

Citizen science, local knowledge, and the United Nations Sustainable Development Goals (SDGs)

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Leaders | Development

The 169 commandments

The proposed sustainable development goals would be worse than useless

Stupid Development Goals (SDGs)

Criticism

- 169 priorities, in practice, no priorities at all
- Fragmentation of effort and resources
- Measuring, validating and communicating 232 indicators difficult and expensive

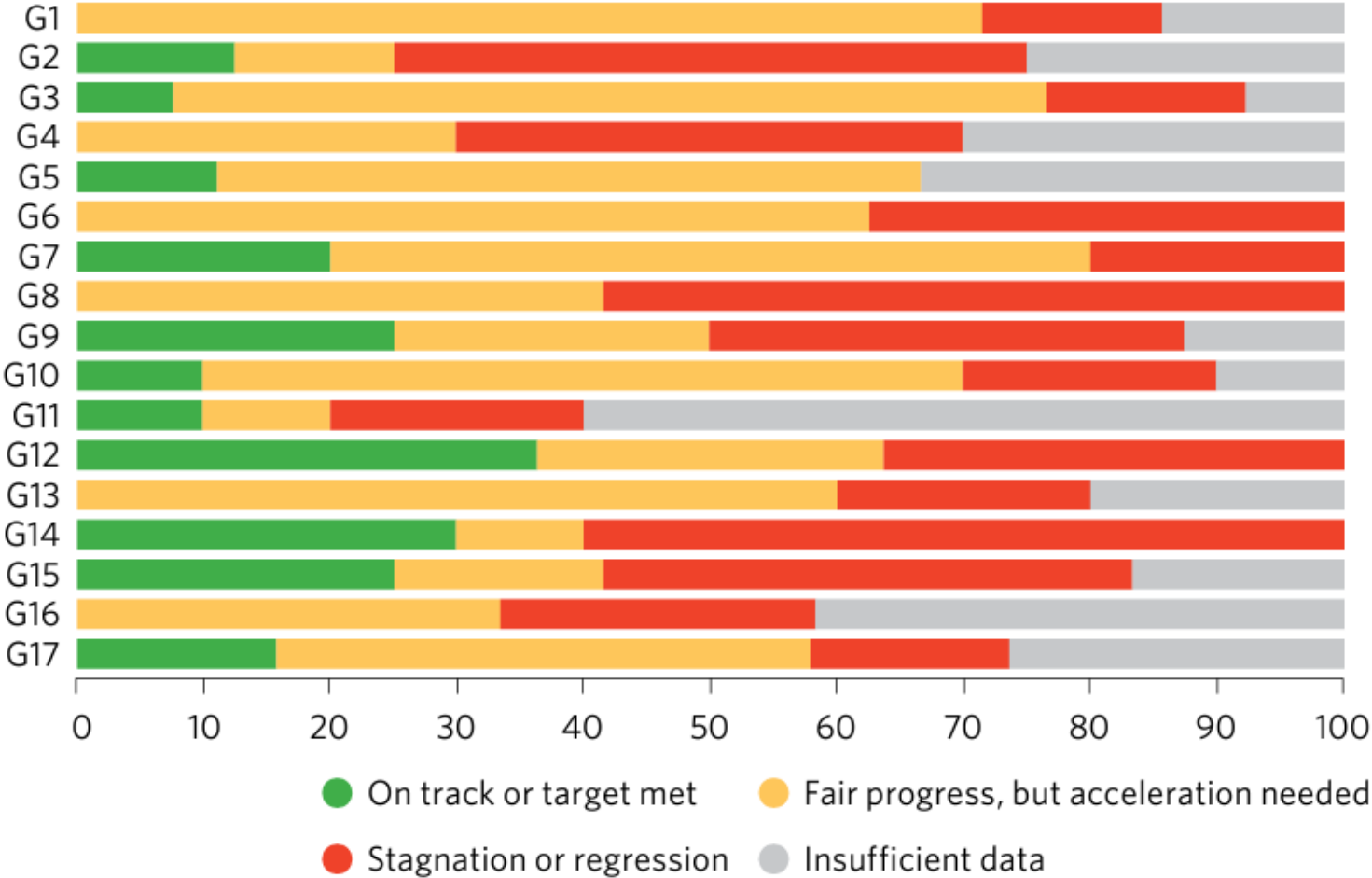
Response

- Democratic process
- More targets may mean more funding
- It has flaws and it could have been better, some targets are not achievable, but ...

SUSTAINABLE DEVELOPMENT GOALS

The SDGs mark the first time in human history that the nations of the world agreed on a comprehensive vision, supported by concrete goals and targets, for the future we want, for "sustainable development"...

Progress assessment for the 17 Goals based on assessed targets, 2023 or latest data (percentage)



UN SDG Report, 2023

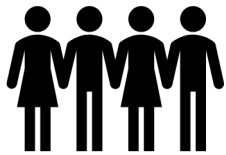
Almost half of the 92 environmental SDG indicators lack data

We cannot improve what we cannot measure...

Citizen science



Gill Conquest, EXCITES, University College London



Public Participation



Knowledge production



Voluntary contributions



Citizen Science

- Sharing biodiversity related observations, measuring water or air quality, reporting on safety or violence, identifying slums and poverty, etc.
- From hypothesis driven research led by scientists and volunteers contribute data, to initiatives volunteers and scientists identify the research question together and work together in many aspects of research.



