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Citizen science data, marine plastics, and SDG monitoring: How to build trust in citizen science data and methodologies among diverse actors with varying needs and motivations?

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EGU25, Vienna


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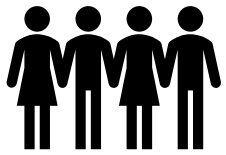
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE
17 PARTNERSHIPS FOR THE GOALS
THE GLOBAL GOALS
For Sustainable Development

Citizen science

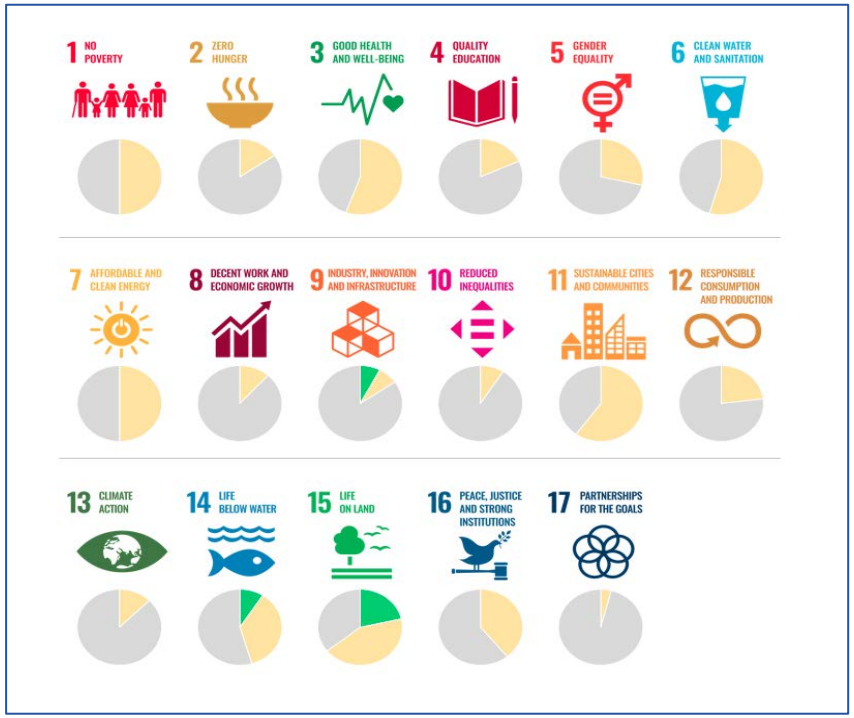


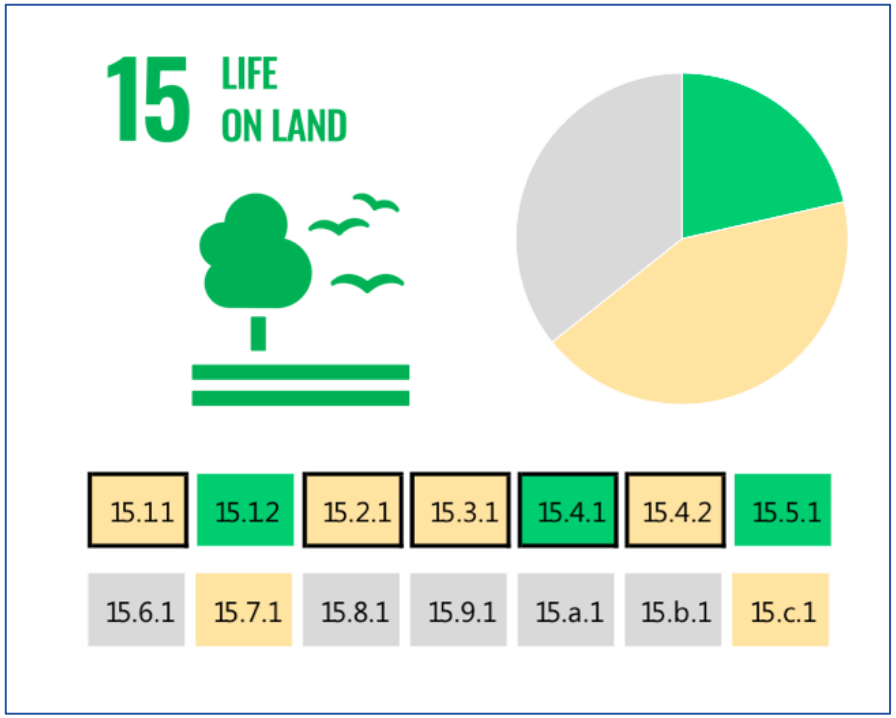
Public Participation

Knowledge production

Voluntary contributions

The SDG indicators where citizen science projects are “already contributing” (in green), “could contribute” (in yellow) or where there is “no alignment” (in grey). The overall citizen science contributions to each SDG are summarized as pie charts.





