<u>Special Collection</u> **"Contributions of Citizen Science to the SDGs and other International Development Frameworks of Citizen Science: Theory and Practice"**

Supplemental File 4. Appendix D to Citizen science: What is it in it for the official statistics community?

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Other information from qualitative feedback provided by the 2021 survey respondents

A. Respondents' definition of citizen science data

39% provided a definition of citizen science data that covered at least one of its aspects according to the definition used in this article.

B. Other barriers mentioned in the qualitative feedback by respondents with no experience with citizen science data

Other barriers mentioned included a lack of clarity on what is possible and how such data can fill gaps, missing technical capacity to lead on such projects or the time and funding to apply them, resistance to introducing solutions involving uncertainty on quality-related aspects and, in some cases, the difficult dialogue with NGOs which may not consider quantitative approaches and official statistics as valid methods and approaches. Some respondents indicated that their current legal basis has not provided a mandate for engaging with other stakeholders.

Statistical literacy of citizens or even their lack of interest were identified as another constraint. Concerns related to ensuring confidentiality and impartiality of data have also been expressed, with the latter being particularly important in the case of so-called "advocacy" data, which relates to the methodological and quality concerns.

A number of problems raised were in fact directly related to data quality. Some felt that citizen science data may be non-representative as they may not follow a proper sampling methodology. It may either only reflect the views of some concerned individuals with potential selection bias or only focus on a selected local area or a city. The insufficient geographical coverage is a concern for producing national level statistics. Here, the lack of data quality verification mechanisms or opportunities due to insufficient knowledge, human resources or funding was mentioned several times. Finally, one of the respondents noted that "sustainability of access is perhaps the main perceived barrier, making the upfront investment in this method of data collection something that NSOs are reluctant to take on at this stage".

C. Other barriers mentioned by respondents with experience of citizen science data

Many of the qualitative feedback referred to quality- and methodology-related considerations and knowledge about how to address them. Some survey respondents mentioned awareness, regulatory aspects, representativeness, lack of information about how the data were produced, ethics in the use of

data and confidentiality, as well as uncertainty with regards to the sustainability of the data source and related issue of time series, and insufficient human and financial resources as other common obstacles.

D. Additional qualitative information related to experiences with specific citizen science data projects

When asked about involving citizen science stakeholders in the methodological decisions and about the existence of specific rules on access and confidentiality measures to treat these datasets, 6 and 5 out of 12 respondents respectively answered "yes". Some of those who were not involved directly in those projects were unsure about stakeholder participation in discussing the methodology.

In terms of incentives and motivation for citizen scientists and CSOs to contribute to data production by NSOs was that such projects help bring community's perspective and strengthen its agency. Citizen science community was generally more eager to engage on those data issues where specific challenges or policy issues were at stake. Multi-stakeholder data workshops or gatherings bringing together the statistical system, parliament, government, development partners, academia, and research institutions or the creation of national reporting platforms are examples of other types of good practices or incentives.

Lack of cooperation with local authorities was specifically highlighted in the survey as an area that needs to be addressed to better leverage citizen science data from the local level. Another limiting factor identified in the survey was the limited ICT integration/modernization in the process of data production and dissemination.

Among factors that have sparked such collaborations were collaboration with the University, dedicated capacity development projects in the field, awareness, the opportunities offered by such collaboration for timely data and the legal base.