

Final Report: Sustainable Cities, Resilience and Risk Management

As we move towards the closure of this project, this report provides and gives an overview of the key deliverables completed. To meet many of the SDG's, sustainable components have been built into the program so activities will be ongoing. Achieving the outcomes required incorporating an integrated and multi-pronged approach was utilized with multiple benefits accruing the across various multilateral environmental conventions in Climate Change, Biodiversity, Pollutants Chemicals, Mercury and even sections of the new Escazu Agreement formerly called Principle 10. The strategy used was to piggyback on other existing

programs and events, using in kind and volunteered support many activities which has produced significant results with contributions positively impacting the attitudes and behaviors of the residents, children and visitors. The program used volunteers who came from as far as France, USA, and South Africa. They contributed their skills, talents towards painting marine



for

murals for public education and awareness, project writing and proposal development, creation of the web site, all aimed at sustainable efforts with a special focus on our youth. My involvement, participation and sharing at the Basel, Stockholm, Rotterdam and Minamata – Conventions and Mercury Inventory Assessments training provided valuable learnings and opportunities for greater engagement for community outreach and the development of local actions in waste management. Being selected to serve on the Mercury National Working Group has now led to a Partnership Agreement between IPEN CEE regional hub & Toxic Metals WG coordination Arnika - Toxics and Waste Programme in the Czech Republic and a local group-BWC for Mercury Monitoring of Women in Small Islands Developing States. This is being implemented through an exercise in hair sampling and testing of 30 women of childbearing ages both in Antigua and Barbuda. Another major accomplishment was the development of youth leaders through the Beach Stewardship program using several innovative processes. Through building networks and collaboration with many private sector groups with the sailing academy in Falmouth enabled us to undertake activities like paddling for mangrove cleanups, sailing and beach cleaning for protection of turtles and other sea creatures allowed children to be exposed to the idea of integrating caring for nature as part through these fun activities. Local ownership and community buy in is so important as evidenced by the support from the head teacher of the Glanville's school who offered her student body and campus to do a bin making workshop and to be involved in the activities. The schools provide a great learning experience. In Barbuda, the buy in and support by the Principle of the Holy trinity school in Barbuda points to the recognition that

the care and preservation of our mangroves, beach and coastal areas must involve behavioral and attitude change starting with the children. The long-term goal is to get this concept to have multiplier effects and impacts through self-sustained activities with the children as Stewards pushing and moving this concept through the schools and communities. With many of the mothers were involved in a national cleanup of waste and debris at the start of the 2018 Hurricane season, they wanted the children to have an experience and provided full support for their involvement.

Richard was on island and participated in the World Wetland Day Events that took place during the month of February with outcomes in tree planting at schools, mangrove reforestation, tour of mangroves sites at South Coast Horizons, Media Blitz Artwork, Launch of the marine and cultural community and youth awareness project, bird watching and displays at Carlisle Bay which involved 7 primary Schools. The OAS, GEF/SGP, MEPA Trust, the EAG (Environmental Awareness Group), Flora and Fauna International, RA Events-Walling's Nature Reserve, the Fisheries Division, Community Development Division, hotels, local environmental consulting firms and private sector firms supported the events.



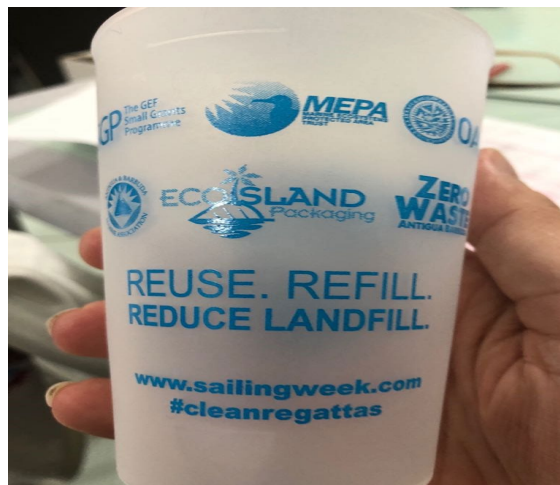
The **waste management workshop** conducted Feb 15 and 16th, was aimed at sharing and compiling information on the social components required to be fully integrated into the Strategic Plan for Zero Waste management in Antigua and Barbuda. The plan takes into account the environmental and social safeguards and has a gender-mainstreaming component. This training followed up to the earlier week of technical training from TNO facilitated by the Aruba UNDP Center of Excellence conducted October

