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

GRANTEE: CLEAN BHUTAN - BHUTAN

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

Environmental and Social Management Plan (ESMP)
Clean Bhutan

1. Subproject Information

Subproject Title:	Circular Bhutan Innovations Project: Pioneering Sustainable Development with Recycled Plastics: Component 1. Polyester Wool Bhutan
Estimated Cost:	US $ 119,500.00
Start/Completion Date:	1st July 2024 – 31st March 2025

2. Site/Location Description

This sub-project focuses on the production of polyester wool (PW) from waste PET plastics as part of the PLEASE project interventions. The proposed polyester wool production facility will be integrated into the existing PET flake manufacturing unit located in Taba, within the Thimphu city area.

Under the PLEASE project, the existing PET flake production unit will be upgraded to facilitate polyester wool production while enhancing the installed capacity of the flake manufacturing system. Polyester wool can be used locally to make niche cushions and pillows by the local handicraft association, reducing imports and creating jobs, especially for local women and People With Disabilities (PWD). The facility has access to a stable 33/11 kV power supply, sourced from hydropower. As part of the project scope, security fencing will be installed around the facility to delineate the plant's boundaries and ensure operational security.

The facility is situated at an altitude of approximately 2,360 meters above sea level (masl), comparable to the southern zone of Thimphu Municipality, including Babesa. Thimphu Chu flows about 350 meters northwest of the site, while Nima Higher Secondary School is situated approximately 350 meters southeast.

The polyester wool production site of Clean Bhutan in Taba, Thimphu is situated in a mixed residential and industrial setting, with approximately 50 households in the surrounding area. The closest building is located about 80 meters away from the facility. As part of the assessment, a community survey was carried out to gather feedback from residents on any concerns related to the facility. While all respondents were aware of the presence of a waste recycling plant, they were unaware of the specific machinery used for polyester wool production. This indicates that noise emissions from the facility are minimal and have not caused any disturbances noticeable to the surrounding community. Additionally, no complaints have been recorded regarding industrial activities, suggesting that the operations are well-contained within regulatory noise limits.

The climatic conditions align with those of Dechencholing and Motithang, which are in proximity to Taba. Thimphu Dzongkhag experiences a distinct seasonal rainfall pattern, with dry months extending

from December to March, during which precipitation levels remain as low as 20 millimeters per month. The monsoon season, spanning from July to September, is characterized by significantly higher precipitation, reaching up to 220 millimeters per month. The annual average rainfall for the region is approximately 650 millimeters.

Land ownership

The facility is operated by Clean Bhutan under the registered entity "Druk Larzo" and was established in 2022 as a Public-Private Partnership (PPP) between the local government and a civil society organization (CSO). The land is owned by the Thimphu Thromde and provided as part of its waste management initiatives, through a lease agreement to Clean Bhutan for 30 years, starting from 2022.

Map to location - (The geographical coordinates for the location are 27.51714° North latitude and 89.64471° East longitude)

3. Sub-Project Description and Activities

This sub-project does not involve any construction activities, as it will be implemented within the existing PET flake production facility.

The key project activities include procuring the necessary machinery, operationalizing the PET-to-polyester wool process, and producing polyester wool. Additionally, the project features an educational component aimed at raising awareness among the local community and students about the circular economy and sustainable plastic waste management.

Main process associated with the production of PET flakes and polyester wool is described below,

Raw Material Collection

PET plastic waste will be sourced primarily from one or two bottling plants and the nearby Dechenphug Lhakhang monastic body. The mixed plastic waste will be transported to the recycling facility for further sorting and segregation based on plastic type:

- PET: Utilized in polyester wool production.
- HDPE, LDPE, and PP: Separated and sold to Recycling Hub operated by Bhutan Ecological Society.

1. PET Flake Production

- **Sorting**: PET bottles will be sorted according to resin classification. If necessary, bottles will be washed to remove contaminants such as dirt and debris. Labels and bottle caps will be removed and stored separately for resale to the Recycling Hub and Green Road.
- **Shredding**: The sorted PET bottles undergo two-stage shredding:

2. Polyester Wool Production

- Conversion: The PET flakes will be fed into the converter machine under controlled temperature conditions specified by the quality assurance unit. The polymer will be processed and blown into a cooling GI wall, where it solidifies into polyester wool.
- Packaging: The final polyester wool product will be collected and stored in a dry, secure area before distribution to retailers and end-users.