Citizen science could benefit the society by:



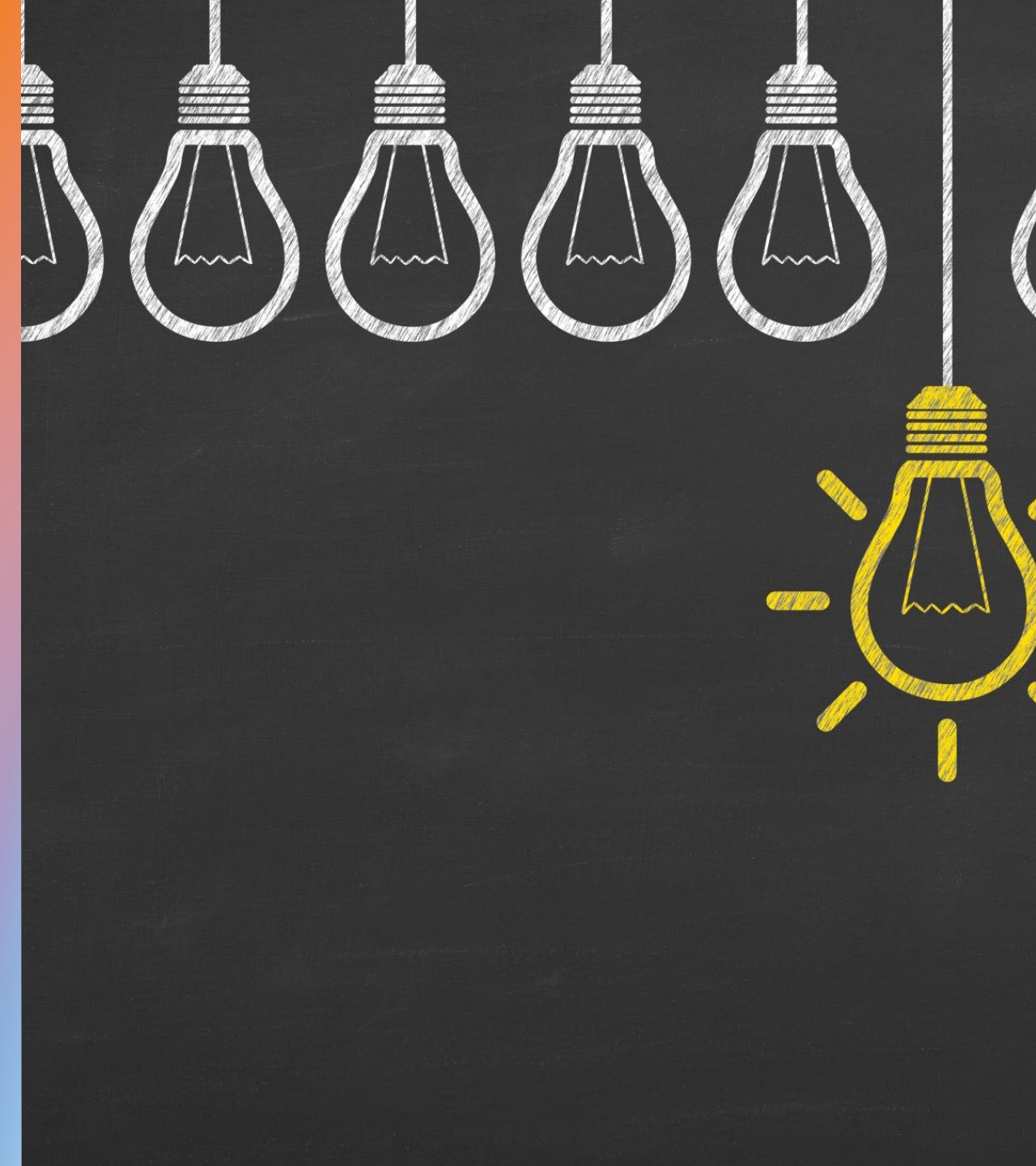
Raising awareness of environmental and other societal issues



