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# Citizen science tackles plastics in Ghana



**Citizen science efforts are instrumental in monitoring our progress towards the UN Sustainable Development Goals. Dilek Fraisl, Research Scholar at the International Institute for Applied Systems Analysis, and Omar Seidu, Director of Social and Demographic Statistics and the SDGs Coordinator at the Ghana Statistical Service, discuss how Ghana successfully integrated citizen science data into its official monitoring of marine plastic debris.**

Left: Dilek Fraisl. Right: Omar Seidu.

**Your team has been working on incorporating citizen science data into the official monitoring of plastic debris density, in accordance with the United Nations (UN) Sustainable Development Goals (SDGs). Can you briefly describe the state of marine plastic pollution in Ghana? How much do we know based on official monitoring of SDG indicators? How has citizen science helped paint a clearer, more accurate picture of the current situation?**

**OS:** An estimated 8 million tonnes of plastic waste leaks into the ocean every year, and Ghana generates approximately 1.1 million tonnes of plastics per year. This is due to the substantial economic growth that Ghana has experienced in recent years, as well as the 2.2% population growth annually, which has urged the Ghanaian authorities to act. Ghana was the first African country to join the Global Plastic Action Partnership in 2019. Ghana also has a growing and active citizen science beach clean-up community including one of our project partners, the Smart Nature Freak Youth Volunteers Foundation (SNFYVF).

Before our work, Ghana had no official data available related to marine plastic litter. Based on the data collected through citizen science initiatives in the country and our project 'Citizen Science for the SDGs in Ghana' (CS4SDGs), we now know that in 2020 alone more than 152 million plastic items were found along the beaches in the country. CS4SDGs is a project that aimed to integrate already existing citizen science beach litter data and networks into the official SDG monitoring and reporting mechanisms of Ghana. The project was a partnership between the International Institute for Applied Systems Analysis (IIASA), the Ghana Statistical Service (GSS), the Ghana Environmental Protection Agency (EPA), the Sustainable Development Solutions Network's Thematic Research Network on Data and Statistics (SDSN TReNDS), the United Nations Environment Programme (UNEP), Earth Challenge, Ocean Conservancy (OC), and citizen science and action groups operating locally in Ghana. CS4SDGs has helped the Ghanaian authorities to address the data gap on marine plastics through citizen science, but it also provided a concrete example of how citizen science data can be integrated into official statistics, which was lacking before the project.

**DF:** Citizen scientists in Ghana had already collected data that helped the authorities to gather baseline data between 2016 and 2020. More specifically, citizen science data helped to understand what the items of plastic litter found in Ghana's beaches were as a percentage of total plastic litter for these four years. These data also helped to identify that plastic pieces are by far the most common items found in Ghana's beaches. Citizen science data have also helped to understand the impact of the COVID-19 pandemic on the environment because in 2020 gloves and masks (personal protective equipment) were found for the first time in Ghana's beaches. In the end, citizen science data were not only helpful for the country's official SDG monitoring and reporting activities but also for taking necessary policy actions to address the marine plastic issue in the country.

**Citizen science, then, was critical in gathering data on beach litter in Ghana. What do you see as the challenges, as well as opportunities, of incorporating citizen science data into official monitoring programmes, especially in countries with limited resources?**

**DF:** We identified that lack of awareness of citizen science data and approaches and of their potential for SDG monitoring and implementation among the data and statistics community is one of the greatest challenges, as well as the gap between the citizen science initiatives that happen mostly at a very local level and the national- and global-level SDG monitoring processes. However, there are initiatives led by citizen science associations across the globe that already implement high levels of quality control processes and that work towards aligning local and global definitions and objectives.

Lack of political will and the legislative base can be a challenge for the integration of citizen science data into official statistics. However, we know from our experience in Ghana that countries with limited resources are already working with new sources of data to mitigate their data gaps and address policy needs. This is because they have both the political will and the legislation in the country that creates an enabling environment for establishing more inclusive data ecosystems. Those countries that lack sufficient human capacity and financial resources might struggle at first to use citizen science data for SDG monitoring. However, based on our project in Ghana, we are developing step-by-step guidelines and how-to manuals to integrate citizen science data into national monitoring, including SDG monitoring. This is exactly what we aimed to achieve with our Ghana project, and we are keen to share our experiences with other countries so that they can adopt and adapt them to their needs.