4. Risks & impact, mitigation, monitoring for the operation stage of the polyester wool production

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
Exposure to dust during machine transportation, loading and unloading activities in the PET collection process.	1. Providing required PPEs 2. Preparation of SOPs with the guidelines on safety. 3. Daily safety briefing to the workers 4. Conducting frequent medical check-ups for employees 5. Operations in a confined area / designated area.	During loading and unloading activities	Transport and HR Supervisor	Use of PPEs Availability of guidelines/ SOP records of medical check ups	Use of PPEs Availability of guidelines/ SOP records of medical check ups	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 200** (PPEs-100 Medical Check-ups – USD 100)
Scattering of waste during transportation can lead to pollution and create a public nuisance.	1. Using covered and enclosed transport vehicles 2. Ensure proper loading and securing of waste to avoid displacement 3. Train transport personnel	During transportation activities	Transport and HR Supervisor	Complaint recorded in GRM Training records	Monthly visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 400** (covered/enclosed vehicles-250 Training transport personnel -150)

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
Liquid waste generation may occur if the washing of raw materials is required, potentially leading to water and soil contamination if not properly managed.	1. Accepting only empty and clean containers to minimize the need for washing 2. Implement primary treatment methods before discharging wastewater into the environment 3. Maximize water reuse after treatment 4. Conduct regular water quality monitoring to ensure compliance with environmental standards before the discharge of wastewater.	During operational activities, when wastewater is generated Quarterly Water Testing	Production Supervisor	Records of water usage for the processing Water Quality Report for Discharge	Monthly visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 200** (Empty and clean containers to minimize washing needs -0 treatment methods for wastewater-0 Maximizing water reuse after treatment-0 water quality monitoring -200)

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
Exposure to vapors/fumes from melting PET flakes may pose inhalation and skin contact hazards.	1. Installation of a chimney to ensure proper ventilation and safe dispersion of emissions 2. Providing required PPE 3. Preparation of Guidelines on safety in SOPs 4. Daily safety briefing to the workers 5. Conducting frequent medical check-ups for employees	Throughout the project period during the wool production at the facility	Production Supervisor	Availability of a Chimney Use of PPEs Availability of guidelines/ SOP records of medical check-ups	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 250** Installation of a chimney for proper ventilation -100 Providing required PPE -50 Preparation of safety guidelines in SOPs-0 Daily safety briefings for workers -0 Frequent medical check-ups for

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							employe-100)
A slight increase in temperature within the unit during machine operation may lead to worker discomfort and a potential fire risk	1. Adequate ventilation will be provided, and fans will be used as necessary. 2. Providing required PPE. 3. Training on First aid and necessary First aid materials are readily available to ensure prompt response to any medical needs. 4. Monitoring the temperature levels within the unit 5. Training on combating fire and installation of appropriate fire extinguishers and Fire Hydrants. 6. Emergency Preparedness plan and Training will be delivered. 7. Providing Worker's GRM	Throughout the operations at the facility	Production Supervisor	Use of PPEs Temperature monitoring records Accident registry Availability of the First Aid box, training records Availability of training records and the Fire extinguishers within their validity period,	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPS Bhutan Country team	USD 2000 (Adequate ventilation and installation of fans-500 Providing required PPE -200 Training on First Aid and provision of First Aid materials-300 Monitoring temperature levels within the unit-0

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
				Emergency Preparedness plan and Training records Number of related grievances filed in workers' GRM			Training on fire safety and installation of fire extinguishers and hydrants-500 Emergency Preparedness Plan and Training-200 GRM-100)
Worker discomfort and health issues due to prolonged exposure to noise and vibrations of the machines	1. Implementing vibration control measures, including properly fixing machines onto foundations, tightening joints and holders, and setting up chamber enclosures with appropriate mufflers for crushers	During the machine installation and at the facility	Production Supervisor	Noise level inside the facility Use of PPEs Number of related grievances filed in	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 500** (vibration control measures (machine foundation, tightening joints etc)-250

