The use of citizen science data for biodiversity monitoring and informing the GBF indicators

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Role of citizen science and participatory approaches in GBF

The GBF Framework is “…a framework for all - for the whole of government and the whole of society. Its success requires political will and recognition at the highest level of government and relies on action and cooperation by all levels of government and by all actors of society”

The GBF Monitoring Framework “…invites Parties and relevant organizations to support community-based monitoring and information systems and citizen science and their contributions to the implementation of the monitoring framework for the Kunming-Montreal Global Biodiversity Framework”
Citizen science

Gill Conquest, EXCITES, University College London

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.

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

15. Life on Land
11. Sustainable Cities and Communities
3. Good Health and Well-being
6. Clean Water and Sanitation
<table>
<thead>
<tr>
<th>GBF Headline Indicator</th>
<th>Citizen Science Projects</th>
</tr>
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<tbody>
<tr>
<td>7.1 Index of coastal eutrophication potential</td>
<td>CITCLOPS, MONOCLE, Secchi Dip-In</td>
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<tr>
<td>10.1 Proportion of agricultural area under productive and sustainable agriculture</td>
<td>FotoQuest Go, Cropland Capture, Grow, Open Tenure, Picture Pile, AgroTutor</td>
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<tr>
<td>10.2 Progress towards sustainable forest management</td>
<td>Relasphone, Amazon Aerobotany, Moabi DRC, Logging Roads, FotoQuest Go, Forest Eyes, Forest Watchers, Picture Pile, GeoWiki Human Impact on Forests</td>
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<tr>
<td>12.1 Average share of the built-up area of cities that is green/blue space for public use for all</td>
<td>OpenStreetMap, UrbanGems, GeoKey, CommunityMaps, CommonSpace, LandMark, Frei. Raum.Netz, Mijn Park, CAP4Access, CityOases</td>
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<tr>
<td>GBF Component or Complementary Indicator</td>
<td>Citizen Science Projects</td>
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<tr>
<td>Plastic debris density</td>
<td>Ocean Conservancy Interna&lt;t&gt;tiona&lt;l&gt; Coastal Cleanup, Litter Intelligence, Australian Marine Debris Initiative, OpenLitterMap, Litterati, Marine Debris Tracker, Marine Litter Watch</td>
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<tr>
<td>Proportion of land that is degraded o&lt;v&gt;er total land area</td>
<td>Geo-Wiki, Forest Watcher, LandMark, Moabi DRC, Logging Roads, Forest Eyes, Open Trash Lab - Landfills, GROW</td>
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<td>Annual mean levels of fine particulate matter (e.g., PM2.5 and PM10) in cities</td>
<td>AirCasting, AirVisual, SmartCitizen, iSCAPE, HackAir, Curious Noses</td>
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<tr>
<td>Proportion of population using safely managed drinking water services</td>
<td>Using Citizen Science Approach to monitor water, sanitation and hygiene Related Risks in Karonga Town of Malawi, Sanitary Inspections (SI) in Malawi, Crowd the Tap</td>
</tr>
<tr>
<td>Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population</td>
<td>Picture Pile, Humanitarian OpenStreetMap, Missing Maps, University of Oxford-Zooniverse-Rescue Global partnership for Hurricane Irma</td>
</tr>
</tbody>
</table>
eBird

• One of the world’s largest biodiversity-related science projects, with more than 100 million bird sightings contributed annually around the world
• An average participation growth rate of 20% year over year
• Documents bird distribution, abundance, habitat use, and trends through checklist data collected within a simple, scientific framework. Birders enter when, where, and how they went birding, and then fill out a checklist of all the birds seen and heard

  • SDG indicators 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type and 15.4.1 Coverage by protected areas of important sites for mountain biodiversity
  • GBF Headline indicator Red List Index, Red List of Ecosystems and others...
SDG 6.3.2 Proportion of bodies of water with good ambient water quality

GBF Target 11 Complementary indicator

*FreshWaterWatch*
Thousands of volunteers from around the world.
Picture Pile

- Pairs of images for change detection
- Wilderness, deforestation, building damage assessment
- Yes/No/Maybe mechanic
- Yes/No/Maybe mechanic modified for categorical and continuous variable data collection
- Could contribute to the monitoring of 15 SDG indicators (SDGs 1, 2, 11, 13, 14, 15)

Challenges of using citizen science in the context of official monitoring & official statistics

- Data Quality
- Local vs Global
- Representativeness/inclusivity (digital divide);
- Various methodologies used in similar projects
- Recruitment and retainment
- Overburdening the public especially those whose daily lives are a struggle;
- Lack of understanding
- Lack of guidance
- Lack of funding
To achieve impact at scale with citizen science

- An urgent dialogue and action among citizen science practitioners and researchers, the official statistics community, citizens, and other actors to build partnerships and to work together;

- Citizen Science Global Partnership, a network of networks that aims to advance citizen science to achieve sustainability at scale, to bridge the gap between these communities and actors;

- The official statistics community to reflect on the inclusiveness and relevance of their practices to individuals, communities, and to society, to keep an open mind for a more constructive discussion and not to get lost in an unproductive debate about citizen science data quality with a biased perception;

- Funders to rethink their strategies, to go beyond short-term pilot studies and provide genuine financial support to citizen science initiatives.

THANK YOU!

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