relationship with the media by sending print articles as well as sound bites from EMA functions and events to enhance the media's coverage of the EMA.

The EMA's website is one of the most important communication tools at the disposal of the Authority. The website content comprises a combination of public communication outputs, official documentation and reports, and general information on issues related to environmental policy and management.

An important feature of the work of the EMA that is being given critical attention is its ability to reach our stakeholders through the use of Social Media.

It is essential that we possess such a capacity. In some respects, our capabilities in the area of public communication provide important support to our technical work. The EMA needs to continue talking to the people through all available avenues, including new and emerging media.

The EMA will continue to be involved in community meetings and public consultations to address matters especially regarding the CEC process.

- EMA Radio series

The "Talking Green" radio series is designed to give members of the public an insight into the work of the EMA. Each 30-minute programme will include an interview with EMA personnel on a specialized topic, as well as environmental news and tips. There are 24 half hour radio interviews planned.

- Schools Programmes

The two schools' competitions, the Primary Schools' "Hands-on" Environmental Competition and the Secondary Schools' Dramatic Envirologue Competition, will be held for the 11th year. These competitions continue to encourage environmental education among students in the primary school system and in Forms 4 to 6, respectively. The Eco-Song Competition, designed for students from Forms 1 to 3, will be held for the second year.

- Youth Programme

The second annual Youth Summer Camp will be held in August and will focus on the theme, *Island Biodiversity for Sustainable Development.*

2.2 NETWORKING

- Community Outreach

The EMA will continue to work towards improving public engagement in the Certificate of Environmental Clearance (CEC) process.

- Education and Awareness

The EMA will continue to disseminate information on environmental issues to its many stakeholders through lectures, workshops and displays. The Authority will also facilitate this process by serving on various committees, as well as judging projects and competitions that focus environmental themes.

2.3 SYSTEMS/LEGISLATIVE REVIEW

- The EMA will finalise the Legal Notices designating the Golden Tree Frog and the Ocelot as environmentally sensitive species
- The EMA plans to review the Environmentally Sensitive Species Rules 2001 and Environmentally Sensitive Species Areas 2001
- To engage a consultant to develop and or provide recommendations regarding the calculation of administrative civil assessments made pursuant to section 66 of the EM Act.

- Enhancing Institutional Capacity in Geographic Information Systems

GISCAD Limited was subcontracted by the EMA in 2008 to determine the needs of the Authority. In 2009, the EMA plans to continue the above-mentioned project. The EMA intends to build and enhance GIS capacity of staff for greater efficiency in work flows and decision

making. GIS functionalities such as spatial analysis, trending/pattern recognition, desktop visualization and the creation of visual products are some of the areas where capacity will be developed.

- Compliance Assistance Program

The EMA plans to continue work on all CAP documents in 2009. (Oil and Gas, Coastal, Agriculture and Land Clearing, Automotive and Bio-diversity)

- Development of Environmental Impact Assessment (EIA) and Cumulative Impact Assessment (CIA) Guidelines for External Stakeholders

The Environmental Management Authority (EMA) is governed by the provisions of the Environmental Management Act Chapter 35:05 and is mandated to determine the environmental impact which might arise out of any new or significantly modified construction, process, works or other activity as outlined in the Certificate of Environmental Clearance (Designated Activities) Order, 2001 as amended by the Environmental Clearance (Designated Activities) (Amendment) Order, 2007.

The technical guideline documents are expected to sensitise external stakeholders and help them to better understand EIA and CIA as they relate to the CEC process. The project will also encourage stakeholders, in particular applicants, to submit relevant, quality information as required for a CEC application, which in turn should lead to a more efficient and effective process. This initiative has also been taken to ensure a transparent, consistent and technically sound process.

- Development of Risk Assessment Technical Guidelines Document and Determination of Risk Criteria/Standards

This project will be continued in 2009. To ensure a transparent, consistent and technically sound process, acceptable risk standards/criteria for Trinidad and Tobago need to be determined. An assessment of risk criteria in other jurisdictions will be used to inform the appropriate standards which will be adopted in Trinidad and Tobago.

