

Plastic Recycling Project

Monrovia, Liberia, West Africa

Implemented by:	Green Cities Inc., Russel Avenue, Sinkor, Monrovia, Liberia
Main Focus:	Production of School Supplies out of Plastic Waste / Raising Awareness & Prevention Self-Sustaining Recycling Processing through Value Chain for Plastic Waste in Urban Liberia Reduction of Youth Unemployment & Opening of Income Generating Opportunities
Project length:	3 Years (2018 – 2020)
Total Costs:	US\$ 373'500.- of which US\$ 112'500.- will be local contribution US\$ 261'000.- remaining to be covered by external contributions

The «Plastic Recycling Project» does pioneer work in Liberia by processing solid plastic waste and bringing the resource back into the market.

Green Cities Inc. (formerly Compost Liberia) is a youth based social enterprise operating Liberia's first waste segregation and recycling center called Green Center. This center was constructed by Global Communities with funding from the Bill and Melinda Gates Foundation in 2012. The goal of Green Cities is to create a clean and green environment through the implementation of a waste value chain. By collecting, processing and selling waste the local business is creating job opportunities for young people in Liberia. To contribute to a clean environment in Monrovia, Green Cities engages in different projects¹.

In collaboration with Cooperaxion, Green Cities started in 2014 to research and pilot on how plastic could be included in the recycling process. In 2015, a plastic crusher and palletizing machine have been purchased for both film plastic, such as water bags (LDPE/HDPE) and hard rubber plastic, such as gallons (HDPE). Water bags, carrying 500ml of water, play a central role in Liberians life: they are often the only source of accessible and clean water affordable. The high demand of such water bags produce a huge amount of daily waste; therefore their disposal is an important environmental issue. Green Cities started to buy collected plastic waste from sensitized community dwellers and through this trade gives vulnerable groups of society an opportunity of income. Manually the products were cut and washed before processed further. The new raw material (pellets or crushed plastic) has been sold to local companies for the production of new plastic products, instead or as addition to virgin² plastic.

Within the new project phase, the processing will be mechanized, diversified and supplemented with the production of an end product - school materials like rulers, set squares etc. The social business will have three ways of income generating: Selling of raw material (pellets or crushed hard plastic), offering services (e.g. washing dirty plastic foils and resell them without further processing), and the selling of end products.

At the same time the implementers are dedicated to a public awareness of different target groups such as youth and women from densely populated communities as well as businesses like offices, hotels, restaurants. A special focus lies on school children: With school materials made out of recycled plastic they can grasp literally that «waste» has value and can be transformed into something useful. All sensitization workshops focus on the processes of reduce, reuse and recycle of the different waste materials.

The project phase 2018 – 2020 has the following focusses:

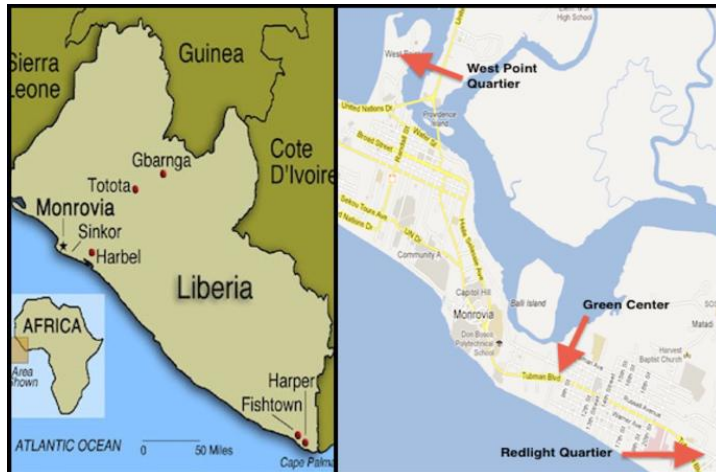
- The **mechanization** of cutting, washing, pelletizing/crushing and production of the end products (installation of machines, method of treatment for process water, placing into operation)
- **Raising awareness about reduce, reuse & recycle** different waste materials: Sensitization workshops for school children; forming of collection-groups with youth organizations in different communities; raising awareness within the biggest markets of Monrovia
- The social business Green Cities will be **gradually supported to become self-sustaining** and independent from funding: After the decisive contribution in 2018 (with a local contribution of 10%), 25% of the 2019 budget and 75% of the 2020 budget will be covered by the initiatives own generated income and from 2021 on the organization will be on its own feet
- The initiative shall be **reproduced and multiplied by a franchising system** in other big cities in Liberia.

