

GREEN LEAF

Annual Trainee Teachers Environmental Educational Workshop

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For the sixth consecutive year, the Environmental Protection Agency (EPA) conducted its annual Environmental Education (EE) Training Workshop for Teachers. Trainee Teachers of the Cyril Potter College of Education (CPCE), Turkeyen, participated in the Workshop which was held during October 22-25, 2015, at Camp Wesleyana, Soesdyke/Linden Highway.

The twenty-nine (29) Trainee Teachers who participated in the EE Workshop are now equipped to develop lessons and learning tools that effectively infuse environmental content. During the Workshop, participants were engaged in techniques for infusing environmental



content into lessons for the core subjects. The EPA's training team which facilitated the workshop utilised interactive and innovative methodologies to achieve the workshop's objectives. A key component of the sessions was learning by experience and investigation to enhance the analytical and critical thinking skills. Additionally, team work was fostered through small group tasks.

The Workshop also included an informal component comprising a nature walk, talent show, and camp fire which showcased traditional folk songs and games.

At the formal closing ceremony, the Trainee Teachers were presented with certificates and special prizes for outstanding participants.



Editorial Note

From the 1970s, environmental education (EE) has been recognised as an important tool in environmental management. Its primary purpose is to enhance an individual's knowledge, attitudes, skills, values and motivation to improve the quality of the environment. Ultimately, EE's goal is to improve the environment and achieve sustainability by raising awareness and increasing knowledge in order to develop and reinforce new patterns of environmentally sensitive behaviour among individuals, groups and society as a whole.

Indeed, while Regulations such as the impending Styrofoam Ban are needed to maintain a quality environment, a continuous, targeted EE program is essential in ensuring that the general public is aware of and understands the need for actions that preserve the quality of our environment. Recognizing this, the EPA has over the years expanded its Environmental Education and Awareness (EEA) program across the country, targeting various communities, youth groups and education institutions.

Come 2016, the Agency will seek to extend its (EEA) program even further to meet not only various target groups, but also to encompass a variety of environmental issues. We look forward to the usual support from other stakeholders and take this opportunity to wish all a prosperous and productive 2016.

Annual Trainee Teachers Environmental Educational Workshop

The EPA commends the Administration of the CPCE and by extension the Ministry of Education for supporting environmental education and making the teachers available for the training workshop. The EPA looks forward to further collaboration in the future.



Environmental Education Workshops Conducted at St. Cuthbert's Mission

In a continued effort to expand its environmental education and awareness on critical environmental issues, the Agency conducted four (4) environmental education workshops at St.



Cuthbert's Mission during November 24-25, 2015. These workshops targeted Women and students of the Primary and Secondary Schools.

For the Primary School, the workshop focused on Climate Change utilising an Activity Booklet on the issue developed by the Agency for Grade 6 students. During the session, the students completed word searches, puzzles, trivias, etc., as they interacted with the material in the Booklet as well as the facilitators to learn more about the global phenomenon and to be better prepared to deal with its associated issues.

Injecting the need for more practical approach to learning, the Agency also conducted a half-day environmental education training with students of Grades 9 and 10 from the St. Cuthbert's Secondary School. The students were introduced to the 'School Yard Ecology' methodology through theoretical and

practical exercises. The training examined the pros and cons of outdoor education as well as the basis of the inquiry cycle such as: how to ask scientific questions, methods of data collection and how to effectively analyse data. This training aimed at equipping students to be more interested in science and conducting more effective research projects.



Recognising the important role that women can play in resource management and the fight against climate change, the Agency conducted two

half-day workshops for the women of the Village. Through presentations, games and interaction sessions, the participants were introduced to the concept of Climate Change, particularly its causes and impacts. The women were also given the opportunity to apply this knowledge in the context of their lifestyles and community development. At the conclusion of the workshop, the women developed a Charter for greening their Village which they committed to sharing with the other women of the Village to encourage a common vision.