Fraisl, D., Campbell, J., See, L. *et al.* Mapping citizen science contributions to the UN sustainable development goals. *Sustain Sci* **15**, 1735–1751 (2020). https://doi.org/10.1007/s11625-020-00833-7

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The contributions of citizen science to SDG monitoring and reporting on marine plastics

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The process of integrating citizen science data on marine litter for SDG indicator 14.1.1b reporting in Ghana

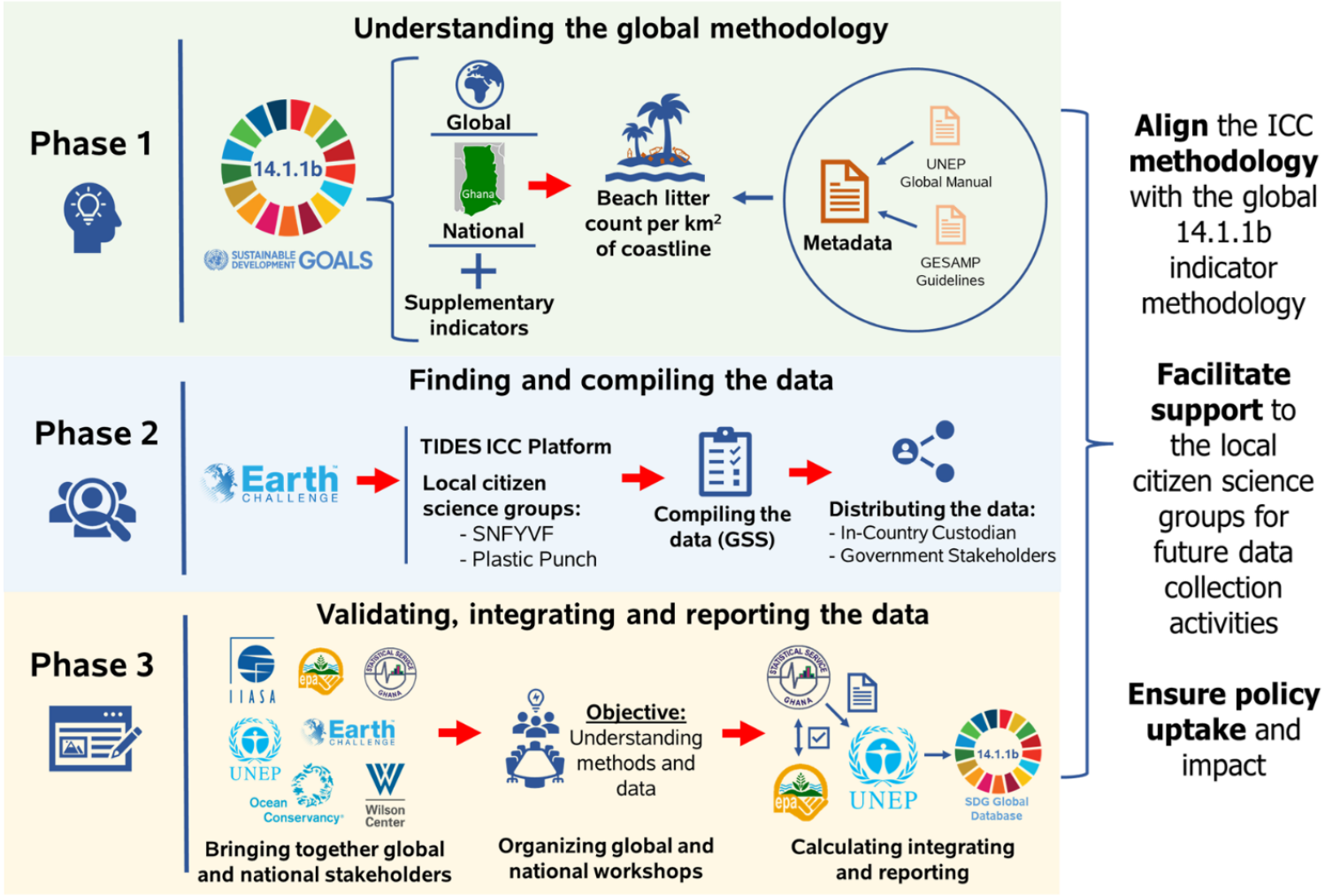

Table S2: Checklist for the process of leveraging existing citizen science data for 14.1.1b reporting

