



GREEN LEAF

TRAINING TEACHERS IN ENVIRONMENTAL EDUCATION

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Twenty-seven (27) Trainee Teachers of the Cyril Potter College of Education (CPCE), are now equipped to integrate Environmental Education (EE) into lessons having participated in an EE Workshop conducted by the Environmental Protection Agency (EPA).

The workshop builds on the EPA's successful implementation of a similar activity last year. The three day event was held during 14-16 October, 2011, at Camp Wesleyana on the Soesdyke Highway and was coordinated and facilitated by Agency's Education, Information and Training Division (EITD).

Participants were drawn from the batch of third year Primary Level Teacher Trainees and represented eight of the ten administrative regions. Three (3) lecturers of the CPCE also participated in the workshop.

Teachers were introduced to the concepts, principles and

methodologies of environmental education. Teachers can have a significant role in promoting and inculcating strong environmental consciousness in schools. This would ultimately lead to our children having an appreciation of the importance of the environment and the will to take care of it for themselves and others.

The workshop sessions were delivered using an experiential approach to highlight common environmental problems facing the world and their link to developmental issues. Discussions centered on climate change, pollution, biodiversity loss and the use of natural resources such as energy and water. Teachers were also exposed to methods of infusing EE into the existing curricula for the core subjects: Science, Social Studies, Mathematics and English. Also, participants were exposed to methodologies and tools that could be effectively used to incorporate EE in the classroom.

Participants portrayed some of the knowledge learnt at the cultural evening through song, poetry and drama on climate change, water and energy conservation. This was testament that learning and teaching environmental issues can be fun!

The teacher trainees welcomed the training in EE and recognized the importance of its incorporation in lessons. At the end of the Workshop, the collective sentiment was: *'We will utilize what we have learnt here.... to incorporate EE into our lessons and curriculum....we will enhance our knowledge of EE, share it with our learners and help to make our environment safer and healthier.'*

Teachers learning EE tools



Editorial Note

With 2011, the **'International Year of Forests'** coming to a close, its purpose in serving to highlight the many services and benefits forests provide and their importance to the sustenance of daily life, must be acknowledged. In the third quarter, the focal areas have been on Food Security and Agriculture, Bio-energy and Urban Forestry. In the last quarter, the focus is on Climate Change, Markets, Trade and Investment, Mountains and Rio +20.

2012, is the UN **'International Year of Sustainable Energy for All'** to bring focus on the importance of energy access for sustainable economic development and supporting the achievement of the Millennium Development Goals. Having access to energy is essential for all people. However, the focus should be on investing and developing renewable sources of energy which are essential in the fight against climate change and in the long run are a much sounder alternative.

Guyana is moving towards energy independence with investments in the Amaila Falls Hydropower Project and the increasing use of solar panels, particularly in the hinterland regions. Other possibilities of expanding the renewable energy sector, such as harnessing wind energy would no doubt be explored. The creation of a Ministry of Natural Resources and the Environment heralds new prospects as Guyana seeks to sustainably manage and use its vast natural resources.



Participants of the camp

EPA HOSTS PROTECTED AREAS MANAGEMENT TRAINING

Nineteen (19) persons drawn from government agencies, indigenous communities, community groups and non-governmental organizations participated in a four-day Protected Areas Management Training Workshop, hosted by the Environmental Protection Agency (EPA), with funding from the World Wildlife Fund (WWF).

The workshop held during October 31- November 03, 2011, was facilitated by experts from Colorado State University – USA and Conservation International. This training was the latest step in a larger Government of Guyana (GoG) initiative to establish a Protected Areas System in Guyana.

In July this year, the GoG passed a landmark Protected Areas Act, and subsequently announced the establishment of **two new Protected Areas** at Shell Beach and the Kanuku Mountains. The training workshop was intended to build the capacity of Guyanese stakeholders to assist in the management of the National Protected Areas System.

During the four-day exercise, participants were exposed to modern concepts and approaches in Protected Areas Management. Among the important topics discussed were institutional development; public participation, collaboration and conflict management; infrastructure planning, development and management; cost management and funding mechanisms; and, planning for tourism.

The institutions and communities that participated in the training workshop are expected to play key roles in

supporting the effective management of Guyana's Protected Areas System. These stakeholders include the Environmental Protection Agency, Guyana Geology and Mines Commission, Guyana Forestry Commission, Ministry of Amerindian Affairs, Kanuku Mountains and Shell Beach Community Representative Groups, Chenapau Village, Konashen Village, Guyana Marine Turtle Conservation Society and Iwokrama International Institute and the World Wildlife Fund.



