

# PLASTICS AND CIRCULAR ECONOMY COMMUNITY SOLUTIONS

#### **AUTHORS**

Sulan Chen\*, Charlotte De Bruyne, Manasa Bollempalli

#### **EDITORS**

Christopher Dickson and Yoko Watanabe

#### **CASE STUDY CONTRIBUTORS**

CASE 1: Philibert Mundanda

CASE 2: Jaison Varghese

CASE 3: Hyacinth Douglas

CASE 4: Abdul Sannoh

CASE 5: Kebba Bojang

CASE 6: George Ortsin

CASE 7: Fathimath Saeedha

CASE 8: Aimal Khaurin

CASE 9: Hovhannes Ghazaryan

CASE 10: Deon Stewart

#### **ACKNOWLEDGEMENTS**

We want to express our deepest gratitude to the thousands of civil society organizations and committed individuals who are working with the GEF Small Grants Programme to protect the environment, enhance local livelihoods, and empower local communities in poor areas. This publication captures only a small portion of their honorable collective effort. The authors would like to thank Stephen Gold, Christian Hofer, Andrew Hudson, Leah Bunce Karrer, Christine Wellington Moore, Pilar Barrera Rey, Anil Bruce Sookdeo, and Xiaofang Zhou for their support. This publication is dedicated to the people who believe in the power of local people and communities to bring about positive change in plastics management for circular economy.

#### **PUBLICATION COORDINATOR**

Ana Maria Currea

#### **DISCLAIMER**

The views expressed in this publication are those of the author(s) and do not necessarily represent the views of the United Nations Development Programme, the United Nations generally, or United Nations Member States.

#### **CITATION**

United Nations Development Programme.  
2019. *Plastics and Circular Economy: Community Solutions*.

#### **DESIGN**

Camilo Salomon @ [www.cjsalomon.com](http://www.cjsalomon.com)

#### **PUBLISHED**

**Small Grants Programme**  
Sustainable Development Cluster  
Bureau for Policy and Programme Support  
United Nations Development Programme  
304 East 45<sup>th</sup> Street, 9<sup>th</sup> Floor,  
New York, NY 10017  
[www.sgp.undp.org](http://www.sgp.undp.org)

Copyright © 2019, United Nations  
Development Programme  
All rights reserved.

\* Lead and corresponding author.  
Email: [sulan.chen@undp.org](mailto:sulan.chen@undp.org)

# Contents

<b>Foreword</b>	2
<b>Message from the Global Manager</b>	4
<b>Acronyms</b>	7
<b>Introduction</b>	8
<b>Material Engineering and Product Design</b>	13
CASE 1. BURUNDI: Banana-tree Bark as an Alternative to Plastic for Seedling Transport Bags	14
CASE 2. INDIA: Improved Plastic Waste Management Supports Marginalized Women's Livelihoods	17
CASE 3. JAMAICA: Recycling Plastic Waste to Conserve Negril's Coral Reef	20
CASE 4. SIERRA LEONE: Youth-led Innovation: Transforming Plastic Waste into New Construction Material	23
<b>Consumer Use and Behavior Shift</b>	26
CASE 5. GAMBIA: Plastic Recycling led by Women's Group Contributes to National Policy on Plastic Ban	28
CASE 6. GHANA: Plastic Waste Turns into Employment for People with Disabilities	31
CASE 7. MALDIVES: Advocating Alternatives to Single-use Plastic Bags	35
<b>Waste Collection and Management</b>	38
CASE 8. AFGHANISTAN: Community-based Plastic Waste Management for Wetland Conservation	39
CASE 9. ARMENIA: Reduce, Reuse and Recycle: Use of Innovative Bar-coded Shopping Bags	42
CASE 10. BAHAMAS: Piloting Sustainable Community-based Waste Management in South Eleuthera	45
<b>Lessons Learned</b>	48
<b>Looking Forward</b>	52
<b>Annex 1. Summary of Project Cases</b>	54
<b>References</b>	55
<b>Endnotes</b>	57

# Foreword



Plastics have become an integral part of our daily life: from plastic straws and shopping bags to laptop computers and construction materials. The linear model of “take, make, use, and dispose” plastic materials poses a grave threat to the sustainability of our economy and environment. By 2050 there will be about 12 billion tonnes of plastic litter in landfills and the natural environment. Recent research also suggests that cost of plastics on environmental degradation, climate change, and health hazards are reaching US\$139 billion annually.

In alignment with UNDP Strategic Plan and GEF’s programming directions, the GEF Small Grants Programme, implemented by UNDP, has been providing technical and financial support to projects led by civil society organizations and communities to test innovative approaches and practices for plastic waste management through a circular economy approach, which promotes closed-loop production and consumption. Such innovative practices include promoting “reduce, reuse, and recycle” plastics through material engineering and product design, shifting consumer use and behaviour, and developing sound approaches to waste collection and management.

Local innovations can play an essential role in plastic management through circular economy approaches, which could prove critical for long-term sustainable development. As illustrated in this report, community innovations stemming from traditional local knowledge as well as from the application of modern science and technology, awareness raising, and advocacy are having tremendous, positive impacts. The cases described here also reveal that the poorest and most vulnerable people in the community often bear the greatest cost of plastic pollution. Many of the projects funded by the Small Grants Programme thus are focused on working with women, youth, and disabled people.

For example, in India nearly 700 ragpickers, many of whom are socially marginalized and illiterate women, have been organized and trained in waste collection and recycling activities, which has also improved their livelihood. Approximately 10 tonnes of plastic waste are collected at five recovery centres in Bhopal every day, and the plastics are recycled by cement industries in and around the city. In Burundi, a women’s association

undertook forest reforestation by using ecological alternatives to plastics in packaging seedlings. The central innovation of this project was to replace plastic bags with bags made of banana bark. This practice was replicated in many other communities, resulting in the avoidance of the use of three million plastic bags throughout Burundi.

These efforts, though inspiring, are like drops of water compared with the ocean of plastics and associated threats we are facing. The problem of plastic pollution is so prevalent, and societal habits and behaviours are so entrenched, that no single-sector approach can address the problem successfully. This publication also reflects upon community challenges and inherent dilemmas in plastics management and the need to adopt a circular economy approach at local levels. We recognize this problem cannot be solved unless all sectors including government, the private sector and communities work together to shift how our economy functions and people live. It is imperative to change collective behaviours and cultures to turn off the tap and reduce plastic pollution at the source, while also reducing consumption and providing an ecological alternative.

We hope these examples from the GEF Small Grants Programme will reach the widest possible audience and inspire further innovation and transformation from the local to the global level. We also hope this publication will further boost policy deliberation, leverage partnerships, and rally actors around the world to address the global plastic waste challenge and sustain our planet and ecosystems.



**Pradeep Kurukulasuriya**  
*Executive Coordinator & Director-  
Global Environmental Finance & Lead,  
Natural Capital and the Environment  
Bureau for Policy and Programme Support  
(BPPS)/Global Policy Network  
United Nations Development Programme*



**Gustavo Fonseca**  
*Director of Programs  
Global Environment Facility*

# Message of the Global Manager



Plastics constitute a growing threat to our environment and human well-being, affecting in particular the world's freshwater systems and marine resources, as well as terrestrial biodiversity and public health. The circular economy concept offers a pathway to more sustainable resource management and a reduced production, use and disposal of plastics. The circular economy approach also helps to deliver many of the Sustainable Development Goals (SDGs), including Goal 12 on ensuring sustainable consumption and production patterns.

Launched in 1992, GEF Small Grants Programme (SGP), implemented by the United Nations Development Programme, has supported more than 22,000 community-based projects to protect the global environment. As of April 2019, the SGP's portfolio on chemical and waste management, which includes plastics, has grown to a total of 714 projects with GEF grants of more than US\$20.5 million. While the portfolio on waste and plastics management is still small compared to others, it is a growing area of concerns and needs by many countries and partners, including among the small island developing states.

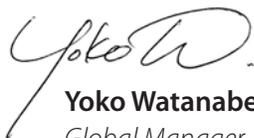
This publication captures SGP's experiences and lessons learned on plastics management, spanning not only the area of chemical and waste management, but also international waters and biodiversity conservation. The projects focus on implementing a circular economy either through recycling, reducing and reusing plastics for new products, influencing consumer use and behavior, or developing better waste collection and management practices at the community level. Some of these initiatives have also been scaled up in partnership with government and private sector.

This publication testifies that there are some key general lessons learned on promoting a circular economy approach at the local level, in particular with regards to: the role of community-based innovations and technologies; multi-stakeholder partnerships; market barriers and policy responses; awareness raising and capacity development; social inclusion and exclusion; and economic feasibility and sustainability.

Considering the limited size and duration of the projects, none can be said to embody a complete circular economy regarding plastic waste management. But each represents a step in that direction and that could influence society to promote relevant practices and policies. Transformational change towards a circular economy requires effort from all sectors of society and from different angles, including government, private sector, and civil society and communities.

In the coming years, SGP plans to expand its support and continue to work closely with the GEF, UNDP, and other partners. A particular focus is to be on concrete, on-the-ground initiatives to promote and implement plastics management and the circular economy, such as those to reduce, reuse, and recycle plastics and contribute towards a future free of plastic waste. This will also include efforts to have a closer dialogue on policy and programme linkages and to promote an integrated approach among communities, government and private sector on the issue.

We hope that these projects supported by SGP will continue to inspire and provide practical examples and lessons, and that the programme will become an important if small vehicle in achieving circular economies at a large scale in partnership with industries and policy-makers.



**Yoko Watanabe**

*Global Manager*

*GEF Small Grants Programme*



Rolph Payet

*“Plastic waste and the harmful chemicals it contains and releases are threatening our planet, ecosystems and human health. People and communities must be put at the centre of plastics management, and we must consider entry points, amplify good practices, and collectively move forward to realize an economy that is more circular. We appreciate the partnership with the GEF Small Grants Programme, which has been spearheading this work with communities, and encourage all stakeholders to act urgently and collaboratively to address this challenge.”*

*Mr. Rolph Payet, Executive Secretary of the Basel, Rotterdam and Stockholm Conventions*



# Acronyms

<b>USD</b>	United States Dollar
<b>GEF</b>	Global Environment Facility
<b>SGP</b>	Small Grants Programme
<b>MSW</b>	Municipal Solid Waste
<b>BMC</b>	Bhopal Municipal Corporation
<b>UNDP</b>	United Nations Development Program
<b>MPPCB</b>	Madhya Pradesh Pollution Control board
<b>SHG</b>	Self Help Group
<b>NCC</b>	Negril Chamber of Commerce
<b>NCRPS</b>	Negril Coral Reef Preservation Society
<b>RPJ</b>	Recycling Partners of Jamaica
<b>EFJ</b>	Environmental Foundation of Jamaica
<b>NGO</b>	Non Governmental Organisation
<b>WIG</b>	Women Initiative Gambia
<b>CBO</b>	Community Based Organisation
<b>PWD</b>	Persons with Disabilities
<b>GOWIC</b>	Godly World International Centre
<b>MACCS</b>	Maldives Authentic Crafts Cooperative Society
<b>STO</b>	State Trading Organization
<b>AYG</b>	Afghanistan Young Greens
<b>KHK</b>	Kol-e Hashmat Khan
<b>KHKCC</b>	Kol-e-Hashmat Khan Community Council
<b>MAIL</b>	Ministry of Agriculture, Irrigation and Livestock
<b>RSCO</b>	Rainbow Social and Cultural Organization
<b>NEPA</b>	National Environmental Protection Agency
<b>ENRMN</b>	Environment and Natural Resources Monitoring Network
<b>ISSD</b>	Innovative Solutions for Sustainable Development of Communities
<b>OEF</b>	One Eleuthera Foundation
<b>SEEP</b>	South Eleuthera Emergency Partners
<b>SDG</b>	Sustainable Development Goals
<b>TAP</b>	Scientific and Technical Advisory Panel



# Introduction

## **PLASTICS: A GROWING THREAT TO THE ENVIRONMENT AND HUMAN WELL-BEING**

*Plastics have permeated every facet of human life, with the current production and consumption pattern of plastics driving the dramatic increase of plastic waste around the world.*

By 2015 the world produced 7.8 billion tonnes of plastic — more than one tonne of plastic for every person alive today.<sup>1</sup> Many of the plastic packaging, wrapping and goods are used once and then discarded as waste, dramatically increasing the quantity of waste that can persist in the natural environment for 500-1000 years afterwards. Only around 10 percent of the plastic waste generated between 1950 and 2015 has been recycled, the remaining 90 percent has been discarded either in landfills or elsewhere in the environment.<sup>2</sup>

The low rate of recycling is not only related to the lack of recycling systems but also because of the non-profitability of plastic recycling in many plastic materials. If current consumption patterns and waste management practices do not improve, by 2050 there will be about 12 billion tonnes of plastic litter in landfills and the natural environment.

