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)

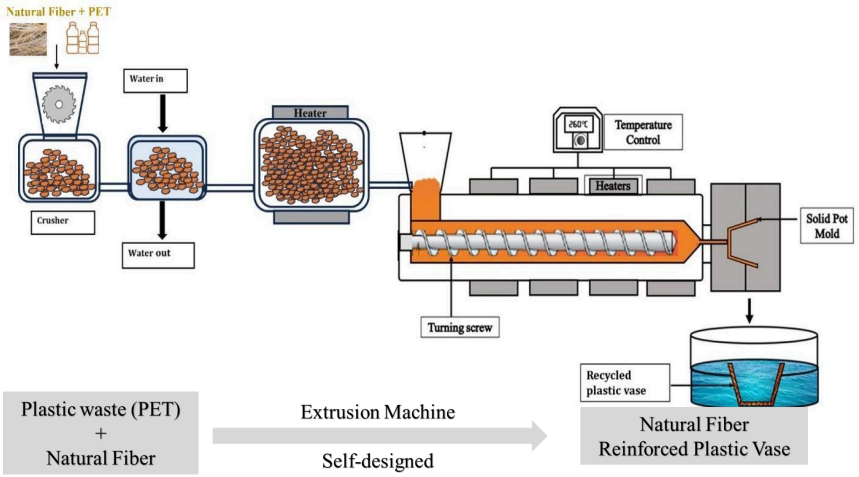
ENVIRONMENTAL AND SOCIAL SCREENING REPORT FOR THE PROJECT:WASTE TO WEALTH: PLASTIC FREE HIMALAYAN RIVERS TO ADVANCED FUNCTIONAL MATERIALS

GRANTEE: DEPARTMENT OF APPLIED SCIENCES & CHEMICAL ENGINEERING, TRIBHUVAN UNIVERSITY - NEPAL

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

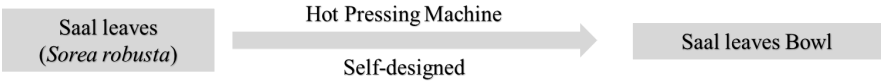
E&S Screening Form

1. Subproject Information

Subproject TiTLE	Project Name: Waste to Wealth: Plastic Free Himalayan Rivers to Advanced Functional Materials
Subproject Location	South Asia Co-operative Environment Programme
Regional Unit in Charge	Department of Applied Sciences & Chemical Engineering/ Shikhar Municipality, Doti.
Estimated cost	120,000 USD
Start/Completion Date of the subproject	September 2024 / April 2025
Brief Description of Subproject	The proposed project "Waste to Wealth: Plastic Free Himalayan Rivers to Advanced Functional Materials" will be implemented by the Department of Applied Sciences and Chemical Engineering of the Tribhuvan University. The key activities of this project includes: 1. **Producing durable plastic ropes reinforced with natural fibers using a self-built machine.** Manufacturing natural fiber reinforced plastic rope for public consumption using self-designed prototype machines, thereby reducing the reliance on imported materials. Incorporation of natural fiber in plastic ropes increases the mechanical strength due to the formation of hydrogen bonding and synergistic effect.  2. **Crafting flower pots from waste plastic using a prototype machine to promote eco-friendly gardening practices**.

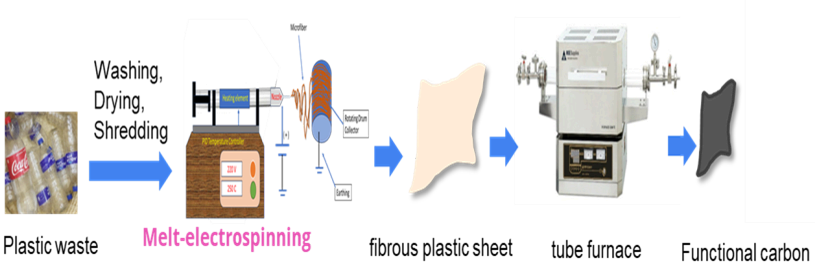
Manufacturing natural fiber reinforced plastic vases for public consumption using self-designed prototype machines, thereby reducing the reliance on imported materials. Incorporation of natural fiber in plastic vase increases the mechanical strength due to the formation of hydrogen bonding and synergistic effect.