9-13, 2017. The ongoing training and capacity building processes are aimed at building the competencies and skill sets of the 25 local groups many of whom are already involved in pilot projects aimed at recycling, up scaling, waste diversion, up cycling, and reusing. The training is being complemented and supported by a survey currently being tested and will be conducted by the workshop participants to give an indication how people feel about waste management. It will also address aspects of livelihoods and opportunities for sustainable employment creation that is possible from separation of the various waste streams. Pilot projects that can be developed will benefit the waste pickers at the landfill who in their search for salable items to generate income are subjected to needles, rats, pests chemicals, mercury hazards and other hazardous conditions so diverting waste pickers to a collection center where they can be provided a living wage is one of the goal of the Strategic Plan and utilizing this circular economy approach helps in the country in reaching the SDG's. The aspects for behavioral and changes in attitudes is key to understanding the emotions of people and their feelings towards waste.

Vital and key information has been added to support and complement the environmental and economic pillars and include information on demographics such as the age of the person, gender, educational level marital status and income level personal household information, the parish where the person lives, number of persons living in the household, the job and profession of the person, a question asking about feelings when noticing garbage on the island to include tires, damaged and old cars, boats, plastics bottles electronics, food waste and other general rubbish along with rubbish heaps with a wide range of choices to answer such as always, sometimes and rarely. The survey further tries to gauge the emotions of the local people seeking to find out if it bothers the person and to what extent when waste is not properly disposed of. What is the a feeling when things are done to help the environment, how does it feel to give away some items egg books and clothes and a mobile phone when it is not being used anymore. What are the Feeling to reuse, recycle or up cycle items? A question relating to the home assessment such as cluttering of waste, and if proper disposal of waste is important to wellbeing, cleanliness and if the person has a willingness to pay even 1.00 per month for a more effective solid waste management system in Antigua. Currently the Kassel University team will do being carried in Antigua and already completed in

Barbuda the tabulations and assessments of the 300 surveys. A follow up workshop will be carried out in late October to inform the groups of the results of the survey.

Apart from the survey and another waste management workshop planned for late October, the efforts of the Antigua and Barbuda Marine Association must be noted, who with their innovation planned the **Antigua Sailing Week Zero Waste Cup initiative** with the support of the OAS, GEF/SGP and Zero Waste Antigua and Barbuda, launched the branded 'your cup for the night/event' event using 7700 reusable cups specially designed for use at all of the events. With approximately 100 yachts on island, each with a crew of between 5 - 15 persons plus the spectators there would be



thousands of plastic cups used every single day of the regatta that would normally end up at the landfill but this year was different.

The cups introduced were reused extensively at the events held during ASW 2018 and every effort was made to get participants to use their one-cup all evening. These actions by The Antigua & Barbuda Marine Association demonstrated its dedicated actions to the responsible protection, enhancement and improvement of the marine industry and the safe guarding of the environment in Antigua & Barbuda. OAS support went into the Zero waste Cup initiative and its logo was one of 6 logos displayed on the cups used exclusively throughout all the events at the Antigua sailing week events. It attracted over 1000 persons, 100 sailing ships with many partnerships built with over 25 groups. The message was loud and clear and aimed at reducing the amount of plastic cups that are used for this regatta, at the after sailing parties in the Antigua Yacht Club, Nelsons Dockyard and other bars and restaurants in English Harbour. A total of 38,375 plastic cups were diverted from the landfill or 426k-kg plastics diverted. Cups were issued to all official bars & restaurants, Chase the Race Boats and all volunteers. In addition, the team provided a lot of man-hours before, during & after (ongoing) the event to ensure that venues were aware of the initiative together with other 'green initiatives' such as Straws on Request and organized the Green Zone within the Waddle Grill for local entrepreneurs to promote their green initiatives without cost.

The Antigua Sailing Week Green Team is a great group of mainly males, who work throughout the week sorting garbage/recycling; emptying the bins, picking up litter throughout the events and come back year after year to volunteer (they get a t shirt and a stipend to cover food and travel). They do the hot dirty work, which they do with a smile and work very hard because they all believe in what we collectively are all trying to do.



The results were very good with less garbage collected and taken to landfill. We did offer a Reuse Collection Point for those people who didn't want to take the cups but only about 500 in total were collected so we think people took them as memoir. More people are thinking about reusing as opposed to just recyclable and next

year we would look to do a cup deposit return system to try and increase the reusing within the event. .

Jennifer Moran to of **Adopt a Coastline project** with the recyclables is also doing great work. Notice in the picture the table stand made of crushed up aluminum cans. Beautiful. Also notice the recycling bins made of oasis plastic bottles, which has been created and designed by the Youths Stewards from such beach waste items, and the skillsets provided to the youths enabling them to produce valuable and usable items from waste items.

