Statement of the Citizen Science & Open Science Community of Practice (under the Citizen Science Global Partnership) on the DRAFT UNESCO Recommendation on Open Science

Until 31 December 2020, stakeholders including the CS & OS CoP have an opportunity to provide feedback on the Draft Recommendation. Via this joint statement, members of this CS & OS CoP wish to provide consolidated feedback, not foreclosing individual responses by the CS & OS CoP members to UNESCO via the broader consultation process.

Background on the CS & OS CoP

The Citizen Science & Open Science Community of Practice (CoP) was formed in early 2020 under the Citizen Science Global Partnership as a response to the UNESCO process of formulating a Recommendation on Open Science. The CS & OS CoP intends to seize the opportunity to advocate for and support Citizen Science as an essential element of a global perspective of Open Science. This represents a key occasion for international exchange and cooperation that should extend beyond the UNESCO process. At UNESCO's invitation, the CoP produced an input paper providing global perspectives on Citizen Science and Open Science, based on inputs from >60 Citizen Science researchers and practitioners around the globe. In addition, the CoP supported three regional consultations of UNESCO, and will continue to contribute to the UNESCO Recommendation on Open Science as the process unfolds.

In its paper on Citizen Science and Open Science, the CS & OS CoP made **two primary recommendations** for the UNESCO Recommendation on Open Science:

1. Opening up access to data, publications, and other research products is necessary but not sufficient to transition science fully towards Open Science. Citizen Science presents the means for open, holistic and participatory processes of knowledge generation, **therefore Citizen Science should be acknowledged as an important pillar of Open Science to enable it to add this significant value.**
2. The Citizen Science contribution to Open Science should be maximised by **i) drawing on the vast practical experience within its communities**, of the implementation of Citizen Science via the careful assessment of opportunities and challenges, and application of lessons learned, **ii) fostering greater and enhanced cooperation**, synergies and cross-pollination of practitioners among and between Citizen Science and Open Science communities, and **iii) ensuring global access and solidarity to support infrastructures**, including technical infrastructures and community networks.

Consolidated feedback by the CoP on the UNESCO draft Recommendation
We recognize that UNESCO has taken into account many of our suggestions around the importance of opening the process of science, including in the third key objective and element listed, "**open the process of scientific knowledge creation and circulation to societal actors beyond the institutionalized scientific community (p.8).**"

This recognized, we propose:

(1) Throughout the Recommendation:

- Carefully consider the **order** of the listed aspects in the sequence of several articles and sub-statements, so that the process of **practicing** Open Science is not listed last but first (or near the start), to reflect adequately the importance of opening up the scientific **process**, not just its outputs.
- Further, we propose a stronger emphasis on **members of the general public - including communities and civil society organisations - as primary stakeholders** throughout the Recommendation (especially in articles: Art. 15, 16, 22, 23).

(2) In specific articles, **we propose the following changes/additions** (underscored):

- Article 9 (vii) (Open Engagement of Societal Actors): In addition to web-based platforms and social media, open source hardware and software (especially low cost sensors and mobile apps) should be added since they also facilitate the contributions of the public to open scientific research.

- Article 9 (viii) (Openness to Indigenous Knowledge Systems): There is a need to also acknowledge the right of Indigenous peoples and local communities to govern and make decisions on custodianship, ownership and administration of data and information about these communities and sovereign nations themselves (e.g., health data, administrative records).

- Article 10 (Sensitive data): "Sacred indigenous knowledge" is not the only sensitive data about indigenous peoples and communities. For this reason, please consider enhancing the term "sacred indigenous knowledge" with "sensitive indigenous knowledge, information, data, and imagery".

- Article 12 (key Open Science actors): Citizen scientists as key actors of Open Science are not mentioned so far. The language used in (i) seems to focus on professional researchers and in (v) on technology developers. Moreover (xi) 'users and the public at large' implies a recipient - rather than an active contributory role which is directly contrary to the philosophy of Open Science outlined in Article 9 (vii).
  To include citizen scientists as key actors, we propose:
  - Article 12 (i): "Researchers, regardless of their nationality, ethnicity, gender, discipline and socio-economic background, professional status or affiliation who are at the center of Open Science activities, including citizen scientists".
  - Article 12 (v): "Software developers, coders, creatives, innovators, engineers, citizen scientists, and all people that engage in peer production of science contributing to the dynamic hybrid interdisciplinary spaces where open science is practiced and advanced."