Section of participants during one of the sessions

Outreach at Kwakwani

The EPA participated in Kwakwani Day, meeting with and interacting with community members of the riverine community.

The annual event held on November 05, 2011, was organized by the Kwakwani Lion's Club to foster community efforts and promote community achievements in a positive way.

Visitors to the Agency's booth participated in interactive discussions and observed pictorial displays on biodiversity, climate change and environmental issues related to mining and logging. Residents were keen to learn more about the environment and expressed the need for greater awareness efforts in the community. Discussions with teachers of the community led to interest in the formation of an Environmental

Club. It is likely that the club would soon be formed by teachers and students of the primary and secondary institutions in the area.



Visitors at the Agency's booth

TWO NEW PROTECTED AREAS DECLARED

On October 20, 2011, the President declared Kanuku Mountains in Region 9 and Shell Beach in Region 1 as two new protected areas. Guyana now has a total of four protected areas with Kaieteur National Park and Iwokrama having already been legally established.

The Kanuku Mountains and Shell Beach were identified as pilot sites for protection so that the lessons learnt from the creation of these protected areas would inform the process for the establishment of new ones.

Extensive consultations were held with relevant stakeholders, including user communities, in the delineation process for both the Kanuku Mountains and Shell Beach areas. Similar consultations were carried out for the management planning processes for the



Shell Beach

Kanuku Mountains. Conservation International in Guyana and the Guyana Marine Turtle Conservation Society, which were identified as the lead Agencies in the Kanuku Mountains and Shell Beach areas, respectively, facilitated these consultations which involved the participation of 18 indigenous communities in the



Kanuku Mountains

Kanuku Mountain and 14 communities at Shell Beach.

During the delineation processes, Community Representative Groups (CRGs), comprising the Toshao of each participating community, were formed. These CRGs

functioned as a medium for communication between the communities and the other stakeholders throughout the process. They also provided resource information to communities and made recommendations to the Lead Agencies to guide operations at the site level.

The consultations were made possible through the Guyana Protected Areas System Project (GPAS) funded by the German Government through KfW (German Development Bank) and implemented by the Environmental Protection Agency. The two new protected areas were declared under the recently passed Protected Areas Act, 2011.

EMD RESTRUCTURED FOR GREATER EFFICIENCY

The Environmental Management Division seeks to ensure that development projects conform to the goal of sustainable development. This is achieved through the management of the processes of Environmental Authorization, Complaints and Response, and Monitoring and Enforcement.

In October 2007, a Monitoring and Enforcement (M&E) Unit within the EMD to strengthen its compliance monitoring and enforcement processes. The Unit is specifically tasked with monitoring permitted operations, processing Applications for Renewals, Variance and Transfer, and coordinating and lending support to national anti-littering initiatives through the M&E Anti-Littering Programme.

In an effort to further improve the efficiency of the Division, a revised Divisional structure was implemented at the beginning of 2011. In the new Divisional Structure, one Senior Environmental Officer (SEO) now has responsibility for one category of developmental projects. Projects continue to be placed into three

categories: **Agriculture, Fisheries and Tourism, Industry, Infrastructure and Energy, and Mining and Forestry.**

A **Hazardous Materials and Air Quality Unit** was added to the Divisional Structure in February, 2011. Currently, its focus is on developing an action plan, procedures, guidelines and mechanisms to support the enforcement of the Hazardous Waste and Air Quality Regulations.

Research and Development (R&D) is spearheaded by a SEO and is geared towards enhancing tools for Environmental Management. The SEO (R&D) also guides an Integrated Coastal Zone Management Officer and Field Technicians who support the work of the Division.

REDUCING THE EFFECTS OF DISASTERS

A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources.



The unpredictability of life, however, does not mean that we have to be unprepared to deal with the effects of disasters. Each individual can take steps to prepare for disasters and minimize the impact of losses as a result. In October, the EPA joined other stakeholders in participating in activities to observe **'International Day for Disaster Reduction'** and increase awareness of the subject among the populace. This was held at the Sophia Exhibition Complex, on October 13, 2011.

Types of Disasters

Natural- tsunamis, floods, cyclones, earthquakes, volcanic eruptions, wild fires, hurricanes, landslides, etc.



Man made- oil spills, fires, pollution, etc.

Some disasters are secondary, meaning that they result from another disaster, e.g. an earthquake that triggers a tsunami, that results in coastal flooding, such as the 2005 tsunami in South East Asia.

While we cannot control or stop natural phenomenon, it is our responses to these occurrences that will determine the magnitude of the damages experienced.

