

ENVIROFOCUS



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DIRECTOR'S MESSAGE

he Environmental Protection Department has undergone significant evolution since its establishment in March 1971. These changes have been driven largely by adaptations in light of new globally driven challenges in the areas of emerging environmental concerns such as antimicrobial resistance, groundwater protection, management of solid and hazardous wastes, plastics pollution, radiation protection, air and noise pollution, climate change impacts, global policy and legal reforms, and changing social perspectives on the environment.

As such, the department participated in the development of the following legislation:

- the Marine Pollution Control (Discharge) Regulations 2023;
- the Water Reuse Bill, 2023;
- the Barbados Water Authority (Amendment) Bill 2023;
- the Barbados Water Authority (Water Protection Zones) Order, 2023;
- the Draft Radiation Protection, Safety, and Security Bill and Regulations;
- and the Draft Barbados National Ozone Depleting Substances (ODS) Phase-out Policy.

The department also participated in the 5th Session of the Intergovernmental Negotiating Committee (INC) to develop an international legally binding instrument on plastic pollution in the marine environment.

In addition, the department managed the Global Environment Facility (GEF) and the United Nations Environment Programme (UNEP) Integrating Water, Land and Ecosystem Management in Small Island Developing States (IWEco) Hedgerow Rehabilitation Project for Barbados, which was designed to reduce the adverse impacts of sediment in surface runoff from soil erosion on the nearshore marine environments.

As we approach our 55th anniversary in 2026, the EPD will continue to advocate for policies, legislative, and environmental management tools that will allow the department to function effectively in a manner that promotes the protection of the environment while concurrently

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PERSISTENT ORGANIC POLLUTANTS –WHAT TO KNOW!

ersistent Organic Pollutants (POPs) are organic chemical compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes. Due to their stability, they persist in the environment for long periods, accumulate in the fatty tissues of living organisms, and can have significant adverse effects on human health and the environment. POPs can travel long distances through air and water, making them a global concern.

Characteristics of POPs:

- Persistence: Resistant to breakdown.
- Bioaccumulation: Build up in organisms and bio-magnify through food chains.
- Toxicity: Can cause adverse effects on the immune system, reproductive system, endocrine system, and can be carcinogenic.
- Long-range transport: Can travel vast distances from their source through atmospheric and oceanic processes.

Examples of POPs:

- Banned and restricted pesticides like DDT and endosulfans
- Industrial chemicals like PCBs, dioxins and furans found in old transformers and created via incomplete combustion of waste and fuels
- Flame retardants like PBDEs which can be found in e-waste

What's being done to reduce POPs?

- Governments and organizations are working together to ban or restrict POPs
- Companies are developing safer alternatives
- People can make a difference by choosing products with safer chemicals and reducing waste

How can you help?

- Choose products with safer chemicals
- Reduce, reuse, and recycle to minimize waste
- Support policies and organizations that work to reduce POPs

By understanding POPs and taking action, we can all help create a safer, healthier environment for ourselves and future generations.

For more information on POPs you can check out the Stockholm Convention at <u>pops.int</u> and the Stop The Pops Campaign at <u>stopthepops.com</u>



MANAGING CONTAMINANTS OF CONCERN IN OUR DRINKING WATER

ersistent Organic Pollutants (POPs) are organic chemical compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes. Due to their stability, they persist in the environment for long periods, accumulate in the fatty tissues of living organisms, and can have significant adverse effects on human health and the environment. POPs long distances through air and water, making them a global concern. POPs can be found in everyday consumer goods like cooking utensils, pesticides, industrial chemicals, and as additives in materials like flame retardants and waterproofing agents.

As such, the Environmental Protection Department (EPD) conducts a twice yearly widescreen monitoring program of chemicals/pollutants of concern across twelve (12) potable water pumping stations across Barbados. The collected water samples are shipped to an accredited laboratory in Florida for analysis.