Phase 1: Understanding the global methodology for indicator 14.1.1b on *plastic debris density*
☐ Examine the global methodology for SDG indicator 14.1.1b with a focus on beach litter - average count of plastic items per km^2; ☐ Review the SDG Indicator 14.1.1b Metadata (UN 2021); ☐ Review the Global Manual on Measuring SDG 14.1.1, SDG 14.2.1 and SDG 14.5.1. (UNEP 2021); ☐ Review the GESAMP Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean (GESAMP 2019); ☐ Identify additional aims beyond SDG monitoring, if applicable. Examples include: ☐ Policy formulation; ☐ Education and awareness raising; ☐ Supporting citizen science initiatives for future data collection activities.
Phase 2: Finding and compiling the data
☐ Create a list of key stakeholders for in-country, as well as global engagement, e.g., NSO, line ministries, CSOs, academia, UNEP, ICC, etc.; ☐ Explore if there are existing citizen science projects, local citizen scientist networks or citizen science data available in the country. Examples of data platforms include: ☐ Global Earth Challenge Marine Litter Data Integration Platform (Earth Day Network 2021); ☐ ICC TIDES database (Ocean Conservancy 2022). ☐ If data are available, investigate issues, such as: ☐ The number of beach litter collections per year; ☐ The dispersion of the locations of the data collection activities; ☐ The classification of litter into plastics and non-plastics as per the global methodology; ☐ Completeness of the data; whether area covered is captured or needs to be approximated; ☐ Any outlier values available in the data set.
Phase 3: Validating, integrating, and reporting the data
☐ Bring key stakeholders together and ensure their engagement by providing a platform to communicate needs, motivations, and concerns; ☐ Ensure both national and global level coordination and collaboration that goes beyond the data validation activity; ☐ Organize several workshops with clear goals, such as: ☐ Understanding the methodologies developed by the citizen science projects; ☐ Determining how these methodologies were implemented by local citizen scientist networks and CSOs; ☐ Understanding the eligibility of coastal sites: ☐ Identifying any geographic areas of policy interest and any existing litter prevention interventions; ☐ Discerning between sites with land- or ocean-sourced litter flows. ☐ Clarifying any open issues with the data set; ☐ Identifying areas of future improvements of the methodologies or their implementation; ☐ Understanding the limitations and challenges of citizen science data and how to overcome them or minimize their effect; ☐ Ensuring that the data produced are of sufficient quality for informing the SDG indicator 14.1.1b, as well as policy action; ☐ Ensuring that the ethical principles are followed while developing and using the methodology, e.g., data privacy, etc. ☐ Determining whether citizen science methodologies could be integrated into future policy monitoring. ☐ Gather a small team of statisticians and thematic experts for data validation; ☐ Identify any shortcomings related to the data set. Some of the questions that can be asked here include: ☐ Does the citizen science methodology align with the global 14.1.1b methodology? ☐ Was the area covered captured during data collection? ☐ Were the data collection sites selected using a sampling method or opportunistically (with no sampling design)? ☐ If opportunistically, could the data be representative of the overall country? ☐ Calculate the indicator, with support from UNEP and other partners if needed; ☐ Follow the in-country structures and regulations to communicate the results, e.g., official communique between government agencies; ☐ Consider reporting the results to the UN SDG Global Database and in the Voluntary National Review, once approved; ☐ Use the results for policy development or improvement.

Bridging local data collection efforts with global monitoring processes by leveraging the SDG framework

Encure inclusiveness through meaningful engagement of all stakeholders

Create time and space for these stakeholders to meet and connect

Listen and understand the motivations, interests and concerns

Be transparent about citizen science results and methodologies, especially how these methodologies were implemented

Citizens and communities are no free labor to close government data gaps; they should receive a share of the benefit from participating

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THANK YOU!!

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