Guyana to Prepare 3rd National Report on the Implementation of the Cartagena Protocol on Biosafety (CPB)

Guyana ratified the United Nations Convention on Biological Diversity (UNCBD) on August 29, 1994 and is therefore committed to implementing the Decisions of the Convention’s Conference of Parties (COP). The Cartagena Protocol on Biosafety (CPB) is an international supplementary agreement to the Convention which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, also taking into account risks to human health. This Protocol was adopted on January 29, 2000, and entered into force on September 11, 2003.

In accordance with Article 33 of the Cartagena Protocol, *‘Each Party shall monitor the implementation of its obligations under this Protocol, and shall, at intervals to be determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol, report to the Conference of the Parties on measures that it has taken to implement the Protocol.’* The Environmental Protection Agency-Guyana (EPA), is the focal institution for the CBD and the CPB. In meeting its obligations, the Agency, through its Biodiversity Management Division (BMD), has begun the process of preparing the Third

National Report (3NR) on the implementation of the CPB to the C B D . T h e preparation of this report is to be facilitated by a reputable consultancy firm.



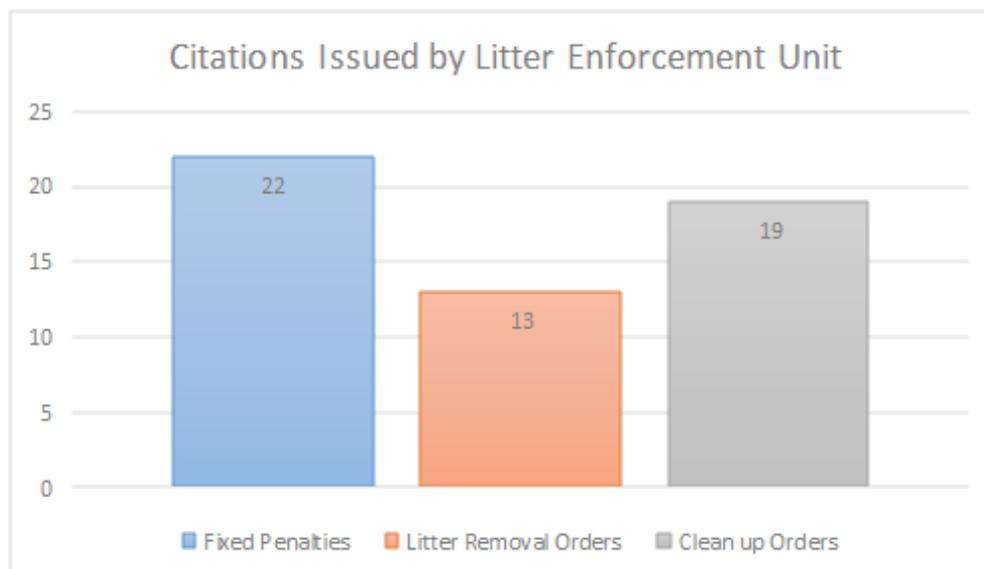
Convention on Biological Diversity

The Environmental Protection Agency (EPA) has received support from the Global Environment Facility (GEF), through the United Nations Environment Programme (UNEP), towards the “Preparation of the Third National Report to the Cartagena Protocol on Biosafety”. The Agency is presently developing Terms of Reference and tender documents. These documents will soon be available for suitable candidates to make their bids via the National Procurement and Tender Board (NPTAB). The project’s duration is approximately three (3) months and is expected to conclude in March 2016.

Litter Enforcement Unit continues the good work

The Litter Enforcement Unit was established in May, 2014, to address the environmental ills of littering in Guyana. While the Unit was initially set up to operate in the capital city, Georgetown, its work has expanded to other Regions of the country. The Unit continues to monitor the litter situation through targeted outreaches and by investigating complaints that are received from the general public.

For the period October to December, 2015, a total of 54 citations were issued. These included twenty-two (22) Fixed Penalties for accepting liability for littering offences, thirteen (13) litter removal orders and nineteen (19) Clean-up orders. Litter Enforcement contributes to ensuring that there is a clean and green Guyana for all.



EPA reaches out to the general public at various exhibitions

In this quarter, the Agency took the opportunity to interface with members of the public by participating in various exhibitions held in different Regions of the country.