In 2009, the EMA will ensure that the external guideline document contains all of the information that stakeholders will require and is in format that is user-friendly. This document will require in-depth public consultation, which will be done through consultation with relevant stakeholders and using the Public Comment procedure as defined in Section 28 of the EM Act Chapter 35:05.

- Development of an Environmental Assessment Toolkit

The EMA Environmental Assessment Toolkit will contain procedures, policies, guidelines or methodologies that can be used repetitively to ensure that each application is being assessed in a similar manner. It will also allow for the documentation of the review and decision-making process.

The Toolkit will include the following:

1. Site Visit report and checklist.
2. Screening Checklist.
3. Scoping Checklist (to assist with developing specific Terms of References).
4. Preliminary Environmental Impact Assessment (EIA) Review Checklist.
5. Checklist for Detailed Review & Assessment of EIA Reports.
6. Review & Assessment Report.
7. The EMA's Internal Guidelines, e.g. Cumulative Impact Assessment Practitioners Guide, Reduce EIA Guidelines, etc.
8. Electronic Library to ensure that all the necessary information is easily accessible to the relevant officers.

Items 1 – 6 are specific tools which are used during the different steps in the assessment of a CEC application. Item 7 will contain procedures, policies, guidelines or methodologies to address specific issues as they arise.

- Best Management Practices for Auto-body Garages in Trinidad and Tobago

This project will research the Best Management Practices (BMP) for automotive repair garages and auto-body shops. The feasibility of products and technologies available in Trinidad and Tobago will also be examined. This research will be used to inform the development of a Compliance Assistance Programme (CAP) document for Designated Activity 43 (a).

Recommendations will be made on the most feasible BMPs which will help stakeholders in this sector comply with regulatory requirements and improve environmental performance.

2.4 CO-ORDINATION/GOVERNMENT RELATIONS

- Nariva Reforestation Initiative

The Nariva Swamp Restoration and Carbon Sequestration Initiative is a collaborative project being undertaken by the Forestry Division- Ministry of Agriculture, Lands and Marine Resources the EMA and the University of the West Indies. The objective of this project is to initiate a pre-pilot phase linked to the pilot phase consisting of the establishment of the nursery and plan, with the eventual hiring of a Project Coordinator to coordinate the complete implementation of the reforestation plan.

The reforestation plan is linked to the hydrology, topographical and climate studies to determine the potential for carbon sequestration and the mitigation of greenhouse gases (GHG) through the restoration of wetlands located in the Nariva Swamp.

- World Environment Day Activities

Whether the Authority celebrates World Environment Day via the United nations theme for the year or a more localized theme, it will do so in collaboration with its sister environmental agencies and Ministries.

- International Coastal Clean-up (ICC)

The EMA will continue its role on the National Planning Committee which plans the annual beach clean-up throughout Trinidad and Tobago. The EMA hosts the Salybia Beach site and invites volunteers, schools, Community-based and non-governmental organizations to clean up that beach on the third Saturday in September every year. This event is a worldwide event and raises awareness about Marine Pollution due to land-based activities. The EMA continues to be a part of this committee.

APPENDIX 1

BOARD OF DIRECTORS

As at December 31, 2008

Dr. John Agard	-	**Chairman**
Mr. David Abdulah	-	**Director**
Dr. Rohit Doon	-	**Director**
Ms. Molly Gaskin	-	**Director**
Dr. Carol James	-	**Director**
Mr. Ruben Mc Sween	-	**Director**
Ms. Nafeesa Mohammed	-	**Director**
Mr. Raye Sandy	-	**Director**
Dr. Dave McIntosh	-	**Ex-Officio Member**
		Managing Director

BOARD COMMITTEES

HUMAN RESOURCES COMMITTEE

Mr. David Abdulah	-	**Chairman**
Dr. John Agard	-	**Member**
Mr. Ruben Mc Sween	-	**Member**
Ms. Molly Gaskin	-	**Member**