*The current linear model of ‘take, make, use, and dispose’ is highly costly in environmental, economic and health terms.* Plastic litter in the Asia-Pacific region alone costs its tourism, fishing and shipping industries US\$1.3 billion per year. In Europe, cleaning plastic waste from coasts and beaches costs about US\$711 million per year. Studies suggest that the total economic damage to the world’s marine ecosystem caused by plastic amounts



to at least US\$13 billion every year. However, the natural capital cost of plastics stemming from environmental degradation, climate change and health hazards are estimated to be even higher; a recent analysis estimated these costs to reach up to US\$139 billion annually.<sup>3</sup> At the manufacturing stage, conventional plastic production is highly dependent on virgin fossil feedstocks (mainly natural gas and oil) as well as other resources, including water; it takes about 185 liters of water to make a kilogram of plastic.<sup>4</sup> Plastics are therefore a major contributor to greenhouse gas emissions and climate change: CO<sub>2</sub> emissions from the extraction and processing of fossil fuel as plastics feedstocks; and the combustion of waste plastics, emitting 390 million tonnes of CO<sub>2</sub> in 2012.<sup>5</sup>

**Plastic waste particularly affects the world's freshwater systems and ocean and marine resources.** Plastic waste pollutes our freshwater systems, through disintegrated plastic particles smaller than five millimetres known as microplastics, and is transported through sewage, rivers and floodwaters.<sup>6</sup> Sewage sludge is often applied to fields as fertilizer, implying that several thousand tonnes of microplastics end up in our soil each year, releasing harmful chemicals that seep into groundwater or other surrounding water sources, further contaminating ecosystems. In the ocean, there is an estimated 150 Mt of plastics or more than five trillion micro and microplastic particles. Plastic debris injures and kills fish, seabirds and marine mammals, severely threatening marine biodiversity. According to the United Nations, at least 800 species worldwide are affected by marine debris, and as much as 80 percent of that litter is plastic.<sup>7</sup> The impacts include fatalities as a result of ingestion, starvation, suffocation, infection, drowning, and entanglement. If the current trend continues, there could be more plastic than fish (by weight) in the ocean by 2050.<sup>8</sup>

**A significant proportion of disposed plastic also ends up as municipal solid waste, where it causes environmental degradation of land, public health hazards and threats to terrestrial biodiversity.** In many developing countries, inadequate or informal waste management systems mean that waste is often burned in open dumps or household backyards, including in cities linked to the top ten rivers that carry the majority of plastic waste to the sea. The open burning of plastics has three negative effects: it releases CO<sub>2</sub> and black carbon – two very potent climate-changing substances; it emits chlorinated and brominated additives and other persistent organic pollutants, and it poses severe threats to plant, animal and human health, because toxic particulates can easily settle on crops or in waterways.

## THE CIRCULAR ECONOMY CONCEPT: A PATHWAY TOWARDS MORE SUSTAINABLE RESOURCE MANAGEMENT

*The concept of circular economy offers an alternative to the current linear “take, make, use, dispose” economy model, and aims to keep resources in use for as long as possible, to extract maximum value from them whilst in use, and to recover and regenerate products and materials at the end of their service life.<sup>10</sup>*

The concept offers a circular process of inputs and outputs to ensure materials and resources remain in the production and consumption process. It encompasses three principles:

- Design out toxins, waste and pollution
- Keep products and materials in use
- Regenerate natural systems<sup>11</sup>

Circular economy solutions for plastics should focus on the elimination of single use plastics and the effective management of long-lived plastics such as those used in vehicles and construction. Figure 1 includes a comparison of circular economy versus linear economy.

The economic, health and environmental reasons to act on plastic waste are clear. The shift towards a circular economy in which plastics never become waste while creating economic opportunities appears to be an effective strategy for starting to tackle the problem of plastic litter. Circular economy solutions for plastic include:

- Using plastic waste as a resource
- Designing degradable non-toxic alternatives to single use plastics
- Encouraging recycling
- Encouraging the adoption of sustainable business models
- Developing information platforms to aid circular solutions
- Adopting policy measures to address the unsustainable production and use of plastics directly.<sup>12</sup>

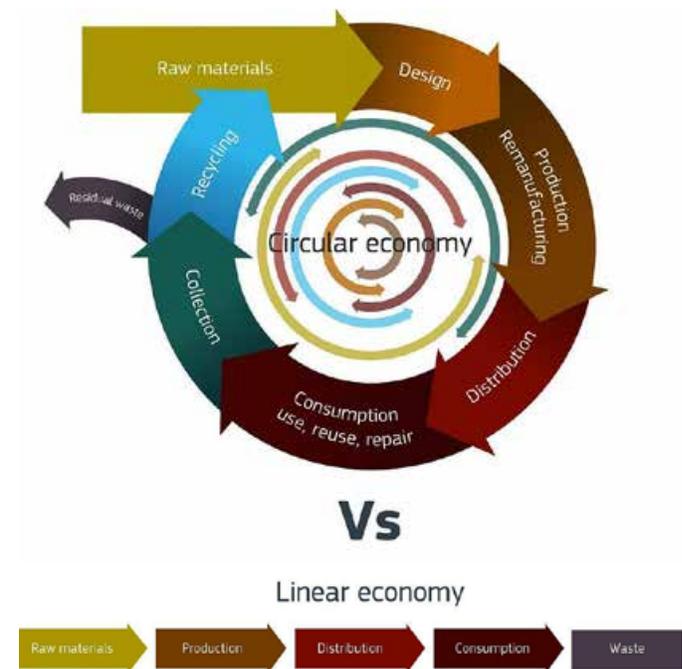
While circular economy will help in ‘closing the material loop’, i.e. to minimize waste and to keep materials in the economy and out of landfills and incinerators, the development, implementation and scaling up of the solutions remain challenging because the whole world is on this fast track of linear production, consumption and disposal model. An all-encompassing solution should seek to ‘slow the material loop’, that is to reduce demand and produce only essential plastic products, while discouraging non-essential production and use of plastics, and promoting the use of renewable and recyclable alternatives to plastics.

**The circular economy approach can also help to deliver the Sustainable Development Goals (SDGs);** Goal 12 on ensuring sustainable consumption and production patterns includes targets on achieving sustainable management and efficient use of natural resources, sound management of chemicals and wastes, and improving waste prevention, reduction, recycling and reuse; Goal 8 on inclusive and sustainable economic growth includes a target to improve global resource efficiency in consumption and production and decoupling economic growth from environmental degradation; finally, Goal 14 on the use of oceans, seas, and

marine resources and has a target on preventing marine pollution, from land-based activities, including marine debris, of which plastics make up the majority.

The conceptualization and practice of circular economy has so far largely been undertaken by academics, policy makers, businesses and foundations, while the implementation remains inadequate. Where waste management is not developed and implemented, it is often the poorest people that bear the greatest cost of plastic pollution and environmental degradation.<sup>13</sup> Plastic pollutes life-sustaining rivers, leads to diseases, and floods poor communities that lack proper waste collection infrastructure. Where government and business have not taken the necessary actions, **local communities and grassroots organizations have often initiated their own small-scale circular economy initiatives in order to reduce the impacts of plastic litter on their environment and to relieve the pressure on local ecosystems and services.**

**FIGURE 1. CIRCULAR ECONOMY Vs. LINEAR ECONOMY**



European Commission, 2014. Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Towards a circular economy: A zero waste programme for Europe, available at: <http://ec.europa.eu/environment/circular-economy/pdf/circular-economy-communication.pdf>

Community efforts in promoting and implementing circular economy are often left undocumented, resulting in a gap in the literature on how the concept is implemented or practiced at the local and community level, and what good local practices exist that could be or have been replicated or scaled up. This publication aims to fill this gap and draws on innovative community experiences from around the world to test and experiment different approaches to reducing, recycling and reusing plastic waste in an environmentally sustainable and socially inclusive manner.

## THE GEF SMALL GRANTS PROGRAMME AND THE ROLE OF LOCAL COMMUNITIES

**The GEF Small Grants Programme (SGP)** is a corporate programme funded by the Global Environment Facility (GEF) and implemented by the United Nations Development Programme (UNDP) since 1992 to support local action to address global environmental challenges. SGP provides direct financial and technical support to communities and civil society organizations for projects that protect the global environment with grants of up to US\$50,000 per project. SGP also provides strategic grants of up to US\$150,000 for exceptional projects that demonstrate significant potential for scaling up. Areas of work include biodiversity conservation and sustainable use, mitigation and adaptation to climate change, conservation of international waters, chemicals and waste management, and sustainable land management.

Table 1 shows the distribution of SGP's chemicals and waste portfolio by region. SGP projects have mainly focused on the following categories of activities:

- Promote environmentally friendly waste management to avoid open burning of waste including plastics to avoid unintentional releases of persistent organic pollutants (POPs);
- Identify, manage and dispose obsolete community pesticide stockpiles;
- Promote organic and sustainable agriculture to avoid illegal community uses of POPs pesticides and reduce land degradation;
- Improve communities' awareness and understanding of POPs toxicity and impact on human and ecological health;
- Develop civil society organizations (CSOs) and communities capacity addressing POPs.

**On every initiative that it supports, including solid waste management and particular challenges on plastic waste, SGP applies a bottom-up approach** and works in partnership with civil society organizations, governments, private companies, academics, international donors and other stakeholders. Actions taken on the ground by local communities often act as catalysts to compel coordination among other actors at national or regional scale. Local

**TABLE 1. SGP CHEMICALS AND WASTE PORTFOLIO BY REGION**

 REGION	 NUMBER OF PROJECTS	 GRANT AMOUNT	 CO-FINANCING IN CASH	 CO-FINANCING IN KIND
Africa	220	6 819 354 USD	2 889 463 USD	3 849 655 USD
Arab States	38	1 247 615 USD	442 161 USD	474 834 USD
Asia and the Pacific	196	5 294 679 USD	4 139 096 USD	2 473 319 USD
Europe and the CIS	119	3 193 616 USD	1 892 758 USD	1 388 043 USD
Latin America and the Caribbean	141	3 982 764 USD	1 713 882 USD	3 865 577 USD
<b>Total</b>	<b>714</b>	<b>20 538 028 USD</b>	<b>11 077 360 USD</b>	<b>12 051 428 USD</b>

communities can play a key role in advocating for better waste management and environmental protection, often generating the momentum for policy makers and decision makers to tackle the issues.

***SGP practices an integrated approach to address the interrelationships between environment, economic development and social inclusion, in alignment with key principles of circular economy.*** SGP recognizes the intrinsic linkages between environment and development issues at the community level and advocates that the most effective approach is to integrate environment with development, while empowering people and communities. SGP's work continuously aims to increase integration of marginalized groups in environment and development initiatives, including women, indigenous peoples, youth, and persons with disabilities. The improvement of livelihoods remains a key strategy of the SGP, since the sustainable management of land, biodiversity, and other ecosystem resources directly affects the generation of global environmental benefits that contribute to the wellbeing of local communities. SGP approach leverages shifts towards environmentally sustainable livelihood options, and increases education and awareness on environmental issues. Such an approach resonates with the key principles of circular economy.

***SGP plays a role in sharing and exchange of community knowledge and experience on innovative solutions from the ground up.*** Due to its nature and in line with its mandate, SGP not only contributes to actions that result in direct global environmental benefits, but also promotes innovation, testing and demonstration approaches, modalities, and management processes that through upscaling, replication and mainstreaming will lead to direct global environmental benefits. The latter aspect is especially relevant in solid and plastic

waste management because of the vast extent of the problem in comparison with the small scope of individual community projects. As the results achieved by these local plastic waste management projects can be amplified through the creation of knowledge, demonstration of solutions, and exchange of experience within a larger framework for action including policy and regulation. SGP's global network is a key for promoting south-south exchanges of best practices from one country to another. In addition, SGP collaborates with regional projects or initiatives, and by linking communities among themselves for knowledge sharing and exchange.

***The 10 cases included in this publication show*** that local communities and grassroots solutions are already contributing to the implementation of the circular economy concept by providing circular solutions to plastic waste problems through community-based actions to "reduce, reuse and recycle" plastics, known as "3Rs" ranking by the priority of actions. With the purpose to highlight their featured practices, these cases have been categorized into the following types of projects:

- Material engineering and product design to promote 3Rs;
- Consumer use and behavior shift due to campaigns, awareness raising and capacity development;
- Waste collection and management.<sup>14</sup>

While these experiments and practices may be at a preliminary stage, they offer direct on-the-ground experiences and lessons learned for practitioners and policy makers to further refine these practices, the approach and the policies to harness the great potential of the circular economy. Annex 1 summarizes these projects and their impact.