In October, the Agency participated in two exhibitions which were running simultaneously in Regions 9 and in Georgetown, Region 4. The Rupununi Expo & Business Forum and Agricultural Expo, was held in Lethem, Region 9, at the Triple “R” Rodeo Ground from October 30 to November 01, 2015, under the theme “Promoting Entrepreneurial Development through Partnership”. The Agency’s Booth was visited by school children, Brazilians, local businessmen, women and community members and visitors from other Regions who travelled up to be a part of the Expo. The visitors to the Agency’s Booth engaged in asking questions and playing the “Environmental Spin the Wheel’ Game.



Concurrently, in continuing efforts to restore the capital Georgetown and other Regions to a clean and green environment, the Mayor and City Council (M&CC) introduced its first Green Conference and Expo. This event was launched with the Conference on October 30, 2015, at the Promenade Gardens, and continued through November 01, 2015, with a grand exhibition each night at the Parade ground. This event was set to initiate a national discussion on Guyana’s green potential while sensitising and building partnerships with stakeholders to win their participation in maintaining the green city.



The Green Conference and Expo used a targeted approach to various sectors including energy, manufacturing, food and beverage distributors, electrical, construction and mechanical services, mining, health and waste management, among others. Exhibitors were all expected to demonstrate eco-friendly or ‘green’ practices relevant to their organisation/company and to utilise as much green materials as possible. Emphasis was placed on conservation efforts in domestic and commercial settings.

EPA participated in the Green Expo with its Booth highlighting various eco-friendly actions to encourage conservation and waste reduction. Visitors, both young and old, were first drawn to the attractive Booth decked with natural Bougainvillea and palms in *upcycled* tires among other vibrant displays. Visitors engaged in fun interactive games, such as, Waste Management Snakes and Ladders, ‘How large is your Carbon Footprint?’ and Water Challenge; viewed environmental models and received several educational brochures, booklets, posters and gifts. The Water Challenge game was popular requiring players to match prescribed water quantities to various actions—participants were generally surprised to learn than some simple activities around the

home utilise large quantities of water.

Officers at the EPA’s Booth informed visitors of EPA’s role in ensuring a clean and green environment while drawing attention to the various legislations and guidelines which enable EPA to execute its relevant functions.

Officers from the Agency also travelled to Kwakwani, Region 10, on November 01, 2015, to be a part of the Kwakwani Day Expo hosted by the Lions Club of Kwakwani. This one-day exhibition was held at the Independence Square and reached out to members of the community. The Agency displayed waste materials that can be “upcycled”, an Environmental Spin the Wheel game and a Water Challenge Game educating the public on the importance of water and how much we actually use, reducing waste and our environment on a whole.

The Agency also participated in the second Annual GIS Day exhibition which was held on November 18, 2015, at the University of Guyana, Turkeyen Campus under the theme “Discovering the World through GIS.” The booth displayed maps and EPA’s brochures and booklets. Officers of the EPA were on hand to answer questions posed by visitors to the booth.



Kids Corner

Experimenting with Environmental Science

Carbon in the Atmosphere

Purpose

To demonstrate that there is carbon in the atmosphere.

Additional information

Carbon exists everywhere, though it makes up less than 0.04% of the atmosphere, mostly in the form of carbon dioxide (CO₂). Carbon dioxide plays a vital role in the support of life. Trees and plants convert carbon dioxide into carbohydrates, releasing oxygen in the process. Oxygen, as we know, is vital to our very existence. In this experiment, you will conduct tests that will prove there is carbon almost everywhere.

**** WARNING **** This project involves the use of fire and can be dangerous if not conducted with the appropriate safety measures. Please ensure you have the help of an adult BEFORE attempting to conduct this experiment.



Required materials

Lighter or matches, 1 thin candle, 2 deep ceramic bowls, 1 teaspoon of Sugar, Leaves, Paper, Metal lid, Tongs, Pencil, Water.

Estimated Experiment Time

Between 10 and 20 minutes.

