PLEASE Project
Plastic Free Rivers and Seas for South Asia

South Asia Co-operative Environment Programme (SACEP) Plastic free Rivers and Seas for South Asia (P171269)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) OF RECYCLING FACILITY - COXS BAZAR

GRANTEE: URBAN DEVELOPMENT PROGRAMME, BRAC - BANGLADESH

Implemented by: SACEP
Supported by: UNOPS
Supported by: WORLD BANK GROUP

Environmental and Social Management Plan (ESMP)
Towards a Comprehensive and Human-centered Plastic Waste Management Approach in the Cox's Bazar and Affected Regions by Myanmar Refugees - BRAC

1. Subproject Information

Subproject Title:	Construction and operation of the Recycling Facility By BRACC
Estimated Cost:	Recycling Facility: USD 170,000
Start/Completion Date:	10 Feb-2024 to 31-May-2025

2. Site/Location Description

Recycling Facility

The recycling facility will be established in Bontola Village, under South Mithaichari Union, Ramu Thana, in Cox's Bazar District. This location features a diverse geographical landscape including residential zones located approximately 20 metres from the facility and most of the households are lower-income people, agricultural lands about 90 metres away, and proximity to natural water bodies. The site is approximately 800 metres from the main road, accessible via a 7 to 8-foot wide earthen and brick road, which connects the proposed plant site in the north to a 10-foot wide earthen and brick road on the south side, linking with the Pauroshova. Currently, the 7 to 8-foot road is the primary access route to the proposed plant area. The selected site is adjacent to a residential area; a few parts of the residential area are situated over the hilly terrain about 12 meters from the facility and the height of the terrain is about 3 meters. The area has a variety of plant species typical of both residential and agricultural settings, such as mango, jackfruit, banana, and coconut trees, along with mahogany, teak, and rain trees. Agricultural production includes rice and vegetables, with betel leaf being a prominent crop in the vicinity. Topographically, the site includes flat agricultural fields, slightly elevated residential areas, and gently sloping zones leading to natural water bodies. The proposed plant location is on flat, low-lying land. The soil primarily comprises sand with varying levels of silt and clay, which differ significantly across the area.

Currently, the site has a compost plant, with other parts of the compound established under the Bangladesh Climate Change Trust by the Department of Environment (DoE). The composting plant collects waste from 15 different hotels in Cox's Bazar. After segregating the waste, they retain what is needed for composting and send the rest to the landfill. The composting plant only segregates biodegradable and non-biodegradable waste. The biodegradable waste is used for composting and non-biodegradable remains in landfills. There is no existing 3-phase line and subs station inside the facility. The nearest transmission line is located within 10 metres, allowing for a straightforward connection to the 3-phase line and the substation from this line. The compost plant currently has an operational 3-compartment water treatment system. A natural canal (small water channel) is 22 metres from the site. Although the canal is typically dry, it connects to the surrounding area and a culvert is 20 metres from the site.

Climate-wise, Bontola Village experiences mild winters with temperatures typically around 15°C (59°F) and hot summers where temperatures can rise to 34°C (93°F). It receives significant rainfall, especially during the monsoon season, with annual averages ranging from 3,500 to 4,000 mm (137 to 157 inches), and maintains

high humidity levels often exceeding 70%, particularly during the monsoon months. Rainwater from the site follows the route of the natural canal (khal) (located 9 metres from the site) by a drainage system.

Google PIN of the location: https://maps.app.goo.gl/jCwaz3bWU1GR2Dr78

Latitude and Longitude: 21°24'11.2"N 92°02'43.6"E

Google Earth Image:

Ecological and Environmental Context: The site is 5 Km from the Pagli Chora River, which plays a crucial role in the local hydrology. The area is part of a region with a monsoon climate, experiencing significant seasonal rainfall which impacts local agriculture and biodiversity. A small natural lake around 9 metres away from the proposed facility. which gets used by the local community for irrigation purposes and to farm betel leaf. The pond is created during the regular monsoon period which might necessitate some consideration of water management and pollution control measures.

Socio-Economic & Cultural Relevance: The community is dynamic, with agriculture and local trade forming the backbone of its socioeconomic structure. Introducing a recycling facility offers the potential to stimulate economic growth by generating employment opportunities and promoting local development. However, to ensure a positive transition, engaging with the community will be crucial to manage expectations, address concerns, and foster trust. Environmental considerations are also vital, as a small natural pond near the facility plays an important role in the community's livelihood, providing water for irrigation and supporting betel leaf cultivation. Safeguarding this resource will be essential to maintain environmental balance and community well-being. The area does not feature significant historical or archaeological sites but its cultural identity is deeply rooted in local customs and practices. For the project to succeed, it must align with these cultural values, ensuring that development is both respectful and inclusive. Through thoughtful planning and meaningful engagement, the recycling facility can become an asset, driving economic progress and also strengthening the community's connection to its environment and traditions.