PUBLIC AWARENESS AND EDUCATION COMMITTEE

Ms. Molly Gaskin	-	**Chairperson**
Mr. Ruben McSween	-	**Member**

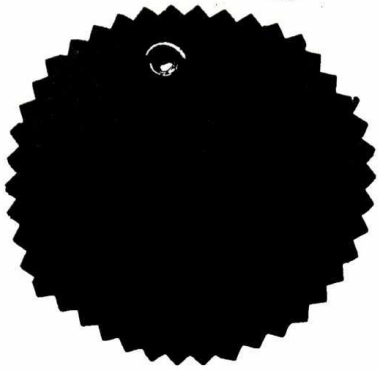
TECHNICAL COMMITTEE

Dr. John Agard	-	**Chairman**
Dr. Rohit Doon	-	**Member**
Mr. Raye Sandy	-	**Member**
Dr. Carol James	-	**Member**
Ms. Nafeesa Mohammed	-	**Member**

TRUSTEES OF THE ENVIRONMENTAL FUND

Mr. Ruben Mc Sween	-	**Chairman**
Ms. Molly Gaskin	-	**Trustee**
Mr. Raye Sandy	-	**Trustee**
Dr. Carol James	-	**Trustee**
Ms. Nafeesa Mohammed	-	**Trustee**

PART C: ENVIRONMENTAL TRUST FUND AUDITED FINANCIAL REPORT FOR THE YEAR ENDED: SEPTEMBER 30, 2008



REPUBLIC OF TRINIDAD AND TOBAGO
AUDITOR GENERAL'S DEPARTMENT

REPORT OF THE AUDITOR GENERAL

ON THE FINANCIAL STATEMENTS OF THE ENVIRONMENTAL MANAGEMENT AUTHORITY – ENVIRONMENTAL TRUST FUND

FOR THE YEAR ENDED

2008 September 30

REPORT OF THE AUDITOR GENERAL OF THE REPUBLIC OF TRINIDAD AND TOBAGO ON THE FINANCIAL STATEMENTS OF THE ENVIRONMENTAL MANAGEMENT AUTHORITY - ENVIRONMENTAL TRUST FUND FOR THE YEAR ENDED 2008 SEPTEMBER 30

The accompanying Financial Statements of the Environmental Management Authority - Environmental Trust Fund for the year ended 2008 September 30 have been audited. The Statements as set out on pages 2 to 17 comprise a Balance Sheet as at 2008 September 30, a Statement of Income, a Statement of Movement of Funds and a Statement of Cash Flows for the year ended 2008 September 30 and Notes to the Financial Statements numbered 1 to 14.

2. The audit was conducted by a firm of Accountants appointed by the Board of Directors with the written consent of the Auditor General. Their Report dated 2009 May 20 refers.

SUBMISSION OF REPORT

3. This Report is being submitted to the Speaker of the House of Representatives, the President of the Senate and the Minister of Finance in accordance with the provisions of sections 116 and 119 of the Constitution of the Republic of Trinidad and Tobago.

2010 JANUARY 12

REPUBLIC OF TRINIDAD AND TOBAGO RB 2010-01-12 AUDITOR GENERAL

SHARMAN OTTLEY
AUDITOR GENERAL

PKF

Chartered Accountants
& Business Advisors

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

FINANCIAL STATEMENTS

30 SEPTEMBER 2008

PKF

Chartered Accountants
& Business Advisors

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

INDEX

PKF

Chartered Accountants
& Business Advisors

INDEPENDENT AUDITORS' REPORT

The Trustees
Environmental Management Authority -
Environmental Trust Fund

We have audited the accompanying financial statements of Environmental Management Authority – Environmental Trust Fund, which comprise the balance sheet as at 30 September 2008, the statements of income, movement of funds and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory notes.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with International Financial Reporting Standards. This responsibility includes: designing, implementing and maintaining internal control, relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Environmental Management Authority – Environmental Trust Fund as of 30 September 2008, and of its financial performance and cash flows for the year then ended in accordance with International Financial Reporting Standards.