Supporting science and scientific activities



Contributing to decision and policy making

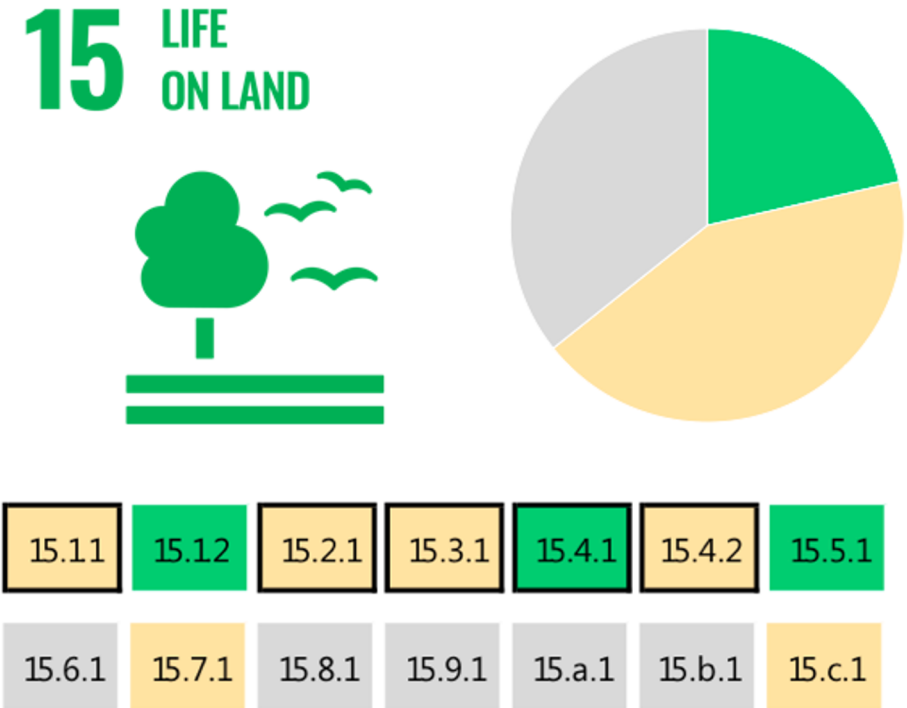
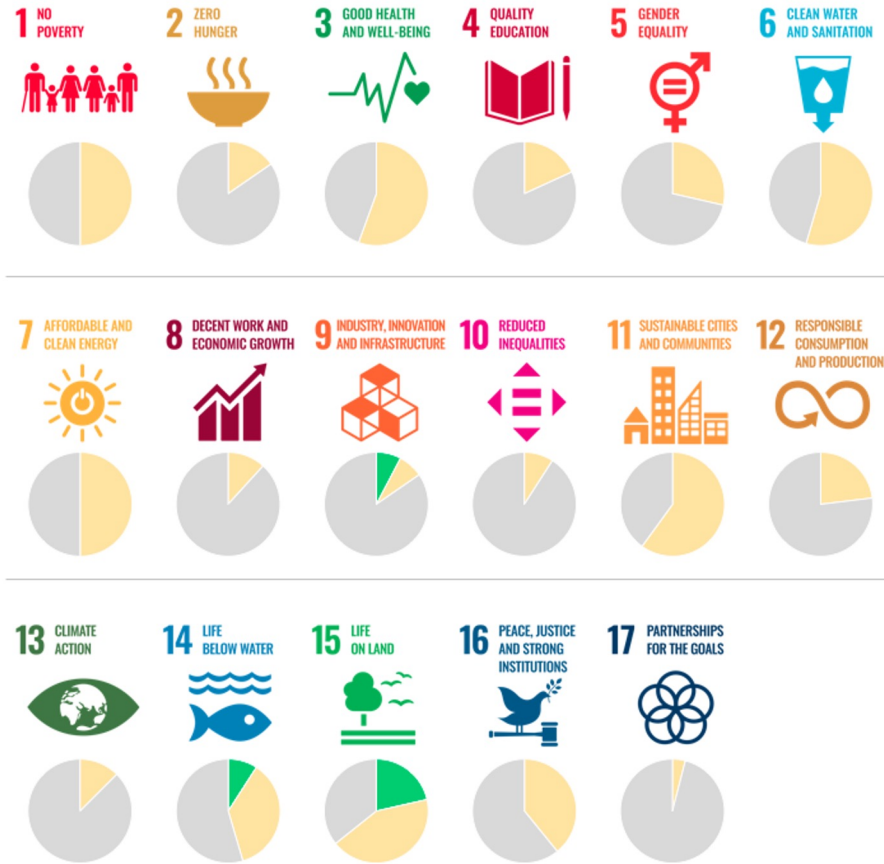


Challenges

- Data Quality
- Local vs Global
- Various methodologies used in similar projects
- Representativeness/inclusiveness
- Recruitment and retainment

Examples of Limitations	Recommendations on how to overcome them	Related design and implementation stage
Required wide range of skills outside of the research subject	Establish partnerships with other project teams and stakeholders conducting similar projects and activities; work with participants who have expertise ⁴²	Stage 3: Designing the project Stage 4: Building the community
Lack of participant engagement and lack of diversity among participants	Understand participant motivations at the design stage; create tasks that appeal to different motivations; integrate tasks into the existing day-to-day activities of the participants ³⁵ ; facilitate participant feedback and exchange throughout the project ^{62,195,196} ; avoid dependency on resources not locally available ³⁵ ; integrate co-designed processes depending on the availability of time, resources and implementation experience ^{62,195,196}	Stage 4: Building the community
Bias related to the quality of non-professional contributions, with subsequent risk of citizen science not being recognized as a legitimate source of knowledge in decision-making	Be aware of the potential loss of power and control on the part of conventional-thinking scientists and decision-makers ^{24,35}	Stage 3: Designing the project Stage 5: Managing the data (steps related to assuring and analyzing)
Bias related to human population density	Examine the literature to identify potential biases and their influence on the project, take them into account during design and analysis ^{56,198-204}	Stage 3: Designing the project Stage 5: Managing the data (steps related to assuring and analyzing)
Temporal biases, such as the daytime and weekend bias		
Bias related to the extent of participant contributions		
Bias in the profile of participants		
Quality of sensors used		
Varying data protection laws in different countries	Consider what data are essential for the project at the design stage of a project. For example, the data minimization principle of the EU GDPR ¹⁶¹	Stage 3: Designing the project Stage 5: Managing the data (steps related to planning, collecting, assuring, analyzing, describing and preserving)
Issues related to designing and implementing projects in remote areas	Account for potential issues while designing citizen science projects under such circumstances; Ensure high level of participant engagement through co-designed approaches ²⁰⁵	Stage 3: Designing the project Stage 4: Building the community Stage 5: Managing the data (steps related to planning and collecting)
Risks related to data collection, such as loss of smartphones, visiting locations that are remote or unsafe, political risks, etc.	Clearly communicate the potential risks related to participation along with information on how to avoid them ⁵⁵	Stage 3: Designing the project Stage 5: Managing the data (steps related to planning and collecting)