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
	2. Providing required PPE, such as earplugs or earmuffs, to workers. 3. Maintaining noise levels at 75dB(A) during daytime 4. Provide the worker's GRM			workers' GRM			PPEs-100 Maintaining noise levels-0 GRM-100)
Potential breakdowns and failures of machinery, leading to operational disruptions and delays.	1. Routine equipment inspections and preventive maintenance. 2. Creating and implementing SOPs for machine operations 3. Ensuring only trained personnel operate equipment through regular training	Throughout the operations at the facility	Production Manager	Preventive maintenance record SOps and training records	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	**USD 500** (Routine equipment inspections /maintenance-250 SOPs for machine operations -0 Training of staff-250)
Soil and water pollution due to materials that cannot be processed by	1. Sending unused plastics, labels, caps, and other materials to recyclers like	Throughout the operations at the facility	Production Manager	Issue notes for materials	Monthly site visit Throughout the project period	E. Director - Clean Bhutan	USD 150

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
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the unit, and other waste generation during the operations process, affecting the aesthetics of the outside surroundings	BES (Bhutan Ecological Society)and Greenroad. 2. Disposing non-recyclable and organic waste through local authorities and ensuring cleanliness of the site. 3. Redirecting defective or rejected products to the recycling process.			Waste disposal records		Technical Expert-UNOPs Bhutan Country team	(Sending unused plastics, labels, caps, and other materials to recyclers-50 Disposing of non-recyclable and organic waste through local authorities -50 Redirecting defective or rejected products to the recycling

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
							process – 50
Lack of OHS measures at the worksite	1. Providing required PPE, Preparation of SOPs and Daily safety briefing to the workers 2. Conducting frequent medical check- ups for employees 3. Training on Safeguard 4. Accident reporting mechanism 5. Training on First aid and necessary First aid materials are readily available to ensure prompt response to any medical needs. 6. Training on combating fire and installation of appropriate fire extinguishers and a Fire Hydrant 7. Emergency Preparedness plan and necessary trainings 8. Providing sanitary facilities, providing separate washing facilities	Throughout the operations at the facility	Production Manager	Workers wearing PPE during operational activities and sign boards Training records Accident registry Availability of First Aid box and training records Availability of training records and the Fire extinguishers within	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	USD 300 (PPEs– USD 50 Medical checkups -100 Safety training -50 Sanitary facilities-50 Instruction boards and housekeeping -50)

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
	for male and female workers, and access to safe drinking water 9. Following good housekeeping and cleaning practice 10. Display Instruction boards			their validity period, Emergency Preparedness plan and training records Availability of adequate sanitary facilities and safe drinking water, House keeping and cleaning checklist			
Risks of Sexual exploitation and abuse (SEA) and sexual harassment (SH) among workers and between workers and community members at the facility	1. Establishment of PSEA policy. 2. Provide a workers' grievance mechanism (Workers' GRM), incorporating SEA/SH focal points for both genders and an effective referral mechanism.	Prior to the recruitment of the workforce at the site During the recruitment of the workforce	HR officer	Availability of workers' GRM and SEA/SH Focal Points Availability of the	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	USD 500 (Establishment of PSEA policy -150 GRM with SEA/SH

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	3. Provide an anonymous reporting and complaining system along with protection measures for individuals who report. 4. Provide training on recognizing, preventing, and responding to SEA/ and SH for workers and communities. 5. Prepare a Code of Conduct for workers at the facility that includes reference to SEA/SH. 6. Ensure workers at the facility sign a Code of Conduct (CoC)	Throughout the operation of the facility		reporting system Number of SEA/SH awareness sessions for a) workers, and b) surrounding communities Availability of CoC Percentage of workers that have signed the CoC			focal points-100 Reporting and protection system-0 Training SEA/SH-250 Preparing Code of Conduct-0
Potential for social issues related to labor influx	1. Worker grievance redress meetings and awareness of communicable diseases. 2. Awareness on gender-based violence.	Throughout operation of facility	Production Manager	Availability of meeting and training records	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan	USD 300 (Worker grievance redress meetings