A sailor from one of the yachts bought two of them at \$500.00 each to use as clothes hampers to throw in their wet clothes. They can also be used as recycling bins for plastic bottles at events, and other uses.





It is recognized that almost all small islands like Antigua face a big problem-Solid waste with negative consequences which include the: pollution of the oceans, our streets, the air we breathe our and groundwater and human health. The situation is worsening as a result of our Increase in consumption, improved living conditions, industrialization, commercialization and packaging. Antigua and Barbuda is second in the world following Trinidad with 12.5 kg/capita/day with 5.5kh/capita/day 12 times over the world average. The World Economic Forum provided the data in 2015. The situation is worsening because the number of people living in extreme poverty has halved over the last 25 years and the increases in consumption and is often not connected to a proper waste management system.

The involvement of the youth and their stewardship is spearheaded through the Adopt a coastline program and dedicated to restoring and preserving Antigua’s coastlines through a grass roots campaign that includes group beach clean ups, stewardship, education, raising public awareness, community action, social media and citizen science. The youth stewardship program educates and engages local communities, specially with the youth aimed to create future generations of coastal stewards. This program fosters a caring connection to the coastlines, protected mangrove areas and our environment as a whole, encouraging youth voices with a vision to create ways to adjust the cultural assumptions that have led to the human error and flaws that have created the neglect and lack of care towards our environment by previous generations.



Through hands on actions and active participation, lasting lifetime habits and learn ways are created to thrive in unison with nature. Through the creation of social and traditional media campaigns awareness and with product development and marketing tools viable means have been created to sustain income and livelihoods via a circle economy model. Adopt coastline has organized several group beach cleanups in areas where birds fish and turtles nest and feed. It is important to introduce people to pristine places where wildlife is struggling to survive so they can experience firsthand the impact of beach and coastal debris on animal habitats with events where people can actively learn more such as film screenings, art shows, and sailing events. OAS supported through video, pictures and paintings. The work envisages building networks and partnerships with overseas volunteers and visitors, local community and groups from many sectors Including NGO's, schools, communities, businesses, government, homeowners, construction industry, and marine industry. The process is hands on using grass root techniques such as community outreach and social media to create interest in coastal cleaning. The approach is to focus on areas where human contamination is imposing on what is left of pristine places. The areas being focused on are area where animals, mangroves and reefs are struggling to survive and directly adjacent to communities and sometimes used as illegal dumping grounds.

Through the beach cleanups communities can actively show the impact of debris on their coastlines, which engages individuals and promotes a change in human activities and behaviors, which can help to prevent debris from source point. The on source areas are addressed and work involving the offenders is done in a personal manner targeted to create awareness and elicit support in a friendly and community inspired manner. Starting with the launch of the Facebook page the posts are now reaching thousands, with multiple and recurring sharing and new members coming onboard weekly with the media base growing quickly. There is a positive outreach growth of 100 new members since program started, averaging 30 new members monthly. Youth stewards have started their own Whatsapp group to keep in daily contact and share posts and ideas.

The group has launched Instagram and Twitter, a holding page for website, while working on web building for the group. There is ongoing beautification on the coastlines by the youth teams in addition to committed stewardship and the group is placing make do bins in areas to make it easier for cleaning and maintenance of the coastlines. Using old Tires dumped on Falmouth Beach have also been made into bins with signage and bags inserted and painted. In addition the use of horse feed bags donated from Spring Hill riding stables were placed along other beaches and signage has been made from up cycled wood gotten from the marina.

Signage and bins on walkways have been erected to hold trash along the coastlines with the intention to demonstrate that when such initiatives are taken towards beautification and protection of our ecosystems, the community responds positively by helping to keep Antigua clean. With bins in place, that are regularly emptied, and areas are monitored by the youth and their presence and efforts are recorded online, There are clear indicators for recording positive improvement and so far efforts have been successful in showing behavior changes when the initiative is taken even by a few. It is noticed that trash has now been placed in our feed bags and in addition, tour guides have started contributing to cleaning up, and are

working collaboratively now, whereas in past they had not cleaned at all and have simply brought tourists through trash filled trails, now they are active participants in the shoreline management. Visitors are using the bins demonstrating that it is an effective means to curtail coastline trash.

Participation in the Falmouth Marina Markets was a means to launch and showcase the project with the products and services displayed at major events like Classic Regatta, and Antigua Sailing Week along with other groups. These events have served to introduce youth and their work with active introduction of the program in anticipation of future sponsorship. In addition, market events have helped raise funds and support for activities and have helped to demonstrate what is possible and helped to test market the products.