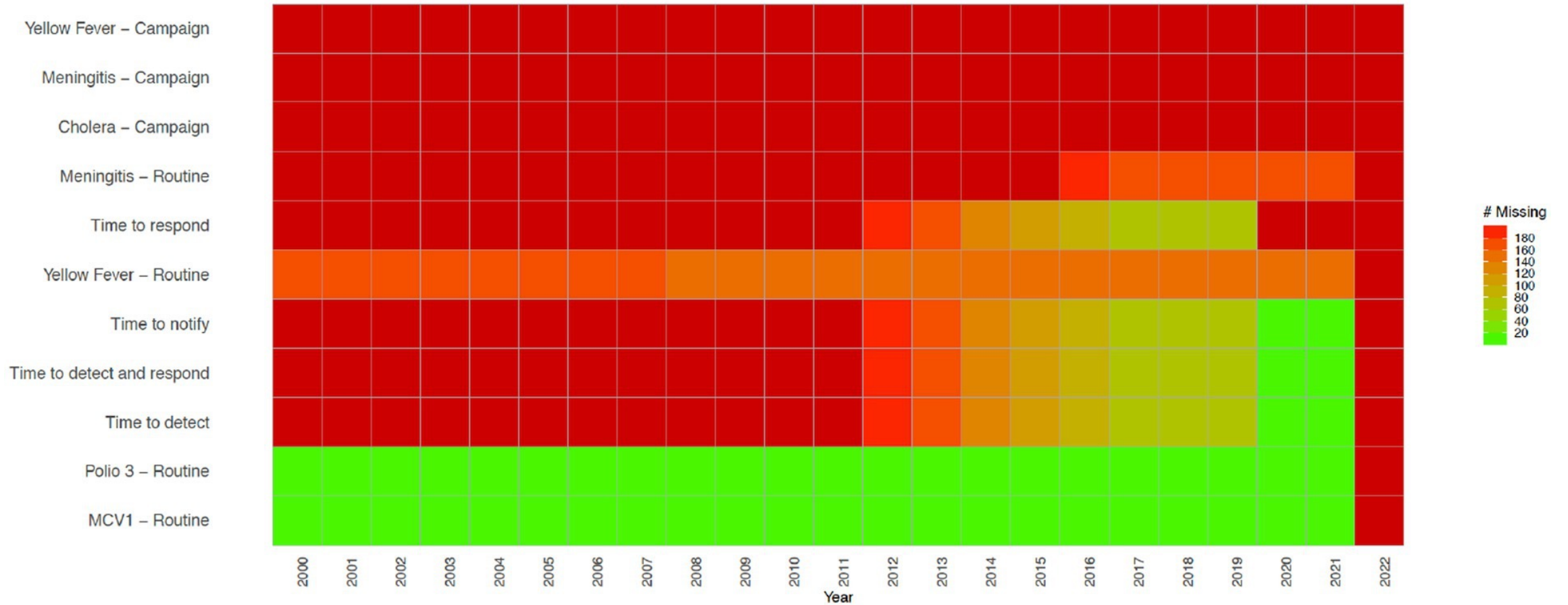
The SDG indicators where citizen science projects are “already contributing” (in green), “could contribute” (in yellow) or where there is “no alignment” (in grey). The overall citizen science contributions to each SDG are summarized as pie charts.



The greatest contribution of citizen science data to SDG monitoring would be in:



Health Emergencies Protection



Health Emergencies indicators from the WHO’s Triple Billion Targets and the SDG framework. Dark red indicates that data are missing for all countries for the mentioned year while bright green on the opposite end of the spectrum shows that there are no missing values reported for all countries, which is 194 in total. Shades in between show partial data availability.

Fraisl D, See L, Estevez D, Tomaska N and MacFeely S (2023) Citizen science for monitoring the health and well-being related Sustainable Development Goals and the World Health Organization’s Triple Billion Targets. *Front. Public Health* 11:1202188. doi: 10.3389/fpubh.2023.1202188

The health and well-being related SDG indicators and Triple Billion Targets covered in this study. Indicators where citizen science projects are “already contributing” are in dark blue, “could contribute” are in light blue or where there is “no alignment” are in grey. The values within each box are the indicator numbers or titles.



Fraisl D, See L, Estevez D et al (2023) Citizen science for monitoring health and wellbeing related sustainable development goals and the World Health Organization’s triple billion targets. Front Public Health 11:1202188 <https://doi.org/10.3389/fpubh.2023.1202188>



Localizing the SDGs and citizen science

- Local and regional governments play a key role in the SDGs, and a stand-alone goal on Sustainable Cities and Human Settlements (SDG 11) is just one obvious example of this.
- Localization is both about how the SDGs can provide a framework for local development and policy and how local and regional governments can support the SDG achievement through bottom-up action.