# Material Engineering and Product Design





# BURUNDI

## Banana-tree Bark as an Alternative to Plastic for Seedling Transport Bags



### GRANTEE

Dukingirikibira ("Let us protect our forest")



### LOCATION

Bugarama district,  
Muramvya commune,  
Muramvya province



### START/END DATE

March 2017 –  
October 2017



### PROJECT CONTEXT

The project was carried out in the Muramvya commune near the Kibira national park, located in Bugarama district in western Burundi. During the 1993 socio-political crisis in Burundi, communities near the Kibira national park fled from the conflict between the rebels and military to live inside the forest. While there, they survived by eating fruits from the *Prunus africana* trees. After the war, when they returned to their villages, the women in these communities, including from the indigenous Batwa tribe, decided to create an association called Dukingirikibira, which translates to "let us protect our forest." The association allowed them to work together on conserving the forest that had nurtured them when they were escaping the war.

There was an urgent need to reforest the park as the trees had been cut by poachers and locals during the war. Dukingirikibira initiated several activities, including replanting *Prunus africana*, closing down flower farms in the protected areas that had been linked with forest clearing, and preventing any further deforestation by poachers. The project further supported reforestation efforts and developed an innovative method to eliminate the use of plastic in the process.

The main partners of this project were SGP Burundi, the Ministry of Environment, Agriculture and Livestock, and the American Embassy.

## PROJECT IMPLEMENTATION

The main livelihood activities of these communities were the breeding of livestock and cultivation of vegetables, which were then sold in the nearby town market. Key project activities were designed to support these activities such as mushrooms cultivation, pig breeding, and cereal and cassava grinding in an environmentally friendly way.

The central innovation of the project was to replace the use of plastic bags during reforestation with bags made out of banana-tree bark. A main part of the process is transplanting saplings from the nursery to the reforestation site. In this method, plastic bags filled with soil are typically used to protect the roots of the saplings during transport. In this project, the community members came up with the innovative practice of using bark from the banana tree to make the bags to hold the

*After the war women created an association called Dukingirikibira or “let us protect our forest” to work together on conserving the forest that had nurtured them when they were escaping the war.*

saplings. The saplings are then planted along with the bark-based bags, which decompose into organic manure. This eliminates the use of plastic in reforestation and conservation practices, plastic which would otherwise end up in landfills.



PHOTO: SGP BURUNDI

## RESULTS

Around 300,000 seedlings were planted in the national park, a 3.2-per-cent reforestation of 13,000 hectares of forest. An additional 150,000 seedlings were also planted in the project beneficiaries' farmlands.

The use of bark bags in all SGP projects, saved approximately 3,000,000 plastic bags. The local community also generates income from the sale of the bark bags to the project managers. The sales of bark bags along with cereal and cassava grinding earns every household up to US\$55 per annum.

## LESSONS LEARNED

The project was led and executed mainly by women and people from the indigenous Batwa community. The seeds harvested by the Batwa grew at a much better rate and quality than the same seeds planted by an agronomist. It was a telling demonstration of the rich value of indigenous knowledge and practices when it comes to reforestation efforts and protecting natural resources.

The use of banana-tree bark bags has been appreciated by the Ministry of Environment, Agriculture and Breeding. SGP Burundi has now disseminated the lessons from the experience and requested all the other SGP grantee partners to use banana-tree bark bags instead of plastic holders in their nurseries. The practice is now being replicated nationally and internationally.





# INDIA

## Improved Plastic Waste Management Supports Marginalized Women's Livelihoods



### GRANTEE

Sarthak Samudayik Vikas Avam Jan Kalyan Sanstha



### LOCATION

Indore and Bhopal  
Municipal Corporation,  
Madhya Pradesh, India



### START/END DATE

December 2014 –  
December 2015

### PROJECT CONTEXT

India is facing a massive waste-management challenge due to growing urbanization. Studies reveal that the country generates about 100,000 million tonnes of municipal solid waste (MSW) every day, only about 24 percent of which is treated while the rest is dumped in landfills.<sup>15</sup> This is also reflected in Bhopal, which generates 800 million tonnes of MSW per day. Around 120 million tonnes or 15 percent is plastic waste, and approximately 60-70 percent of the total waste is dumped into landfills.<sup>16</sup>

Since 2008, Sarthak Samudayik Vikas Avam Jan Kalyan Sanstha (Sarthak) has been working with waste collectors, or “rag pickers”<sup>17</sup>(Sarthak Karmis), in Bhopal to streamline plastic waste collection and sales to recyclers. Rag pickers are individuals whose livelihood is picking over refuse in landfill sites or elsewhere to

salvage goods and materials for recycling or reuse. They are mostly women who are poor, illiterate, and come from socially marginalized castes, rendering them highly vulnerable. An initial SGP grant in 2010 enabled Sarthak to conduct focused interventions in five wards of Bhopal Municipal Corporation (BMC) and begin organizing rag pickers in self-help groups (SHGs). In 2014, Sarthak was awarded another grant by SGP to mobilize more than 2000 unorganized rag pickers and increase their socio-economic capacities through improved municipal solid waste management practices in 70 wards of Bhopal Municipal Corporation.

The project was implemented in close collaboration with the municipal corporations of Bhopal, GEF-UNDP Small Grants Programme (SGP), and the Municipal Commissioner.

## PROJECT IMPLEMENTATION

Key activities of the project included the organization of rag pickers, capacity development, and awareness-raising. The rag pickers were organized through the formation of self-help groups, and provided with capacity building on waste collection, segregation and processing. Given the occupational hazards involved, Sarthak also conducted regular health camps. Sensitization and awareness-raising campaigns on integrated waste management were conducted with urban communities such as residents' associations, colleges, and schools in the city.

By collaborating with local government bodies, the Bhopal Municipal Corporation allocated 230 square metres for setting up waste collection centres. The Madhya Pradesh Pollution Control board (MPPCB), facilitated waste transportation to the cement kilns. In 2014, five plastic waste collection centres were upgraded to plastic waste recovery centres in Bhopal. This included fitting the centres with plastic shredders, compressor scrap baling machines, etc. The centres are facilitated by Sarthak and managed by the women's SHGs.

The processed plastic waste has been used for road making after mixing with Bitumen at 160 degrees Celsius as per the Centre for Road Research and Government of India guidelines. The higher-grade polyethylene is baled

and sent to cement plants to be used as alternate fuels. These are non-recyclable plastics and can burn with coal in temperatures higher than 1,300 degrees Celsius. Thus, in collaboration with Sarthak the SHGs managing the plastic recovery centres also run small enterprises by selling the processed plastic wastes to recyclers, road construction agencies, and cement factories.

---

*Women rag pickers now earn around US\$3 – US\$11 every day from selling plastic waste, which is then sold to make roads. Roads made with mixed plastic last long due to their high resistance to water, significant for a region with a critical monsoon period.*

## RESULTS

By the end of 2016, 646 rag pickers were organised in 42 SHGs. More than 60 percent are women and now earn around US\$3 – US\$11 every day from selling the plastic waste. In total 40 members from the women's SHGs have also been trained in making bags out of used polythene, which are sold in exhibitions across India.

Approximately 10 tonnes of plastic waste is collected at five recovery centres in Bhopal every day. Around 45 tonnes of plastic waste is sold to cement industries in and around Bhopal to be used as fuel in the furnaces. Around 60 tonnes of plastic waste is sold to Madhya Pradesh Rural Road Development Authority every month to be used in road construction. Roads made with mixed plastic last long due to their high resistance to water, significant for a region with a critical monsoon period.

Bhopal Municipality has also provided 850 cycle rickshaws to the Sarthak Karmis for easier waste collection. Over 850 rag pickers are also enrolled in health insurance schemes now, and most of them have been provided with municipal identity cards and uniforms through this project. The success of this project has also led to establishing a pilot plastic recovery centre in Indore. As a result, around 3,500 rag pickers have been organized into SHGs in the city.

Finally, the Government of Madhya Pradesh released a policy on plastics describing the "Bhopal Model" and specifying the Sarthak Karmis as an integral part of the collection centres, thus organizing them as an entity within the policy. Sarthak has also been included as the NGO representative to the High-Level Committee to share their learning and best practices.<sup>18</sup>

## LESSONS LEARNED

Urban waste management is one of the top priorities of Government of India, and local and affordable innovations in this sector are highly valued. Urban local bodies need support in setting up sustainable business models through public-private partnerships.

Most of the rag pickers were poor, illiterate, unorganized, and further marginalized due to their social status as Schedules Castes and Other Backward Classes. Sustained awareness programs

and introduction of the SHG model really helped in inculcating their ownership of the project. This further helped in increasing their financial literacy and introduced a culture of savings.

A crucial element of the project's success was Sarthak's partnership with urban municipal governments and local industries. This helped significantly in highlighting the vulnerable conditions of the ragpickers, and allowed for the SHG livelihood model to be mainstreamed.





# JAMAICA

## Recycling Plastic Waste to Conserve Negril's Coral Reef



GRANTEE

Negril Chamber of Commerce



LOCATION

Negril – Jamaica



START/END DATE

January 2009 –  
March 2010

### PROJECT CONTEXT

In Negril, poor or absent waste management has resulted in the destruction of coastal, marine, and freshwater ecosystems. The burning of household waste not only emits toxic pollutants but also leads to soil erosion, which causes nutrient-rich soil to flow freely into the South Negril River and the area's canals. This soil ultimately reaches the ocean, causing permanent damage to the coral reef as sedimentation and too many nutrients can directly smother a reef or increase turbidity in the coastal waters, which reduces light available to corals and their symbiotic algae.

There is also an increasing accumulation of recyclable materials such as plastic and glass containers that end up floating in the ocean, lying on the coral or resting on the ocean floor. Waste accumulation in the ocean has steadily increased since the mid-1970s with the development and growth in the tourist industry. This has caused habitat depletion along Jamaican coastlines and several marine species have become critically endangered, including the green and hawksbill turtles, elkhorn and staghorn corals,

and the black grouper. The elkhorn and staghorn corals have seen their population in Jamaica decline by 97 and 98 percent respectively, in the last 30 years, according to the International Union for the Conservation of Nature. In the Negril area specifically, the populations of green and hawksbill turtles have declined by around 57 percent and 85 percent. With the depletion of fish habitat, the livelihood of fishermen has been impacted. Damage from waste to the coral reef system has also resulted in the continuing loss of beach area due to sand erosion, as reefs protect beaches from waves and currents, and also contribute material to their sand over time.

The goal of this project was to prevent the destruction and promote the restoration of Negril's coral reef by creating community education programmes, better waste management and the implementation of a consistent system of recycling that would divert tonnes of plastic materials from the ocean. This would in turn protect the coastal, marine, and freshwater ecosystems, boost tourism, and contribute to the economy.

## PROJECT IMPLEMENTATION

The project was implemented by the Negril Chamber of Commerce (NCC) and consisted of two interconnected activities: land-based collection and recycling of plastic materials, and marine species monitoring. The NCC worked with a number of partners to implement this project, namely the Negril Coral Reef Preservation Society (NCRPS), the Negril Environmental Protection Trust (NEPT), the Rock House Foundation, the Theodore Foundation, and local schools.

In the first phase, the project focused on environmental education and awareness-raising activities, and introduced a system to collect, sort and recycle plastic waste. Receptacles for the collection of plastics were placed in three schools in the Negril area with a total of 2,550 students. All three schools participated in environmental education and stewardship, and students were trained during morning assembly on garbage separation and recycling.

In the second phase, a variety of products were made from recyclable waste. For example, ashtrays, flower vases and building blocks were created from glass waste and an entire house was built from glass, plastic and aluminium supplied by the Negril Recycling Center. Other products made from plastic included plastic lumber. The project also collected data and information for the monitoring of marine biodiversity, and organized reef dives to monitor water quality.

---

*People are more willing to recycle if they simply have sufficient access to collection points for waste.*

## RESULTS

The Bio Boost Negril Recycling Project has achieved significant results in terms of waste collection and reuse of recycled materials, the protection of biodiversity, the strengthening of local partnerships, the inclusion of women and youth, outreach and education, and the successful engagement of the private sector.