3. Subproject Description and Activities

Recycling Facility

The project aims to establish a **recycling facility focusing** on transforming local plastic waste management practices. This facility will provide technical and financial support to local recyclers, enhance workplace safety standards, and incorporate community-based initiatives to ensure sustainable operations.

Core Activities:

Construction Phase:

- **Land Preparation:** Clearing the site, removing topsoil and levelling the land to an average depth of 200 mm.
- **Facility Construction:** Building a 5280 sq feet recycling facility to accommodate the recycling plant and an Effluent Treatment Plant (ETP) with a capacity of 1-2 cubic metres per day.
- **Installation Works:** Performing electric wiring, plumbing, sanitary fittings, finishing, painting, and colouring.
- **Landscaping:** Gardening and tree planting to promote environmental sustainability following the Forest Department's guidelines.
- **Machinery Installation:** Transporting and installing necessary machinery for the facility.

Operation Phase:

- **Storage Area:** Constructing different storage areas for raw materials and finished products inside the shed. Raw plastic received from scrap dealers will be stored before processing, and finished products will be stored before distribution.
- **Raw Material Processing Systems:** Creating specialised areas for sorting, cleaning, and preparing plastics for recycling. This includes un-baling plastics, and shredding them into smaller flakes to increase surface area.
- **Washing Wastewater Treatment Operations(Effluent Treatment Plant):** Smaller flakes will come to the washing zone and will be separated using a sieve. After that, the wastewater will go into the ETP. Managing wastewater through processes including sedimentation, oil and grease removal, aeration and FBBR (Fluidized Bed Biofilm Reactor), clarifiers, sand filters, and sludge tanks to meet EIA-specified discharge limits.
- **Palletisation and Extrusion Processes:** Palletization involves melting dried plastic flakes and forming them into pellets, which serve as raw material for producing new plastic products. Extrusion processes and heat pressing are then employed to shape these pellets into specific products e.g.: lumber, sheets & pallets.
- **Safety Training and Health Audits:** Provide comprehensive training for all employees on workplace safety, emergency response procedures, and the proper handling of recycling machinery. Additionally, conduct regular health and safety audits to ensure compliance with safety standards and identify areas for improvement.

The water requirement for the facility would be approx. 1,000 to 2,000 litres of groundwater per day as its primary water source and the electricity requirement is approx. 220 kwh/day. The expected processing capacity of the facility is approx. 200 kg of plastic per day. The cost per kg waste processing is 15 BDT. Solid waste generation from the recycling process is expected to be around 10 kg per day, primarily contaminants and unusable materials. Additionally, wastewater output ranges between 1,500 to 2,000 litres daily, representing 60-70% of the water used.

Work Force:

Construction Phase:

An estimated 20 to 30 workers will be required during the construction phase of the recycling facility. This workforce includes general labour, skilled workers, machine operators, supervisors of the construction work etc., and each plays a crucial role in ensuring the project's success. All labourers and workers will be hired by the construction firm, with BRAC monitoring the construction work.

- **General Labour:** General Labour will play a foundational role in the construction process. They will perform the physical tasks required to prepare, build and finalise the site. During the site preparation, labourers will clear debris, level the ground and support skilled workers in setting up the facility. The construction work will require 15-20 labourers at peal activity and ensure that all manual work is completed efficiently.
- **Mason:** Masons are critical to constructing the main shed, wash facilities and other structural components. Precision in their work ensures the structural integrity and durability of the facility. 3 to 4 experienced masons will be needed to handle the work effectively. They will coordinate closely with the supervisor to ensure that the construction adheres to the project's design specifications and safety standards.
- **Welders and Steelworkers:** Welders and steelworkers will manage the metalwork required for the facility which will be focused on reinforcement and architectural elements. Given the technical nature of this work, there will be required 2-3 skilled welders and steelworkers for the construction work. They will hold a critical role in both the functionality and aesthetics of the facility.
- **Plumbers:** Plumbers will be responsible for installing water supply lines, drainage systems and sanitary fixtures in the facility. 2 to 3 Skilled plumbers will be required to complete the work. Their expertise will ensure that the facility meets hygiene standards and functions effectively.
- **Carpenters:** Carpenters will handle the framework tasks, this is essential during the structural and finishing phase They will build shuttering and frameworks for concrete pouring formed accurately. The construction work will require 2-3 slicked carpenters to complete the task.
- **Electricians:** Electricians will handle all electrical installations, including wiring, lighting and power outlets. They will ensure that the facility's electrical systems are safe, and efficient and comply with regulatory standards. This construction phase will require 2-3 skilled electricians. They will be integral to making the facility fully functional for its intended use.
- **Machine Operators:** Machine operators will be required during the early stage of the construction to handle equipment like compactors for the site cleaning and levelling; they will ensure that the machinery is operated safely and maintained in good working condition. One machine operator will be sufficient for this task.
- **Security Guards:** 2-4 security guards will be employed to maintain the security of the construction site, materials, materials, personnel, and assets during the construction phase. They work in alternating shifts to provide 24-hour security coverage, conduct routine checks, and monitor access to the facility to prevent unauthorized entry and ensure the safety of all employees.
- **Supervisory Staff** Supervisory staff oversee all phases of the construction work. This team will include a construction supervisor, a site engineer and a structural engineer. They will involve managing workers, conducting quality control checks, and resolving any issues in the facility premises during the construction work. 3 to 4 supervisory staff will be needed to ensure the project is completed efficiently & safely and complies with the national rules and regulations.

