

Report:

LCA Training Session for Plastic Waste Recycling Project, 11th December 2024

1. Introduction

The session commenced with a round of introductions, establishing a collaborative and inclusive environment among participants from UNEP, the consultancy team, and project representatives from Cambodia and Pakistan. Each participant provided an overview of their roles and expectations for the session. Matthew Burke, the lead consultant, highlighted his expertise in applying Life Cycle Assessment (LCA) methodologies to waste management projects, particularly in data-limited contexts. Archana Datta from UNEP emphasized the strategic importance of addressing plastic waste management challenges in developing countries, underlining UNEP's commitment to fostering sustainable practices through capacity building and innovation. Shunichi Honda, UNEP project lead, provided context for the session by connecting it to UNEP's broader goals of promoting circular economy principles and environmentally sound waste management practices.

This introductory session not only set a professional tone but also created a sense of shared purpose, uniting participants under the common objective of addressing the pressing challenges of plastic waste management in Cambodia and Pakistan.

2. Brief Summary of Two Projects and How They Inter-relate

Following the introductions, Shunichi presented an overview of the two interrelated country-specific projects. In Cambodia, the focus is on empowering small and medium-sized enterprises (SMEs) in the recycling sector to enhance their capacity and adopt sustainable practices. This involves fostering innovation and building a circular economy framework through targeted interventions. In Pakistan, the project aims to address systemic waste management challenges, improve plastic waste recycling technologies, and strengthen policy support.

Shunichi explained how both projects align under UNEP's overarching mission to promote sustainable waste management globally. He highlighted the shared reliance on informal recycling sectors in both countries and the significant potential for positive environmental and socio-economic impacts through targeted LCA applications. The session underscored the importance of leveraging insights and methodologies from one project to inform and optimize the other, ensuring the projects remain interconnected and mutually reinforcing. Participants noted the alignment of project goals and expressed enthusiasm for exploring scalable solutions that could benefit both countries.

3. Introduction to LCA and Underlying Methodology

Matthew delivered a detailed presentation on the principles of LCA, providing a comprehensive overview of its goals, scope, and potential applications in evaluating the environmental impacts of plastic waste recycling technologies. He elaborated on the four primary stages of LCA—goal and scope definition, inventory analysis, impact assessment, and interpretation—illustrating each with examples relevant to plastic waste management.

Acknowledging the data limitations in Cambodia and Pakistan, Matthew introduced a streamlined LCA methodology inspired by the EU's Product Environmental Footprint (PEF) framework. He explained how this methodology balances analytical rigor with practical applicability by using standardised datasets, generic emission factors, and proxies for missing data. The presentation emphasized the importance of tailoring the methodology to the unique challenges of informal recycling sectors while ensuring it provides actionable insights for recyclers, policymakers, and other stakeholders.

Matthew also touched on the flexibility of the framework, highlighting its adaptability to evolving data availability and regional contexts. This adaptability, he noted, would allow the methodology to remain relevant and robust, even in countries with limited data infrastructure.

4. Data Requirements for LCA

Matthew's next session focused on the data requirements for implementing the LCA framework, a streamlined version of Table 1 from the submitted methodology, which focussed on key data. This key data focussed on the plastic waste collection, plastic waste pre-processing, and recycling life cycle stages. He outlined the types of data needed, including polymer-specific consumption rates, energy inputs, and waste management practices. Recognising the challenges of obtaining such granular data in Cambodia and Pakistan, he proposed the use of secondary data from global databases like Ecoinvent, academic literature, and regional assessments.

Matthew highlighted the importance of prioritising data collection efforts to ensure the methodology remains practical and impactful. He discussed strategies for addressing gaps, such as using regional averages or default values to fill missing data points. Participants raised questions about the variability in informal recycling practices and how to account for these differences in the LCA framework. Matthew responded by emphasizing the need for flexibility and iterative refinement, suggesting that the framework be designed to accommodate a range of scenarios while maintaining consistency and comparability. He also emphasized how this is particularly important in the SME recycling space, which is extremely variable and prone to large shifts due to market demands and/or the availability of input plastics.