PKF

Port of Spain
20 May 2009

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Email pkf-trinidad@trinidad.net
PKF | 245 Belmont Circular Road | PO Bag 250 | Belmont | Port-of-Spain | Trinidad | WI

Partners Ainsley A. Mark | Michael G. Toney | Reneé-Lisa Philip | Mark K. Superville

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

BALANCE SHEET

ASSETS

	Notes	30 September 2008	2007
Cash Resources:			
Cash in hand and at bank	5	$ 7,350,892	$ 5,616,333
Short-term investments	6	11,350,125	12,049,918
Total Cash Resources		18,701,017	17,666,251
Other Assets:			
Accounts receivable and prepayments	7	1,330,718	580,621
Fixed assets	8	28,281,447	24,557,969
Total Other Assets		29,612,165	25,138,590
Total Assets		**$ 48,313,182**	**$42,804,841**

LIABILITIES AND FUNDS

Liabilities:			
Overdrawn current account	9	$ 39,533	$ -
Accounts payable and accruals	10	6,680,575	1,640,977
Total Liabilities		6,720,108	1,640,977
Funds:			
GORTT Fund		36,283,290	36,505,155
UNDP Fund		649,916	(140,175)
IBRD Fund		3,888,680	4,178,917
Other Fund		771,188	619,967
Total Funds		41,593,074	41,163,864
Total Liabilities and Funds		**$ 48,313,182**	**$42,804,841**

Robert C. Jeen
Trustee

Barbara Lodge-Johnson
Trustee

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF INCOME

	For the year ended 30 September 2008	2007
Income:		
Government Fund	$ 36,070,000	$ 29,295,000
UNDP Fund	2,090,300	524,099
IBRD Fund	1,232,815	551,623
Other Fund income	422,569	377,223
Interest income	809,833	951,343
Activities income	1,403,019	2,945,506
Profit on disposal of fixed assets	-	71,826
Gain on foreign exchange	997	2,369
	42,029,533	34,718,989
Project expenses	(10,196,930)	(4,812,047)
Income after project expenditure	31,832,603	29,906,942
Expenditure:		
Advertising and promotions	752,538	1,290,799
Audit fees	59,400	65,000
Conference costs	50,537	51,902
Contract services	285,226	254,657
Depreciation	1,569,902	1,443,000
Directors' fees	314,800	229,200
Interest and bank charges	12,270	10,097
Insurance	333,948	329,489
Loss on disposal of fixed assets	341,488	-
Motor vehicle expenses	313,987	267,214
Maintenance contracts	570,385	382,847
Management fees	19,500	-
Office and general expenses	110,251	58,795
Permitting and compliance costs	3,084,148	2,619,799
Professional fees	28,217	109,592
Publication costs	6,000	45,000
Reference and research cost	154,959	155,152
Rent	1,337,292	576,632
Repairs and maintenance	1,065,815	285,310
Salaries and benefits	17,016,209	15,014,531
Security	617,569	434,189
Selection and recruitment costs	88,332	94,543
Supplies	685,490	577,835
Training	433,869	253,905
Travel	185,264	177,302
Utilities	1,184,151	753,598
	30,621,547	25,480,388
Net surplus for the year	**$ 1,211,056**	**$ 4,426,554**

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF MOVEMENT OF FUNDS

For the year ended 30 September 2008

	GORTT Fund	UNDP Fund	IBRD Fund	Other Fund	Total
Balance as at 1 October 2006	$ 32,427,846	$ (161,025)	$4,227,745	$ 242,744	$36,737,310
Funds received	29,295,000	524,099	551,623	377,223	30,747,945
Interest income	944,265	-	7,078	-	951,343
Activities income	2,945,506	-	-	-	2,945,506
Profit on disposal of fixed asset	71,826	-	-	-	71,826
Gain on foreign exchange	2,369	-	-	-	2,369
Expenditure	(29,181,657)	(503,249)	(607,529)	-	(30,292,435)
Balance as at 1 October 2007	36,505,155	(140,175)	4,178,917	619,967	41,163,864
Equity adjustment **(Note 14)**	(781,846)	-	-	-	(781,846)
Funds received	36,070,000	2,090,300	1,232,815	422,569	39,815,684
Interest income	805,725	-	4,108	-	809,833
Activities income	1,403,019	-	-	-	1,403,019
Gain on foreign exchange	997	-	-	-	997
Loss on disposal of fixed assets	(341,800)	-	-	-	(341,800)
Other expenditure	(37,377,960)	(1,300,209)	(1,527,160)	(271,348)	(40,476,677)
Balance at 30 September 2008	**$ 36,283,290**	**$ 649,916**	**$3,888,680**	**$ 771,188**	**$41,593,074**