Recently, the Department has added per- and polyfluoroalkyl substances (PFAS) and Nitroso-dimethylamine (NDMA) to the list of substances to test.

periodically updated as new contaminants of concern are added to the list upon reviews; as part of the Stockholm Convention on Persistent Organic Pollutants (POPs).

The PFAS are synthetic substances that can contaminate drinking water. These may include antifoaming agents, pesticides, coatings, waxes, lubricants, greases and aerosol propellants. PFAS are known as forever chemicals which break down slowly and can accumulate in people, animals and the environment. Some of the side effects from exposure to these contaminates include increased cholesterol levels, liver damage, hormone disruptions, decreased fertility in women, increased risks of thyroid disease, kidney, breast and testicular cancers. Internationally, research is still ongoing to better understand these health effects. PFAS can be removed from drinking water by carbon filtration (kitchen faucet, fridge pitchers or at the main) or reverse osmosis.

NDMA is a chemical formed in industrial and natural processes. NDMA can form in drinking water as a result of chloroamine disinfection and in chlorinated waste water. NDMA is considered a probable human carcinogen. It can be removed from drinking water by processes such as reverse osmosis and ultrafiltration².

References

1– Illinois Department of Health

2- Health Canada, Guidelines for Drinking Water Quality, 2011

TWENTY YEARS OF THE STOCKHOLM CONVENTION



By Patra Tyrell and Ezradeene Holford

usinesses, countries, and executive bodies are increasingly responding to imperative and a collective demand to make environmentally conscious decisions in order to preserve the environment. One way this is manifested is through the implementation of environmental treaties and targets aimed at sustainability. Some of these treaties include the Rotterdam Convention, the Stockholm Convention, the Minamata Convention, and the Basel Convention. On the other hand, the targets can include the sustainable development goals outlined by the United Nations. This brief essay serves to outline the impacts and successes of the Stockholm Convention during its twenty (20) years of existence. Special focus will also be given to the fundamentals of the Stockholm Convention and what Barbados has achieved since becoming a Party to this Convention.

According to the United Nations Industrial Development Organization (UNIDO), the Stockholm Convention is a global agreement that seeks to protect humans and the environment from chemicals known as Persistent Organic Pollutants (POPs), which are carbon-based chemicals that remain in the environment for long periods of time (UNIDO, 2017). This treaty transcends geographical borders, involving 186 countries, including several in the Caribbean region (Chasek, 2023). An important characteristic to note is that POPs can be dispersed over great distances; in addition to that, they are bioaccumulative and have negative effects on the environment as well as on humans, primarily in the long term. These chemicals are quite significant, and as a result, they should be contained to lessen the adverse effects they can have on humans and natural ecosystems.

"POPs are very hazardous and humans can easily become exposed to the dangerous effects through activities as simple as breathing and eating."

The Stockholm Convention was adopted on 22 May 2001 They have been widely used throughout the supply chain in transition to safer alternatives, to target additional POPs for intention to last indefinitely. action, to clean up old stockpiles and equipment containing POPs, and to work together for a POPs-free future (UNIDO, 2017).

When POPs are closely examined, it becomes clear why celebrated 20 years of participation in the Stockholm they should be eliminated. POPs are hazardous, and Convention. humans can easily become exposed to their dangerous effects through activities as simple as breathing and eating.

and came into force on 17 May 2004, three (3) years after pesticides and industry, and they can even be released its inception. The treaty has been ratified by 128 parties and unintentionally (United Nations Environment Programme, signed by 152 countries. There are five (5) main aims of the 2017). Some POPs were banned or restricted decades ago, convention: to eliminate dangerous POPs, to support the but they still persist today, as they were created with the

> Many Small Island Developing States (SIDS), including Barbados, are signatories to the Stockholm Convention. Barbados joined the convention on 5 September 2004 and



TWENTY YEARS OF THE STOCKHOLM CONVENTION CONT'D

Over the years, several changes have been made to assist in the reduction and possible elimination of POPs from the country. For starters, between 2003 and 2004, a report was compiled about the status of Barbados concerning POPs. At that time, the initial National Implementation Plan (NIP) was approved and entered the implementation stage. The aims of the plan followed the basic requirements for parties under the Stockholm Convention; however, some challenges were identified, including a lack of adequately trained personnel, limited financial resources, and insufficient technical infrastructure. According to the plan, there were two (2) main categories of POPs of concern: POPs pesticides and polychlorinated biphenyls (PCBs), which are a group of man –made organic chemicals consisting of carbon, hydrogen, and chlorine atoms (United States Environmental Protection Agency, 2015).