Step-By-Step Procedure

1. Create carbon from leaves

- Place several small leaves into one of the deep ceramic bowls.
- Light a match and drop it into the leaves.
- Wait for the leaves to completely burn.
- The burnt leaves leave behind ash, which is carbon.

2. Create carbon from sugar

- Use the matches to light the candle (make sure the candle is in a candleholder and being held upright).
- Use the tongs and hold the metal lid above the candle flame so the middle of the lid is being heated by the direct flame.
- Place a teaspoon of sugar on the metal lid.
- Continue to hold the lid with sugar over the flame.
- What happens to the sugar? It turns black, leaving behind carbon.

3. Create carbon from the paper and pencil

- Use the pencil to color a dark black circle on the paper.
- Rub your fingers on the paper several times until your fingers have a black soot on them, which is carbon.

Observation

Why do you think there is carbon present when you burn the leaves? What would happen if you tried to burn a different material, such as newspaper? When you used the candle to heat the lid and burn the sugar... did you take a look at the bottom of the lid? What do you think you might find?

Result

When you burned the leaves, the ash that remains is the carbon that was contained in the leaves. When carbon (atomic symbol C) is heated at a very high temperature, it is converted into the gas carbon dioxide (CO₂).



Moratorium on Styrofoam Importation Effective January 01, 2016

As of January 01, 2016, a country-wide Ban on the importation of expanded Polystyrene, better known as Styrofoam, will be in effect. The Ban will focus mainly on Styrofoam containers used for food services like boxes, plates and cups while promoting the use of biodegradable alternatives.



Styrofoam is a known contributor to Guyana’s Solid Waste problem with negative effects on the environment and human health. Because it is non-biodegradable – does not breakdown readily in the environment - Styrofoam when it finds its way into water ways restricts the flow of water which can contribute to flooding and creates breeding grounds for vectors of disease. Styrofoam can also negatively impact on marine life causing them serious harm and even death.

Environmental health concerns start with Styrene which is used to make Styrofoam and broadly used in the manufacture of plastics, resins, and rubber. However, styrene has been established by creditable international bodies as a possible human carcinogen.

Styrofoam found littered in the environs negatively affects the aesthetics of the environment. This repels tourists and locals alike and puts an economic burden on Guyana to clean up the clogged waterways.



In view of its negative effects, the Environmental Protection Agency (EPA) in consultation with other relevant stakeholders developed the Styrofoam Ban Regulations which were passed this year.

The EPA recognizes that the key role of Education and Awareness for the successful implementation of the Ban and as such, a Public Symposium was conducted to provide opportunity for stakeholders to make an input into the implementation process for the Ban. In 2016, the Public can expect a continuation of education and awareness on the Styrofoam Ban and alternative to this form of packaging.

Environmental Authorizations

The Environmental Management Permitting Division (EMPD) grants Environmental Authorizations for various projects submitted to the Agency. This is done after a site visit is conducted to assess the potential or current environmental impacts of the project. Large projects are usually required to submit an Environmental and Social Impact Assessment (ESIA) or Environmental Management Plan (EMP). Noise permits for various events and operations are also granted by the Agency.

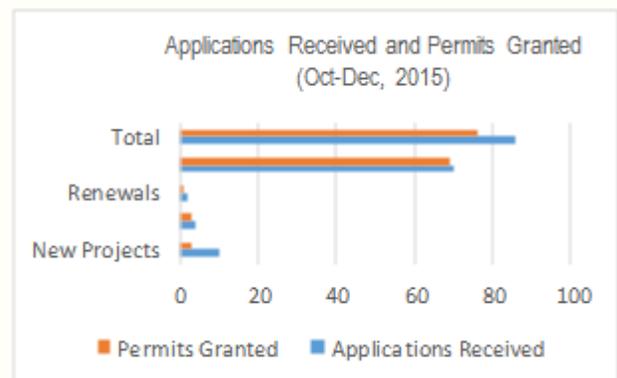
For the period October to December, 2015, a total of eighty-six (86) Applications for Environmental Authorization were received. Ten (10) of the Applications were for New projects, four (4) for Existing projects, and two (2) for Renewal of Environmental Authorization. Sixty-nine (69) Applications for Noise Permits were received and issued for this period. One (1) application for Long Term Noise Permit was received.