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
	3. Priority will be given to recruiting workers from the local community.			Records on Gender Awareness Selection criteria for recruitment		Country team	and awareness-100 Awareness of gender-based violence-150 recruitment outreach-150)
Lack of compliance with labor laws	1. Provide workers' GRM. 2. Development and implementation of a code of conduct in line with national labor laws 3. Pay wages in accordance with national laws	Throughout operation of at the facility	Production Manager	Number of workers' grievances filed Availability and implementation of the code of conduct Payrolls	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	USD 100 (GRM training - 100 Compliance with national labor laws -0

Anticipated E&S risks & impact	Risk mitigation & management measures	Impact mitigation		Impact/mitigation monitoring			Mitigation & monitoring cost in USD
		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
							Ensuring wages are paid in accordance with national laws -0)
Risk of child labor and forced labor at the facility	1. Comply with minimum age requirements of national laws and document age of workers upon hiring. 2. Verify age of workers with communities where required. 3. Provide workers' GRM and access to Project GRM. 4. Raise awareness in communities.	During the recruitment process Throughout operation of facility	HR Officer	Number of workers' grievances filed	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	USD 100 (GRM training -100)
Limited support of the Government and other stakeholders	1. Identify Stakeholders and communities. 2. Conduct awareness programs/consultations as appropriate.	Before the implementation and throughout the project period	Communication Officer	Participation of stakeholders	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPs Bhutan Country team	USD 200 (awareness and consultation programs-200)

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		Location/ timing/ frequency	Responsibility	Parameter to be monitored	Methodology including location & frequency	Responsibility	
Lack of awareness on a Grievance Redress Mechanism	1. Create awareness of the Project GRM and its reporting channels, implemented by the PIU. 2. Provide an additional reporting channel through complaint boxes installed at the sub-project site. 3. Ensure that the contact details of the SEA/SH Focal Point are placed on notice boards in the project location. 4. Ensure that complaints received through the complaint boxes at the site are handled appropriately or transferred to the Project GRM.	Throughout the Project period	Communication Officer	Number of awareness sessions held Number of complaint boxes installed	Monthly site visit Throughout the project period	E. Director - Clean Bhutan Technical Expert-UNOPS Bhutan Country team	USD 200 (GRM Training-100 PSEA policy training-100)

5. Capacity Development & Training

To ensure effective operation and management, all recruits will undergo comprehensive training on environmental and social safeguards, and operational aspects including:

- Occupational Safety & Emergency Preparedness: Training on PPE usage, safeguards, first aid, emergency response, and fire drills.
- Risk Management & Workplace Harmony: Awareness on identifying and addressing occupational hazards, emergencies, social grievances, and workplace conflicts.
- Gender & Social Inclusion: Understanding gender-based violence, discrimination, and Protection from Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), and workers GRM.
- Technical & Operational Training: Hands-on training in machine operations, periodic updates on technological advancements, and adaptation to new equipment, facilities, and operational procedures.
- Process & Quality Control: Guidance on production workflows, quality assurance, housekeeping, and environmental and social protection, with a strong focus on waste management.
- Environmental & Social Assessment: Training on Initial Environmental and Social Assessment (IESA) and the development of Standard Operating Procedures (SOPs) for monitoring and response, ensuring sustainability and maintaining product quality.

In addition to the above training, associated communities will also receive training on:

- Gender & Social Inclusion, covering gender-based violence, discrimination, Protection from Sexual Exploitation and Abuse (PSEA), and community grievance redress mechanisms (GRM).
- The circular economy and sustainable plastic waste management, promote responsible waste practices and resource efficiency.

6. Implementation Schedule and Cost Estimates

Mitigation measures	**Timeline**	**Cost - USD**
PPEs and medical checkups	Sep 2024 to Feb 2025	800
Training and awareness	Sep 2024- March 2025	2350
Environmental protection measures (air/noise pollution control, water testing etc)	Nov 2024- March 2025	1450
Grievance Redress Mechanism (GRM), SEA/ SH and maintaining cleanliness, hygiene, proper ventilation, and other OHS requirements	Sep 2024 - March 2025	1300

Total Cost	5900

Annexures

- Environmental and Social screening report
- MOU between Thimphu Thromde and Clean Bhutan
- PSEA policy - Clean Bhutan
- Pictures of the surroundings of Clean Bhutan