Once Barbados ratified the Stockholm Convention, the country demonstrated its commitment to environmental health and sustainable development. The island nation recognizes that, despite its small size, it has a critical role in contributing to global environmental security. As an island state with a fragile ecosystem, Barbados is particularly vulnerable to the effects of POPs, which can be transported across borders by wind and ocean currents, posing threats to marine life, biodiversity, and human health.

In implementing the Stockholm Convention, Barbados has taken several significant steps through the development of a National Implementation Plan outlining strategies for managing and eliminating POPs. Barbados' approach includes legislative measures, international cooperation, monitoring and research, and public awareness and education.

In the second phase of NIP development, it was discovered that the production of POPs pesticides has never taken place in Barbados. Additionally, there was no data to indicate that PCBs are currently produced or have ever been produced on the island. In terms of implementation and challenges, Barbados has strengthened its legislative framework to control and regulate the importation, production, use, and disposal of POPs. This includes banning the use of certain pesticides and chemicals listed under the Convention, such as aldrin, chlordane, DDT, and dieldrin.

The government has also initiated programs to monitor the presence of POPs in the environment and conduct research to understand their impact on health and ecosystems. This helps assess the extent of POPs pollution and the effectiveness of measures taken to eliminate them. For instance, the Environmental Protection Department and the Barbados Water Authority routinely monitor groundwater wells in Barbados, and a wide-spectrum analysis of groundwater samples from one or two of these water supply wells is carried out on an annual basis.



DID YOU KNOW?

- The world generates over 2 billion tons of municipal solid waste annually, and this number is expected to increase by 70% by 2050 if no action is taken.
- Approximately 2
 billion people lack
 access to safely
 m a n a g e d
 drinking water
 s e r v i c e s ,
 significantly
 affecting health
 and livelihoods

TWENTY YEARS OF THE STOCKHOLM CONVENTION CONT'D

The Stockholm Convention has brought significant benefits to Barbados, including:

- Protecting its unique biodiversity
- Safeguarding public health
- Promoting a sustainable and healthy environment
- Access to technical and financial assistance for effective POPs management, supporting the country's goals of sustainable development and international environmental standards.

In conclusion, benefits to Barbados' participation in the Stockholm Convention is critical as the framework allows for the protection of not only global health and the environment from hazardous chemicals, but can have beneficial impacts on our ability to manage hazardous chemicals in the Barbadian landscape thereby safeguarding Barbados,

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DID YOU KNOW ABOUT THE EPD'S HEDGEROW REHABILITATION PROJECT?

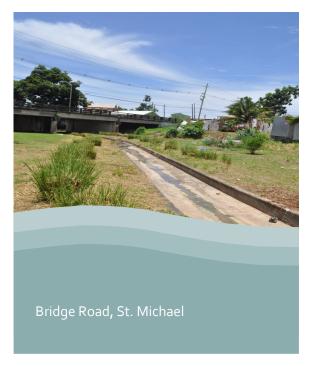
The Environmental Protection Department (EPD), in partnership with the Global Environment Facility and the United Nations Environment Programme (UNEP), created a hedgerow rehabilitation project for Barbados. As the number of hard surfaces, such as roads, parking lots, and driveways, has increased over the years, so has the amount of stormwater runoff. This runoff carries pollution that makes its way to coastal areas and can also transport significant amounts of soil, contributing to soil erosion on land. The implementation of hedgerows will help reduce soil loss and minimize the impact on the sea and the coral reefs along our coasts.