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF CASH FLOWS

	For the year ended 30 September 2008	2007
Cash Flows from Operating Activities:		
Net surplus for the year	$ 1,211,056	$ 4,426,554
Adjustments:		
Depreciation	1,569,902	1,443,000
Loss on disposal of fixed assets	341,488	(71,826)
Equity adjustment **(Note 14)**	(781,846)	-
	2,340,600	5,797,728
(Increase) in accounts receivable and prepayments	(750,099)	(195,421)
Increase/(decrease) in accounts payable and accruals	5,039,599	(756,188)
Cash provided by Operating Activities	6,630,100	4,846,119
Cash Flows from Investing Activities:		
Purchase of fixed assets	(5,666,870)	(8,892,126)
Proceeds from sale of fixed assets	32,003	170,198
Cash used in Investing Activities	(5,634,867)	(8,721,928)
Increase/(decrease) in cash and cash equivalents	995,233	(3,875,809)
Cash and cash equivalents, beginning of year	17,666,251	21,542,060
Cash and cash equivalents, end of year	**$18,661,484**	**$ 17,666,251**
Represented by:		
Cash in hand and at bank	$ 7,350,892	$ 5,616,333
Short-term investments	11,350,125	12,049,918
Overdrawn current account	(39,533)	-
	$18,661,484	**$17,666,251**

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2008

1. **Registration and Activities:**

The Environmental Management Authority (the Authority) is a Statutory Authority established when Parliament assented to the Environmental Management Act on 7 March 1995. The Authority was established to develop and implement institutional arrangements for the regulation and management of the environment in the Republic of Trinidad and Tobago.

The Environmental Trust Fund was established by the Act to fund the operations of the Authority and is administered by five members of the Board of Directors, designated by the President to act as Trustees.

The Environmental Management Act 1995 was repealed in March 2000 and replaced by the Environmental Management Act 2000. The new Act changed the financial year end of the Authority to 30 September.

2. **Summary of Significant Accounting Policies:**

(a) Basis of financial statements preparation -

These financial statements are prepared in accordance with International Financial Reporting Standards (IFRS), and are stated in Trinidad and Tobago dollars. The historical cost basis is used, except for the measurement at fair value of available-for-sale investments and certain other financial instruments.

(b) New Accounting Standards and Interpretations -

i) The Authority has not applied the following International Financial Reporting Interpretations Committee (IFRIC) interpretations that became effective during the current year as they do not apply to the activities of the Authority:

IFRIC 12	Service Concession Arrangements
IFRIC 13	Customer Loyalty Programmes
IFRIC 16	Hedges of a Net Investment in a Foreign Operation

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2008

2. **Summary of Significant Accounting Policies (Cont'd):**

(b) New Accounting Standards and Interpretations (cont'd) -

ii) Certain amendments or revisions to the standards listed below are effective for accounting periods beginning on or after 1 January 2009.

IFRS 1	First-time Adoption of International Financial Reporting Standards.
IFRS 2	Share-based Payment.
IFRS 8	Operating Segments.
IAS 1	Presentation of Financial Statements.
IAS 16	Property, Plant and Equipment.
IAS 19	Employee Benefits.
IAS 20	Government Grants and Disclosure of Government Assistance.
IAS 23	Borrowing Costs.
IAS 27	Consolidated and Separate Financial Statements.
IAS 28	Investment in Associates.
IAS 29	Financial Reporting in Hyperinflationary Economies.
IAS 32	Financial Instruments: Presentation.
IAS 36	Impairment of Assets.
IAS 38	Intangible Assets.
IAS 39	Financial Instruments: Recognition and Measurement.
IAS 40	Investment Property.

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2008

2. **Summary of Significant Accounting Policies (Cont'd):**

(b) New Accounting Standards and Interpretations (cont'd) -

ii) (cont'd) -

IAS 41	Agriculture.
IFRIC 14	IAS 19 – The Limit on a Defined Benefit Asset, Minimum Funding Requirements and their Interaction
IFRIC 15	Agreements for the Construction of Real Estate.