Operational Phase:

The factory will employ a total of 10 workers to ensure efficient and well-structured operations. The workforce is organized into specific roles with clearly defined responsibilities to maintain productivity and operational excellence.

- **Technical Manager/Supervisor (1 person):** The Technical Manager/Supervisor will be responsible for overseeing the entire technical and operational activities of the factory. This role includes supervising the machine operators, ensuring all machinery is functioning optimally, and maintaining adherence to quality standards and production targets. The supervisor also plays a key role in implementing operational efficiencies and troubleshooting technical issues.
- **Administrative and Accounting Personnel (1 person):** This individual will handle all administrative tasks, including documentation, employee records, and internal communication. They manage financial operations such as accounting, payroll, budgeting, and procurement. Ensuring compliance with statutory requirements and maintaining financial transparency are also critical aspects of this role.
- **Security Guards (2 persons):** Two security guards will be employed to maintain the security of the factory premises, personnel, and assets. They work in alternating shifts to provide 24-hour security coverage, conduct routine checks, and monitor access to the facility to prevent unauthorized entry and ensure the safety of all employees.
- **Cleaner (1 person):** The cleaner will be responsible for maintaining hygiene and cleanliness across all areas of the factory, including production zones, administrative offices, and common spaces. This role is essential in ensuring a safe and healthy working environment, as well as assisting in waste disposal to keep the premises orderly and operational.
- **General Workers (5 persons):** A team of five general workers operates machinery and manages production lines to ensure smooth daily operations. They handle materials, raw inputs, and final products as per the production workflow. Additionally, they assist in other general tasks such as loading and unloading materials and maintaining work areas.

An agreement has been formalized between Cox's Bazar Municipality and BRAC. The land was approved for use as the factory premises at the allocated site. As the land is owned by Cox's Bazar Municipality, this arrangement ensures proper authorization and alignment with local governance. This institutional collaboration underscores the commitment to compliance with local regulations and facilitates the smooth establishment and operation of the factory.

4. ESMP Matrix: Risk and Impacts, Mitigation, Monitoring

4.1 Construction Phase

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
Inadequate management of hydrological flow and stormwater could lead to flooding, waterlogging, soil erosion, or runoff contamination, adversely impacting the site, nearby communities, and ecosystems	I. Conduct a comprehensive hydrological analysis to understand the land's flow patterns and drainage characteristics. II. Preserve and integrate the natural stormwater flow into the facility design based on the findings of the hydrological study, ensuring minimal disruption to existing water flow. III. Implement effective drainage systems to safely channel upstream water flow into the canal, and elevate the project site using soil or sand to mitigate the risks of flooding and waterlogging IV. Proper embankment to avoid soil erosion.	Design of construction and throughout the construction	Construction Supervisor	Hydrological analysis report Availability of proper drainage system Number of flooding incidents reported and the area affected (in square meters)	Monthly site visit/ Regular Monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	2000

[1] **Overall Monitoring and supervision of the implementation of ESMP will be done by the PIU and UNOPs Program team**