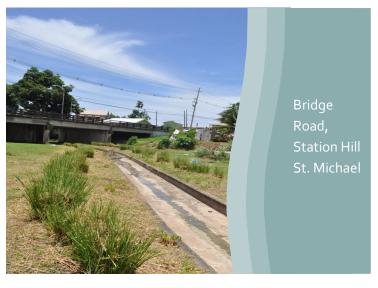
The project utilizes two well-known grasses: khus khus grass and lemongrass. Hedgerows are being reinstated between agricultural fields, roads, and gullies, thereby reducing soil erosion during heavy rainfall. These hedgerows will also help maintain healthy land and marine ecosystems, protect agricultural assets, and contribute to the preservation of biodiversity.

Farmers, horticulturalists, agencies and the general public will be equipped with the right knowledge and guidance to encourage the planting of hedgerows and improve land and water management through best management practices. The areas that are part of the project are:

- ♦ Bridge Road, St. Michael
- ♦ Constitution River St. Michael
- ♦ Pine Basin, St. Michael
- ♦ Mapp Hill, St. Michael;
- ♦ Tweedside Road, St. Michael
- International Garden of the National Botanical Gardens, Waterford St. Michael
- ♦ Carmichael, St. George
- ♦ Lower Greys, Christ Church;
- ♦ Three Houses, St. Philip.
- ♦ Highway H, Glebe Land, St. John





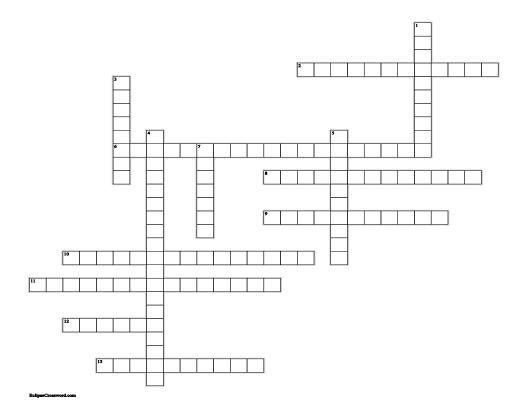








CROSSWORD CORNER



Across

- 2. Type of braking to charge your EV Battery
- 6. regulates the trade of hazardous chemicals and promotes shared responsibility and cooperation on their safe management.
- 8. term for the shipment of hazardous waste shipped abroad
- 9. This activity will prolong the life of your vehicle
- 10. The process of building up in organisms and increasing through food chains.
- 11. This multilateral environmental agreement manages the transboundary movement of hazardous wastes
- 12. A banned pesticide
- 13. One of the plant species to combat soil erosion

Down

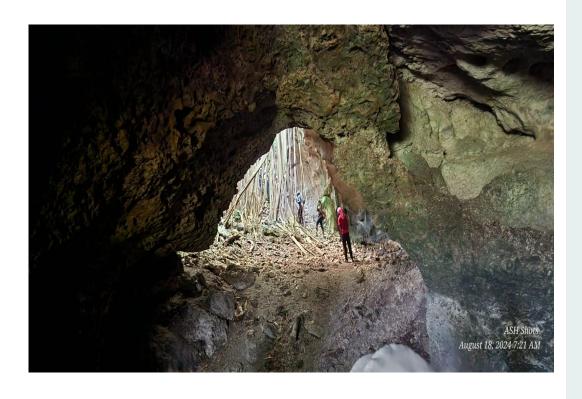
- I. The means by which persons can become exposed to POPs
- 3. Project to combat soil erosion
- 4. The multilateral environmental agreement that manages persistent organic pollutants.
- 5. Resistant to breakdown through natural processes
- 7. The act of recovering valuable materials from expired or discarded waste

LOCAL SNAPS



DID YOU KNOW?

Barbados boasts
numerous
limestone caves,
sculpted over
millennia by water
erosion of the
island's limestone
bedrock.