The Division conducted three (3) site visits for new projects and nine (9) site visits for existing operations. Compliance/renewal audits were also conducted for five (5) operations that were issued with an Environmental Authorization.

The Agency granted seventy-six (76) Environmental Authorizations during this period. Three (3) Environmental Permits and three (3)

Operation Permits were granted for new projects, and one (1) renewal was granted. Sixty-nine (69) short-term noise permits were issued by the Division.

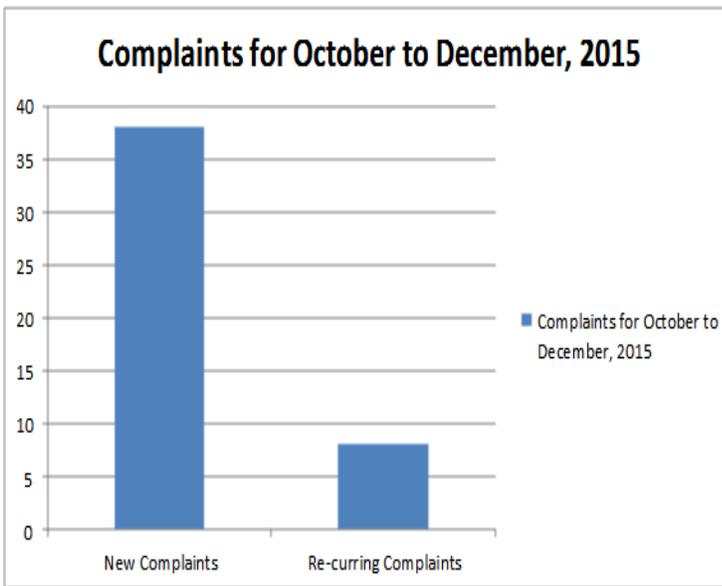
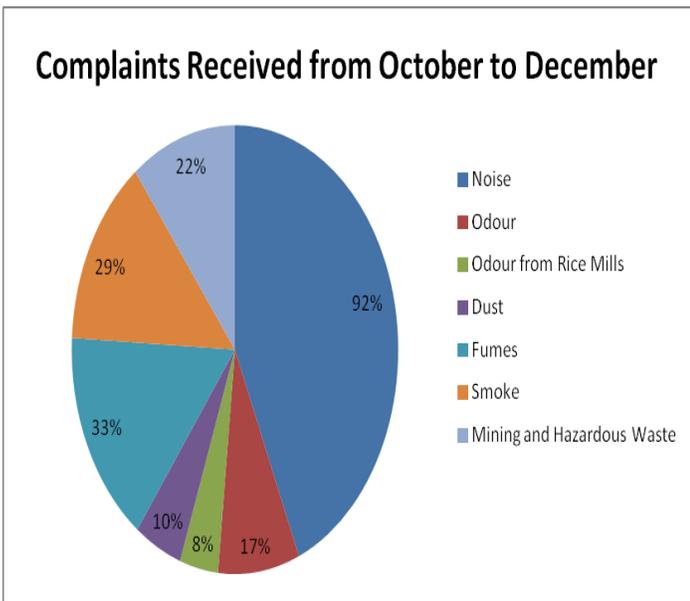
The Division continues to process the other applications received during this period to determine whether these projects will be required to conduct Environmental Impact Assessment (EIA) or prepare an Environmental Management Plan (EMP).



Complaints and Response Management

The Environmental Management Compliance Division (EMCD) undertakes monitoring of projects to ensure that they are compliant with the environmental regulations. This is conducted through compliance inspections and response to complaints.

During the period October to December 2015, the Division received a total of thirty-eight (38) new complaints and eight (8) recurring complaints. The Division conducted fifty-five (55) compliance inspections and thirty-five (35) follow-up compliant inspections. No surveillance monitoring exercises were conducted during the period and four (4) prohibition notices were issued for the quarter.