A total of 50 receptacles are in place for the collection of recyclables, and 20 tonnes of recyclable materials that would otherwise have ended up in the ocean were collected. New products from recycled materials were created for tourists, community members and businesses. The sale of these products resulted in an additional income for seven individuals. As a follow-up of the project, the Recycling Partners of Jamaica (RPJ) -a public-private partnership- was established and designated as a registered charitable and national recycling entity.

To protect biodiversity and monitor coral reefs, underwater clean-ups were conducted, and four critically endangered, globally significant species were monitored, leading to their improved protection. These were the green turtle (*Chelonia mydas*), the hawksbill turtle (*Eretmochelys imbricate*), the elkhorn coral (*Acropora palmata*) and staghorn coral (*Acropora cervicornis*). Overall these efforts resulted in the

protection of 200 hectares of marine and coastal area. Since the end of the project, the Negril Marine Park Zoning Plan was established, first for the period 2013-2018, and then in an updated version that seeks to ensure the sustainable use of the natural resources and promotes the safety of users and compliance with applicable laws and regulations within the Marine Park.

In terms of social inclusion, fifty women were involved in workshops, craft creation, and beach clean-ups. Several women agreed to monitor the collection bins and to continue raising awareness of recycling among passers-by and customers. Educators in schools organized recycling with their students. Overall, the project reached out to 500 households, 2,000 students, and 30 businesses, mainly hotels, in Negril.

Collaborations and partnerships were established and maintained with five local NGOs, and several new alliances were forged with various stakeholders and the Negril Recycling Center. Many long-standing partnerships were also strengthened under the renewed recycling vision for Negril. After the project funding was granted from the Environmental Foundation of Jamaica (EFJ) to purchase an extruder for plastics, allowing the Negril Recycling Centre to convert high density plastic composites into plastic lumber.

## LESSONS LEARNED

This project demonstrates that awareness-raising and education are important drivers to achieve long-term behavioural change. Due to the project's efforts, the burning of plastic in the community has decreased considerably. People in Negril now want to be involved in recycling efforts, and private businesses are requesting their own recycling units and bins. Awareness-raising campaigns have continued not only in Negril but all over Jamaica, through a campaign titled *Nuh Dutty Up Jamaica*. The Negril Environmental Trust and Protection (NEPT) Communication broadcasts all environmental activities through social media.

Infrastructure and access are equally important, as the project showed that people are more willing to recycle if they simply have sufficient access to collection points for waste. Recently, the NCC was

awarded a US\$1.3 million grant by the Digicel Foundation to restore operations at the Negril Recycling Center after a 2017 fire damaged the centre's capacity, and to step up recycling activities there.

Monitoring revealed that the amount of plastics in local waterways was much greater than originally estimated, and it can now be tackled more effectively. To increase sustainability over the long term it is recommended that a sustainable joint programme is established to continue biodiversity preservation and ensure regeneration of the coral reef. Through environmental education, environmentally friendly habits can be established which will be maintained generation after generation.





# SIERRA LEONE

## Youth-led Innovation: Transforming Plastic Waste into New Construction Material



GRANTEE  
Youth Build Sierra Leone



LOCATION  
Makeni, Bombali District



START/END DATE  
December 2017 –  
November 2018



### PROJECT CONTEXT

Makeni is the largest city in the Northern Province of Sierra Leone. The city is the capital of Bombali District, and is the economic centre of the Northern Province. Makeni is the fifth-largest city in Sierra Leone by population, with a population of 125,970 as of 2015. It lies 137 kilometres east of Freetown.<sup>19</sup> In the past 10 years the volume of municipal waste produced has grown significantly due to rapid economic development and population growth, leaving the city highly polluted.<sup>20</sup>

The operations of the waste sector in Makeni can at best be described as rudimentary and dysfunctional: There are no policies or regulations in place that ensure separation at the point of generation; collection systems are weak and do not cover the entire city; there are no organized sorting or recycling activities; and the disposal structures and methods are environmentally unsafe.<sup>21</sup> The capacity of the city council to manage the amount of waste produced has proven to be very ineffective. The situation calls for innovative solutions and support from all stakeholders.



PHOTO: SGP SIERRA LEONE

## PROJECT IMPLEMENTATION

Youth Build, an NGO led by youth, has piloted an innovative approach to waste management in the city with the support from GEF SGP. The project focused on a circular environmental management of municipal waste based on the principle of “reduce, reuse, and recycle.” Waste reduction started with the collection and sorting of waste. Plastic and paper were kept aside as raw materials to be used to produce useful construction materials. Awareness-raising activities have also been organized to reduce, reuse and recycle waste at the community level.

The innovative aspect of this project is the reuse of the collected waste plastic, rubber, and sand into a product called e-stones. E-stones are a mixture of plastics, rubber and sand that can be moulded into a floor tile. The plastic and rubber are melted into a pasty liquid in a drum, then sand is added to the drum while it is still being heated, and the ingredients are thoroughly mixed. The mixture is then poured and allowed to cool into brick-like structures. The e-stones are weather resistant, stronger than cement bricks, and can be used for outdoor paving.

Discarded hospital beds and other metal items were welded into rectangles with a base and top cover for the production of trash bins. Trash bins made from metal plates bought from shops are not the best to make affordable bins. Through stakeholder consultation and experimentation, Youth Build Sierra Leone realized that they can actually use waste material to make more durable and affordable bins. They experimented with using scrap materials to produce affordable bins. Households and offices purchased the products e-stones and trash bins.

*Re-used waste plastic, rubber, and sand was developed into a product called e-stones, a kind of brick that is weather resistant, stronger than cement bricks, and can be used for outdoor paving.*

## RESULTS

Youth Build has created sustainable jobs for over 400 youths and vulnerable women and has produced over 15,000 e-stones with minimal amount of coal for heat. Prior to their employment with Youth Build, the 400 participants had no trained skills, no sustainable source of income and earned irregular daily wages averaging US\$1-US\$2 per week for casual labour. With this project they are assured of a weekly payment average of US\$10.50 from the NGO. These youth and women have benefited from being trained in waste management and have also contributed to the beautification of

Makeni City by voluntarily paving public areas and supporting the council in cleaning public areas on monthly basis.

Currently, the project has 1,800 clients at the household and office levels, from whom they collect between 800 and 1,200 tonnes of waste per annum. The project produces around 4,000 e-stones per month, which were used to pave the compounds of two initial e-stone clients. The project also provided the installation of the e-stones.

## LESSONS LEARNED

As a young organization, established in 2014, Youth Build has been working closely with the Makeni city council, local communities and other partners to gradually gain recognition. Key partners include the waste management department of the Makeni City council, the Ministry of Lands and Country Planning, and a local community-based organization of vulnerable women working on promoting environmental and waste management issues called eWomen.

Since the inception of the project in Makeni, households have been gradually adopting the culture of depositing trash and household waste in trash bins, especially those that are actively involved with our project, because they are gradually seeing the benefits from the recycling of waste plastics in producing e-stones. The tradition of discarding refuse is gradually being phased out as the organization expands the

project and brings new clients on board. Youth Build hopes this expansion will create more jobs for youths and women in other towns within Bombali District.

The project does risk increasing emissions from the manufacturing of e-stones and other products. The heating and mixing of the plastic and sand also poses a small health risk to the operators. This is also true of welding to produce trash bins. However, the workers use masks and gloves. For the next phase it is recommended to look more closely at how to ensure further safety in the e-stone production process.

Good planning paid off during execution. The leading partners of this project spent a fair amount of time developing a good project. Youth Build and eWomen worked together to develop the concept. They kept the plans up-to-date and made key project information available for everyone on a WhatsApp group.



# Consumer Use and Behavior Shift







# GAMBIA

## Plastic Recycling led by Women's Group Contributes to National Policy on Plastic Ban



GRANTEE

Women Initiative Gambia



LOCATION

Njau, Somita, Siffoe



START/END DATE

August 2013 –

July 2014



### PROJECT CONTEXT

As in most developing countries, the use of plastics is widespread in Gambia. Cheap imports have produced a culture of plastic product use in all Gambian households, resulting in widespread littering of the environment. This has led to uncontrolled dumping and open burning of plastic waste, which in turn have had major impacts on human health and the environment.

The project was piloted in three rural communities, Njau in the centre of the country, Somita in the east and Siffoe in the west. All are made up of small-scale farmers,

with women playing major roles in the economic lives of the population. The centre for training on plastic recycling was in Njau. Selected women drawn from the communities underwent a week-long training session on plastic recycling, which covered collection methods, storage, processing, marketing, bookkeeping and record management. At the end of the sessions the trainees returned to their respective communities and executed the project on their own with technical back-up support from the project staff.

## PROJECT IMPLEMENTATION

This project was implemented by a women-led organization called Women Initiative Gambia (WIG). WIG is a community-based organization (CBO) established in 2009, and now counting 328 women members from across the country. Its goal is to improve the economic and social status of its members. WIG works with disadvantaged women and young girls by providing skills training in plastic waste recycling, bee keeping, soap making, tie and batik making and entrepreneurship, among others.

The project had three major objectives to address environmental degradation through plastic waste recycling; provide the beneficiaries with income opportunities from plastic recycling and turning the plastic waste into useful products for sale, and improve the health and well-being of communities by turning their communities plastic-free.

Project activities included awareness raising, capacity building on transforming plastic waste into useful products and promotion of sales and marketing.

Awareness raising focused on the dangers posed by plastics to people, livestock, and the environment, with particular emphasis on the dangers of small ruminants

ingesting plastics leading to bloating and, ultimately, death. The specific dangers of endocrine disrupting chemicals found in plastic products to pregnant women and small children was also highlighted.

Capacity building activities included the collection of plastic waste, storage techniques, processing (including washing and drying), shredding and weaving techniques to transform plastic waste into useful products such as handbags, school bags, sandals and key holders. The training also included lessons on adding value to the final products to enhance marketability. Women were also trained in marketing techniques, small business entrepreneurship, record and bookkeeping to supplement business opportunities offered by plastic recycling.

---

*The Women Initiative in Gambia provides disadvantaged women and young girls skills training in plastic waste recycling, bee keeping, soap making, tie and batik making and entrepreneurship.*

## RESULTS

Around 100 women were sensitized to the negative impacts of plastic waste. These women in turn sensitized other members of their communities after the programme. Sixteen women visited the WIG training and recycling centre in the village of Njau to gain first-hand experience of plastic waste recycling. Each of the 100 women earned US\$150 to US\$200 per recycling activity from the sale of recycled-plastic school bags, shopping bags, sandals, key holders, etc. The women are able to carry out two recycling activities per year.

This project plans to employ an online sales and marketing platform to promote and sell the products in local and overseas markets. The project should be easily sustained since raw materials are readily

available and the skills imparted to the participants are lifelong. Moreover, the economic gains derived from the finished products are projected to help keep the participants engaged and to draw in new ones.

The project is likely to influence national policies on the control of plastics in the country. In the year it was launched, the government of Gambia placed a complete ban on the import and use of plastic bags in the country to address the widespread nationwide problem of plastics pollution. This project effectively demonstrates practical ways of transforming plastic waste into useful products.

## LESSONS LEARNED

WIG is focused on working with women groups in rural areas to give women a voice in their own development and train them on income generation, investment and decision-making skills. It is however understood that in this culture, the men must feel they are consulted before they will support such women-led activities. Thus, as an entry point, the project consulted with the community leaders and men in positions of authority and influence and engaged them to seek their support and clarify their misconceptions about women's empowerment. This has gone a long way to pave the way for the smooth implementation of the project.

People's participation and community leadership support are critical to the success of the project. The three beneficiary communities have taken great interest in the project, as evidenced by more people showing up at the sensitization workshops than originally targeted. The influential leaders of both communities have embraced the project and pledged their commitment to the success of the project.





# GHANA

## Plastic Waste Turns into Employment for People with Disabilities



GRANTEE  
Godly World International Centre



LOCATION  
Bolgatanga,  
Ve and Bongo



START/END DATE  
December 2017 –  
July 2019



### PROJECT CONTEXT

On 3 June 2015, 154 lives were lost in devastating floods and fire explosions in Accra, Ghana. The government set up an investigation committee. The report of the committee among other things revealed that the poor management of plastic waste was a major contributory factor to the tragedy. It said the country's plastic waste situation had reached a "crisis point", and failure to reverse it might lead to an environmental catastrophe.<sup>22</sup>

The northern savannah of Ghana is afflicted by extreme poverty and severe hunger. Because of this, youth and

persons with disabilities (PWD) migrate in large numbers to the relatively affluent southern part of the country. A local NGO, the Godly World International Centre (GOWIC) sought to address the poverty and migration trends by developing the capacities of PWD to manage plastic waste in Bolgatanga, Ve, and Bongo districts. The participants were trained to collect and process the plastic waste into shopping bags, hats, wallet, and doormats, and to sell them.