DID YOU KNOW?

The
Intergovernmental
Panel on Climate
Change (IPCC) states
that to limit global
warming to 1.5
degrees Celsius, we
need to cut
greenhouse gas
emissions by about
45% by 2030.







MY INTERNSHIP HELPED ENHANCE MY PROFESSIONAL SKILLS

Nikki-Green-Walcott-University of the West Indies

y internship at the Environmental Protection Department (EPD) was an enriching experience that provided me with practical insights into environmental conservation and regulatory practices. As I am nearing the completion of my degree in Chemistry at the University of the West Indies, I expected this opportunity to allow me to learn outside the classroom and gain hands-on experience. Over the course of six weeks, I engaged in activities that enhanced my understanding of environmental issues and developed my professional skills.

allowed me to hone my technical skills, including analytical abilities, as well as learn how to use data analysis tools effectively. I also enhanced my personal abilities, such as time management, to ensure tasks were completed on schedule, and my communication skills, as I needed to convey any challenges I encountered while working on assigned tasks.

This internship was an invaluable experience that significantly enhanced my knowledge of what is done to protect and conserve the environment.

Completing this work allowed me to hone my technical skills, including analytical abilities, as well as learn how to use data analysis tools successfully.

In primarily worked within the Water Quality Section, but throughout the internship, I had the chance to interact with all the various sections within the department. I participated in fieldwork that involved collecting both marine and groundwater samples for the Water Quality Section, visiting air quality monitoring sites and solid waste management facilities, and even conducting site visits with the Building Section, where I learned about the health and safety regulations that must be adhered to when constructing a building.

One of my main tasks was to create a report on the water quality of west coast beaches from 2009 to 2023, focusing on physicochemical parameters such as pH, turbidity, total suspended solids, total phosphates, and total nitrogen. This required me to analyze the data obtained over these years and identify any trends or concerns during this time frame or at any of the beaches. Completing this work

Overall, this internship was an invaluable experience that significantly enhanced my knowledge of efforts to protect and conserve the environment. The practical skills and knowledge I gained will be instrumental in my future career. I am grateful for the opportunity to work alongside a dedicated staff committed to preserving our environment. I would like to extend my gratitude to the entire EPD team for their guidance and support throughout my internship.

HOUSEHOLD ENVIRONMENTAL TIPS



Switch to ecofriendly brands of cleaning products or, make your own using vinegar and citrus fruit peels.

Don't pour dirty
cooking oil down the
drain which can
create problems in
your grease trap and/
or septic tank

Use rags , newspaper or reusable cloths instead of paper towels for cleaning

SUMMER INTERNSHIP AT THE ENVIRONMENTAL PROTECTION DEPARTMENT

Ezradeene Holford—University of the West Indies

The six-week summer internship at the Environmental Protection Department (EPD) was an insightful experience, blending theoretical knowledge with practical application in environmental management.



In the first week, I gained a foundational understanding of EPD operations. This included studying the departmental sections, the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS), and analyzing Environmental Impact Assessments (EIAs). My practical work involved observing groundwater sampling to ensure potable water safety and assisting with the maintenance and inspection of the EPD's established air monitoring stations, as well as the traffic and noise monitoring equipment. These activities highlighted the importance of monitoring for informing the management of human health and the environment.

The second week allowed me to participate in a workshop on implementing GHS and sustainable waste management in Small Island Developing States (SIDS). Key challenges identified included public unawareness of GHS, insufficient government support, and economic barriers to sustainable waste disposal practices. Emphasis was placed on GHS as a comprehensive system for identifying hazardous chemicals, extending beyond agriculture to household and commercial sectors. Discussions also tackled inefficiencies in waste segregation and transportation, as well as the economic unfeasibility of implementing recycling measures due to limited waste volume on islands. Calls for international support underscored the need for long-term sustainable solutions.

In the following weeks, the focus shifted to the Buildings Development Control Section, which oversees public health through sustainable urban planning. This unit ensures compliance with health standards in building applications, including proper ventilation and waste management systems.