3. **Replacing plastic utensils with plates and bowls made from locally abundant Saal leaves, offering a more sustainable alternative.**



4. **Developing functional carbon materials as a sustainable solution for eliminating plastic waste, with plans to utilize these materials in solar energy applications and environmental remediation**

Advancing the development of functional carbon materials as a sustainable solution to end plastic waste. A solvent-free electrospinning process will be utilized to fabricate high-value carbon materials from PET waste through carbonization. The carbonization process is carried out in an inert environment using nitrogen gas at 700-900 ℃ in the tube furnace for three hours with a ramping rate of 3 ℃ per minute.



Environmental and Social Screening Questionnaires

Questions	Answer		Remarks
	Yes	No	

ESS1			
1. Is the subproject likely to have significant adverse environmental impacts that are sensitive and unprecedented that trigger the 'Ineligible Activities' or other exclusion criteria?		NO	The subproject is unlikely to have significant adverse environmental impacts or trigger ineligible activities.
2. Does the subproject involve installation/new construction or significant expansion of ponds, solid waste management systems, shelters, roads (including access roads), community centers, schools, bridges, and jetties?		NO	No new construction or major infrastructure expansion is involved. All activities will be carried out within existing facilities.
3. Does the subproject involve renovation or rehabilitation or installation of any small-scale infrastructure, such as groundwater wells, latrines, showers/washing facilities, or shelters?		NO	The project does not require small-scale infrastructure renovation or installation.
4. Will construction or renovation work require new borrow pits or quarries to be opened?		NO	No new borrow pits or quarries are required.
5. Does the project lead to any risks and impacts on individuals or groups who, because of their particular circumstances, may be disadvantaged or vulnerable.[1]		NO	No, the project does not involve any activities that would impact vulnerable or disadvantaged groups.
6. Does the implementing partner have sufficient capacity to implement the E&S risk mitigation activities?	YES		Yes, the implementing partner is an institute within a government university and has sufficient capacity to implement environmental and social risk mitigation activities. They have expertise in this field, ensuring they possess the necessary knowledge and skills for effective mitigation.
ESS2			
7. Does the subproject involve use of goods and equipment where the production could have involved forced labor, child labor, or other harmful or exploitative forms of labor?		NO	The project does not involve goods or equipment linked to forced or exploitative labor. As a government university, the implementing partner will ensure compliance with Nepal's labor laws, including

[1] "Disadvantaged or vulnerable" refers to those individuals or groups who, by virtue of, for example, their age, gender, ethnicity, religion, physical, mental or other disability, social, civic or health status, sexual orientation, gender identity, economic disadvantages or ethnic peoples status, and/or dependence on unique natural resources, may be more likely to be adversely affected by the project impacts and/or more limited than others in their ability to take advantage of a project's benefits.

			regulations prohibiting forced and child labor. KarmarchryaNeyamFinal…
8. Does the subproject involve recruitment of workforce including direct, contracted, primary supply, and/or community workers?		NO	There is no labor requirement for the project. However the project staff will be recruited following a contract-based structure, where individuals or teams are engaged for a defined scope of work. As most of the members involved in this project are full-time faculty of the University, their engagement is governed by the TU Service Commission regulations.
9. Will the workers be exposed to workplace hazards that need to be managed in accordance with local regulations and EHSGs? Do workers need PPE relative to the potential risks and hazards associated with their work?	YES		There is a minor risk of exposure to such risk. However, relevant PPE will be provided where necessary to ensure worker safety.
10. Is there a risk that women may be underpaid compared to men when working on the project activities or a risk of other forms of discrimination?		NO	The project follows a strict policy of equal pay for equal work, ensuring that all individuals, regardless of gender, receive fair compensation. Additionally, the project upholds anti-discrimination policies, promoting an inclusive and equitable work environment. Regular monitoring and evaluation mechanisms are in place to prevent any form of gender-based discrimination. (TU Service rule book Attached in the annex)
11. Is there a risk of contractors or partners not complying with ESS2 and local labor regulations (including signing code of conduct)?		NO	Contractors and partners are required to comply with ESS2 and local labor regulations, including signing the code of conduct. Regular monitoring, audits, and contractual obligations ensure adherence. Any non-compliance risks are mitigated through strict enforcement, capacity-building