## PROJECT IMPLEMENTATION

The key activities of the project included feasibility and awareness raising, collaboration with local government bodies, capacity building & financial literacy, waste reuse and reduction.

GOWIC conducted a feasibility study in the communities within the Bolgatanga Municipality on the menace of plastic waste disposal. This helped GOWIC develop a business model to convert waste into marketable products and transform waste land into organic farms to produce vegetables for the local market. Awareness campaigns on plastic waste management were conducted through local radio stations and in churches, mosques, schools, and residential areas.

By collaborating with the local government, the local municipal assemblies provided two training centres where GOWIC trained the PWDs. This pilot project, with support from the regional association of PWDs, currently have 9 training and weaving centres in the Bolgatanga Municipality and the Bongo and Nabdam Districts.

To develop capacity building and financial literacy, PWDs were trained in different skills including business skills for plastic waste management enterprises, weaving and other ways of turning plastic waste into products such as shopping bags, doormats, hats, ropes, trays, purses, and sofas. In addition, GOWIC also trained 25 PWDs in sustainable organic agricultural methods and conservation of natural ecosystems. GOWIC also helped them acquire land from local landowners to farm. They also underwent sensitization

*Plastic waste has become a raw material that generates income for collectors, including people with disabilities. Through recycling, re-use or energy production, materials such as plastics, aluminium, glass, textiles, biomass, or even sludge, can be reconverted into either raw materials or energy briquettes.*

programmes on climate change within the Upper East Region. Finally, along with providing basic financial education, GOWIC also initiated small savings and credit schemes so that the participants could learn to save and invest.

In order to change consumer behaviour patterns to waste reuse and reduction, GOWIC implemented an innovative model of entrepreneurship. GOWIC acts as a company and pays consumers or households for their empty plastic water sachets<sup>23</sup>. By paying for their waste, GOWIC gives citizens an incentive to collect their waste products, and fewer plastic bags are dumped openly.





PHOTO: SGP GHANA

## RESULTS

The project has helped to reduce open burning of plastic waste and introduced a culture of recycling. Every month, up to 12 tonnes of plastic waste are collected and used to design and produce bags, hats, and other products across the centres. Close to 5 hectares of residential land and open spaces previously littered with plastic waste is currently under farming by the PWD. The farmers prepare their own compost and practice conservation agriculture.

Plastic waste has become a raw material that generates income for the collectors. Around 40 PWDs have gained permanent employment. The centres buy a bag of plastic waste for US\$2.00, and the average monthly returns of groups selling the plastic waste is US\$150. Each PWD engaged in the weaving of the baskets, hat, doormats etc. earns an average of US\$2 per day,

on a par with the average earnings in other sectors. In addition, the PWDs have also begun to save money collectively. On the average, the yearly savings returns range between US\$80-US\$200.

By putting in place a circular method of plastic waste management, this project has seen an improvement in the quality of life of the beneficiaries. It contributes to the reduction of plastic waste in landfills and drains, and of the overall environmental pollution and its attendant consequences of flooding, respiratory infections, skin disease, etc. The project has opened up jobs and other opportunities, and improved incomes, living conditions, sanitation and health in the engaged communities. Finally, it also contributed to reducing rural urban migration.

## LESSONS LEARNED

Waste is often considered a financial and environmental burden with no value, and when improperly managed it is hazardous to humans, the economy and the environment, both global and local. Municipalities and district assemblies across Ghana face the same challenges when dealing with waste, namely lacking or inadequate facilities, improperly maintained or faulty equipment, scarce collection points, all leading to over-reliance on landfill disposal and open burning. However, a modernized approach and appropriate technology can be employed in municipal, town and village waste transformation practices to create economic value through recycling, re-use or energy production. Materials such as plastics, aluminium, glass, textiles, biomass, or even sludge, can be reconverted into either raw materials or energy briquettes.

The project has called for a change in our approach towards plastic waste management through an integrated approach that includes five steps. The first step is to develop an efficient waste collection system where sorting of waste is done at household, institutional and commercial-activity levels. This approach requires the supply of different waste collection bins for biodegradable and

non-biodegradable materials. This will be preceded by an intensive public education system to train households on the waste sorting system.

The second step is to build an efficient service to collect the waste from houses, schools and designated streets to the main sorting and processing centres for a fee. Young people could be trained in the use of tricycles to collect waste. Collection would be done on daily basis to avoid decay and decomposition.

The third step is the collection, sorting and disinfecting centres. Waste would be sent to a centre with facilities for further sorting and disinfecting by trained personnel. The fourth step is to empower vulnerable or marginalized communities by training them in transforming the waste for other uses. The fifth step is to set up a social enterprise that will trade in plastic materials and commercialize the trade.

This project has developed into a bankable system of plastic waste management model in Ghana and is being considered by the municipal authorities for implementation on a larger scale. Going forward the goal is to replicate this project model in all major urban centres.





# MALDIVES

## Advocating Alternatives to Single-use Plastic Bags



### GRANTEE

Maldives Authentic Crafts Cooperative Society (MACCS)



### LOCATION

Malé – Maldives



### START/END DATE

July 2018 –  
January 2020

### PROJECT CONTEXT

Plastics are used ubiquitously in the Maldives. From single-use plastic products to fishing lines, plastics are consumed without any consideration for the repercussions on the country's fragile environment. In the absence of a comprehensive recycling program or government regulations on single-use plastics, the need

for measures to significantly reduce usage is increasingly evident. The Maldives Authentic Crafts Cooperative Society (MACCS) advocates for and facilitates the banning of single-use plastic bags in Malé, capital of the Maldives. The present pilot project aimed to raise awareness and explore the uptake of potential alternatives.

## PROJECT IMPLEMENTATION

The project was implemented by MACCS, a handicraft cooperative founded in 2011 by a group of women who assist and promote the development of the Maldives' local handicraft industry. The cooperative acts as a central buying and selling point and promotes sustainable livelihoods through the establishment of a wide network of producers and buyers. In a first stage, MACCS made a baseline assessment of the use of single-use plastic bags in selected shops and residences in Malé, raised awareness about the hazards of such bags, and assessed the level of acceptance of alternatives.

In the absence of a comprehensive recycling programme, or enforced regulations on the use of plastic bags, the primary objective was reducing plastic pollution through awareness raising, community-centred reduction of waste, demonstration of alternatives, and policy advocacy. Specific objectives included raising awareness about the harm of single-use plastic bags to the environment through leaflets, posters and social media. This material was then used to gain buy-in from selected households, supermarkets and shops to introduce alternatives to single-use plastic bags. The success of the project was

measured in terms of greater public awareness about the use of plastic bags, an increasing number of retail outlets offering alternatives, and an overall reduced use of plastic bags in the community. Success was also measured by the use of results by policy makers in announcing plans for a national ban on plastic bags in December 2018, which should make the island free of plastic bags by 2020.

---

*“Plastic Noon Gotheh” means “Living without Plastic”. Plastic Noon Gotheh engaged with government, colleges, private firms, gyms, households and public events to advocate for reduction and eventually a ban of single-use plastics.*

## RESULTS

The project advocacy campaign became popularly known by its tagline, “Plastic Noon Gotheh” which means “Living without Plastic”. Plastic Noon Gotheh has engaged with government, colleges, private firms, gyms, households and public events to advocate for reduction and eventually a ban of single-use plastics.

Community outreach and awareness raising resulted in the project organizers being invited to speak at the Office of the President of Maldives, and to organize information sessions for all office staff, which marked the commencement of banning all single-use plastic by the President's Office staff.

The projects' social media campaign also attracted considerable attention, through Twitter, Facebook and Instagram. The hashtag #PlasticNoonGotheh and the topic of plastic pollution trended on social media platforms. Events to raise awareness on plastic pollution used the hashtag to promote events.

These campaigning efforts have led to a decrease of single-use plastic items at public events, and a more generalized use of the project logo and tagline “PlasticNoonGotheh” by event organizers.

The project is also represented in the technical committee for waste management of the Male region, and advocates to the Ministry of Environment regarding the regulation and use of oxo-biodegradable bags.

With the groundwork laid, the project can now move forward with approaching shops, households and supermarkets: The next step is to introduce reusable bags to customers of three supermarkets, 10 corner shops and 30 households. One of the biggest supermarket chains in Malé, the government-owned State Trading Organization (STO), has agreed to work with the project and make available a check-out counter offering reusable at each of their supermarkets.

## LESSONS LEARNED

Changing long-standing behaviour requires continuous community awareness raising and advocacy to demonstrate the harmful effects of single-use plastic items, such as plastic shopping bags, to the local community and offer alternative solutions. Communication about the actions and outcomes of this project will be shared with government actors to advocate for the implementation of a complete ban on single-use plastic in the Maldives.

With the advocacy campaign providing the necessary support, the project can now move on to the next phase and start to work with local partners, stores and people, to actively replace plastic with reusable bags. This project and particularly the advocacy work is expected to continue in the future, until a complete ban on single use plastics has been adopted and can be enforced by government.



# Waste Collection and Management





# AFGHANISTAN

## Community-based Plastic Waste Management for Wetland Conservation



### GRANTEE

Afghanistan Young Greens (AYG)



### LOCATION

Kol-e Hashmat Khan  
protected area, Kabul,  
Afghanistan



### START/END DATE

March 2017 –  
March 2019

### PROJECT CONTEXT

The NGO Afghanistan Young Greens (AYG) has been active in conserving the wetlands around the Kol-e Hashmat Khan (KHK) Lake, on the south-eastern outskirts of Kabul. In the vicinity of the lake, there are dwellings of different communities and nomads counting approximately 68,000 inhabitants across 4,000 households. The KHK Lake was one of the most important and well-protected wetlands until the onset of war in 1979, when the lake supported as many as 30,000-35,000 water-birds and over 150 species of migratory birds were recorded in the area.

Currently, huge amounts of waste, especially plastic, are found around and in the lake, due to unorganized local tourism and illegal dumping from local communities and settlements that are encroaching on the lake. The capacity of the municipality to collect waste is low. The mass of plastic waste inside the lake creates disturbances

for migratory birds, and flies accumulate during the summer and hot season, creating public health risks for community members, especially children.

A 10-year conservation and restoration plan for the area was adopted in 2016, with the SGP supporting two main objectives: to identify conservation gaps through research on the KHK wetland resources and to conserve the wetland resources through community-led waste management initiatives. In order to avoid duplication of activities and to ensure optimal use of pre-existing facilities and experience, the project cooperated with major players and stakeholders including the Ministry of Agriculture, Irrigation and Livestock (MAIL), the Wildlife Conservation Society, the local SGP grantee partner Rainbow Social and Cultural Organization (RSCO), the National Environmental Protection Agency (NEPA), the Environment and Natural Resources Monitoring Network (ENRMN) and the local communities around the lake.

## PROJECT IMPLEMENTATION

One of the key innovative aspects of this project is the set-up of a waste management initiative, as an essential element to counter the challenge of randomly dumping solid waste and plastic litter, to support lake conservation efforts and to create an additional source of income for local communities.

The project focused on reducing the volume of plastic waste produced by the communities, through education and awareness-raising activities, increasing plastic waste collection, monitoring project progress and conservation efforts and supporting local livelihoods.

AYG started by sensitizing community members about the risks and consequences of storing waste in their immediate environment, and especially focused on providing families with information about how to reduce waste and use less plastic.

In particular, the organization initiated a collection mechanism for waste management, started collecting waste from 1,500 families, and installed 20 waste bins in different parts of the lake area. Village conservation committees were set up and trained in lake management. Some of the family members were hired as waste collectors, responsible for managing and collecting the waste from the families. As a result, they currently receive a monthly income of more than US\$100.

AYG is working with the Kol-e-Hashmat Khan Community Council (KHKCC) to develop recycling mechanisms for the collected waste, especially plastics and metal, with the aim of creating a sustainable waste management system. It also aims to generate additional income for the community by enabling it to hire more waste collectors and to increase the number of beneficiary households. KHKCC is expected to take over and lead the waste management and recycling activity, and its operational costs are expected to be covered by the households (US\$2.60 per month per family). Depending on the needs and preferences of the community members, revenue investments can also go towards community infrastructure for drinking water, planting trees and greening the area, or other public works.