SUMMER INTERNSHIP AT THE ENVIRONMENTAL PROTECTION DEPARTMENT CONT'D

Issues such as inadequate grease traps in residences and poor ventilation in commercial buildings were explored. These deficiencies can lead to health risks, including "sick building syndrome," underscoring the importance of orderly development for public well-being and resource conservation.

In Week 4, I had the opportunity to conduct fieldwork and participate in data entry activities. Complaints logged by the public were entered into a database, followed by beach sampling along the South Coast. Sampling was occasionally hindered by silty waters or stormwater runoff, which could affect test results. Additionally, I participated in an online course on Persistent Organic Pollutants (POPs) and the Stockholm Convention, gaining insights into international efforts to manage these potentially hazardous chemicals.

In Week 5, my engagement deepened with the BCRC-Caribbean courses on POPs, and I supported the Hedgerow Project, which aimed to combat soil erosion by planting grasses like khus khus grass and lemongrass around vulnerable agricultural and erosion-prone areas. Notable sites included Bridge Road, the Botanical Gardens, and Three Houses Park, highlighting the project's environmental and agricultural benefits.

My final week culminated with the completion of the BCRC-Caribbean courses, further marine sampling, and observing recycling center inspections. This hands-on exposure emphasized the multifaceted responsibilities of EPD officers, from monitoring recycling processes to protecting marine ecosystems.

Overall, the internship showcased the breadth of the EPD's work, including environmental monitoring, public health protection, waste management, and public education. It was a dynamic, thought-provoking experience that reinforced the significance of environmental stewardship and the diverse challenges faced by such departments.

DID YOU KNOW?

- More than 1 million species of plants and animals are currently threatened with extinction, primarily due to habitat loss, climate change, and pollution.
- As of 2023, atmospheric carbon dioxide levels have surpassed 420 parts per million (ppm), the highest in at least 3 million years.

SUMMER INTERNSHIP AT THE ENVIRONMENTAL PROTECTION DEPARTMENT

Patra Tyrell-University of the West Indies



am Patra Tyrell, and I served as an intern at the Environmental Protection Department for six (6) weeks. It was truly an invaluable experience, and I believe I emerged from this internship as a more informed and environmentally aware individual. During my time there, I had the opportunity to assist with marine water sampling, groundwater sampling, and air quality monitoring. I also visited several recycling facilities across the island to observe their work environments. Other tasks included collaborating with a fellow intern on an essay, creating a brief report on the water quality at the Graeme Hall Bisecting Canal, and completing BCRC Caribbean's online course, which was designed to facilitate understanding of the Stockholm Convention on Persistent Organic Pollutants (POPs).



Visit to a recycling facility

I thoroughly enjoyed the internship because I was never limited to one task. At times, I would be in the office, and other times, I would be in the field. I believe this arrangement was instrumental in helping me become a more

"I also enjoyed the camaraderie with my colleagues; we shared jokes, opinions, advice and aspects of our culture with each other which truly made the experience more memorable and enriching.."

well-rounded professional. It also reinforced my interest in Environmental Science and its various disciplines, such as air quality management and hydrology. One of the highlights of the internship was how several concepts I had learned during my time at the University of the West Indies were reinforced in a more tangible and practical way. It was fascinating to see the different sites in Barbados, such as the

beaches, springs, and the overall landscape, and to unravel the valuable information that can be derived from them.

I also enjoyed the camaraderie with my colleagues; we shared jokes, opinions, advice, and aspects of our cultures (as I am Jamaican), which made the experience even more memorable and enriching. I stepped out of my comfort zone by playing road tennis with some staff members. Even though I felt some pain shortly after the game, it was actually quite fun! I also had the opportunity to participate in line dancing with some of my colleagues. Although I am not a dancer, I think I did a decent job.