			initiatives, and corrective actions
12. Will the infrastructure activity require large numbers of workers from outside the local areas (more than 100)		NO	No such large influx of external workers is anticipated.
13. Will the activity require the establishment of a worker's camp?		NO	No worker camps are required.
14. Are the activities prone to hazards, and risks and could result in accidents and injuries during construction or operation?	Yes		Project activities only have minimal risks of workplace hazards associated with the research activities.
ESS3			
15. Is the project likely to generate solid or liquid waste that could adversely impact soils, vegetation, rivers, streams, groundwater, or nearby communities?		NO	The project will not generate waste that could adversely impact the environment or communities.
16. Do any of the installation/construction or operations involve the removal of asbestos or other hazardous materials?		NO	Such activities are not involved.
17. Are works likely to cause significant negative impacts to air and/or water quality?		NO	There are no such activities that could cause a significant impact on air and water quality.
18. Does the activity rely on existing infrastructure (such as discharge points) that is inadequate to prevent environmental impacts?		NO	Existing infrastructure is adequate to prevent environmental impacts.
19. Is there any potential to have an impact on soil or water bodies due to agro-chemicals (e.g., pesticides) used in farmlands due to the consequences of the subproject activities (e.g., development of irrigation system, agriculture-related activities, seed and fertilizer assistance, procurement of pesticides)?		NO	Such activities are not involved.
20. Is there a possibility that the infrastructure works will adversely affect the aesthetic attractiveness of the local landscape?		NO	The project does not negatively impact the aesthetic appeal of the area.
21. Is there a possibility that the new infrastructure will be a source of significant contamination and pollution?		NO	No, the project will not generate any significant contaminants or pollution. It primarily focuses on research activities related to recycling and the development of alternative products to replace plastic using Saal leaves.

22. Will the operation involve the use of considerable amounts of natural resources (construction materials, water spillage, land, energy from biomass, etc.) or may lead to their depletion or degradation at points of source?		NO	Some project activities will utilize natural renewable resources such as Saal leaves and natural fibers. However, the project will not cause their depletion or degradation at the source.
23 Will the works generate solid or liquid wastes?	Yes		Some solid waste will be generated; however, it will be minimal and can be managed effectively.
24. Does the sub-project include an adequate plan for the collection and disposal?	Yes		A waste collection and disposal plan is in place.
25. Do any of the sub-projects generate and transport hazardous waste?		NO	No hazardous waste is generated or transported.
ESS4			
26. Is there a risk of increased community exposure to communicable diseases (such as COVID-19, HIV/AIDS, and Malaria) through labor influx? or an increase in the risk of traffic-related accidents?		NO	There is no anticipated increase in the risk of communicable diseases or traffic accidents, as the project does not involve labor influx.
27. Is an influx of workers, from outside the community, expected? Would workers be expected to use the health services of the community? Would they create pressure on existing community services (water, electricity, health, recreation, and others?)		NO	No, an influx of workers from outside the community is not anticipated.
28. Is there a risk that SEA/SH may increase as a result of project work?		NO	No such risk of increased SEA/SH is anticipated during the project time period. TU follows the national standards in SEA/SH policy guidelines. (The PSEA policy is attached in the annex)
29. Would any public facilities, such as schools, health clinics, and churches be negatively affected by project activities?		NO	No. There will be no negative impact on public facilities
30. Is there an increase in the risk of traffic-related accidents?		NO	No. There are no activities in the project that could cause traffic-related accidents.
31. Will the operating noise level of the infrastructure exceed the allowable noise limits?		NO	There will be no activities that generate significant noise, and the project will not exceed allowable noise limits.