---

*Trust building was crucial to ensure community participation in waste collection.*

## RESULTS

The waste management model of AYG has been very effective and welcomed by the community members as a primary solution for local waste management. Due to the education and awareness-raising activities of this project, the perception of the community members has positively changed towards the protection and conservation of the KHK lake. The awareness of families and school students has increased, there are a number of volunteers to monitor and prevent waste disposal at the lake and the area is now being kept free from plastics, positively affecting health and welfare of the community members.

AYG advocacy efforts have also influenced key stakeholders within the government. Agents within the MAIL, the NEPA and the Kabul Municipality have been mobilized and are now taking action for waste management in the area.

This project resulted in the sustainable conservation of the lake and its ecosystems and wildlife; the number of migratory bird species has increased enormously in the last two years, as has the amount of fish in the lake. The water flow to the lake has increased and the KHK has become the largest wetland ecosystem of the Kabul City area.

## LESSONS LEARNED

Trust building through the dedicated work of local staff and volunteers was crucial to ensure community participation in the project. The gradual introduction of this innovative approach to waste collection allowed AYG to learn how to work more closely with local communities in order to address their needs while increasing awareness and strengthening cooperation between them.

Communication and coordination with key government stakeholders as well as with community elders, enabled the AYG team to run project activities in the field more smoothly and effectively, and will likely

allow it to expand its efforts in the future. This waste management model will continue to offer a sustainable solution for the communities of the KHK area and, has also been replicated in another part of Kabul city, where the main beneficiaries are internally displaced persons and returnees. SGP played an active and important role in communication and coordination with high-level authorities and stakeholders within the government and was also very supportive in mobilizing grantee partners to seek their collaboration and support for large events.





# ARMENIA

## Reduce, Reuse and Recycle: Use of Innovative Bar-coded Shopping Bags



GRANTEE

Innovative Solutions for Sustainable Development of Communities (ISSD)



LOCATION

Armenia



START/END DATE

June 2018 –  
June 2019



### PROJECT CONTEXT

In Armenia, it is very common to burn household and municipal solid waste, to reduce volume, in both authorized (regulated) landfills and illegal dumpsites. In many urban and rural communities with no or poor waste management services, household waste is dumped into water bodies (e.g. lakes, rivers or canals) or disposed of along the roadside, a practice known as fly-tipping. Unregulated open-air burning of solid waste

poses a high risk of toxic fume emissions, with serious health hazards. Depending on how plastic and other waste is disposed of on dumpsites, dozens of pollutants can leach into the soil, water and atmosphere. These pollutants make their way into the food chain, where they have been associated with increasing the risk of cancer and other adverse health effects.<sup>24</sup>

## PROJECT IMPLEMENTATION

The aim of the project is to support waste separation, sorting, reuse and recycling in Armenia, promote new business opportunities in the waste management industry (handling and disposal), increase public awareness of recycling and reuse, and promote environmental education.

While the project is still ongoing, key activities include the promotion of a recycling culture with innovative initiatives, capacity development and awareness raising, livelihood and economic opportunities from waste management, and policy advocacy.

Waste-sorting bins have been installed in more than 100 organizations including schools, universities, offices, and government agencies. In partnership with supermarkets and shops, the project has developed bar-coded reusable shopping bags, which aim to incentivize customers to use long-lasting shopping bags instead of single-use plastic bags. The bar-coding tracks customers' bag use and awards bonus points for each reuse. An innovative online platform is also being developed to record and report waste sorting, collection and transportation.

The project has developed training materials and programmes to enhance the capacity of community members regarding waste management. The project has been implementing various activities to increase public awareness, including clean-up events and waste management during festivals and key events.

*This project introduced a new culture of separating, sorting and recycling waste, a culture of valuing our nature and resources, of caring about health and well-being.*

To create additional income and enhance local livelihoods, the project connects communities and recycling companies, aiming to create new business opportunities. This will stimulate communities to organize the sorting of waste and to sell it to recycling enterprises, generating new income streams.

This project works closely with the Ministry of Nature Protection on a newly launched policy reform to reduce the use of plastics. The team provides knowledge and expertise, including information gathered from working with various stakeholders in the field of waste management, to provide evidence on the necessity of policy changes. A number of ministries and the municipality of Yerevan have joined the Recycle It initiative by becoming beneficiary institutions. ISSD is advocating for the importance of a circular economy and working on making this a nationwide project.

## RESULTS

This project introduced a new culture of separating, sorting and recycling waste, a culture of valuing our nature and resources, of caring about health and well-being. Approximately 1,200 people have participated in trainings organized by the team, of whom 68 percent were women. As of January 2019, the project had 120,000 stakeholders out of which approximately 70 percent are women. One school principal noted the positive tendency that pupils have started to care more about the environment, and to separate their waste.

Decreased waste to landfill and increased materials for recycling. Within eight months the project collected 15 tonnes of sorted waste (around 8.7 tonnes of plastic, 5.1 tonnes of paper, 0.8 tonnes of metal and 0.4 tonnes of glass), which was delivered to recycling stations where the materials found a new lease of useful life. In September 2018 the team co-organized the Armenian

events for World Clean-up Day, the first time the country has participated. More than 100 volunteers helped clean up four remote and marginalized villages of Armenia. After the event more than 3 tonnes of trash were taken to landfills and 150 kilogrammes of recyclables were transported to corresponding stations. The project created four full time-jobs for the team and between three and four additional outsourced jobs. Gathering and delivering recyclables also stimulates job creation at the recycling stations.

Along with policymakers, ISSD is working on laws that will lower the use of natural resources by organizations and decrease the quantity of waste ending up in landfills. The team has also presented the project to the Prime Minister's office and the Municipality of Yerevan to discuss the possibilities of scaling up the project and making it accessible to the whole population of Armenia.

## LESSONS LEARNED

Time is needed to understand that waste is a resource. During the implementation of the project the team has recognized that Armenians are ready to sort and recycle, and even ready to pay for that as they start to understand the importance of recycling compared to dumping waste in the landfills or suffering exposure to open-air waste burning. It was initially a challenge to find partners interested in starting sorting in their organizations, but after couple of months the organizations were approaching the team of their own initiative. It is estimated that, on average, one organization needs two months to start sorting correctly.

In some cases, the team faced challenges with finding appropriate and affordable suppliers of the various goods and services needed for ensuring the success of the project. Another challenge was that some organizations were unwilling to share information. In those cases, the team members had to work with individuals of one-on-one basis, to help them understand the importance of the project and of distributing correct information.

The next step is to add a new function to the online portal on waste collection, sorting, and transportation. This will allow drivers with cars to sign up and receive information about partners, as sort of Uber for waste.

For example, consider that organization X has filled its sorting bin with plastic and paper waste. The organization puts this information into the website, and drivers receive a notification that they can the waste is available. Those drivers are then able to collect the waste if convenient for them, take it to the recycling station and receive money for it. This can be beneficial for those individuals that work, live or drive by recycling stations. The money received for taking recyclables to the station can help them cut their general cost for petrol.

The major barriers related to upscaling are the limited financial resources and number of recycling stations available in Armenia. To solve these issues the team has applied to various organizations for additional funding and now is designing a new project to establish a recycling station in Armenia that will be able to serve various regions, sort and recycle waste, and make a final product, thus boosting Armenia's circular economy regarding waste management. Additionally, legislative limitations do not favour the scaling up of the project. For this reason, local authorities are currently adjusting and updating rules and regulations at the levels of community, city and state.



10

# BAHAMAS

## Piloting Sustainable Community-based Waste Management in South Eleuthera



GRANTEE

One Eleuthera Foundation (OEF)



LOCATION

South Eleuthera –  
Bahamas

START/END DATE

January 2015 –  
December 2015

### PROJECT CONTEXT

Throughout the Bahamas waste management has posed a severe problem for many years. Eleuthera is no exception. With seven major landfills in South Eleuthera alone and a number of unauthorized dumping sites the roadsides are often littered with refuse. Furthermore, landfills are only allotted a certain amount of land, therefore trash must be burned regularly in order to make space for new garbage. This leads to harmful chemicals such as nitrogen oxides, volatile organic

compounds, carbon monoxide, and particle pollution being released into the air, all of which lead to both public health and environmental problems.

Many people are unaware of the importance of recycling and the benefits this could bring to their lives, homes and health. A major reason for Eleuthera's waste issues is that there are no alternative means of disposing of trash and other unwanted items.

## PROJECT IMPLEMENTATION

With support from the SGP, the One Eleuthera Foundation and South Eleuthera Emergency Partners sought to improve waste collection and sorting; reduce the amount of recyclable materials that end up in landfills in South Eleuthera, educate the public.

Communities installed recycling bins at the five primary schools throughout South Eleuthera and during major public events. South Eleuthera Emergency Partners' current collection facility strengthened its capacity to collect, sort, temporarily store and further distribute recyclable materials for recycling.

Plastics and aluminium cans are now weighed and shipped to Cans For Kids, a non-profit recycling organization located in New Providence, where they are further directed for recycling internationally. Some plastics are used to create waste receptacles or repurposed as storage containers. Glass bottles are sorted and either shipped to the brewery in New Providence,

used by local artists in craft work, or made available to locals who use them to preserve tomatoes, peppers and other foodstuffs.

Awareness raising takes place through advertisements, presentations, public events, volunteer opportunities and other activities. This activity focuses largely on primary school students as they are successful at influencing their parents, guardians and other adults.

---

*Developing and selling products from recycled waste is important to ensure a revenue stream that can sustain the community recycling programme.*



PHOTO: SGP BAHAMAS

## RESULTS

Drop-off locations for recyclables increased from just one to a total of 27 bins. Additionally, the South Eleuthera Emergency Partners (SEEP) Recycling Depot was strengthened. At the end of the project 1.4 tonnes of garbage had been collected and distributed at the depot, including 270 kilograms of plastics, 80 of cans, and 900 kilograms of glass.

Within the community, knowledge was increased regarding recycling and its benefits, and of alternative uses for solid waste. 679 students received training about recycling and nearly 200 people were reached

through several awareness-raising events. Follow-up surveys conducted in schools in South Eleuthera indicate that an average of 85 percent of students retained the information they received on recycling and 92 percent of them now recycle frequently. Due to awareness-raising in the community, some local restaurants and events have started to use biodegradable plates, cups and other items, and stores have increased the availability of biodegradable products for sale.

## LESSONS LEARNED

Local organizations are key partners and stakeholders of the recycling program; reaching out to schools, restaurants, artisans, non-profits, government agencies, local stores and other businesses was therefore of critical importance to the success of project.

Because long-term financial sustainability of the community recycling programme may be challenging, developing and selling products from recycled waste

is important to ensure a revenue stream. These products can include jewellery, plates, or ground plastics for construction.

Consistent and innovative education is important to change the behaviour of the community over the long term. Firm belief in this project from SGP resulted in the capacity of the Foundation and partners to continue and even expand this project.





## Lessons Learned

This publication shows communities can be key drivers in offering innovative solutions to *reduce, reuse* and *recycle* plastics for promoting a circular economy. It also lays out SGP's experiences and lessons learned for other communities, governments and private-sector agents to consider when seeking to address the challenge of managing plastic waste. Considering the limited size and duration of the projects, none can be said to embody a complete circular economy regarding plastic waste management, but they are steps in that direction that could influence a society to promote relevant practices and policies.

Transformational change towards a circular economy requires effort from all sectors of society and from

different angles: in other words, both bottom-up and top-down initiatives are required. We recognize the severe constraints faced by communities in terms of lack of capacity, technology, and facilities in relation to the vast scope of the plastic management problem. However, these projects showcase ideas and practices on how to achieve a circular path through sustainable plastic management. We take note of the constraints and risks faced by community plastic waste management projects, and offer lessons learned for future innovative interventions. Importantly, these projects also highlight the urgent need for a globally integrated approach to a planet free of plastic waste.

## COMMUNITY INNOVATION AND TECHNOLOGIES

Local innovations can play an essential role in plastic management and the circular economy, which in turn are crucial for long-term sustainable development. Community innovations stem from both traditional local knowledge and the application of modern science and technology, and range from plastic products produced, to waste materials used, to processes undertaken. It is important to highlight and document these innovations and technologies for global learning and sharing.

Technology and the internet are major tools for innovation and allow small scale local projects to be expressed on a global scale. In Armenia, for example, technologies and access to internet are used to promote innovative practices to reduce plastics use. The project has developed bar-coded shopping bags in partnership with supermarkets and shops to incentivize customers to use long-lasting shopping bags instead of single-use plastic bags, with a bonus every time the customers reuse their bags. An innovative online platform has also been developed to record and report waste sorting, collection and transportation. The next step is to add a new function which will allow drivers with cars to sign up and transport waste whenever it is ready and according to their convenience.