The «Plastic Recycling Project» will become a self-supporting waste value chain, contributing to a clean environment and generating income opportunities. With the sale of 2.5 kg collected plastic waste, community dwellers are able to buy a cup of rice, Liberians most stable food.

¹ Other engagements of Green Cities: composting, production of organic fertilizer, paper-recycling, collection, sorting, storing and selling of other recyclables such as aluminum and metal cans, metal, glass, electronic wastes

² Virgin Plastic is newly-manufactured plastic that has not yet been made into a product, is therefore the opposite of recycled plastic.

Location



Liberia, Monrovia | *Green Center* (production place of Green Cities) in Sinkor and two of the biggest markets in the communities West Point and Redlight

Liberia

- At 96,320 km² (111,369 km² incl. water), Liberia is more than twice as large as Switzerland and has about half as many inhabitants (about 4.7 million)
- The Republic of Liberia was founded in 1847 by the «Americo-Liberians», previously enslaved people from the United States
- There are 16 different ethnic groups living in Liberia. The most common languages are Liberian English, Mande, Kru, Gola and Kpelle
- Liberia exports mainly rubber, iron, wood, diamonds, cocoa, coffee and gold; importing mainly fuels, machinery, foodstuffs such as rice (the staple food of Liberians)
- According to the MPI (Multidimensional Poverty Index), 83.9% of Liberians are at least 30% or more deprived and are therefore considered “poor” according to this index

Recall that 1) a person is considered poor if they are deprived in at least 30% of the weighted indicators and 2) the intensity of poverty denotes the proportion of indicators in which they are deprived:

<http://www.ophi.org.uk/wp-content/uploads/Liberia.pdf> (15.02.18)

<https://www.cia.gov/library/publications/the-world-factbook/geos/li.html> (13.02.18)

Impressions



Top left: Plastics accounts for the largest share of inorganic waste in Liberia. In particular, the drinking water bags cannot be reused.

Top center: The waste is often deposited in the middle of the communities, as here in Soniwein directly between the hospital clinic and the market. Very rarely these local deposits are cleaned.

Top right & bottom left: Individuals, youth organizations, marketers or companies can sell plastic films and hard rubber plastic per kilo to Green Cities.

Bottom middle: The plastic is processed into pellets (foil plastic) and crushed chaff (hard rubber) by the team of young adults from which new products are created:

- Hard rubber gallons are crushed (white chaff) and sold to other companies who fabricate new products such as bottles.

- Plastic water bags are washed, dried and pelletized (greenish/gray pellets) and can either be sold as pellets or Green Cities can produce new products directly from the foil plastic, such as school materials.

Bottom right: This initiative is accompanied by raising awareness courses for various target groups on reduction, reuse and recycling of “waste”.