32. Will the operation result in emission of significant amounts of dust, hazardous fumes?		NO	No significant emissions of dust or hazardous fumes.
33. Could the activity spark tension or conflict among the local communities?		NO	The project does not cause community conflicts due to its activities.
ESS5			
34. Will the subproject require involuntary acquisition of new land (will the government use eminent domain powers to acquire the land)?[2]		NO	The project does not require land for its activities. There are no construction activities involved and it primarily consists of research activities to be carried out by the university.
35. Will the subproject lead to temporary or permanent physical displacement (including people without legal claims to land)?		NO	Not applicable, as there is no requirement for land.
36. Will the subproject lead to economic displacement (such as loss of assets or livelihoods, or access to resources due to land acquisition or access restrictions)?		NO	Not applicable, as there is no requirement for land.
37. Has the site of the subproject been acquired through eminent domain in the past 5 years, in anticipation of the subproject?		NO	No prior land acquisition using eminent domain.
38. Are there any associated facilities needed for the subproject (such as access roads or electricity transmission lines) that will require the involuntary acquisition of new land?		NO	Not applicable, as there is no requirement for land.
39. Is private land required for the subproject activity being voluntarily donated to the project?[3]		NO	Not applicable, as there is no requirement for land.
40. Will the works or any other project activities result in the permanent or temporary loss of crops, fruit trees, infrastructure and business infrastructure?			No activities will lead to the loss of crops, fruit trees, or infrastructure.
ESS6			

[2] Environmental and Social Standard 5, Footnote 10: "In some circumstances, it may be proposed that part or all of the land to be used by the project is donated on a voluntary basis without payment of full compensation. Subject to prior Bank approval, this may be acceptable providing the Borrower demonstrates that: (a) the potential donor or donors have been appropriately informed and consulted about the project and the choices available to them; (b) potential donors are aware that refusal is an option, and have confirmed in writing their willingness to proceed with the donation; (c) the amount of land being donated is minor and will not reduce the donor's remaining land area below that required to maintain the donor's livelihood at current levels; (d) no household relocation is involved; (e) the donor is expected to benefit directly from the project; and (f) for community or collective land, donation can only occur with the consent of individuals using or occupying the land. The Borrower will maintain a transparent record of all consultations and agreements reached."

[3] Environmental and Social Standard 5, Footnote 10: "In some circumstances, it may be proposed that part or all of the land to be used by the project is donated on a voluntary basis without payment of full compensation. Subject to prior Bank approval, this may be acceptable providing the Borrower demonstrates that: (a) the potential donor or donors have been appropriately informed and consulted about the project and the choices available to them; (b) potential donors are aware that refusal is an option, and have confirmed in writing their willingness to proceed with the donation; (c) the amount of land being donated is minor and will not reduce the donor's remaining land area below that required to maintain the donor's livelihood at current levels; (d) no household relocation is involved; (e) the donor is expected to benefit directly from the project; and (f) for community or collective land, donation can only occur with the consent of individuals using or occupying the land. The Borrower will maintain a transparent record of all consultations and agreements reached."

41. Does the subproject involve activities that have the potential to cause any significant loss or degradation of critical habitats[4] whether directly or indirectly, or which would lead to adverse impacts on natural habitats[5]?		NO	There are no activities with the potential to cause loss or degradation of critical habitats.
42. Will the project involve the conversion or degradation of non-critical natural habitats?		NO	There are no activities with the potential to cause conversion or degradation of non critical habitats.
43. Will this activity require clearance of mangroves?		NO	No mangrove clearance required.
44. Will this activity require the clearance of trees, including inland natural vegetation?		NO	No tree clearance required for the project activities.
45. Will there be any significant impact on any ecosystems of importance (especially those supporting rare, threatened or endangered species of flora and fauna)?		NO	No impact on key ecosystems or endangered species.
ESS7			
46. Are there any Indigenous people present in the subproject area that are likely to be affected by the proposed subproject negatively?		NO	No indigenous communities were negatively affected.
ESS8			
47. Is the subproject to be located adjacent to a sensitive site (historical, archaeological, or culturally significant site) or facility?		NO	No proximity to sensitive historical or cultural sites.
48. Locate near buildings, sacred trees, or objects having spiritual values to local communities (e.g. memorials, graves, or stones) or require excavation near there.		NO	No excavation near spiritually significant locations.
ESS10			
49. Have the communities been systematically identified?	YES		Communities have been identified and engaged.
50. Have the communities within the project intervention area engaged in the project design (including any outreach that has already taken place as part of proposal	YES		Community outreach was conducted during project design.