Data gaps related to marine plastics are a global problem. This is because of the vastness of the oceans and the extensive circulation of plastics, even to the most remote areas of the world, which makes the research on marine litter and its impact on the environment difficult and costly. Marine plastics are not the only issue citizen science data can help address. The SDG framework has major data gaps. For example, according to UNEP, 58% of the 92 environmental (SDG) indicators lack data, and citizen science data have great potential

CREDITS: LEFT, SILVERI, IIASA; RIGHT, OMAR SEIDU

to address these data gaps. For example, in a previous research project we showed that 33% of the SDG indicators can benefit from citizen science data, and the greatest input from citizen science to the SDGs can be in the environmental SDG indicators.

**Can you briefly outline the main steps for a country wishing to incorporate marine plastic litter citizen science data into their official SDG monitoring and reporting activities based on your experiences in Ghana, including how you validated the citizen science data?**

**DF:** Our process of integrating citizen science data on marine plastic litter started with understanding the global methodology for indicator 14.1.1b Plastic Debris Density, followed by identifying whether there are existing citizen science and other data available in Ghana on marine litter that can be leveraged for SDG reporting. We used the Earth Challenge Marine Litter Data Integration Platform and OC Trash Information and Data for Education and Solutions (TIDES) database at this stage. In the second step, we compiled the data along with making contacts to the local initiatives so that they can be engaged in collaboration with other stakeholders to validate the data in the next step. Data validation included understanding the data and the data collection methodologies, which were facilitated through a series of workshops, and policy roundtables. In a nutshell, as part of the validation process, we brought the key stakeholders together, including the experts from IIASA that have experience and knowledge of citizen science data and the SDGs; the GSS and the EPA as the country leads; UNEP as the custodian agency responsible for global monitoring and reporting of various environmental SDG indicators including 14.1.1b; Earth Challenge and the OC as data compilers; and the SNFYVF and Plastic Punch as the local citizen science community representatives and Civil Society Organizations in Ghana. Once the validation was completed, the data were then integrated into official statistics through a collaboration between the GSS and the EPA as the in-country custodian agency. Finally, the indicator data are communicated to UNEP for official reporting to the SDG Global Database, which is maintained by the UN Statistics Division. We will make our process and results openly available for those who want to utilize them to address their data and policy needs.

**The global methodology for plastic debris density calls for the use of citizen science. How did Ghana achieve that in your view? In what ways did incorporating citizen science data sets in Ghana's monitoring programme affect the design of relevant policies?**

**OS:** One of the key factors for the success of our project was due to Ghana's progressive approach to the use of new sources of data for official statistics. For example, the Ghanaian Government passed the new Statistical Service Act in 2019, which mandates the GSS to coordinate statistical information across the whole government system, develop and raise awareness of codes of ethics and practices to produce data, and include new sources of data as a valid input for production of official statistics. This shows that the effective legal arrangements can prepare the groundwork for citizen science data to be used as official statistics and for SDG monitoring and reporting. Political commitment from the partners in Ghana also helped to achieve success. Ultimately, without the support of citizen science and action groups in the country that actually collected the litter and the data on the ground, this project would have never been successful. Since the start, citizen scientists have been willing to work with the government agencies and international partners, as well as other key stakeholders to support our project, which played a significant role in achieving our result.

As a result of our project, Ghana is now the first country to officially report on SDG indicator 14.1.1b in the global repository using citizen science data. Our results will provide inputs into the formulation of an Integrated Coastal and Marine Management Policy that is currently being developed by the Ministry of Environment in Ghana. The policy will seek to set the framework to guide programme development and implementation to jointly address marine pollution in line with the Abidjan Convention. The policy is expected to be completed and adopted in 2023. The GSS and the EPA have been streamlining efforts in the country since the start of the project to ensure policy outcomes.

*Interviewed by Stephanie M. Olen*

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