Certain amendments or revisions to the standards listed below are effective for accounting periods beginning on or after 1 July 2009.

IFRS 3	Business Combinations – Comprehensive revision on applying the acquisition method
IFRS 5	Non-current Assets Held for Sale and Discontinued Operations.
IAS 31	Interest in Joint Ventures.
IFRIC 17	Distributions of Non-cash Assets to Owners.
IFRIC 18	Transfer of Assets from Customers.

(c) Fixed assets and depreciation -

Land and buildings comprise offices occupied by the Authority and include land purchased for construction of new offices in Trincity, stated at historical cost, less depreciation. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Authority and the cost of the item can be measured reliably. All other repairs and maintenance are charged to the Statement of Income during the financial period in which they are incurred.

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2008

2. **Summary of Significant Accounting Policies (Cont'd):**

(c) Fixed assets and depreciation (cont'd) -

Depreciation is calculated on the reducing balance method to write off the cost of assets to their residual values over their estimated useful life as follows:

Building	-	2% - 20% per annum
Furniture and fittings	-	10% per annum
Office equipment	-	20% per annum
Motor vehicles	-	25% per annum
Computer equipment	-	25% per annum
Library/Information	-	10% per annum

Land is not depreciated as it is deemed to have an indefinite life.

Where the carrying amount of an asset is greater than its estimated recoverable amount, it is written down immediately to its recoverable amount.

Gains and losses on disposal of property, plant and equipment are determined by reference to their carrying amounts and are included in the Statement of Income.

(d) Foreign currency -

Monetary assets and liabilities denominated in foreign currencies are expressed in Trinidad and Tobago dollars at rates of exchange ruling at the Balance Sheet date. All revenue and expenditure transactions denominated in foreign currencies are translated at the rates of exchange ruling at the date of the transaction and the resulting profits and losses on exchange from trading activities are recorded in the Statement of Income.

(e) Taxation -

The Authority is exempt from taxation under the Environmental Management Act of 2000, Part VII Section 76.

(f) Use of estimates -

The preparation of the financial statements in conformity with International Financial Reporting Standards, requires management to make estimates and assumptions that affect the reported amount of assets and liabilities. Also required is the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

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2. **Summary of Significant Accounting Policies (Cont'd):**

(g) Financial instruments -

Financial assets and financial liabilities are recognised on the Authority's Balance Sheet when the Authority becomes a party to the contractual provisions of the instrument.

Cash and cash equivalents

Cash and cash equivalents consist of highly liquid investments with original maturities of three months or less and are carried at cost, which approximates market value.

Trade payables

Trade payables are stated at amounts due.

(h) Income and funding -

Funding was provided to the Environmental Management Authority Environmental Trust Fund as follows:

(i) Proceeds of a loan of US$6.25 million from the IBRD to the Government of the Republic of Trinidad and Tobago (GORTT). The loan facility closed on 31 December 2000. During the financial year ended 30 September 2008, the EMA received grant funds from the IBRD to facilitate the Nariva Reforestation Initiative Project.

(ii) Ongoing funding from the GORTT to cover recurrent and development programme expenditure.

(iii) Grant funds are provided by the United Nations Development and Environment Programmes (UNDP and UNEP) to fund specific activities that are set out in the relevant multilateral agreements. The main projects administered by the Environmental Management Authority Environment Trust Fund during the financial year ended 30 September 2008 are the Second National Communication to the Convention on Climate Change; Phase IV of the Institutional Strengthening Programme for the Phase-out of Ozone Depleting Substances; and Phase II of the Terminal Management Plan for the Phase-out of CFC's.

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3. **Financial Risk Management:**

Financial risk factors

The Authority is exposed to liquidity risk, currency risk, operational risk, compliance risk and reputational risk arising from the financial instruments that it holds. The risk management policies employed by the Authority to manage these risks are discussed below:

(a) Liquidity risk -

Liquidity risk is the risk that arises when the maturity of assets and liabilities do not match. An unmatched position potentially enhances net surplus for the year, but can also increase the risk of losses. The Authority has procedures with the object of minimising such losses such as maintaining sufficient cash and other highly liquid current assets.