[4] Environmental and Social Standard 6, paragraph 23: "Critical habitat is defined as areas with high biodiversity importance or value, including (a) Habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches; (b) Habitat of significant importance to endemic or restricted-range species; (c) Habitat supporting globally or nationally significant concentrations of migratory or congregatory species; (d) Highly threatened or unique ecosystems; and (e) Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d)."

[5] Environmental and Social Standard 6, paragraph 21: "Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition."

development or other relevant community research)?			
51. Are there implementing partner(s)?	YES		Implementing partners (National Academy of Science and Technology (NAST) are involved.
52. Have the partnership structure and coordination mechanism clearly described including types of partnership agreements established with the local government?	YES		Partnership and coordination structures are being established and Agreements have been signed. (attached in the annex)
53. Is the grievance mechanism in place?	YES		Yes, a grievance mechanism is in place. GRM is able to handle sensitive complaints related to SEA/SH.
54. Will the project build on previous experiences to ensure complementarity and avoid duplication?	YES		The project does not duplicate prior initiatives.
55. Is there an established SEA/SH and GBV risk management policy?	YES		PSEA policy has been developed.
56. Is there a mechanism to inform women about the risks, activities, GRM, as well as pay and benefits?	YES		Yes, there is an established mechanism which is based on PSEA policy. (attached in the annexure)
57. Have the communities within the project intervention area engaged in the project design (including any outreach that has already taken place as part of proposal development or other relevant community research)?	YES		Community outreach was conducted during project design.
58. Are there implementing partner(s)?	YES		Implementing partners are involved.
59. Has the partner undergone the screening based on a negative list?	YES		No activities fell under the negative list.

3. Negative List Screening

According to the ESMF of the project, the initial screening for eligibility was conducted based on the list of excluded activities that will not be supported by the project.

Negative List	Yes	No

Activities that will produce wastewater where there is no on-site or off-site mechanism to comply with the national standards for effluents	☐	☑
Processes that will emit PM2.5, PM5, PM10, fly ash, toxic fumes and noxious odor exceeding the national emission standards or the World Bank Group Environment, Health and Safety Guidelines (EHSG)	☐	☑
Activity that pollutes groundwater by discharging contaminants during collection, transport, treatment and disposal of plastic waste.	☐	☑
Production of residual waste with no available safe disposal facilities or access to the facilities duly approved by the government.	☐	☑
Activities will involve the recovery of plastics from waste electronic and electrical equipment (WEEE) which will potentially release toxic restricted Brominated Flame Retardant (BFR).	☐	☑
Activities/processes that will involve the use of highly toxic and/or banned chemicals.	☐	☑
Use of technologies in marine clean-up that would harm marine life.	☐	☑
Technologies whose by-products will promote the production of secondary microplastics that may have significant impacts on ecosystems.	☐	☑
Activities that will require the acquisition of any new land or have a negative impact on income/livelihood resources.	☐	☑
Activities that will involve forceful evictions of people.	☐	☑
Activities that will involve child labor / forced labor / serious occupational health and safety concerns for workers.	☐	☑
Involve activities that cause or lead to child abuse, child labor exploitation or human trafficking	☐	☑
Any activities that have negative impacts on Indigenous people including activities that may require free prior and informed consent (FPIC)	☐	☑
Any activity that has a substantial or high environmental/social impact	☐	☑
Pyrolysis and other chemical recycling technologies	☐	☑

4. Conclusion

4.1 Risk Assessment

This initiative is primarily focused on research and development (R&D) and will be conducted within the premises of a government university under a strictly controlled and regulated environment. As a state institution, the university is obligated to adhere to all relevant laws and regulations. Furthermore, the project follows the guidelines set by the Project Environmental and Social Framework (ESF) and the Labour Management procedure.