Localizing the SDGs and citizen science

The SDGs are global, but their achievement will depend on our ability to make them a reality in our cities and local environments and regions and in our ability to bring them to the level of citizens. That's why local and regional governments and local knowledge through citizen science must be at the heart of the 2030 Agenda.



Most citizen science initiatives are conducted at a local and community level.

Any ideas on how these local level issues, engagement practices, and data can help monitor and achieve the SDGs that have a global nature?



Source: Earthwatch Institute



Leaflet | contributors, Points © 2015 EarthWa

6.3.2 Proportion of bodies of water with good ambient water quality

FreshWaterWatch

Over 24,000 measurements from more than 2000 water bodies in 26 countries.

Unlock your future

The yoma platform enables you to build and transform your future by unlocking your hidden potential.



Yoma is a digital platform that aims to support African youth on a “learning to earning journey” with three impact areas: digital skills, social change and environmental impact. The platform leverages a token economy as part of an incentive system for youth action that tackles social and environmental challenges.



Yoma connects youth to opportunities through an **ecosystem of partners** including governments, corporate, civil society and UN organizations and **user-centric mobile technology and offline support**. Yoma serves to **guide, skill** and **connect** youth, including the most marginalized, putting youth at the center and giving them a way to showcase their talent.

What makes the Yoma special is the fact that the projects supported by the project partners are developed by young Africans who use digital citizen science tools to provide data that can be useful for tackling climate resilience.

DonateWater, Empowering Communities through Citizen Science

Harnessing Data and Collaboration to Tackle Water Scarcity and Gender Inequality in Nigeria

UNITAR



6.3.2 Proportion of bodies of water with good ambient water quality



Bringing water to where it's needed most: Clean and accessible for all, year-round



Over 70% of households in rural communities do not have access to improved water supply. They rely solely on self-water supply (free source) such as rivers, perennial streams, water ponds and unprotected wells which is susceptible to water borne diseases. **SOURCE: journal of water resource and protection**

Vision

To ensure that clean water is accessible in every rural community in Nigeria, we aim to eliminate the need for people, especially women and children, to travel long distances in search of water and bear the burden of surviving the impacts of climate change in Nigeria and West Africa.

Mission

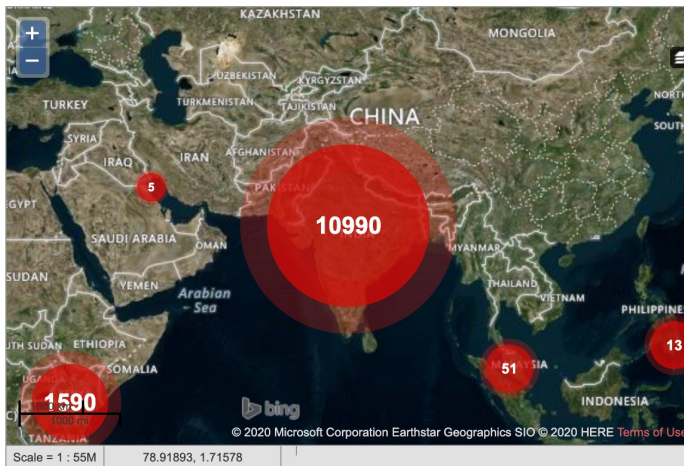
Our goal is to bridge the gap between communities, individuals, and government and local and international agencies in order to improve access to water resources. By using data, statistics, and human and citizen science, we hope to help excluded populations overcome the impacts and effects of climate change and gender exclusion. We will focus on tailoring water projects to the communities that are most in need and work towards a future where everyone has equal access to clean water.

16.1.3 Proportion of population subjected to (a) physical violence, (b) psychological violence and (c) sexual violence in the previous 12 months



If you have been sexually harassed or abused in public spaces anywhere in the world, You can report anonymously in under 2 minutes.

FILTERS → ALL NEWS PICTURES VIDEO



- Safecity is a platform that crowdsources personal stories of sexual harassment and abuse in public spaces;
- These data which may be anonymous, gets aggregated as hot spots on a map indicating trends at a local level;
- The idea is to make these data useful for individuals, local communities and local administration to identify factors that causes behaviour that leads to violence and work on strategies for solutions;
- Since their launch in December 2012, Safecity has collected over 50,000 reports from all over India, Kenya, Nepal and other countries.

Indicator 3.3.5 Number of people requiring interventions against neglected tropical diseases

Snakebite Information and Data Platform

- The platform aims to improve surveillance and contribute to related epidemiological documentation and data on snakebite envenoming, which countries can use to compile statistics for SDG monitoring and beyond;
- The approach allows for better integration of data to improve the mapping and distribution of antivenoms, as well as sharing of resources and coordination of prevention activities;
- The platform allows the public to participate and contribute by sharing photos of what they think are venomous snakes along with their location data. It also shows where the antivenom treatments are needed, which can allow prompt citizen access to treatment.