Plastic Recycling Project Monrovia, Liberia		Budget 2018 (in USD)			Budget 2019 (in USD)			Budget 2020 (in USD)		
		Total Budget	local contribution	external contribution	Total Budget	local contribution	external contribution	Total Budget	local contribution	external contribution
1	Construction & Installation	32'882	0	32'882	0	0	0	0	0	0
	Construction of Building Enhancement	9'632	0	9'632	0	0	0	0	0	0
	Connection of Electricity in the Buildings	4'750	0	4'750	0	0	0	0	0	0
	Installation of New Machines	6'000	0	6'000	0	0	0	0	0	0
	Installation of Water Treatment System	7'500	0	7'500	0	0	0	0	0	0
	Mold for Endproduct	5'000	0	5'000	0	0	0	0	0	0
2	Maintenance	4'500	0	4'500	3'520	500	3'020	3'520	2'640	880
	Generator Maintenance	2'500	0	2'500	1'600	250	1'350	1'600	1'200	400
	Machinery Maintenance	2'000	0	2'000	1'920	250	1'670	1'920	1'440	480
3	Electricity / Fuel / Water	8'540	540	8'000	16'540	540	16'000	32'540	24'540	8'000
	Fuel for processing (generator)	6'000	0	6'000	12'000	0	12'000	24'000	18'000	6'000
	Fuel for collection (car)	2'000	0	2'000	4'000	0	4'000	8'000	6'000	2'000
	Water Supply	540	540	0	540	540	0	540	540	0
4	Storage Space	10'000	2'500	7'500	2'000	1'000	1'000	2'000	2'000	0
	Rent for Storage Space	5'000	1'000	4'000	2'000	1'000	1'000	2'000	2'000	0
	Construction of Storage Space	5'000	1'500	3'500	0	0	0	0	0	0
5	Supplement Payment for Plastic	13'500	0	13'500	27'000	6'000	21'000	27'000	20'250	6'750
	HDPE (2018:35t, 2019: 70t)	6'300	0	6'300	12'600	3'000	9'600	12'600	9'450	3'150
	LDPE (2018:30t, 2019:70t)	7'200	0	7'200	14'400	3'000	11'400	14'400	10'800	3'600
6	Awareness / Sensitization	16'500	1'300	15'200	3'500	1'500	2'000	1'500	1'500	0
	Transport+Food for Participants (105 x 20.-)	2'100	0	2'100	0	0	0	0	0	0
	Training Center Rent (8 days at 150.-)	1'200	0	1'200	0	0	0	0	0	0
	Facilitation fees (3 pers at 400.-)	1'200	0	1'200	0	0	0	0	0	0
	Communication (8 days at 25.-)	200	0	200	0	0	0	0	0	0
	Media engagement (1x)	500	500	0	0	0	0	0	0	0
	Stationary	800	800	0	0	0	0	0	0	0
	Flyers and Awareness Material	2'000	0	2'000	1'000	500	500	0	0	0
	Simple Bins for Collection in Markets	2'500	0	2'500	0	0	0	0	0	0
	Marketing, Samples, Presentations, ...	6'000	0	6'000	2'500	1'000	1'500	1'500	1'500	0
7	Recruitment / Training Franchising Partner	0	0	0	12'500	0	12'500	12'500	4'000	8'500
	Situation Analysis, Conceptualization	0	0	0	3'000	0	3'000	3'000	0	3'000
	Information, Recruitment, Visiting	0	0	0	1'500	0	1'500	1'500	1'500	0
	Training of Franchising Partner	0	0	0	5'000	0	5'000	5'000	2'500	2'500
	Follow up, Monitoring, Evaluation	0	0	0	3'000	0	3'000	3'000	0	3'000
8	Management and Administration	26'078	7'660	18'418	25'440	12'960	12'480	25'940	23'070	2'870
	Rent for Office Land Space	540	540	0	540	540	0	540	540	0
	Business Taxes to Government	1'800	1'800	0	1'800	1'800	0	1'800	1'800	0
	Health and Safety Materials	852	852	0	852	852	0	852	852	0
	Detergent for Cleaning	300	300	0	300	300	0	300	300	0
	Coordination & Staff (100.-/mt)	1'200	0	1'200	1'200	400	800	1'200	1'200	0
	Sensitization & Promotion Manager (90.-/mt)	1'080	0	1'080	1'080	360	720	1'080	1'080	0
	Processing & Production Manager (90.-/mt)	1'080	0	1'080	1'080	360	720	1'080	1'080	0
	Accountant/Office Manager (100.-/mt)	1'200	0	1'200	1'200	400	800	1'200	1'200	0
	Driver (90.-/mt)	1'080	0	1'080	1'080	360	720	1'080	1'080	0
	Security (100.-/mt)	1'200	0	1'200	1'200	400	800	1'200	1'200	0
	Field Supervisor (90.-/mt)	1'080	0	1'080	1'080	360	720	1'080	1'080	0
	Recycling Technician (80.-/mt)	960	0	960	960	320	640	960	960	0
	Additional Help of 6 Staff (60-90.-/mt)	5'640	0	5'640	5'640	1'880	3'760	5'640	5'640	0
	Feeding for Staffs (300.-/mt)	3'600	2'000	1'600	3'600	2'000	1'600	3'600	3'600	0
	Office material, Internet, Miscellaneous	4'466	2'168	2'298	3'828	2'628	1'200	4'328	1'458	2'870
	Subtotal local direct Projectcosts in U\$D	112'000	12'000	100'000	90'500	22'500	68'000	105'000	78'000	27'000
	<i>Distribution in % of local vs external Contribution</i>	100	10	90	100	25	75	100	75	25
9	Project Control (Follow up) / Project Visit (portion)	4'500	0	4'500	4'500	0	4'500	4'500	0	4'500
10	Bank Taxes and Transfer Fees	1'500	0	1'500	1'500	0	1'500	1'500	0	1'500
11	Reserve (ca. 5% of total project budget)	6'000	0	6'000	6'000	0	6'000	6'000	0	6'000
	Subtotal Project accompany costs in U\$D	12'000	0	12'000	12'000	0	12'000	12'000	0	12'000
12	Administration & Project Management (CH)	10'000	0	10'000	10'000	0	10'000	10'000	0	10'000
	Total Budget 2018 - 2020 (in USD)	134'000	12'000	122'000	112'500	22'500	90'000	127'000	78'000	49'000