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
Accumulated waste piles from the adjacent bio-compost facility may weaken soil stability, increasing the risk of land subsidence or erosion, which could lead to structural damage and safety hazards.	I. Removal of waste piles from the land. II. Filling the land with soil	Throughout the construction	Construction Supervisor	Quantity of waste removed The volume of soil filled	Monthly site visit and regular monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	2000
The construction site currently has a small amount of grass that must be cleared to start construction. Risk of soil erosion and sedimentation	I. Plant strips with native plants along the edge of the land will be preserved. II. The building structure and landscape will be designed to prevent soil erosion and sedimentation. III. Tree planting, gardening, and landscaping will be carried out	Before construction begins	Construction Supervisor	Number of trees planted along with their survival rate Accumulation of sediments in drainage	Weekly Observation, photo evidence	Environmental expert, UNOPS Bangladesh country team BRACC - Programme Manager	100
Land pollution due to the discharge of wastewater generated during the Construction work.	I. Construction wastewater will be directed to a pit	Construction site during concrete and cement work,	Construction Supervisor	Availability of the pit Pit lining integrity	Monthly site visit/ Photo evidence	Environmental expert, UNOPS Bangladesh country team	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
		Weekly			Regular Monitoring	BRAC - Programme Manager	
Public disturbances from noise and vibration during land clearing, site preparation, excavation, earthworks, and the fabrication and installation of roofs, windows, ceilings, and machinery	I. All activities will be conducted during daytime hours to minimize disturbance to neighbouring communities. II. Noise levels at the site boundary will be kept below 55 dB(A). III. A public complaint box will be available to promptly address community concerns. IV. Equipment with lower noise levels will be prioritised, with a preference for using D4-type machines to reduce noise. Noisy machinery will only operate during designated daytime hours.	During Land clearing and Earthwork Earth filling and fabrication & compaction Bi-weekly at the construction site.	Construction Supervisor	Noise monitoring records Availability of complaint box. Number of complaints filed and actions taken in response to complaints Availability of equipment with lower noise level	Monthly site visit/ Photo evidence Regular Monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
Soil and water contamination caused by solid waste	I. Solid waste will be segregated into hazardous, non-hazardous, and reusable categories.	Bi-weekly in the construction site during	Construction Supervisor	Evidence of segregated waste	Daily process inspections	Environmental expert, UNOPS Bangladesh	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
accumulation during construction Public nuisance resulting from emissions produced by open burning.	II. During the construction phase, there will not be any hazardous waste except for paint. If disposal of this material is required, it will be managed by Bangladesh standard practices to ensure environmental compliance and safety. III. Non-recyclable construction waste will be managed by local authorities as per environmental regulations. IV. Open burning will be strictly prohibited.	construction work		Amount of non-recyclable waste managed by local authority	Monthly site visit	country team BRAC - Programme Manager	
Air pollution from dust and exhaust emissions during land preparation, operation of vehicles and equipment, and the loading and unloading of construction materials, excavation, and earthworks. Dust from multiple sources, including heavy	I. Loaded materials in vehicles will be covered with tarpaulins during transportation to prevent dust dispersion. II. Dust in the surrounding areas will be controlled through water sprinkling as needed, especially during the loading, unloading, and transportation of construction materials.	Weekly at the construction site	Construction Supervisor	Air quality indices (PM10, PM2.5, NOx) Records of daily sprinkling with water 100% of workers wearing appropriate PPE	Monthly site visits and photo evidence	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
machinery installation and use in construction, significantly contributes to airborne particulates and emissions	III. Waste workers will be provided with appropriate personal protective equipment (PPE), including N95 masks, to ensure their health and safety. IV. All machinery will be regularly maintained to ensure optimal performance and minimize emissions. V. A complaint box will be installed at the site to facilitate public reporting of concerns related to air quality and other issues. VI. Vehicles transporting materials will adhere to traffic rules and regulations, focusing on carrying the minimum allowable weight and following safety norms			Maintenance records of machinery Availability of complaint box Complaints about traffic violations filed			
Increased traffic, road blockages, and potential accidents resulting from	I. Implement road safety measures for heavy traffic, minimize traffic disruptions, and keep the public informed about the movement of	Construction site; Weekly	Construction Contractor,	Regular site and road inspections, Traffic counts, observation	Monitor traffic movement, and inform the public regularly.	Environmental expert, UNOPS Bangladesh country team	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
changes in traffic patterns	construction vehicles if required.				Daily	BRAC - Programme Manager	
Occupational Health and Safety (OHS) Risks for workers during construction, electrical wiring, and machinery setup.	I. Equip all workers with necessary personal protective equipment (PPE), including helmets, gloves, safety boots, goggles, and high-visibility vests to reduce the risk of physical injuries. II. Implement strict safety protocols for all electrical wiring activities. III. Ensure accessible first aid kits are available on-site. IV. Provide proper sanitary facilities and access to safe drinking water. V. Offer adequate, well-ventilated workspaces, clean eating areas, and separate sleeping areas (if necessary) for workers' comfort and well-being.	Construction site; Weekly	Construction Supervisor	% of workers wearing appropriate PPE during construction activities Availability of a First Aid box and an Accident Register Daily checks of water accumulation areas and cleaning Daily checks of hygiene and cleanliness in eating areas, ventilation systems, and sleeping spaces	Monthly health reports, records	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
