Conserving Biodiversity through an Integrated Approach to Water, Land and Ecosystem Management in Caribbean SIDS

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The Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States is a five-year multi-focal area regional project funded by the Global Environment Facility (GEF). The United Nations Environment Programme (UN Environment) is the lead Implementing agency.
Participating Countries:

National Projects:
- Antigua and Barbuda
- Cuba
- Dominican Republic
- Jamaica
- St Kitts and Nevis
- St Lucia
- St Vincent and the Grenadines
- Trinidad and Tobago

Regional contribution:
- Barbados
- Grenada
To contribute to the preservation of Caribbean ecosystems that are of global significance and the sustainability of livelihoods through the application of existing proven technologies and approaches that are appropriate for small island developing states through improved fresh and coastal water resources management, sustainable land management and sustainable forest management that also seek to enhance resilience of socioecological systems to the impacts of climate change.
Project Objective

I. Component
   Develop and foster implementation of targeted Innovative, climate-change resilient approaches

II. Component
   Strengthen water, land and ecosystems resources Monitoring, and Indicators frameworks

III. Component
   Strengthen policy, legislative and institutional reforms and capacity building

IV. Component
   Enhance knowledge exchange

V. Component
   Project management

VI. Component
   Mid term review and terminal evaluation for the project
Enhancement and maintenance of biodiversity over 2,952.4 km² / 13,670 hectares planned in four watersheds: Rio Guanabo watershed (east of Havana, on northern coast), Arimao River watershed (southeast coast), Agabama River Basin (south eastern Cuba), and San Juan watershed (eastern Cuba).

High species richness in Project target areas: at least 130 species of birds (15 are endemic); 33 floral species are critically endangered, 41 are endangered, and 21 vulnerable to human-induced threats. Of these floral species, 64 % are endemic.

Relatively few scientific studies conducted in these areas to date.

Environmental baselines are being conducted during early stages of project implementation.

Reforestation is a key activity.

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Enhancement and maintenance of biodiversity in watersheds, reforestation, and environmental baseline activities are the main highlights of the IWEco National Project in Cuba.
**Mitigation of poor biophysical conditions** in the upper reaches of the Soufriere Watershed, rich in biodiversity, and the site of the Pitons World Heritage Site.

Town of Soufriere and the surrounding communities are among the most **economically vulnerable** in St. Lucia.

Area susceptible to **land degradation due to steep slopes**, soil types, heavy rainfall.

**Land degradation mitigation** over 90 hectares to restore agricultural land productivity, reduce risk to life and property from landslide occurrence and reduction of sedimentation into an adjacent marine protected area.

**Alternative farming and sustainable forest management**, production and promotion of biodiversity friendly goods and services, e.g. non-timber forest products, Agro-Tourism Park.

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Land degradation due to steep slopes, alternative farming, and sustainable forest management are the main highlights of the IWEco National Project in St. Lucia.
Georgetown Watershed, a national biodiversity hotspot, home to several rare and threatened species, most significantly the endemic St. Vincent Parrot (Amazona guildingii), and five endemic reptiles.

Reforestation and conservation forestry interventions over at least 7.5 hectares within upland areas where landslides have occurred and along 1.8 km of eroding riverbank.

Thinning of the Blue Mahoe and Mahogany forest plantations over approx 5 hectares to improve stability of the existing forest plantation and enhance the diversity of the forest, through natural regeneration of indigenous forest tree species; thereby also increasing the habitat of the St. Vincent Parrot.

Enrichment planting of naturalized species; the development of the Jennings Bird Watching Trail.

Conduct of census of the St. Vincent parrot (Amazona guildingii), which is vulnerable due to limited size of its habitat and natural disasters.

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Reforestation, conservation forestry interventions, census of the St. Vincent parrot and enrichment planting of naturalized species are key aspects of the IWEco National Project in St. Vincent and the Grenadines.
Restoration of important elements of biodiversity of the Negril Great Morass, one of the largest natural coastland ecosystems in the Caribbean region, supporting internationally significant species and high species endemism.

Strengthened management of the Negril Environment Protection Area (declared a protected area under the Natural Resources Conservation Authority Act in 1997)

The Negril Royal Palm Reserve, approximately 162ha, contains biodiversity representative of the larger wetland area and has the largest stand of the endemic Royal Palm in Jamaica.

Sedges and grasses provide refuge, breeding, feeding and nesting for a number of shore and wading birds including the rare, endangered and Caribbean endemic West Indian Whistling Duck

Interventions include: the control and management of invasive alien species, habitat rehabilitation, rehydration of the morass, land use management, and development of the visitor centre in the Royal Palm Reserve

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The Negril Great Morass, one of the largest natural coastland ecosystems in the Caribbean region, is a key part of the IWEco National Project in Jamaica.
Executed by the Environmental Management Authority (EMA), started May 2018; duration 48 months

Aims to reduce and reverse land degradation associated with quarry operations at selected quarry sites in the NE Trinidad using an integrated water, land and ecosystems management approach

Area Includes the Aripo Savannas (Environmentally Sensitive Area)

To restore natural vegetation, reduce sedimentation and flood risk and restore ecological function to 40 hectares of exhausted or abandoned quarry sand and gravel pits

Rehabilitation of degraded land will result in increasing biodiversity

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Reduce and reverse land degradation associated with quarry operations are the key activities of the IWEco National Project in Trinidad and Tobago.
IWEco and Biodiversity: Trinidad & Tobago