On the national level, governments:



- Offer meteorological and Earth exploration satellite services that play a major role in predicting and detecting disasters;
- Issue warnings to the public directly or notify agencies responsible for doing so;

- Pre-disaster planning, preparedness and monitoring, including relief management; and
- Work in tandem with humanitarian organisations such as the Red Cross, Lions International, etc.



In your communities and homes, you can:

To prepare for a flood:

- Learn about your community's emergency plans, evacuation routes and location of emergency shelters.
- Stock supplies such as:
 - Clean containers for drinking water, large enough for a 3-5 days drinking supply;
 - 3-5 days supply of non-perishable food and a non electric can opener;
 - First aid kit and manual, prescription medicine and medical supplies;
 - Water purifying supplies such as chlorine or iodine tablets or household bleach;
 - Baby formulas, diapers and other items;
 - Rubber boots and waterproof gloves; and
 - Insect repellent, flashlight, and personal hygiene items such as toothbrush, soap and sanitary napkins.



To prepare for fires :

- Purchase a fire extinguisher and learn how to use it;
- Create a fire escape plan for your family and practice your escape plan; and
- Practice fire prevention tips such as installing smoke alarms and detectors, keeping matches and lighters out of the reach of children, not smoking in bed or when you are sleepy.

"Vulnerability to disaster is growing faster than resilience.[...] Disaster risk reduction should be an everyday concern for everybody. Let us all invest today for a safer tomorrow." Secretary-General Ban Ki-moon.

Trivia: Can you name the disasters in the pictures?

Answers: hurricane, forest fire, oil spill, structural collapse.

KIDS CORNER

Flowers are one of the most used decorations at Christmas time, whether on wreaths or as a symbol of the season. Let's learn a bit about flowers!



Safety Tips: Do not eat or drink any of the materials used in this activity. Ask for guidance.

Experiment: Magic with flowers

Materials Needed

- A white flower, e.g. a carnation
- 2 glass containers
- Red ink or red food colouring
- Blue ink or blue food colouring
- Scissors

Instructions

1. Take a white flower and split the stem to about half way up.
2. Place red ink in one container with water and blue ink in the other glass.
3. Place half of the stem in the water with red ink and the other half in the glass with blue ink.
4. Leave overnight and check for results the next day.

Note: One side of the flower should be red and the other side blue.



Explanation

The flower takes up water from the containers through tiny vessels all along its length. The ink stains the vessels through which it passes.

Make a prediction, test it out, and then send your findings to eit.epaguyana@gmail.com.

Flower pressing

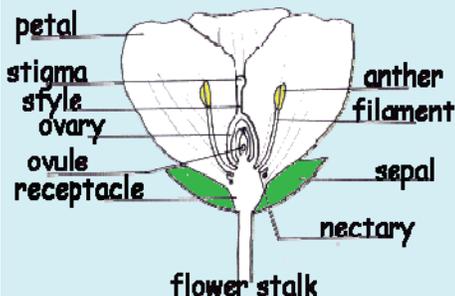
What to do

1. Arrange the flower to show it at its best.
2. Place it between two pieces of newspaper, then place it between two heavy books.
3. Leave it to dry for about a week until it has completely dried out, then stick the flower in a scrapbook.

You will need

- A flower
- Two heavy books
- Newspaper
- A scrapbook

The flower parts:



Petal: Petals are used to attract insects into the flower, they may have guidelines on them and be scented.

Stigma: This covered in a sticky substance that the pollen grains will adhere to.

Style: The style raises the stigma away from the Ovary to decrease the likelihood of pollen contamination. It varies in length.

Ovary: This protects the ovule and once fertilization has taken place, it will become the fruit.

Ovule: The ovule is like the egg in animals and once fertilization has taken place, it become the seed.

Receptacle: This is the flower's attachment to the stalk and in some cases becomes part of the fruit after fertilization, e.g. strawberry.

Flower stalk: Gives support to the flower and elevates the flower for the insects.

Nectary: This is where a sugary solution called nectar is held to attract insects.

Sepal: Sepals protect the flower whilst the flower is developing from a bud.

Filament: This is the stalk of the anther.

Anther: The anthers contain pollen sacs. The sacs release pollen on to the outside of the anthers that brush against insects on entering the flowers. The pollen once deposited on the insect is transferred to the stigma of another flower or the same flower. The ovule is then able to be fertilized.



Fun Flower Facts

- In the 1600s, tulip bulbs were more valuable than gold, costing up to \$5000 for one bulb.
- Lifejackets used to be filled with sunflower stems.
- The largest flower in the world is the *Titan arums* which can be up to 10 feet high and 3 feet wide. They are known as the 'corpse flower' because they smell like decaying flesh.