The range of products and activities include:

- Created Bin Making Prototypes large and medium and Furthered the bin project to production stages, working out new samples for small large medium bottles to include an interior and outdoor utilitarian models with a Bin making tutorial created.
- Created Maps for postcard promo and media kit (to be published for sponsorship kit and for sale)
- Started beautification marine and coastal designed murals
- Product design for market events (bottle openers, hangers)
- Created signage from buoys
- Participated in Market events
- Product development for sponsorship products; magnets and jewelry line
- Worked on tags, packaging, point of purchase displays
- Sourced materials and delivered items needed from overseas

One of the great innovations is the power of the Youth Stewardship Program to create media and product development The youth were recruited through the Sailing Academy sessions which began with ongoing group cleanups serving as training sessions now established, as a group of 15-23 year olds who are currently working in teams and rotating between six coastlines while documenting their experiences and journeys.



The expanded vision is focused on facilitating pathways for the youth stewards to create viable means of support for their activities through product development, media output, and soliciting sponsorship from businesses and property owners. The selected youth stewards were engaged in social media from the start a required essential goal that they have influencing power by spreading news on their own personal journey in creative ways using snap chat, Intagra, Facebook to create a

buzz within their own peer group's friends and family extending to the outside world.

By documenting their process and experiences as they evolve led to an archive, a media library to later create educational and promotional tools. Numbers are very impressive. One of the goals established from the beginning of the journey was to calculate each steward own trash input in our life, and work towards a goal of cleaning to offset and erase it. The personal

aspect of this work was crucial; persons reflecting on their behaviors so as to better understand the behaviors of others in order to find solutions.

Stewards were collaborating with each other and the overseas volunteers who helped to create the space to launch the project. All the furnishings were made using up cycled and recycled materials, creating a provisions garden, and working on web development. This hub functions as a learning center and support a zero waste lifestyle with a gallery showroom to display the works made from recycled materials. It is currently in the process to be open.

The support from the private sector business was very encouraging which came in a variety of ways to include collaborating with property owners associations to make recycle bins which were sold to property owners, organizing large volume pickups for solid waste with donations coming from many sources, homeowners, and hatch crews restaurants via sticker donations. Super Yacht guides, homeowners

The liaison was successful with yacht crews and was done via events in the marina and through social media, and sponsorship was introduced to stewardship services via purchase, participation, or donation. Funds have been raised via bin sales, donations, and product sales to start a bicycle fund. One bike has been donated. 3-4 used bicycles were purchase and overseas volunteers held a bike clinic in May. There have been strong and robust collaborations with local manufacturers on procurement of waste materials for future product development. Throughout the project, identification was made of the key benefactors in each area stewarded in a collaborative action giving an indication of who would benefit the most, a business or community or tourist walking off the beaten path. Other indicators were -Has the steward made an enough positive impact to elicit sponsorship, does he or she have documentation to back up their efforts, What additional steps needed were determined by the area and the communities it serves since some are directly related to fishing and marine industries, some were tourist and others were remote areas.

In one of the remote areas that had a riding stable, the horses go on trails with tourists that were trash filled, and the difference was noticeable. Tour companies and others benefited from this form of stewardship, hotels that take guests to remote beaches benefited as well indicating that when one is active on the coastlines it is easy to identify who uses them and to make plans how to approach the key stakeholders. The product development came from the creative youth who felt compelled by certain coastal and marine waste materials. Jennifer's background in product development and retail guidance provided understanding based on their skill set to create functional and other kinds of art or decor items. Next step is to launch the gallery space, and with Jennifer as an artist, producer, buyer, and retailer of her own product lines, she is very familiar with all the steps needed to take on to have this be successful. Thanks to an online presence, the products are promoted on social media in order to streamline what are the most popular items and if they can become production items to wholesale on island and in other markets. There are many avenues that can take once there are the hands on the coastlines mining for materials. Tourists love local made, recycled, a

giveback cause, a story behind an item, and they love the sea. There is much to succeed in tapping into this market which is still underdeveloped.

As a small island whose landfill is on the coastline, the more we can keep out of landfill the better. Steps are in place for greater development of community programs that create awareness of the critical importance of the yachting industry and the tourist industry generally to the livelihoods and wellbeing of all areas of the community. There is also need to engender support for key charitable events in the community that raise awareness of environmental issues and their effect on their personal health and that of the community and country.