Challenges and Impacts

- Inadequate regulation of quarry operations
- Poor land use practices and resource management
- Conflict amongst stakeholders
- Severe land degradation and loss of vegetative cover
- Ecosystem degradation and loss of biodiversity
- River sedimentation, siltation of surrounding water courses
- Degradation of coastal water quality
- Dust and Noise pollution, Vibration
- Visual amenity and landscape character – i.e. visual “eye sores”
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Approaches

Rehabilitation - measures taken to repair disturbed or degraded land and return it to a stable and non-polluting state

Capacity building – including training of community

Public and private sector partnership

Development and dissemination of guidelines for land restoration

Strengthening the monitoring indicator framework

Knowledge sharing
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Approaches
Pilot training and demonstration rehabilitation site - NQCL, the state owned and operated quarry.

Three areas:

- **Site 1**: Focused on planting of tree species for food production, creation of wildlife habitat and regeneration of original forest species.

- **Site 2**: Area of a back filled exhausted quarry pit devoid of soil nutrients with severe gullying and erosion occurring.

- **Site 3**: Compacted, backfilled, exhausted quarry pit where forest species enrichment is being tested to determine best species for rehabilitation of quarries.

Interventions at all three sites completed in July 2019 (maintenance continues twice weekly)
IWEco and Biodiversity: Trinidad & Tobago

Highlights – Site 2

- **Site 2**: Area of a back filled **exhausted quarry** pit devoid of soil nutrients with severe gullying and erosion occurring.

Interventions include:

- **Soil nutrification** - mulch using waste beer hops; tree and grass cuttings and sargassum which would otherwise go to a landfill

- **Planting of vetiver grass** to address soil erosion

- **Creation of living check dams** to stem gullying and water run off

- **Creation of a plant nursery**
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Highlights – Site 2

Map Showing Locations of Rehabilitated Sites completed under the GEF-IWEco Project

Inset map to the left shows locations of rehabilitated sites in relation to the NQCL main office.

Satellite imagery is from the year 2014.
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Highlights – Site 2
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Highlights

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Highlights – Site 1 and 3

- **Site 1**: Focused on planting of *tree species for food production*, creation of wildlife habitat and regeneration of original forest species

- **Site 3**: Compacted, backfilled, exhausted quarry pit where *forest species enrichment* is being tested to determine best species for rehabilitation of quarries.
IWEco and Biodiversity: Trinidad & Tobago

Highlights – Site 1 and 3
Improved **community capability**, enabling replication at other, additional sites. Two NGOs, the Trust for Sustainable Livelihoods (SUSTRUST) and IAMovement (IAM), in collaboration with the UNDP Small Grants Programme, developed a quarry rehabilitation training programme as part of the project’s livelihoods programme.

- **Twenty-seven persons** from surrounding communities trained in classroom and field work at the pilot sites.
- “**Quarry Rehabilitation Champions**” trained in site preparation and planting, creation of check dams and fire tracing, nursery development, top-soil conservation and management, mulching, and planting vetiver.
- Training in the use of **vetiver grass** to make a variety of products - an alternative livelihood opportunity.
- **QRCs graduated in January 2020** and available to work on other interventions.
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Highlights – Development of Guidelines for Preparation of Rehabilitation Plans

Development of Guidelines for Preparation of Rehabilitation Plans

- **Public awareness campaign** to increase voluntary compliance by quarry operators and monitoring of quarries by regulatory agencies

- **Draft “Guideline for the Preparation of Rehabilitation Plans”** completed by the EMA (December 2018) and undergoing stakeholder review

- This guidebook is designed to **assist applicants in submitting satisfactory Rehabilitation Plans for approval**, as required prior to commencement of mining/quarrying operations for which a Certificate of Environmental Clearance (CEC) has been granted
Results and lesson learned (1/2)

- Land degradation can be reduced and reversed, and ecological function restored, in exhausted or abandoned quarry sand and gravel pits - GPS mapping exercise conducted by the EMA in August 2019, determined that the total area rehabilitated in the period May 2018 to July 2019 was 7.05 hectares. (map)

- Evidence of return of flora and fauna species
Results and lesson learned (2/2)

- Community capacity building component has been transformative – participants have described appreciating the value bush/trees more and feeling empowered.

- Persons trained in land rehabilitation and sustainable planting techniques have gained additional livelihood opportunities.
Significant potential for replication and upscaling

- **Replication has started** - in November 2019, work began at an additional site for rehabilitation (private sector (Carib Glassworks Ltd.))

- Implementation of the *Guidelines for the preparation of Rehabilitation Plans* will assist applicants for quarry licenses in submitting satisfactory rehab plans and complying with regulations.
I was one didn’t like trees…I would see trees and just like to chop, chop, chop, burn, burn, burn… I was a hater of trees…

Now, I am not like that again – I try to impart a little bit of what I learn to anybody I meet…to make the place a better place!

Marva Ann Neptune-White
Quarry Rehabilitation Champion, 2019

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Never underestimate the power of a community to do an intervention to solve an environmental problem because we have proven that these community people, ordinary people, were able to be retooled, empowered, and they are ready to solve the major environmental problem of deforestation.

Carlton Roberts
Trust for Sustainable Livelihoods, 2019