- Ancient civilizations burned aster leaves to ward off evil spirits.
- Dandelions are a good source of Vitamins A and C, iron, calcium and potassium.
- Flora was the Roman goddess of flowers.



ENVIRONMENTAL AUTHORISATIONS

The Environmental Management Division (EMD) grants Environmental Authorisation for various projects submitted to the Agency. This is done after a site visit is conducted to assess the potential or current environmental impact 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.

A total of forty-two (42) Applications for Environmental Authorization, were received for the period September – November, 2011. Twenty-four (24) of the Applications were for new projects, nine (9) for existing projects, six (6) for renewal of Environmental Authorizations, two (2) for the variance of Environmental Authorizations and one (1) was for the transfer of an Environmental Authorization .

The division received six (6) Environmental Management Plans (EMPs) during this period. EMPs were submitted by the Ministry of Public Works – Works Service Group for the Expansion of the East Bank Public Road (Providence to Diamond) and Santa Fe Inc. for an Integrated Farm Project located at Santa Fe, North Rupununi Savannahs, Region 9.

Revised EMPs were also submitted for the following projects: Guyana Industrial Minerals Inc. – Bauxite Mining of the Upper and Lower Waratilla, Banks DIH Ltd. - Waste Water Treatment Project,

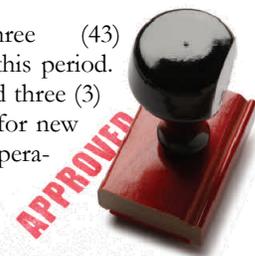
National Drainage and Irrigation Authority (East Demerara Water Conservancy Northern release at Hope Duch Four) and Sat Narine - Concrete and Aggregates Inc. for the preparation of Pre-Concrete Products and Sand Storage.

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

Thirty-four (34) Applications for Noise Permits were received and thirty-four Noise Permits were issued for this period.

The Division conducted twenty-three (23) site visits for new projects and five (5) verification visits for existing projects/ operations. Compliance/renewal audits/modification visits were also conducted for fifteen (15) operations that were issued with Environmental Authorizations.

The Agency granted forty-three (43) Environmental Authorizations during this period. Twelve (12) Environmental Permits and three (3) Letters of Authorization were granted for new projects. Twenty-seven (27) Operation Permits and one (1) Letter of Authorization were granted to existing projects.



ENHANCING STAFF SKILLS

WELCOME

The EPA welcomes Ms. Melissa Leonard, Executive Assistant, Mr. Rayner McAndrew, Environmental Officer, NRMD, Ms. Clydecia McClure, Senior Environmental Officer, NRMD, and Mr. Afzal Baksh, Office Assistant, Admin.

GOODBYE

During the 4th quarter of 2011, the Agency bade farewell to: Mr. Damien Fernandes—who has taken up a position within the newly formed Ministry of Natural Resources and the Environment, Ms. Shabana Yusuf and Ms. Ramena Mangal.

Best Wishes in all future endeavours!

TRAINING

- Dr. Indarjit Ramdass, Executive Director, attended the Constituency Meeting of GEF Focal Points, in Belize City, Belize, November 02 -03, 2011. The Executive Director also attended a Workshop for Latin America and the Caribbean Region, Panama City, Panama during the period November 10-12, 2011.
- Ms. Chuvika Harilal, SEO, Protected Areas Unit, NRMD, par-

ticipated in the RedLAC 13th General Assembly, November 7-10 which took place in Paramaribo, Suriname.

Ms Harilal, also attended the Stakeholders' Consultation Workshop in support of Three (3) Studies: Development of a Medium- Term investment Plan, Identification of Incentives to Stimulate Investment in Sustainable Land management and a Funding Needs Assessment for Sustainable Land Management Priorities.

- Ms. Sonia Gumbs-Luke, SEO, EMD, attended a one-day Workshop – Preliminary Findings on Application of the IDB Disaster Risk indicators to Guyana.
- Ms. Gumbs-Luke, Ms. Teijvarti Persaud and Ms. Marle Pantoja Reyes SEOs, EMD, also attended a seminar on Atlantic Canada's Energy Regulations Model on November 21, 2011.
- Ms. Tashana Redmond, SEO, EMD, attended a symposium on International Standards – Creating Confidence Globally.
- Ms. Clydecia McClure, SEO, Biodiversity Unit, NRMD and Ms. Felicia Adams, Environmental Officer II, EMD attended a stakeholder Consultation Workshop- Development of Land Use Planning Project on November 22.

YOUTH LEARNING TO BE ENERGY WISE

The Guyana Energy Agency (GEA) celebrated Energy Week during November 7 – 11, 2011 under the theme: **Guyana's Youths: "Adopting Clean Low-Energy Lifestyles"**. The week's activities focused on sensitising the younger members of the population on energy use and the critical role it plays in Guyana's development.