Lack of understanding of EHS risks and impacts and of mitigation measures leads to accidents and health impacts	I. Assess the capacity of the construction company on OHS II. Train workers on OHS through toolbox talks	On-site, throughout the construction activity	Contractor	Percentage of construction companies whose capacity has been assessed. The number of toolbox talks conducted.	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
Physical and psychosocial risks associated with the health and safety of the workers during construction.	I. Workers will receive comprehensive training on PPE use and maintenance, along with safe work practices. II. Ensure access to clean sanitary facilities and safe drinking water. III. An accident register will document all incidents. IV. The site will feature safety kits, emergency services, first aid, and fire extinguishers. V. The work environment will include adequate ventilation, clean dining areas, and	Construction site; Weekly	Construction Supervisor	Number of training sessions for workers Availability of clean sanitary facilities Availability of safety kits Availability of ventilation Availability of OHS Plan Availability of fire extinguisher	Site inspections, incident reports, Regular monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
	separate accommodations if needed. VI. Occupational Health and Safety Plan, first aid and protective equipment, training, safety measures, regular VII. Available fire extinguishers and conduct r fire safety drills VIII. Train workers on fire prevention and emergency response procedures. IX. Establish and communicate evacuation routes.						
The influx of 20-30 construction workers may lead to the spread of communicable diseases	I. Worker grievance meetings will be conducted alongside awareness sessions on communicable diseases and gender-based violence.	Construction site; regularly	Construction Supervisor	Awareness sessions and meeting records.	Regular monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
Risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) between Project workers; and between Project workers and local community members	I. Appoint a PSEA Focal Point at the site. II. Provide awareness training on recognizing, and preventing SEA/SH for a) Project workers, and b) affected communities III. Provide training on the GRM, including for SEA/SH-related grievances to a) Project workers, and b) affected communities IV. Request all Project workers to sign a Code of Conduct (CoC) including instructions for SEA/SH prevention V. Provide specific SEA/SH response mechanism as part of the Project GRM, including referral to SEA/SH	Training and awareness will be conducted prior to commencement of work Implementation of Focal Points and singing of CoC at site during construction period.	Construction Supervisor Gender and PSEA focal point of BRAC PLEASE project	Number of training sessions provided to workers Number of awareness sessions provided to communities Number of training sessions on GRM provided to communities Percentage of workers that have signed the CoC	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
Non compliance with the local regulatory requirement and workers dissatisfaction	I. Construction workers will be trained and made aware of the (GRM). Workers will have the option to raise complaints	On-site, throughout activities	Contractor and HR Officer	Number of workers' grievances filed Availability and	Monthly Monitoring	Environmental expert, UNOPS Bangladesh country team	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
due to extensive work requirements	anonymously via phone call or complaint box II. Implement LMP in line with PLEASE Project LMP and Bangladesh national labour laws. III. Wages will be paid under the national Labor Management Procedures (LMP).			implementation of code of conduct Payrolls Site visit and reviewing received complaints		BRAC - Programme Manager	
Risk of child labour	I. Comply with the minimum age requirements of the Project (in accordance with national laws and ESS2) and document the age of workers upon hiring. II. Verify the age of workers in communities where required. III. Conduct a background check of contractors during the bidding process, including a record of health and safety violations, fines, and public	At the site, throughout construction	Contractor and HR Officer	Number of workers' grievances filed Number of track record searches conducted	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
	documents related to workers' rights violations, GBV/SEA/SH issues, etc.						
Risk of forced labor	I. Provide workers' GRM and access to Project GRM for reporting the complaints II. Raise awareness in communities	Throughout construction	Contractor and HR Officer	Number of grievances filed in workers' GRM	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
Hazardous chemicals from construction materials like paints	I. Designated areas for chemical storage II. Collection of contaminated containers by the service provider III. Provision of suitable PPE for handling and disposal of waste	At the site, during painting, colouring, and the application of anti-termite and pest control. Bi-weekly.	Construction Supervisor	Availability of designated area for storage Number of workers wearing appropriate PPE	Site visits and daily process observations, photo evidence Monthly visit	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
Lack of stakeholder engagement	I. Establish a site-specific stakeholder map that includes vulnerable groups, project-affected parties, and	Before the commencement of works	Construction Supervisor	Availability of stakeholder mapping	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
	other interested parties (based on the Project Stakeholder Engagement Plan - SEP). II. Define information dissemination channels for the identified stakeholders and provide sub-project-related information. III. Define consultation channels for the mapped stakeholders and conduct consultations with all stakeholders, including on environmental and social risks and mitigation measures.		Manager -Partnership and Collaboration	Number of project information dissemination events Number of consultations with identified stakeholders Number of consultations with identified members of vulnerable groups		BRAC - Programme Manager	
Lack of awareness of Grievance Redress Mechanism (GRM)	I. Create awareness of the Project GRM and its reporting channels, implemented by the PIU II. Provide an additional reporting channel with	Sub-Project Location/Through out the operational period.	Construction Supervisor Manager -Partnership and Collaboration	Number of awareness sessions held	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team, BRAC -	100