(i) Risk management

The matching and controlled mismatching of the maturities and interest rates of assets and liabilities are fundamental to the management of the Authority. The Authority employs various asset/liability techniques to manage liquidity gaps. Liquidity gaps are mitigated by the nature of a substantial amount of the Authority's assets as well as securing sufficient cash from the Government of the Republic of Trinidad and Tobago.

To manage and reduce liquidity risk the Authority's management actively seeks to match cash inflows with liability requirements.

(b) Currency risk -

Currency risk is the risk that the value of financial instruments will fluctuate due to changes in foreign exchange rates. Currency risk arises when future commercial transactions and recognised assets and liabilities are denominated in a currency that is not the Authority's measurement currency. The Authority is exposed to foreign exchange risk arising from various currency exposures primarily with respect to the United States dollar. The Authority's management monitors the exchange rate fluctuations on a continuous basis and acts accordingly.

(c) Operational risk -

Operational risk is the risk that derives from deficiencies relating to the Authority's information technology and control systems, as well as the risk of human error and natural disasters. The Authority's systems are evaluated, maintained and upgraded periodically.

(d) Compliance risk -

Compliance risk is the risk of financial loss, including fines and other penalties, which arise from non-compliance with laws and regulations of the State.

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3. **Financial Risk Management (Cont'd):**

(e) **Reputational risk -**

The risk of loss of reputation arising from the negative publicity relating to the Authority's operations (whether true or false) may result in a reduction in its revenue from government funding.

4. **Critical Accounting Estimates and Judgements:**

The preparation of financial statements in accordance with International Financial Reporting Standards requires management to make judgements, estimates and assumptions in the process of applying the Authority's accounting policies.

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The Authority makes estimates and assumptions concerning the future and actual results could differ from those estimates as the resulting accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below:

Changes in accounting estimates are recognised in the Statement of Income in the period in which the estimate is changed, if the change affects that period only. If the change affects a prior period, the Authority recognizes this change in the Statement of Movement of Funds in the current period.

The critical judgement, apart from that involving estimations, which has the most significant effect on the amounts recognised in the financial statements, is as follows:- Which depreciation method for buildings and equipment is used.

The key assumption concerning the future and other key sources of estimation uncertainty at the Balance Sheet date (requiring management's most difficult, subjective or complex judgements) that has a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year is with respect to buildings and equipment. Management exercises judgement in determining whether future economic benefits can be derived from expenditures to be capitalised and in estimating the useful lives and residual values of these assets.

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5. **Cash in Hand and at Bank:**

	30 September 2008	2007
Petty cash	$ 8,940	$ 6,816
Republic Bank Limited -		
Operating account	5,002,686	3,826,152
Nariva Carbon Assessment Grant	245,448	278,309
First Citizens Bank Limited -		
Permit income account	1,037,849	266,111
RBTT Bank Limited -		
Institutional strengthening	107,801	127,957
Other projects	246,273	196,113
Biodiversity	41,934	41,934
UNFCCC	-	319,350
Biosafety	224,633	344,401
NCSA	76,512	-
Scotiabank Trinidad and Tobago Limited -		
Terminal Phaseout Management Plan	338,674	156,492
Fleet Card	20,142	52,698
	$ 7,350,892	$ 5,616,333

6. **Short-term Investments:**

Available-for-Sale:	30 September 2008	2007
Republic Bank Limited Pool Bond	$ 2,921,378	$ 4,070,946
Trinidad and Tobago Unit Trust Corporation	3,871,760	3,641,502
RBTT Bank Limited	2,570,513	4,337,470
ROYTRIN climate change	1,986,474	-
	$ 11,350,125	$ 12,049,918

7. **Accounts Receivable and Prepayments:**

	30 September 2008	2007
Accounts receivable	$ 40,000	$ 6,000
VAT receivable	1,088,689	438,743
Other receivables	100,306	102,019
Prepayments	101,723	33,859
	$ 1,330,718	$ 580,621