## MULTI-STAKEHOLDER PARTNERSHIPS

Plastics have permeated every aspect of modern life and all industrial sectors. Communities alone cannot address this challenge without a holistic approach involving all stakeholders, from citizens to governments to private sectors. Plastic waste management needs to be integrated at local, national, and international levels, regarding both policy and implementation, and with the participation of all key stakeholders. Partnerships with governments and private sectors are seen at the community level in projects featured in this publication. Sustainable business models can be supported through public-private partnerships at all levels. However, in many projects, the results and impact remain local and site-specific, mainly due to the lack of an overall national enabling environment in terms of government policies and market incentives.

In India, a crucial element of the project's success was Sarthak's partnership with urban municipal governments and local industries. This helped significantly in highlighting the vulnerable conditions of the ragpickers, and allowed for this particular livelihood model to be replicated in another city. In Ghana, the project implemented an innovative model of entrepreneurship. It acts as a company and pays consumers or households for their empty water sachets. By paying for their waste, the project provides citizens with an incentive to collect their waste products, and fewer plastic bags are dumped in the open.



## MARKET BARRIERS AND POLICY RESPONSES

There is a lack of enabling policies and market environment for sustainable plastic management and the circular economy. Governments have not developed or implemented effective policy responses to reduce, reuse and recycle plastics.<sup>25</sup> In many countries, governments have put economic development over environmental protection, leading to less policy attention being paid to plastic management issues, particularly those that may widely affect industrial sectors.

At present, recycled plastic production is for the most part not economically competitive. The rate of recycling is low globally. Many manufacturers continue to rely solely on virgin plastic inputs, not only because of their lower cost, but also due to inertia, and uncertainty about the properties of recycled plastics. The high cost of recycling, together with the unreliable market value and demand regarding recycled products, pose challenges to long term sustainability of recycling practices with the exception of plastic products such as bottles. Against such an unfavourable market and the policy macro environment, community projects have worked to address market barriers and advocate for government policy responses.

To address market barriers, in Gambia women were trained in marketing techniques, small business entrepreneurship, and record- and bookkeeping, to supplement business opportunities offered by plastic recycling. Further to this training, the women have plans to use an online sales and marketing platform to promote and sell the products all over the world. However, the ultimate goal is to reduce consumption of plastic products, rather than make them more marketable even in their recycled forms. For this change to occur, plastic production needs to be replaced with environmentally friendly products at all levels and industries.

To influence government policies, the project in Armenia worked with the Ministry of Nature Protection on a newly launched policy reform to reduce the use of plastics. The team provides knowledge and expertise, including information gathered from working with various stakeholders in the field of waste management, to provide evidence on the necessity of policy changes. A number of ministries and the municipality of Yerevan have joined the Recycle It initiative to recycle plastic waste. The intention is to advocate for government to adopt a plastic-free policy for the future.

## AWARENESS RAISING, CAPACITY DEVELOPMENT AND BEHAVIOURAL CHANGES

Education and awareness raising among citizens are key to shifting consumption habits and behaviours. Management of plastic waste often starts at the household and individual levels, and effective strategies to educate and motivate citizens are essential to change behaviours. Reduction of plastic use is the first step towards a circular economy. All the project cases in this publication recognize the need to reduce plastic consumption by means of awareness raising, environmental education and advocacy. This is especially the case in small island states where no recycling capacity or facility is available.

In the Maldives, for example, recycling is not always economically feasible, partly due to the scale of the area, and as a consequence there are no recycling facilities on the islands. The only logical solution is to reduce and eventually eliminate the use of single-use plastics entirely. Therefore, the project in the Maldives has focused on awareness raising, campaigning and advocacy for the government to ban single-use plastic bags, and call on people to reduce the use of plastics.

Similarly, one key objective of the project in Armenia is to campaign for a government ban on single-use plastic bags. Likewise in Jamaica, the project demonstrates the importance of awareness and environmental education. Due to the project's awareness raising and campaign efforts in this field, the burning of plastic waste in the community has decreased considerably. People in Negril now want to be involved in recycling efforts and private businesses are requesting their own recycling bins.

### **SOCIAL INCLUSION OR EXCLUSION?**

In many development projects, it is often challenging to incorporate the voices and participation of poor, vulnerable and marginalized people and communities. Due to their marginalized status, their voices are often not heard and their existence was not noted during project development and implementation. It should be noted that many projects featured in this publication are led by women, youth and children and people with disabilities. While we recognize the importance of engaging the most vulnerable and marginalized groups, it is also concerning to point out that waste management, especially informal waste picking and sorting, is often undertaken by women, youth and disabled people who cannot find more profitable, cleaner and respectable jobs. Informal waste management jobs are considered "dirty" jobs, and often only the poorest and most marginalized are engaged in this sector.

Health hazards in community waste management projects can further exacerbate this exclusion. Plastic waste poses a serious health risk to the communities around it. In Armenia, it was initially a considerable challenge to find partners interested in starting waste sorting in their organizations. In Sierra Leone, heating the plastic and sand for mixing can pose a risk of burning and inhaling of persistent organic pollutants, despite the masks and gloves used by the workers. For the next phase of the project, it is advised to look into this aspect and improve the safety in the e-stone production process.

These people often lack access to health services, which further compounds their social and economic marginalization. As such, projects working with plastic waste management need to seriously consider the relevant occupational hazards and their implications for social inclusion. Preventive and precautionary measures can range from providing basic safety equipment to conducting regular health check-ups.

### **ECONOMIC FEASIBILITY AND SUSTAINABILITY**

Currently, the cost of collecting and processing recyclable materials far outweigh their value as a commodity. This poses a fundamental challenge to the sustainability of project results beyond the life of community projects. Selling products produced from plastic waste may not yield adequate profits to sustain an initiative after the completion of SGP projects. To generate interest in plastic waste management, it needs to be showcased tangibly that waste can be successfully repurposed, and that it can be sustainable and income-generating to do so.

Goods produced from plastic waste include construction materials, furniture, and consumer goods. The demand for these products remains limited, and the profit is yet to be determined. In Gambia, each of the 100 women earned US\$150 to US\$200 per recycling activity from the sale of recycled-plastic school bags, shopping bags, sandals, and key holders. The women are able to carry out two recycling activities per year, making a total of US\$300–US\$400 per year. Such activities are organized with the support of SGP grants. Sustainability of these activities remains uncertain beyond the exhaustion of grant funds.

It's our view that innovative recycled plastic products can play a significant role in raising awareness and shifting consumer behaviours and culture, but their economic feasibility and sustainability remain to be proved.





# Looking Forward

The United Nations SDGs and the policies of the GEF call for all governments, private-sector agents and civil society organizations, as well as all other stakeholders, to act and address plastic management and circular economy challenges.

## A CALL FOR A FUTURE FREE OF PLASTIC WASTE

It has been proven that both the production and the consumption of plastics create risks for human

health and compound the environmental challenges associated with climate change, loss of biodiversity, land degradation, deforestation and water pollution. Thus, the core idea behind plastic waste management is that one day we will no longer have to manage plastic as waste but become completely plastic waste free. We should aim high and strive to attain a society where all plastics produced are used and remain in the circular economy, eliminating plastic pollution to our land, waterways and oceans.

## A COLLECTIVE BEHAVIOURAL AND CULTURAL SHIFT

To achieve a future free of plastic waste, a paradigm shift is needed in the behaviours and culture around the production and consumption of plastics. This shift must come from people and communities that are made aware of plastics pollution, leading to behavioural changes, combined with pro-active government policy and the private sector's shouldering of its environmental responsibilities. The priorities of governments, the private sector and civil society organizations should be to change collective behaviours and cultures to stop the flow of plastic and reduce this pollution at the source, while reducing consumption and providing a more environmentally friendly alternative.

## A PARADIGM SHIFT TOWARDS CIRCULAR ECONOMY

Plastic waste also becomes an economic issue, although the externalities in terms of the environmental costs are often not quantified or taken into account. Communities cannot resolve this alone, and we need an integrated approach involving local, national, and international actors across all sectors of society. It is imperative for the government, private-sector agents, and communities to work together and fundamentally shift how our economy functions and how people live their lives. We need to develop and implement a circular economy in which plastic materials run in a circular process, and are not discarded to pollute our environment.

## SGP'S ROLES AND CONTRIBUTION

In the coming years, SGP plans to expand its support and continue to work closely with the GEF, UNDP, and other partners, particularly on concrete on-the-ground initiatives to promote and implement plastic management and the circular economy, including projects to reduce, reuse, and recycle plastics and contribute towards a plastics-free future. This will also include efforts to have closer dialogue on policy and programme linkages, and promote integration between communities, government and the private sector on the issue. We hope that these projects supported by SGP will continue to inspire and provide practical examples and lessons, and

*SDG 12 in particular aims to “ensure sustainable consumption and production patterns” with its target 12.5 on waste management: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.*

*GEF-7 programming document points out that, recognizing the need to transform the entire lifecycle of plastics to reduce marine plastic pollution, the GEF will invest in plastics and circular economy initiatives to promote the adoption of closed-loop production and consumption patterns instead of traditional linear take-make-waste approaches.*

make an important, if small, contribution towards the implementation of large-scale circular economies in partnership with industry and policy makers.



# Annex 1. Summary of Project Cases



COUNTRY



DURATION



FUNDING



CO-FINANCING



RESULTS

## MATERIAL ENGINEERING AND PRODUCT DESIGN

Burundi	March 2017 – October 2017	US\$21,000	US\$22,469	<ul style="list-style-type: none"> <li>Use of banana bark bag led to avoiding use of estimated 3 million plastic bags</li> <li>Reforestation of 13,000ha</li> <li>150,000 seedlings planted on farmland of beneficiaries</li> <li>Income generation from producing alternative bags (US\$55/Y/household)</li> </ul>
India	December 2014 – December 2015	US\$45,742	US\$82,660	<ul style="list-style-type: none"> <li>Collecting waste became a significant source of livelihoods for local communities, allowed for health insurance</li> <li>Plastic waste used as fuel in furnaces and road construction</li> <li>Establishment of pilot plastic recovery center</li> <li>Government Madhya Pradesh introduced policy on plastics, integrating community-led waste collection efforts in the policy framework</li> </ul>
Jamaica	January 2009 – March 2010	US\$39,200	US\$25,793	<ul style="list-style-type: none"> <li>Collection of 20 tonnes of recyclable waste</li> <li>Reuse of recycled material and design of products from recycled materials</li> <li>Biodiversity protection and coral reef monitoring; protection of 4 species of turtles and corals</li> <li>Updated Negril Marine Park Zoning Plan and protected area</li> <li>Protection of 200 ha of marine and coastal area</li> <li>Gender and youth outreach and awareness raising, 50 women involved in all project activities, 500 households, 2000 students and 30 businesses</li> <li>Collaboration and partnerships established with 5 local NGOs and the Negril Recycling Center</li> </ul>
Sierra Leone	December 2017 – November 2018	US\$13,600	US\$5,790	<ul style="list-style-type: none"> <li>Collecting waste from 1800 households and offices</li> <li>Creation of sustainable employment for over 400 youth and women and training in waste management</li> <li>Beautification of Makeni city</li> <li>Production of 15,000 e-stones used for outdoor paving and made of plastic, rubber and sand</li> </ul>

## CONSUMER USE AND BEHAVIORS

Gambia	August 2013 – July 2014	US\$20,000	US\$20,500	<ul style="list-style-type: none"> <li>Sensitisation of 100 women about plastic waste</li> <li>Increased livelihoods from sale of products made with recycled plastic waste</li> </ul>
Ghana	December 2017 – July 2019	US\$7,000	US\$27,000	<ul style="list-style-type: none"> <li>Reduced burning of plastic waste and increased recycling</li> <li>5ha land previously filled with litter restored and allocated for eco-farming</li> <li>Increased livelihoods from sale of products of recycled waste</li> <li>Reduced environmental pollution</li> <li>Improved sanitation and health for communities</li> <li>Reduced urban migration from rural area</li> </ul>
Maldives	July 2018 – January 2020	US\$38,180	US\$28,404	<ul style="list-style-type: none"> <li>Successful advocacy, awareness raising ad social media campaign to decrease the use of plastic bags</li> <li>Established partnerships with government and private sector</li> <li>Introduction of reusable bags to supermarkets and other businesses</li> </ul>