In essence, I am extremely grateful for being selected as one of the interns for summer 2024 because I gained a wealth of knowledge and connected with intriguing individuals. I am especially thankful for the guidance and support provided by my colleagues throughout my internship. Their willingness to share tips and offer mentorship has been invaluable, and I truly appreciated the welcoming environment they fostered.

MAXIMIZING THE ENVIRONMENTAL BENEFITS OF HYBRID AND ELECTRIC VEHICLES

s the world continues to transition towards more sustainable transportation options, hybrid and electric vehicles (EVs) have become increasingly popular. But did you know that there are ways to maximize the environmental benefits of owning one of these eco-friendly vehicles?

In this article, we'll explore some simple yet effective tips to help you get the most out of your hybrid or EV, and reduce your carbon footprint in the process.



Charging Up with Renewable Energy

When it comes to charging your EV, the source of that energy matters. Consider investing in a solar panel system or exploring community solar programs to power your vehicle.

Drive Smarter, Not Harder

Optimizing your driving habits can also make a big difference in the environmental benefits of your hybrid or EV. For hybrids, use regenerative braking effectively and avoid rapid acceleration and braking. For EVs, plan your trips to avoid running out of charge, and minimize the use of air conditioning and heating, which can reduce range.

Battery Care 101

Proper battery maintenance is essential for extending the life of your vehicle's battery and reducing the need for replacement. Follow the manufacturer's recommendations for cooling/ventilation, charging and maintenance.

Recycle, Reuse, Reduce

When it's time to replace your old battery, make sure to recycle it properly. Many manufacturers have programs in place to recycle batteries, which can recover valuable materials and reduce waste.

Choose Your Vehicle Wisely

When purchasing a new hybrid or EV, consider the environmental impact of the vehicle's production and disposal in addition to its operational emissions. Electric vehicles generally have a higher initial carbon footprint due to battery production, but they typically produce fewer emissions over their lifetime compared to gasoline vehicles.

Regular Maintenance Matters

Regular maintenance can help keep your vehicle running efficiently, reducing overall emissions. Keep your tires properly inflated, and ensure your engine is well-tuned to get the most out of your hybrid or EV.

By following these simple tips, you can maximize the environmental benefits of owning a hybrid or EV and contribute to a more sustainable future. So why not start making a difference today?

Environmental Protection Department

The Environmental
Protection Department (EPD)
is a regulatory government
agency under the Ministry of
Environment and National
Beautification. It was
established in 1971 and has
responsibility for
environmental monitoring
and control of conditions
likely to affect the quality of
the land, air, water, and the
general health and
environmental well-being of
the inhabitants of Barbados.

The main goals of the Environmental Protection Department are as follows:

Goal 1: To understand our Environment

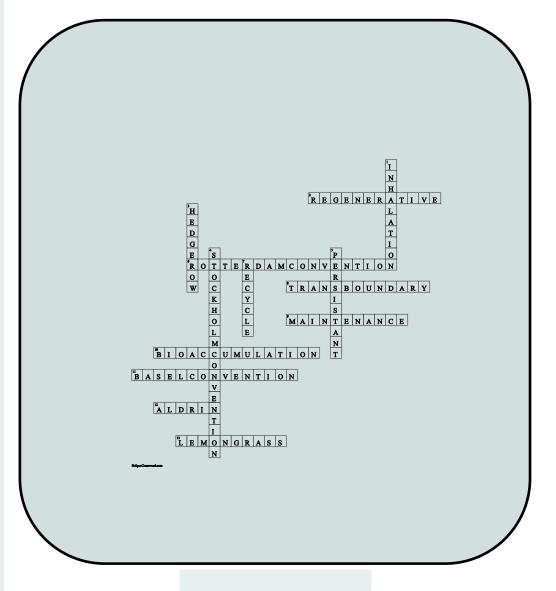
Goal 2: Protect our environment and human health from man-made sources of pollution

Goal 3: Foster Resource Efficiency and organization excellence

Goal 4: Promote

Environmental Stewardship

CROSSWORD PUZZLE SOLUTION



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