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring & Mitigation Cost (USD)
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location & Frequency	Responsibility[1]	
	complaint boxes installed at the sub-project site. III. Ensure that the contact details of the SEA/SH Focal Point are placed on notice boards in the project location IV. Ensure that complaints received through the complaint boxes at the site are handled appropriately or transferred to the Project GRM V. Ensure that complaints received through additional complaint boxes or the SEA/SH Focal Point in relation to SEA/SH are handled with strict confidentiality and in a survivor-centred manner. VI. Establish a map of local SEA/SH service providers and ensure every case reported is provided with referrals, if the survivor wishes that.	SEA/SH referral service mapping must be conducted before the commencement of work. Linkages to Project GRM were established before the works.		Number of complaint boxes installed Number of SEA/SH Focal Points appointed Number of SEA/SH cases reported that receive referral services Map of local SEA/SH service providers available		Programme Manager	

4.2 Operational Phase

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
Water and soil pollution may occur due to the wastewater generated during washing processes.	I. The facility will implement sediment control measures such as filters and grease traps. II. Clear and structured runoff management systems will be in place to guide treated water through an Effluent Treatment Plant (ETP) and the facility will reuse approximately 70% of the water from ETP.	Recycling site; Daily	Factory Manager	Water quality (pH, turbidity, contaminants), BOD, COD	Analytical reports of treated water every 3 months.	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	2000
Public nuisance due to the Noise and vibration generated during the machine operations of the facility and health implications	I. Ensure low noise emissions and modern equipment with advanced control systems as mandatory requirements during the bidding process. II. Install the crusher machine in an enclosed chamber with appropriate muffler systems	Facility site and surrounding; Continuous monitoring and quarterly reviews	Factory Manager	Reports, public complains Noise level at the factory and the boundary Availability of enclosure for crusher machine	Examination of existing Documents / reports/ complaints	Environmental expert, UNOPS Bangladesh country team BRAC-Programme Manager	2000

[2] **Overall Monitoring and supervision of the implementation of ESMP will be done by the PIU and UNOPs Program team**

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
	to minimize vibrations and reduce noise levels. III. During daytime hours, ensure noise levels at the boundary remain below 55 dB(A). IV. Follow regular maintenance schedules for equipment to maintain efficiency and minimize noise and emissions over time. V. Use filters and effective ventilation systems to control the release of volatile organic compounds (VOCs) and particulate matter (PM). VI. Provide necessary personal protective equipment (PPE) for workers to safeguard their health during operations.			Record of maintenance of equipment Availability of an effective ventilation system of workers wearing appropriate PPE	Noise Measurement Reports		
Microplastics can be generated during the process of sanding and shredding	I. The sanding and shredder machines should be inside an enclosed space within the facility. II. Use a sieve of less than 7mm to separate the normal	Recycling site; Daily, throughout the operation	Factory Manager	Enclosed facility available for shredder machines Usage of sieve	Daily monitoring	Environmental expert, UNOPS Bangladesh country team BRAC-Programme	1000

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
	shredded plastics and microplastics. III. The collected microplastics should be added back to the extrusion machine			Evidence that collected microplastics are returned to the machine		Manager	
Improper waste management at the site	I. Employ skilled labour for waste segregation. II. Redirect off-cuts to recycling processes III. Dispose of non-recyclable waste through local authorities; prohibit open burning. IV. Maintain disposal records for monitoring.	Daily, throughout the operation	Factory Manager	Evidence of waste segregation Amount of waste processed and disposal records	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100
GHG Emissions and Air pollution	I. Use energy-efficient machinery and processes. II. Regular maintenance of machinery to reduce inefficiencies. III. Conduct awareness and training programs to encourage sustainable practices among workers and the community.	Recycling site, throughout operation	Factory Manager	Machinery maintenance report Number of training programmes Emission monitoring record	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
	IV. Monitor emissions and adopt corrective measures as needed.						
Lack of awareness on the Grievance Redress Mechanism (GRM)	I. Create awareness of the Project GRM and its reporting channels, implemented by the PIU II. Provide an additional reporting channel through complaint boxes installed at the sub-project site. III. Ensure that the contact details of the SEA/SH Focal Point are placed on notice boards in the project location IV. Ensure that complaints received through the complaint boxes at the site are handled appropriately or transferred to the Project GRM.	Recycling site, throughout operation	Factory Manager	Number of awareness sessions held Number of complaint boxes installed Number of SEA/SH Focal Points appointed Number of SEA/SH cases reported that receive referral services Map of local SEA/SH service providers available	Monthly Monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	100