- ○ Article 12 (xi) should use terminology that emphasises their active roles: "Members of the general public - including communities and civil society organisations - who can actively contribute to research, appreciate available scientific outputs, provide relevant feedback, communicate science and/or create value-added outcomes in collaboration with or without the original producers of scientific outputs."
  - ○ Article 12 (xi) Listing this key set of actors *last* could be considered degrading, and UNESCO might consider moving it up to indicate that this sector is a priority.

- ● Article 14 (intellectual property):
  - ○ Make potential active roles of members of the general public explicit: "Open Science critiques and transforms the boundaries of intellectual property to increase access to knowledge by everyone as well as create opportunities for members of the general public to act as co-creators of knowledge."
  - ○ Add the sentence: "Moreover, open licenses can not only facilitate access to finalized products, but can also enhance (re-)use and repurposing of resources to encourage creation of derivative products and services, or innovation resulting from data interoperability."

- ● Article 16 (b) (equal opportunity): It should be added: "Equal opportunities and access: all researchers and societal actors regardless of country of origin, gender, field of research, funding basis, professional status, affiliation, or career stage have an equal opportunity to contribute to and benefit from Open Science."

- ● Article 18 (e) (common understanding of open science): It is important to ensure the needs and rights of indigenous peoples over their traditional knowledge, as well as their rights over other kinds of information, data, and imagery about indigenous communities and their lands, territories and resources.

- ● Article 18 (f) (common understanding of Open Science): In addition to the private sector, members of the general public at large including communities and civil society organisations should be included into further discussions on how to shape and enlarge Open Science since they bring in the perspective of many citizen and community science activities.

- ● Article 19 (g) (enabling policy environment): The reference to 'models' that allow co-production of knowledge should be made more precise: "Designing models that allow co-production of knowledge and methods and tools with heterogeneous actors and establishing guidelines to ensure the recognition of *non-professional* collaborations."

- ● Article 20 (infrastructures and services):
  - ○ (g) It is essential to **include civil society organisations as recipients of funding for building Open Science infrastructures**;
  - ○ (h) It is worth adding: "Co-creation of such AI technologies with citizen scientists (that often work alongside these AI or provide the data for them) and members of

the public at large (which will use and face the knowledge created in such ways) should be supported."

- ○ (j) Highlight that not only technical infrastructures are needed to facilitate such cooperation: "Platforms *and networks* for exchanges and co-creation of knowledge between scientists and society, including through predictable and sustainable funding for volunteer organizations conducting Citizen Science and participatory research at the local level."

- ● Article 21 (capacity building): The **role of members of the general public** - including communities and civil society organisations - needs to be strengthened.
  - ○ In the objectives, the phrase should be expanded: "This should have as its objective to develop the critical mass of scientists *and civil society actors* ...".
  - ○ Paragraph (a): "Providing systematic and continuous capacity building on Open Science concepts, principles and practice, including data science and stewardship, curation and archiving, information and data literacy, web safety, content ownership and sharing, as well as software engineering and computer science, *cooperation with civil society, knowledge co-creation and science-society cooperations*.
  - ○ Most substantially, an additional paragraph should be created to stimulate capacity building in an essential area that has hitherto been left out: *(e) Investing in and promoting advanced education and capacity building in critical big data and algorithm literacy for civil society organizations and members of the general public. Skills in this area are an essential base for societies to scrutinize, use, contribute to and innovate with a science that increasingly leverages big data, AI and co-creation.*

- ● Article 22 (c) on scientific culture and aligning incentives: Include "*co-creation of knowledge*" as one relevant dimension that should be covered by evaluation systems.

- ● Article 23 (vi): While we welcome the mention and promotion of innovative approaches for Open Science at different stages of the scientific process, we believe that item (b) needs to be strengthened: "*Referring to, using and* develop*ing* new participatory methods and validation techniques to incorporate and value inputs from the broader public, including through participatory and citizen science."

We thank UNESCO for this opportunity to contribute to the Recommendation. The CS & OS CoP is available to continue to contribute to the UNESCO Recommendation on Open Science as the process unfolds, including via reflection among its practitioner members from the fields of Citizen Science and Open Science on the implications of the UNESCO Recommendation on their own practices.