Upcoming Activities

The EPA initiates and undertakes activities on a continuous basis to pursue its mandate.. Having successfully achieved the set goals for the fourth quarter of the year, planning and coordination have already begun towards its planned objectives for the next quarter.

Activities scheduled for January - March, 2016, include the following:



Activity	Theme	Target Group	Date
World Wetlands Day	Wetlands for our Future: Sustainable Livelihoods	General Public and Selected Schools	February 02
World Wildlife Day	The future of wildlife is in our hands	General Public and Selected Schools	March 03
World Water Day	Water and Jobs	General Public and Selected Schools	March 22
Workshop on EPA Guidelines	---	Government Technical Institute	January 27
Consultations on the third National Report on the Cartagena Protocol on Biosafety	---	Relevant Stakeholders	TBA

WILDLIFE SPOTLIGHT

The Emerald Eyed Tree Frog (*Hypsiboas crepitans*)

The Emerald Eyed Tree Frog (*Hypsiboas crepitans*) is a native species of Trinidad and Tobago. It is also known by the common names Neotropical Tree Frog and Flying Frog and is widespread in Panama, Colombia, Venezuela, Trinidad and Tobago and the Guianas including Brazil.

Appearance

These medium-sized tree frogs, change colour during their life cycle. A young frog is usually green in colour but adults have the ability to change colour e.g. from a tan or red-brown to a milk-white, grey-brown or light metallic green when captured. The skin in on its "back" is smooth and that on its underside is grainy to the touch. This frog has no webbing between the first two "fingers" but reduced webbing between the other two "fingers"; but their "toes" are heavily webbed. A large, central, dark blotch, often X-shaped can be seen on its "back". The frog's metallic green iris gives it its common name. Females grow up to 73 mm in while males are smaller, up to 61mm.



Habitat

The frog is extremely variable in habitat, and is found on land and in freshwater habitats ranging in humid tropical forests, semi-arid environments, grasslands, llanos, intervening habitats, pastures and lower montane forests. The frogs are arboreal and nocturnal animals found in shrubs, leaves of trees and near watercourses where there is an abundance of leafy vegetation. They use this vegetation as camouflage from predators and shade in the day to prevent desiccation from the heat of the sun.

Diet

These nocturnal frogs seem to feed mostly near ponds edges, rivers, shrubs and in trees and in urban areas; they feed on a rich diet of insects such as small crickets, flies and other small insects. As tadpoles, they feed on algae and dead matter that is present in the water. The Emerald Eyed Tree Frog is a secondary consumer in its environment, however it is preyed on by lots of animals such as the giant water bugs, snakes and other amphibians.

Reproduction and nesting

Breeding occurs throughout much of the rainy season when males call from the edges of temporary ponds or flooded grassy areas. This occurs usually in April at the height of the dry season as well as after heavy rains of June and July. Reproduction occurs year round where water is available. However, in savannah areas, these frogs reproduce only in the rainy season. Females may lay over 1,000 eggs which float for 24 hours and then sink. Tadpoles are grey or light brown, and the tail has more yellow undertones. After the eggs are fertilized, they are left in a pond or puddle of water where they would hatch. Metamorphosis occurs at about 3 months.

Fact

These frogs have a distinctive call which enable them to separate from other species of frogs, which may be pitching their calls in the same ponds. This also allows them to vocally communicate with other males and advertise their calls to attract females that are nearby.



THE GREEN LEAF

The Green Leaf is published quarterly by the Environmental Protection Agency, Guyana.

This publication is intended to promote awareness on the work of the Environmental Protection Agency.

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About Our Logo...

Our logo is the Passion Fruit leaf. Yellow Passion Fruit (*Passiflora edulis flavicarpa*) is native to the Amazon. The passion fruit plant produces beautiful flowers and a sweet - tart fruit. It was named by the Spanish missionaries in South America. Passion Fruit is widely grown throughout the tropics and subtropics. The leaves are used in traditional medicine to settle edgy nerves. They are also used for colic, diarrhea, dysentery and insomnia.