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
Workplace safety and environmental management protocols are not being adequately followed	I. Ensure all capacity-building materials adhere to the highest standards and best practices by having them reviewed by external consultants. II. Conduct regular sensitization and refresher training on the importance of using protective equipment and proper waste-handling techniques.	Recycling site; Ongoing; Monthly	Operations and Maintenance team of the factory	Monthly safety audits and training session reports	Regular safety audits and training sessions.	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	200
Physical and psychosocial risks to worker health and safety during the operational phase	I. Workers will receive comprehensive training on PPE use and maintenance, along with safe work practices. II. Ensure access to clean & inclusive sanitary facilities and safe drinking water. An accident register will document all incidents. III. The site will feature safety kits, emergency services, first aid, and fire extinguishers. The work environment will include adequate ventilation and clean dining areas. IV. Fire safety management plan, which involves regular fire	Recycling site; monthly	Factory Manager	Number of training sessions Number of workers wearing appropriate PPE Availability of first aid boxes and accident registries.	Monthly monitoring and documents of medical assistance needed.	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	300

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
	safety training, the installation of fire extinguishers at strategic points, and routine maintenance of fire safety equipment V. Conduct periodic fire drills to prepare workers for emergencies VI. Establish and communicate evacuation routes.						
Risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) between Project workers; and between Project workers and local community members	I. Appoint a PSEA Focal Point at the site. II. Provide awareness training on recognizing, and preventing SEA/SH for a) Project workers, and b) affected communities III. Provide training on the GRM, including for SEA/SH-related grievances to a) Project workers, and b) affected communities IV. Request all Project workers to sign a Code of Conduct (CoC) including instructions for SEA/SH prevention	Training and awareness will be conducted throughout the operational period at the recycling site Implementation of Focal Points and singing of CoC at the site during the construction period.	Factory Manager Gender of PSEA focal point of BRAC PLEASE project	Number of training sessions provided to workers Number of awareness sessions provided to communities Number of training sessions on GRM provided to communities	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	It is a practical measure, No cost involved

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
	V. Provide specific SEA/SH response mechanism as part of the Project GRM, including referral to SEA/SH services			Percentage of workers that have signed the CoC			
Non-compliance with the local regulatory requirements and workers' dissatisfaction due to extensive work requirements	I. Implement LMP in alignment with PLEASE project LMP II. Provide workers' GRM following BRAC safeguarding & BRAC Prevention of Workplace Bullying and Violence Policy & Procedure policy. III. Wages will be paid under the national Labor Management Procedures (LMP).	Recycling site; throughout operation	Factory Manager	Number of workers' grievances filed Payrolls	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	It is a practical measure with no cost involved
Risk of child labour at the facility	I. Comply with minimum age requirements of national laws and document the age of workers upon hiring. II. Verify the age of workers with communities where required.	At the recycling facility, daily	Factory Manager	Number of workers' grievances filed	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team, BRAC - Programme Manager	It is a practical measure, No cost involved

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring			Monitoring and Cost
		Location/Timing/ Frequency	Responsibility	Indicators to be monitored	Methodology, including Location and Frequency	Responsibility[2]	
Risk of forced labor	I. Provide a confidential and accessible Grievance redress mechanism (GRM) for workers to report issues II. Raise awareness in communities	At the recycling Facility, daily	Factory Manager	Number of workers' grievances filed	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team BRAC - Programme Manager	It is a practical measure, No cost involved
Gender discrimination in job opportunity and wage	I. Prepare non-discriminatory guidelines for the recruitment process and operations affecting all levels of workers. II. Ensure equal wages for male and female workers	At the recycling Facility, daily	Factory Manager	Availability of HR Policy Grievance Redress Mechanism	Monthly monitoring	Environmental expert, UNOPS Bangladesh country team, BRAC - Programme Manager	It is a practical measure, No cost involved

5. Capacity Development & Training

During Construction

- BRAC will hire a construction firm to construct the recycling facility, ensuring that the firm complies with workplace health and safety standards.
- The Terms of Reference (ToR) for hiring the consultant and agreement with the partner will include specific requirements for providing workplace health and safety training and safety gear to construction workers during the construction period.
- Training on Safeguards, First Aid, Emergency Preparedness, and Fire Drills.
- Training on Recognizing, Preventing, and Responding to Occupational Health and Safety (OHS), GRM, LMP, Sexual Exploitation and Abuse (SEA), and Gender-Based Violence.