Home / Teams / Snakebite Information and Data Platform



Dear user,
This project focuses on venomous snakes specifically. Please submit your venomous snake photos here. You can either upload an existing photo or take a new photo. Please do not use this form to seek identification of snakes following a snakebite incident. If you, or someone you know has been bitten by a venomous snake, please seek medical attention immediately. If you have questions or comments, please send email to snakebite@who.int

Scientific name [COMMON NAME]*
-Please select-

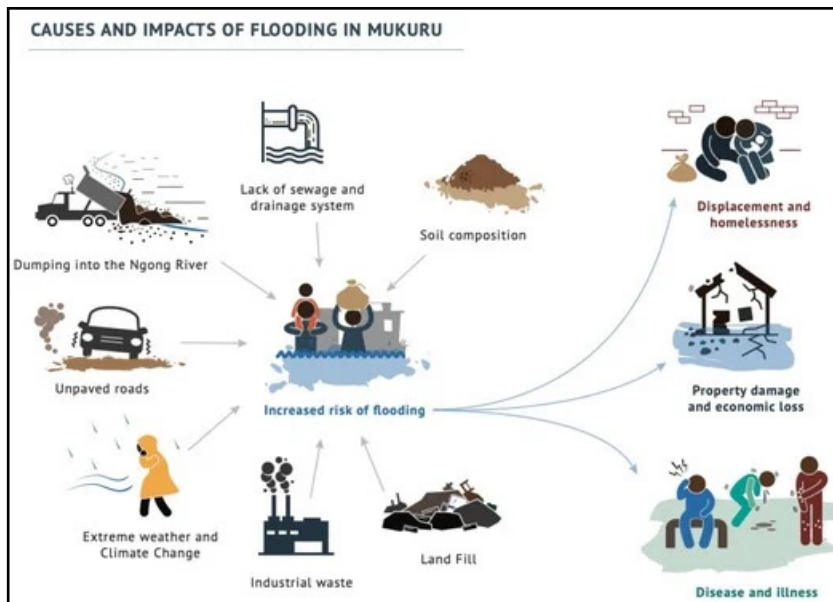
Please upload your photo here (max. 10MB).*
jpeg, png, tiff and other photo formats can be uploaded





Indicator 6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water

- In Mukuru, a citizen-science, climate justice planning process was implemented. As part of the project, a data-gathering process with citizens was co-created and the project generated evidence to inform an integrated, climate justice strategy.
- The citizen science processes showed that less 1% of residents had access to a private in-home toilet, and 37% lacked regular access to safe and affordable drinking water. As part of the project, thousands of residents were involved and they co-designed climate change adaptation strategies, such as flood mitigation, formalizing roads and pathways with drainage, and a water and sanitation infrastructure plan for all.
- Citizen scientists then used these data and moved this evidence into action to protect human health and drafted a climate justice strategy.



11.7.1 on the built-up area of cities that is open space for public use



< Zurück

Bitte bewerten Sie die Qualität des Punktes für folgende Attribute:

Wohlfühlen
Nicht wohl ————— Sehr wohl

Ruhig
Nicht ruhig ————— Sehr ruhig

Sicher
Nicht sicher ————— Sehr sicher

Sauber
Nicht sauber ————— Sehr sauber

Attraktivität
Nicht attraktiv ————— Sehr attraktiv

Ausstattung
Nicht gut ————— Sehr gut

Weiter

< Wähle Aktivitäten

Radfahren Parcour Roller

Skaten Ballsport Joggen

Auf Karte anzeigen

A small map snippet showing the Volksgarten area in Vienna, with activity icons for Radfahren, Parcour, Roller, Skaten, Ballsport, and Joggen overlaid on the map.

Was willst du machen?

A map snippet showing the Volksgarten area in Vienna, with activity icons for Radfahren, Parcour, Roller, Skaten, Ballsport, and Joggen overlaid on the map. A red banner at the top asks "Was willst du machen?".

What's next?

How to integrate citizen science data into SDG monitoring and reporting processes?

Sustainability Science
<https://doi.org/10.1007/s11625-023-01402-4>

ORIGINAL ARTICLE 

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

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Abstract
The accumulation of plastic litter in marine environments is a major environmental challenge along with the difficulties in their measurement because of the massive size of the oceans and vast circulation of plastic litter, which is being addressed as part of the United Nations (UN) Sustainable Development Goals (SDGs). Citizen science, public participation in scientific research and knowledge production, represents a potential source of data for SDG monitoring and reporting of marine plastic litter, yet there has been no evidence of its use to date. Here, we show how Ghana has become the first country to integrate existing citizen science data on marine plastic litter in their official monitoring and reporting of SDG indicator 14.1.1b for the years 2016–2020, which has also helped to bridge local data collection efforts with global monitoring processes and policy agendas by leveraging the SDG framework. The results have been used in Ghana's 2022 Voluntary National Review of the SDGs, and reported on the UN SDG Global Database, as well as helping to inform relevant policies in Ghana. In addition, here, we present a pathway that can be adopted by the relevant government authorities in other countries that have an interest in following a similar citizen science data validation and reporting process for this indicator and potentially others.