5. Potential Data Collection Routes and Timelines

The session then turned to data collection strategies, with Matthew outlining a phased approach to align with project timelines and local capacities. He suggested leveraging existing reports, stakeholder interviews, and data from government agencies to supplement secondary sources. He also discussed how surveys could be an ideal data collection route, to ensure larger coverage of the recycling industry and ensure that data collected is not specific to a particular recycler or region; however, it was noted that surveys may be difficult to undertake and may not be feasible in all regions. He also proposed focusing on collecting actionable data that directly informs the LCA study, such as estimates of plastic waste volumes, common recycling practices, and energy consumption rates.

The timeline for data collection was discussed in relation to the onboarding of local consultants in January 2025. Matthew emphasized the importance of coordinating closely with local stakeholders to ensure a streamlined process that is practical and achievable for the region. This can include the collection of mostly, or even only, qualitative data, which can be utilized to guide the secondary data is most relevant for the country (e.g. guide the selection of which ecoinvent dataset is most representative of recycling within Cambodia and Pakistan).

. Archana added that insights from the planned capacity-building sessions in December (Pakistan) and January (Cambodia) would be critical for refining data collection efforts. Participants agreed on the need to balance ambition with practicality, prioritising data that provides the most value for the LCA study.

6. Questions from Project and UNEP Teams

The Q&A session provided an opportunity for participants to seek clarifications and offer additional perspectives. Key questions included:

- How can social and economic metrics be integrated into the LCA framework?
- What are the best practices for engaging informal recyclers and collecting reliable data?
- How can the framework be made user-friendly for local stakeholders?

Matthew addressed these queries by reiterating the importance of designing a simplified yet robust framework that remains adaptable to local contexts. He highlighted examples of successful LCA applications in similar data-limited settings and emphasized the need for stakeholder engagement to build trust and ensure accurate data collection. Archana provided insights on capacity building, stressing the importance of empowering local actors to apply the LCA framework effectively. These local actors also have the best sense of what data can realistically be collected and therefore are key in the data collection planning process.

7. Meeting Close Out

The session concluded with a summary of key takeaways and next steps. Shunichi expressed gratitude for the active participation and constructive discussions, reaffirming UNEP's commitment to supporting the project teams in Cambodia and Pakistan. He announced the capacity-building sessions scheduled for December and January and invited Matthew and Archana to lead these efforts. These capacity-building sessions will be key to finalizing the data collection process, to ensure data collection provides the desired country-specific insights and that data collection can be completed timeously. Additionally, Shunichi shared plans for the UNEP Global Dialogue in Osaka, scheduled for February 2025, where project teams and stakeholders will convene to discuss preliminary findings and refine their approaches.

Participants expressed appreciation for the session's collaborative spirit and committed to advancing the project goals. The meeting closed on a positive note, with a shared sense of purpose and clarity on the path forward.

8. Conclusion

This training session served as a critical step in aligning the LCA framework with the unique challenges of plastic waste recycling in Cambodia and Pakistan. The interactive discussions and actionable insights provided a strong foundation for capacity building and methodology refinement. Moving forward, the collective expertise and shared commitment of all stakeholders will be instrumental in driving sustainable waste management solutions that are both impactful and scalable.

9. List of Participants

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Bopha Sean, COMPOSTED
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Chettiyappan Visvanathan, AIT
Faraz Ahmed, Living Indus Initiative
Faisal Syed, Living Indus Initiative
Faiqa Aziz, UNHABITAT
Haider, Razi Mujtaba, ILO
Humaira Jehanzeb, Living Indus Initiative
Laila Rubab, UNEP
Lei Wang, UNEP
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Matthew Burke, UNEP
Michiko Ota, UNEP
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