During Construction

- Training on machinery operation and safety will be conducted as per the Standard Operating Procedure (SOP).
- Training on Installation and Maintenance of Machines
- Training on Safeguards, First Aid, Emergency Preparedness, and Fire Drills.
- Training on Recognizing, Preventing, and Responding to Occupational Health and Safety (OHS), GRM, LMP, Sexual Exploitation and Abuse (SEA), and Gender-Based Violence.

6. Implementation Schedule and Cost Estimates

Construction Phase 5700

Mitigation Measure	**Estimated Cost (USD)**	**Implementation Schedule**
Conduct a hydrological analysis to integrate natural stormwater flow, implement drainage systems to direct water to the canal, elevate the site to reduce flooding, and build embankments to prevent soil erosion.	2000	Throughout the construction period
The removal of waste piles from the land and filling the area with soil.	2000	Throughout the construction period
Use dust minimisation systems; enforce strict emissions controls on machinery during construction.	200	Throughout the Construction Period
Barriers need to be placed during the construction process to ensure that concrete, cement sand mixture, and admixture don't flow into the water body.	200	During the first week of the Construction Period
Community consultation, awareness sessions and Heath camp	500	Throughout the Construction Period including one health camp
Establish and maintain a GRM system to address stakeholder concerns during construction.	200	Throughout the Construction Period.
Ensure travel and logistical support for site visits and inspections.	200	Throughout the Construction Period.

Tree plantation, gardening and landscaping will be done within the site area after the building is constructed.	200	After 80% of completion of construction
Regular M&E to monitor	200	Throughout the Construction Period

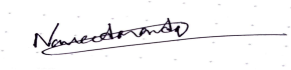
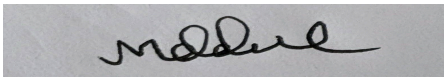
Operational Phase 5800		
Mitigation Measure	**Estimated Cost (USD)**	**Implementation Schedule**
Some of this waste will be extracted during the sorting process, the facility will implement sediment control measures like filters and grease traps and; create runoff management systems as per the recommendations from the IEE.	200	Throughout the operational period.
Modern equipment with advanced control system, Follow regular maintenance of equipment. filters, and effective ventilation to reduce the release of VOCs & PM.	2000	Before starting the operation of the factory
The sanding and shredder machines should be inside an enclosed space within the facility. Use a sieve of less than 7mm to separate the normal shredded plastics and microplastics. The collected microplastics should be added back to the extrusion machine	1000	During the operational period
Community consultation, and awareness sessions about the myth of recycling plastic.	200	Monthly during the operational period
Third-party reviews whether the plan has a proper air and water mitigation plan is being correctly followed or not.	2000	Quarterly during the operational period
Regular M&E to monitor adherence to IEE recommendations.	200	Monthly during the operational period
Training & capacity building (already added with the consultant cost we are only adding the food and venue cost here)	200	Before starting the operational work of the factory.

7. Attachments

1. Land Approval from Cox's Bazar Municipality
2. NOC from Mithaichuri Union Parishad
3. BRAC Environmental Screening Report
4. BRAC soil test report for Recycling Facility
5. BRAC Architectural Drawing
6. BRAC Structural design Recycling Facility

7. BRAC Recycling Facility BOQ
8. Site Clearance Certificate of from DoE
9. BRAC Recycling Facility GRM
10. BRAC Recycling Facility LMP
11. BRAC stakeholder consultation evidence
12. Environment and Social Screening Report

IV. Review & Approval

<table>
<tr><td colspan="2">Prepared By
Md Abu Asif Shamsuddin Naveed
 
Position: Deputy Manager, Plastic Recycling & Operation
Urban Development Programme, BRAC
Date: 29.11, 2024</td></tr>
<tr><td>Reviewed By: Md. Obidul Islam
 
Position: Project Manager, UNOPS- Bangladesh Country team
Date: 12/12/2024</td><td>Approved By:
  .....(Signature)
Position: Environment and Social Development Specialist. SACEP
Date 16/12/2024</td></tr>
</table>