Keywords Citizen science · Data · Official statistics · Sustainable Development Goals (SDGs) · SDG monitoring · Beach litter · Marine plastics · Plastic pollution · Policymaking

Fraisl, D., See, L., Bowers, R. *et al.* The contributions of citizen science to SDG monitoring and reporting on marine plastics. *Sustain Sci* (2023). <https://doi.org/10.1007/s11625-023-01402-4>

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

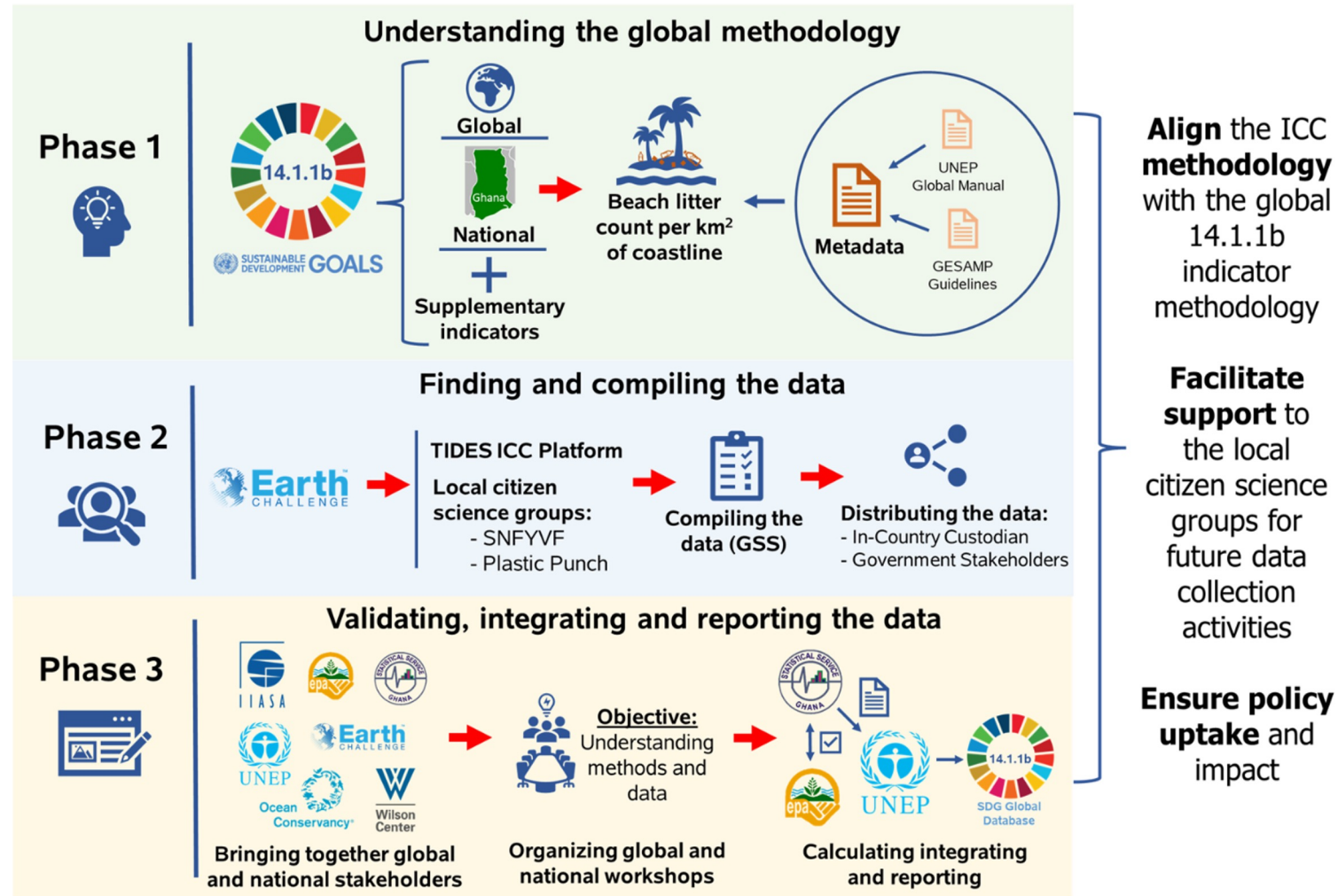


Table S2: Checklist for the process of leveraging existing citizen science data for 14.1.1b reporting