The Education, Information and Training Division of the Environmental Protection Agency (EPA) played an active role in Energy Week activities through an interactive presentation aimed at imparting sound energy-saving practices. The presentation was done on 11, November, 2011, at the Umana Yana where approximately 60 secondary school students and 30 students at the primary level eagerly and enthusiastically participated in discussions on being energy wise at home and at school. The Youths learnt about the different sources of energy, how energy is used and ways in which they could conserve energy. Students were encouraged to implement practices that would ensure energy is not wasted during their daily activities.



**Mrs. Candacie Brower - Thompson
delivering the presentation**

Students were encouraged to perform simple actions while **at home**, such as:

- turning off lights when leaving a room;
- encouraging their parents/guardians to replace incandescent bulbs with energy saving bulbs;
- turning off and unplugging all electrical appliances when not in use; and
- opening windows during the day to let natural light in.



At school, the students were encouraged to be active in energy conservation by:

- forming student patrol units to ensure lights are off in rooms that are not in use;
- placing signs in washrooms to remind fellow students not to waste water;
- report leaking pipes to teachers; and
- taking lunch to school in reusable containers.

Other energy saving tips

- Replace your five most used light bulbs with compact fluorescent bulbs. These light bulbs use two-thirds less energy and last up to 10 times longer;
- Take your own reusable bags to do grocery shopping to save the unnecessary production of plastic bags; and
- Take advantage of daylight by using light-colored, loose-weave curtains on your windows to allow daylight to penetrate the room while preserving privacy. Also, decorate with lighter colors that reflect daylight.

Students were informed of the benefits that would be gained by adopting clean low-energy lifestyles. Since Guyana is heavily reliant on fossil fuels for its energy needs. Students were reminded of the importance of energy conservation which would reduce carbon dioxide emissions, thereby assisting to combat climate change and other atmospheric pollution.



Wildlife Spotlight

Did you know?

The Black Caiman

The Black Caiman, *Melanosuchus niger*, is a Crocodile and the largest member of the family Alligatoridae. It is a carnivorous reptile that lives along slow-moving rivers and lakes, in the seasonally flooded savannahs of the Amazon basin, and in other freshwater habitats in South America.



Largest Fresh Water Predator in South America

The Black Caiman is one of the largest reptiles and the largest predator in the Amazon basin. Most adult black caimans are 3 to 4.26 metres (9.8–14 ft) in length. It has bony ridges over brown eyes, and black, scaly skin that helps with camouflage during nocturnal hunts but may also help absorb heat.

Juvenile Black Caimans eat crustaceans and insects but quickly graduate to eating fish, including piranhas, catfish, and perch, which remain the primary food source. Various prey will be taken by opportunity e.g. turtles, birds and mammals. Larger Caimans can take tapirs, anacondas, deer and capybara. Their teeth are designed to grab but not rip, so they generally try to swallow their food whole after drowning their prey. Jaguars are a known predator of all other caiman species as well as juvenile Black Caimans.

Breeding Season

Black caimans mate in the water. Females build their nests in December at the end of the dry season. The nest is made of soil and vegetation and is about 1.5 meters (5 ft) across and 0.75 meters wide (2.5 ft). They lay between 30-65 eggs, which hatch in about six weeks, at the beginning of the wet season, when newly-flooded marshes provide ideal habitat for the juveniles. Like other crocodylians, Caimans frequently move their young from the nest in their mouths after hatching (hence the belief that they eat their young), and transport them to a safe pool.

Conservation Dependent

Listed as *Conservation Dependent* on the IUCN Red List of Threatened Species, the Black Caiman is estimated to have a wild population of 25,000-50,000 individuals. Humans are their main threat because they are hunted for leather and meat. The Black Caiman population was once severely depleted by overhunting but has been recuperating well. Illegal hunting and habitat destruction still pose a problem and it also faces competition from the Spectacled Caiman that now occupies its habitat. Management programs, including captive breeding and reintroduction schemes, have been created to conserve this species.

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.

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.

Editorial Committee:

Sharifah Razack
Padmini Persaud-Roberts
Candacie Brower- Thompson

Aretha Forde

Fareena Alli

Sean Mendonca

Deuel Hughes

E-mail: cit.epaguyana@gmail.com

Mailing address:

Environmental Protection Agency,
EIT Division,
Ganges Street,
Sophia,
Georgetown.

Telephone #s:

225-6044, 225-6048, 225-5467-9,
225-0506, 225-6917, 225-1218,
225-2062

Fax # 225-5481