The results are clear to see so processes for sustainable actions are being put in place and the process requires continual documentation of all activities, and archiving of content for current and future media releases by youth, leaders and other volunteers. With the logo and graphics finalized, promo stickers were printed, uniform T-shirt's printed, retail T-shirt's test marketing, stamps made for zero waste product line point of purchase packaging and displays all share collectively through ongoing social media campaign. Starting with Facebook; some posts are now reaching thousands, with multiple and recurring sharing and new members coming onboard weekly the media base is growing quickly. There is a positive outreach growth of 100 new members since program started, averaging 30 new members monthly. Youth stewards have started their own What Sapp group to keep in daily contact and share posts and ideas. Launched Integra and Twitter, a holding page for website, while working on building content for the website

There is Ongoing Beautification on the coastlines by the youth teams in addition to stewardship we are placing make do bins in areas to make it easier for us to clean and maintain. Old Tires dumped on Falmouth Beach made into bins with signage bags and painted and also using feed Bags. We made signage from up cycled found signs from marina. And placed signage and bins or ways to hold trash along the coastlines with the intention to demonstrate that when initiative is taken towards beautification the community responds positively by helping Keep Antigua Nice. With bins in place, that are regularly emptied, and areas monitored by the youth, their presence and efforts are recorded online, we have seen positive improvement and so far efforts have been successful in showing behavior does change when initiative is taken by a few. Trash has been placed in our feedbags. In addition, tour guides have started contributing to cleaning up, and we are working collaboratively now, whereas in past they have not cleaned at all and have simply brought tourists through trash filled trails, now they are active participants in the shoreline management.

Trash has been placed in our bins and visitors are using the bins demonstrating that it is an effective means to curtail coastline trash. Participation in Falmouth Marina Markets was a means to launch and showcase our project, products and services.

The events served to introduce youth to general public and visa versa, we have been actively introducing the program in anticipation of future sponsorship, and in addition, market events have helped raise funds and support for activities and have helped test market

products. While actively seeking community involvement, here are some groups and individual support the project has cultivated:

- Collaboration with Antigua Artisans Travelling Market for events and markets
- Collaborating with save Antigua sea turtles on product development and assisting them with production.
- Collaborating with sailing academy youth for recruits and clean-ups
- Collaborating with island academy cadet program on bin production

Bokashi Compost Antigua Barbuda has a focus on waste recycling including food waste for the benefit of the terrestrial and marine ecosystems. It also has the people connections ranging from households, restaurants, bars, gardens, school, with events such as sailing week that is being targeted.

, **Bookish Compost Antigua Barbuda** has been soliciting cooperation from the national Solid Waste management Authority (NSWMA) to help with source separation of waste in the area which is the starting action needed. Bookish is also reaching out to largest supermarkets with delis to support work with individuals, schools, communities, NGOs and others, demonstrating the process of making compost-- an organic garden amendment for protection of our soils--



and helping them to set up organic gardens, using the composts as an organic soil amendment to lessen the use of harmful chemical fertilizers, herbicides and pesticides in food products. I, **Bokashi Compost Antigua Barbuda** is also presently expanding the scope of activities to a larger scale, to include more households, schools and communities across Antigua and Barbuda through an educational composting facility set up in Gunthorpes, via this entrepreneurial enterprise to make and sell composts and to teach households and communities across the nation how to do the same in a community-based, decentralized manner. By doing, Bokashi **Compost Antigua Barbuda** hopes to reach out across the nation



in education and awareness opportunities that are necessary to help us reduce waste and pollution, cope with climate change and divert organic waste from the Cooks Landfill. This in turn will help us prevent methane gas emissions being emitted from the land fill into the atmosphere and other pollution impacts, and also make more compost available to be used in home gardens, backyard gardens, community gardens, landscapes, small farms, entrepreneurship, and more

across the nation. These efforts will also help us to improve our soils and by extension food and nutrition security and conserve associated terrestrial and marine ecosystems that are from various accounts, presently in need of greater protection to improve their resilience especially in the face of Climate change.

Bokashi Compost Antigua Barbuda awareness campaign extends to delis for kitchen scraps fruit and vegetable peelings, egg shells, coffee grounds and so on-- waste from the supermarket and cafeteria that would normally be sent to the land fill --to be diverted instead and be used at the Gunthorpes facility to produce compost. This would also greatly help the facility in its multiple goals of lessening waste and pollution in the our tourism based economy, mitigating and adapting to the impacts of climate change, fostering food and nutrition security, sustainable development, conservation and protection of our biodiversity ecosystems, and greater protection and conservation of our environment as a whole. OAS support provided a video feature on this waste diversion strategy for promoting climate smart agriculture.