Phase 1: Understanding the global methodology for indicator 14.1.1b on <i>plastic debris density</i>
<ul style="list-style-type: none"> <input type="checkbox"/> Examine the global methodology for SDG indicator 14.1.1b with a focus on beach litter - average count of plastic items per km²; <ul style="list-style-type: none"> <input type="checkbox"/> Review the SDG Indicator 14.1.1b Metadata (UN 2021); <input type="checkbox"/> Review the Global Manual on Measuring SDG 14.1.1, SDG 14.2.1 and SDG 14.5.1. (UNEP 2021); <input type="checkbox"/> Review the GESAMP Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean (GESAMP 2019); <input type="checkbox"/> Identify additional aims beyond SDG monitoring, if applicable. Examples include: <ul style="list-style-type: none"> <input type="checkbox"/> Policy formulation; <input type="checkbox"/> Education and awareness raising; <input type="checkbox"/> Supporting citizen science initiatives for future data collection activities.
Phase 2: Finding and compiling the data
<ul style="list-style-type: none"> <input type="checkbox"/> Create a list of key stakeholders for in-country, as well as global engagement, e.g., NSO, line ministries, CSOs, academia, UNEP, ICC, etc.; <input type="checkbox"/> 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: <ul style="list-style-type: none"> <input type="checkbox"/> Global Earth Challenge Marine Litter Data Integration Platform (Earth Day Network 2021); <input type="checkbox"/> ICC TIDES database (Ocean Conservancy 2022). <input type="checkbox"/> If data are available, investigate issues, such as: <ul style="list-style-type: none"> <input type="checkbox"/> The number of beach litter collections per year; <input type="checkbox"/> The dispersion of the locations of the data collection activities; <input type="checkbox"/> The classification of litter into plastics and non-plastics as per the global methodology; <input type="checkbox"/> Completeness of the data; whether area covered is captured or needs to be approximated; <input type="checkbox"/> Any outlier values available in the data set.
Phase 3: Validating, integrating, and reporting the data
<ul style="list-style-type: none"> <input type="checkbox"/> Bring key stakeholders together and ensure their engagement by providing a platform to communicate needs, motivations, and concerns; <input type="checkbox"/> Ensure both national and global level coordination and collaboration that goes beyond the data validation activity; <input type="checkbox"/> Organize several workshops with clear goals, such as: <ul style="list-style-type: none"> <input type="checkbox"/> Understanding the methodologies developed by the citizen science projects; <input type="checkbox"/> Determining how these methodologies were implemented by local citizen scientist networks and CSOs; <input type="checkbox"/> Understanding the eligibility of coastal sites: <ul style="list-style-type: none"> <input type="checkbox"/> Identifying any geographic areas of policy interest and any existing litter prevention interventions; <input type="checkbox"/> Discerning between sites with land- or ocean-sourced litter flows. <input type="checkbox"/> Clarifying any open issues with the data set; <input type="checkbox"/> Identifying areas of future improvements of the methodologies or their implementation; <input type="checkbox"/> Understanding the limitations and challenges of citizen science data and how to overcome them or minimize their effect; <input type="checkbox"/> Ensuring that the data produced are of sufficient quality for informing the SDG indicator 14.1.1b, as well as policy action; <input type="checkbox"/> Ensuring that the ethical principles are followed while developing and using the methodology, e.g., data privacy, etc. <input type="checkbox"/> Determining whether citizen science methodologies could be integrated into future policy monitoring. <input type="checkbox"/> Gather a small team of statisticians and thematic experts for data validation; <input type="checkbox"/> Identify any shortcomings related to the data set. Some of the questions that can be asked here include: <ul style="list-style-type: none"> <input type="checkbox"/> Does the citizen science methodology align with the global 14.1.1b methodology? <input type="checkbox"/> Was the area covered captured during data collection? <input type="checkbox"/> Were the data collection sites selected using a sampling method or opportunistically (with no sampling design)? <input type="checkbox"/> If opportunistically, could the data be representative of the overall country? <input type="checkbox"/> Calculate the indicator, with support from UNEP and other partners if needed; <input type="checkbox"/> Follow the in-country structures and regulations to communicate the results, e.g., official communique between government agencies; <input type="checkbox"/> Consider reporting the results to the UN SDG Global Database and in the Voluntary National Review, once approved; <input type="checkbox"/> 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

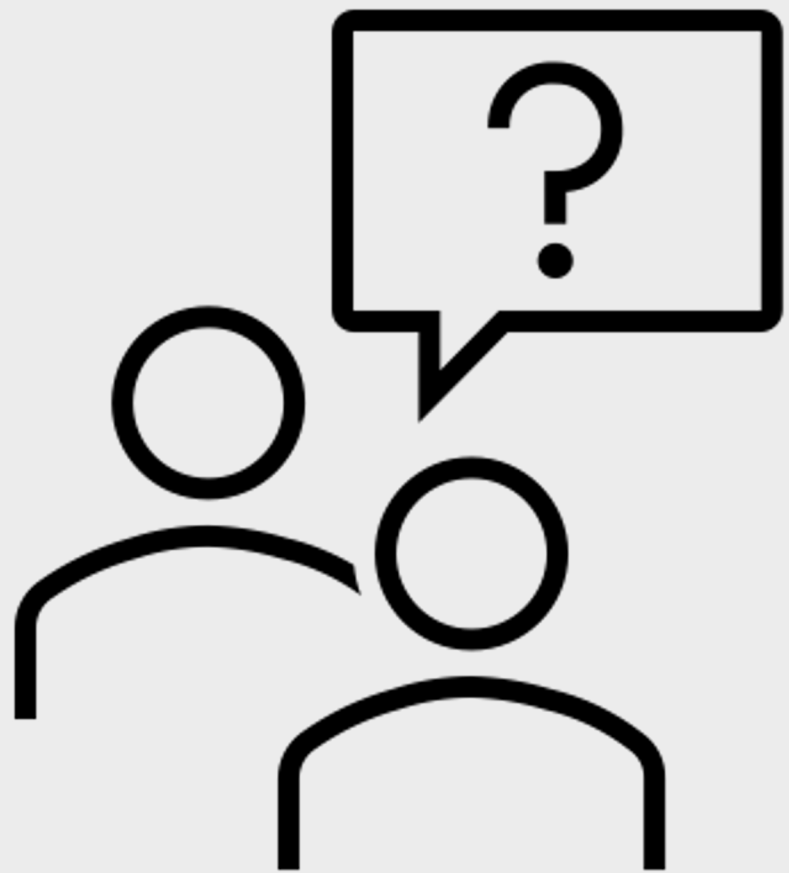


Citizens and communities are no free labor to close government data gaps; they should receive a share of the benefit from participating



@Smart Nature Freaks Youth Volunteers Foundation





THANK YOU!

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