The core activities of the project involve recycling waste plastics into new value-added products such as flower pots, plastic ropes, and functional carbon. Additionally, the project explores sustainable alternatives to plastic products, including the production of biodegradable plates and bowls made from Saal leaves. However, these activities do not involve large-scale production or public participation. Instead, all experimental work will be carried out within the controlled laboratory facilities of the university. Since the project does not involve any form of construction, there are no land acquisition requirements, and no significant environmental damage is anticipated.

While the project will generate some waste byproducts, including natural fiber residues, Saal leaf waste, and plastic waste from defects, there will be no toxic waste generation. All waste materials can be effectively managed through proper disposal and recycling methods, ensuring no harm to the environment or surrounding communities.

There are minor occupational health and safety risks associated with the project, such as exposure to dust, noise from machinery, and potential microbial contamination. However, these risks are effectively mitigated through the application of established laboratory best practices, including the mandatory use of appropriate Personal Protective Equipment (PPE). By implementing these safety measures, the project ensures a secure working environment for all involved personnel.

Summary of the Environment and Social risk presented below,

	Impact			
Likelihood	**Low (1)**	**Moderate (2)**	**Substantial (3)**	**High (4)**
Likely (4)				
Possible (3)				
Unlikely (2)	**ESS1 / 6 ESS2 / 9 ESS3 / 23**			

Rare (1)	**ESS3 / 24**			

According to the Environmental and Social Standard screening conducted for the project activities, this subproject falls under the Low Risk Project.

Therefore, it is recommended to proceed by ensuring compliance with World Bank environmental and social standards, national regulations in Nepal, and the recommendations outlined in the section below.

4.2 Recommendations

A site-specific screening form and compliance with national laws are sufficient, with regular monitoring to ensure adherence to mitigation measures. As the project is under low risk and does not require an ESMP, the following recommendations for mitigation and monitoring should be followed up during project implementation:

1. Develop and adapt operations-specific Standard Operating Procedures (SOPs).
2. Develop and adhere to a **Material Safety Data Sheet (MSDS)** to ensure proper handling, storage, and disposal of materials used in the project.
3. Provide and enforce the use of appropriate PPE, such as gloves, masks, earplugs, and safety goggles based on the risk associated with the activities.
4. Monitor incident reporting and response mechanisms to ensure worker safety.
5. Implement waste segregation and disposal plans, including proper handling of solid plastic residues and grey water.
6. Monitor compliance with national and World Bank waste disposal guidelines and document waste management activities.
7. Conduct regular outreach sessions with local stakeholders to communicate project progress and benefits.
8. Maintain a grievance redress mechanism to promptly address concerns raised by stakeholders, including both the community and workers.
9. Raise awareness about the grievance redress mechanism to ensure all stakeholders, including the community and workers, are informed about how to access and use it
10. Track and document water, energy, and other resource usage to ensure efficient resource consumption.
11. Conduct periodic audits to identify opportunities for further efficiency improvements.
12. Monitor for any unintentional impacts on local biodiversity or ecosystems, ensuring compliance with conservation principles.
13. Avoid activities that may harm the natural environment.
14. Maintain vigilance to prevent impacts on cultural heritage or indigenous communities.
15. Ensure project activities are inclusive and respectful of local values.
16. Appoint PSEA focal points, ensure they receive appropriate training on their roles, develop Terms of Reference (ToRs) if necessary, and disseminate relevant information on these procedures throughout the project.

These measures, combined with regular monitoring and documentation, will ensure the project aligns with its low-risk classification while effectively mitigating potential risks.

Department of Applied Sciences and Chemical Engineering, Tribhuvan University as implementing partner is responsible for maintaining comprehensive records and evidence related to the implementation of environmental and social risk mitigation measures. All mitigation measures will be monitored by the responsible person in the Tribhuvan university and the Technical expert (Environmental) UNOPS, PLEASE project, Nepal. Monitoring will be conducted through site visits and by reviewing relevant evidence and documentation.

Name and title of the person who conducted the screening: Dr. Prakash Chandra Lohani Co-PI **Date of screening**: Feb 25, 2025 	**Name and title of the person who approved the screening:** Rajendra Khanal, PhD Project Manager - Nepal **Date of screening:** March 2025

Annextures

Risk Assessment
MOU with Sikhar Municipality
Service Rule Book-Tribhuvan University
TU_PSEA Policy