## WASTE COLLECTION AND RECYCLING

Afghanistan	March 2017 – March 2019	US\$45,000	US\$47,180	<ul style="list-style-type: none"> <li>Increased awareness among communities and government decision-makers</li> <li>Innovative waste management model</li> <li>Conservation of lake ecosystem and biodiversity</li> </ul>
Armenia	June 2018 – June 2019	US\$49,200	US\$66,000	<ul style="list-style-type: none"> <li>Increased environmental awareness and introduction of a recycling culture</li> <li>Decreased waste to landfill</li> <li>Contribution to national strategies and policies</li> </ul>
Bahamas	January 2015 – December 2015	US\$40,000	US\$32,885	<ul style="list-style-type: none"> <li>Increased collection and recycling of plastic waste</li> <li>Increased knowledge of the benefits of recycling in community</li> <li>Decrease in waste at landfill</li> </ul>

# References

- Ritchie H. and Roser M. (September 2018) *Plastic Pollution – Our World in Data*. Available at <https://ourworldindata.org/plastic-pollution>
- Barra, Ricardo & Leonard, Sunday & Whaley, Christopher & Bierbaum, Rosina. (2018). *Plastics and the Circular Economy – A STAP Document*. 10.13140/RG.2.2.11515.57128.
- Lord, R. (2016) *Plastics and sustainability: a valuation of environmental benefits, costs and opportunities for continuous improvement. Trucost and American Chemistry Council*. Available at <https://plastics.americanchemistry.com/Plastics-and-Sustainability.pdf>
- Zygmunt, J. 2007. "Hidden waters. A Waterwise briefing." *Waterwise*. [http://waterfootprint.org/media/downloads/Zygmunt\\_2007.pdf](http://waterfootprint.org/media/downloads/Zygmunt_2007.pdf)
- A.A. de Souza Machado, W. Kloas, C. Zarfl, S. Hempel, M.C. Rillig. (2018) "Microplastics as an emerging threat to terrestrial ecosystems", in *Global Change Biology*.
- (2016). *Marine Debris: Understanding, Preventing and Mitigating the Significant Adverse Impacts on Marine and Coastal Biodiversity. Technical Series No.83. Secretariat of the Convention on Biological Diversity*. Montreal, 78 pages.
- Reyna-Bensusan, N. et al. (2018). "Uncontrolled burning of solid waste by household in Mexico is a significant contributor to climate change in the country." *Environmental Research*, 163, doi: 10.1016/j.envres.2018.01.042.
- Ellen McArthur Foundation (2013) *Towards the Circular Economy*. Available at – [www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf](http://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf).
- Massey R. (2004) "Environmental Justice: Income, Race and Health", *Global Development and Environment Institute*, Tufts University.
- Joshi & Ahmed (2016). "Status and challenges of municipal solid waste management in India: A review." *Cogent Environmental Science* (2016), 2: 1139434
- The Associated Chambers of Commerce & Industry of India (ASSOCHAM) and PricewaterhouseCoopers (PwC). March 2017. Report on *Waste Management in India – Shifting Gears*. Available at – [www.pwc.in/publications/2017/waste-management-in-india-shifting-gears.html](http://www.pwc.in/publications/2017/waste-management-in-india-shifting-gears.html)
- S. D. Diwevdi, Sheeraz Ahmad Wagay (2014). "Solid Waste Management in Bhanpur Bhopal: Status And Need – A Case Study." *Chemical and Process Engineering Research* [www.iiste.org](http://www.iiste.org) ISSN 2224-7467 (Paper) ISSN 2225-0913 (Online) Vol.18, 2014
- Bhopal Municipal Corporation Internal Presentation (2018). Available at -[https://cdn.cseindia.org/docs/photogallery/slideshows/02\\_20171212\\_BHOPAL\\_SBM\\_PPT.pdf](https://cdn.cseindia.org/docs/photogallery/slideshows/02_20171212_BHOPAL_SBM_PPT.pdf)

Republic of Sierra Leone: 2004 Population and Housing Census: Analytical Report on Population Distribution, Migration and Urbanisation in Sierra Leone; Ibrahim Mohamed Sesay, Andrew A. Karam, Jinnah J. Ngobeh. Published November 2006.

Zainab Tunkara Clarkson. (10 September 2013). "Sierra Leone: Waste Management Challenges." *The Sierra Leone Telegraph*. Available at – [www.thesierraleonetelegraph.com/sierra-leone-waste-management-challenges](http://www.thesierraleonetelegraph.com/sierra-leone-waste-management-challenges).

WeltHunger Hilfer and Makeni City Council. 2016. "Integrated Waste Management Plan for Makeni City." Available at – [www.washlearningsl.org/integrated-waste-management-plan-for-makeni-city/](http://www.washlearningsl.org/integrated-waste-management-plan-for-makeni-city/).

GNFS (2015). Report on Ministerial Committee that Investigated fire outbreak at the Goil Filling Station, Kwame Nkrumah Circle on 3rd June 2015. pages xi-xii. Available at – [www.ghanaweb.com/GhanaHomePage/NewsArchive/June-3-disaster-Full-report-made-public-604410](http://www.ghanaweb.com/GhanaHomePage/NewsArchive/June-3-disaster-Full-report-made-public-604410)

Cogut, Alexander. (October 2016). Open Burning of Waste: A Global Health Disaster." *R20 Regions of Climate Action*. Available at – [https://regions20.org/wp-content/uploads/2016/08/OPEN-BURNING-OF-WASTE-A-GLOBAL-HEALTH-DISASTER\\_R20-Research-Paper\\_Final\\_29.05.2017.pdf](https://regions20.org/wp-content/uploads/2016/08/OPEN-BURNING-OF-WASTE-A-GLOBAL-HEALTH-DISASTER_R20-Research-Paper_Final_29.05.2017.pdf)

OECD (2018) "Improving plastics management: trends, policy responses, and the role of international cooperation and trade." OECD Environment Policy Paper No. 12. Available at – [www.oecd.org/environment/waste/policy-highlights-improving-plastics-management.pdf](http://www.oecd.org/environment/waste/policy-highlights-improving-plastics-management.pdf)

# Endnotes

- <sup>1</sup> Ritchie H. and Roser M, Plastic Pollution – Our World in Data, September 2018, available at <https://ourworldindata.org/plastic-pollution>
- <sup>2</sup> R. Barra and S.A. Leonard, “Plastics and the Circular Economy – A STAP document”, June 2018.
- <sup>3</sup> Lord, R. 2016. Plastics and sustainability: a valuation of environmental benefits, costs and opportunities for continuous improvement. Trucost and American Chemistry Council. <https://plastics.americanchemistry.com/Plastics-and-Sustainability.pdf>
- <sup>4</sup> Zygmunt, J. 2007. Hidden waters. A Waterwise briefing. Waterwise. [http://waterfootprint.org/media/downloads/Zygmunt\\_2007.pdf](http://waterfootprint.org/media/downloads/Zygmunt_2007.pdf)
- <sup>5</sup> Supra note 2
- <sup>6</sup> Microplastics further break down into nanoparticles that are less than 0.1 micrometre in size; See A.A. de Souza Machado, W. Kloas, C. Zarfl, S. Hempel, M.C. Rillig. “Microplastics as an emerging threat to terrestrial ecosystems”, in *Global Change Biology*, 2018.
- <sup>7</sup> Marine Debris: Understanding, Preventing and Mitigating the Significant Adverse Impacts on Marine and Coastal Biodiversity. Technical Series No.83. Secretariat of the Convention on Biological Diversity, Montreal, 2016.
- <sup>8</sup> R. Barra and S.A. Leonard, “Plastics and the Circular Economy – A STAP document”, June 2018.
- <sup>9</sup> Reyna-Bensusan, N. et al. 2018. Uncontrolled burning of solid waste by household in Mexico is a significant contributor to climate change in the country. *Environmental Research*, 163, doi: 10.1016/j.envres.2018.01.042.
- <sup>10</sup> R. Barra and S.A. Leonard, “Plastics and the Circular Economy – A STAP document”, June 2018.
- <sup>11</sup> Ellen McArthur Foundation. 2013. *Towards the Circular Economy* ([www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf](http://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf))
- <sup>12</sup> Supra note 1.
- <sup>13</sup> Massey R., 2004. “Environmental Justice: Income, Race and Health”, Global Development and Environment Institute, Tufts University.
- <sup>14</sup> It should be noted that almost all the projects have undertaken an integrated approach to plastic waste management and circular economy, therefore one project may actually have implemented activities to address all the above three themes.
- <sup>15</sup> Joshi & Ahmed (2016). “Status and challenges of municipal solid waste management in India: A review” *Cogent Environmental Science* (2016), 2: 1139434; The Associated Chambers of Commerce & Industry of India (ASSOCHAM) and PricewaterhouseCoopers (PwC). March 2017. *Report on Waste Management in India – Shifting Gears*. Available at – [www.pwc.in/publications/2017/waste-management-in-india-shifting-gears.html](http://www.pwc.in/publications/2017/waste-management-in-india-shifting-gears.html)
- <sup>16</sup> [iiste.org/Journals/index.php/CPER/article/download/10350/10552](http://iiste.org/Journals/index.php/CPER/article/download/10350/10552)
- <sup>17</sup> The waste collectors are referred to as rag pickers as the waste they collect also includes cloth rags.
- <sup>18</sup> [https://cdn.cseindia.org/docs/photogallery/slideshows/02\\_20171212\\_BHOPAL\\_SBM\\_PPT.pdf](https://cdn.cseindia.org/docs/photogallery/slideshows/02_20171212_BHOPAL_SBM_PPT.pdf)
- <sup>19</sup> Republic of Sierra Leone: 2004 Population and Housing Census: Analytical Report on Population Distribution, Migration and Urbanisation in Sierra Leone; Ibrahim Mohamed Sesay, Andrew A. Karam, Jinnah J. Ngobeh. Published November 2006
- <sup>20</sup> Zainab Tunkara Clarkson. (10 September 2013). “Sierra Leone: Waste Management Challenges.” *The Sierra Leone Telegraph*. Web access – [www.thesierraleonetelegraph.com/sierra-leone-waste-management-challenges](http://www.thesierraleonetelegraph.com/sierra-leone-waste-management-challenges).
- <sup>21</sup> WeltHunger Hilfer and Makeni City Council. 2016. “Integrated Waste Management Plan for Makeni City.” ([www.washlearningsl.org/integrated-waste-management-plan-for-makeni-city/](http://www.washlearningsl.org/integrated-waste-management-plan-for-makeni-city/))
- <sup>22</sup> [www.ghanaweb.com/GhanaHomePage/NewsArchive/June-3-disaster-Full-report-made-public-604410](http://www.ghanaweb.com/GhanaHomePage/NewsArchive/June-3-disaster-Full-report-made-public-604410) (GNFS, 2015. Report on Ministerial Committee that Investigated fire outbreak at the Goil Filling Station, Kwame Nkrumah Circle on 3rd June 2015 pages xi-xii).
- <sup>23</sup> Low-density polyethylene plastic water sachets or pouches are used widely in developing countries, instead of water bottles. They often cause major waste problems, especially there where local collection and recycling systems do not exist.
- <sup>24</sup> Alexander Cogut, “Open Burning of Waste: A Global Health Disaster”; R20 Regions of Climate Action, October 2016
- <sup>25</sup> OECD. 2018. Improving plastics management: trends, policy responses, and the role of international cooperation and trade ([www.oecd.org/environment/waste/policy-highlights-improving-plastics-management.pdf](http://www.oecd.org/environment/waste/policy-highlights-improving-plastics-management.pdf))



The Small Grants Programme (SGP) is a corporate programme of the Global Environment Facility (GEF) implemented by the United Nations Development Programme (UNDP) since 1992. SGP grantmaking in over 125 countries promotes community-based innovation, capacity development, and empowerment through sustainable development projects of local civil society organizations with special consideration for indigenous peoples, women, and youth. SGP has supported over 20,000 community-based projects in biodiversity conservation, climate change mitigation and adaptation, prevention of land degradation, protection of international waters, and reduction of the impact of chemicals, while generating sustainable livelihoods.



The Global Environment Facility (GEF), established on the eve of the 1992 Rio Earth Summit, is a catalyst for action on the environment — and much more. Through its strategic investments, the GEF works with partners to tackle the planet's biggest environmental issues. Our funding also helps reduce poverty, strengthen governance and achieve greater equality between women and men. As such, we occupy a unique space in the global partnership for a more sustainable planet.



*Empowered lives.  
Resilient nations.*

UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in 177 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations. [www.undp.org](http://www.undp.org)



304 E 45<sup>th</sup> Street  
UNDP, 9<sup>th</sup> Floor  
New York, NY 10017  
USA

Email: [sgp.info@undp.org](mailto:sgp.info@undp.org)  
Website: [www.sgp.undp.org](http://www.sgp.undp.org)