8. Fixed Assets:

Cost	Land	Building	Furniture and fittings	Office equipment	Motor vehicles	Computer equipment	Library/ Information	Total
Balance as at 1 October 2007	$10,729,868	$ 11,336,082	$ 2,551,630	$ 3,647,152	$ 2,448,054	$3,720,217	$ 332,331	$ 34,765,334
Additions	3,000,000	-	883,410	504,138	773,072	506,250	-	5,666,870
Disposals	-	-	-	(19,243)	(606,487)	(522,459)	-	(1,148,189)
Balance as at 30 September 2008	13,729,868	11,336,082	3,435,040	4,132,047	2,614,639	3,704,008	332,331	39,284,015
Accumulated Depreciation								
Balance as at 1 October 2007	-	2,773,365	1,083,389	2,183,211	1,319,217	2,642,669	205,514	10,207,365
Charge for the year	-	285,704	233,327	332,346	385,078	320,766	12,681	1,569,902
Disposals	-	-	-	(10,712)	(309,399)	(454,588)	-	(774,699)
Balance as at 30 September 2008	-	3,059,069	1,316,716	2,504,845	1,394,896	2,508,847	218,195	11,002,568
Net Book Value								
Balance as at 30 September 2008	**$13,729,868**	**$ 8,277,013**	**$ 2,118,324**	**$ 1,627,202**	**$ 1,219,743**	**$1,195,161**	**$ 114,136**	**$ 28,281,447**
Balance as at 30 September 2007	**$10,729,868**	**$ 8,562,717**	**$ 1,468,241**	**$ 1,463,941**	**$ 1,128,837**	**$1,077,548**	**$ 126,817**	**$ 24,557,969**

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9. **Overdrawn Current Account:**

	30 September 2008	2007
RBTT Bank Limited - UNFCC	$ 39,533	$ -

10. **Accounts Payable and Accruals:**

	30 September 2008	2007
Accounts payable	$ 1,791,678	$ 480,303
Other payables	96,637	30,447
Accruals	2,900,498	1,130,227
Ministry of Public Utilities and the Environment - National Forest Inventory Project	1,891,762	-
	$ 6,680,575	$ 1,640,977

11. **Funding:**

Funds received during the year ended 30 September 2008 are as follows:

		30 September 2008	2007
External Funding			
UNDP	TT$	$ 2,090,300	$ 524,099
IBRD	TT$	1,232,815	551,623
Other	TT$	422,569	377,223
Core Funding			
GORTT	TT$	36,070,000	29,295,000
Activities Income	TT$	1,403,019	2,945,506

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12. Fair Values:

Fair value is the amount for which an asset could be exchanged, or a liability settled between knowledgeable, willing parties in an arm's length transaction. The existence of published price quotation in an active market is the best evidence of fair value. Where market prices are not available, fair values are estimated using various valuation techniques, including using recent arm's length market transactions between knowledgeable, willing parties, if available, current fair value of another financial instrument that is substantially the same and discounted cash flow analysis.

The following methods have been used to estimate the fair values of various classes of financial assets and liabilities:

Current assets and liabilities -

The carrying amounts of current assets and liabilities are a reasonable approximation of the fair values because of their short-term nature.

13. Related Party Transactions:

Parties are considered to be related if one party has the ability to control the other party or exercise significant influence over the other party in making financial decisions.

Key management personnel are those persons having the authority and responsibility for planning, directing and controlling the activities of the Authority.

A number of transactions are entered into with related parties in the normal course of business. These transactions were carried out on commercial terms at market rates.

Balances and transactions with related parties and key management personnel during the year were as follows:

	30 September 2008	2007
Other expenses		
Directors' fees	$ 314,800	$ 229,200
Key management compensation		
Short-term benefits	2,490,046	2,126,743

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14. **Equity Adjustment:**

The equity adjustment of **$781,846** for violations and damages collected by the Authority during the period June 2002 to September 2007 was recorded as income, pending the outcome of an opinion sought in 2005 from the then Ministry of Public Utilities and Environment. A response was received in November 2008 from the now Ministry of Planning, Housing and Environment which states that the amounts should actually have been deposited to the Consolidated Fund in accordance with Section 79(5) of the Environmental Management Act.

PART D: FINANCIAL ASSISTANCE OF OTHER SUPPORT

There are no qualifying activities under Section 14 (1d) of the Environmental Management Act, 2000, for the year 2008.

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