

Lacuna Fund: Our Voice on Data

Resources for Proposals in Agriculture

This document represents a collection of resources from the Technical Advisory Panel as an addition to those referenced in the RFP document. These are intended to provide assistance in obtaining relevant background information, preparing a competitive proposal, and completing quality work.

These resources are not intended to be exhaustive nor authoritative. This document does not represent an endorsement of work by the Lacuna Fund Secretariat, the TAP, or individual members.

PREVIOUS WORK AND RELEVANT BACKGROUND

Relevant recent challenges and other efforts:

- Papers from the recent International Conference on Learning Representations (ICLR) Computer Vision 4 Agriculture (CV4A) workshop.
- Jadunandan Dash, “Satellites and Crop Interventions,” *Nature Sustainability* 2, no. 10 (October 2019): 903–4, <https://doi.org/10.1038/s41893-019-0402-3>.
- Steffen Fritz et al., “A Global Dataset of Crowdsourced Land Cover and Land Use Reference Data,” *Scientific Data* 4, no. 1 (December 2017): 170075, <https://doi.org/10.1038/sdata.2017.75>
- Juan Carlos Laso Bayas et al., “A Global Reference Database of Crowdsourced Cropland Data Collected Using the Geo-Wiki Platform,” *Scientific Data* 4, no. 1 (December 2017): 170136, <https://doi.org/10.1038/sdata.2017.136>;
- Lei Ma et al., “Deep Learning in Remote Sensing Applications: A Meta-Analysis and Review,” *ISPRS Journal of Photogrammetry and Remote Sensing* 152 (June 1, 2019): 166–77, <https://doi.org/10.1016/j.isprsjprs.2019.04.015>.
- IIASA Earth Challenge 2020 ([press release](#)).

PRIVACY AND ETHICS

- See Overseas Development Institute’s (ODI) [Data Ethics Canvas](#) as a helpful resource to consider ethical issues in a proposed project.
- ODI’s [privacy and openness principles for personal data](#).

OTHER RESOURCES ON OPEN DATA INCLUDE:

- [The Beijing Declaration on Research Data](#)
- [The Big Secret in the Academy Is That Most Research Is Secret: The dangerous rift between open and classified research](#), Spring 2020
- “Legal and Ethical Issues around Incorporating Traditional Knowledge in Polar Data Infrastructures” *Data Science Journal* 16(1)pp1-14.

- The work of [Africa Digital Rights Hub](#).

Although U.S.-oriented, recent work by Trust in Food [highlights farmer perspectives related to ground data collection](#).

DATA QUALITY

See the following references for considerations related to data quality:

- Pengra, Bruce W., et al. "Quality Control and Assessment of Interpreter Consistency of Annual Land Cover Reference Data in an Operational National Monitoring Program." *Remote Sensing of Environment*, Time Series Analysis with High Spatial Resolution Imagery, 238 (March 1, 2020): 111261. <https://doi.org/10.1016/j.rse.2019.111261>.
- Ambica Paliwal and Meha Jain, "The Accuracy of Self-Reported Crop Yield Estimates and Their Ability to Train Remote Sensing Algorithms," *Frontiers in Sustainable Food Systems* 4 (2020), <https://doi.org/10.3389/fsufs.2020.00025>.
- Arthur Elmes et al., "Accounting for Training Data Error in Machine Learning Applied to Earth Observations," *Remote Sensing* 12, no. 6 (March 23, 2020): 1034, <https://doi.org/10.3390/rs12061034>.
- See also a guide for [best practices for ground reference data collection and cataloguing](#).

Note, these are only a few of many resources in this domain.

LABELING TOOLS

The following tools are open source or free to use:

- LACO-Wiki
- Google Earth Engine Apps
- Label-Maker

There are many other available annotation tools, both free and paid, for a variety of purposes.

CATALOGING TOOLS

The following tools are designed to make it easy to create [SpatioTemporal Asset Catalog](#) (STAC) metadata:

- PySTAC – Catalog generation to the latest STAC specification.
- Stac-Browser – Python package to browse created STAC catalogs.

DATA SHARING

Global Open Data for Agriculture and Nutrition network (GODAN) resources on data standards:

- <https://www.godan.info/documents/ownership-open-data-governance-options-agriculture-and-nutrition-0>
- <https://www.godan.info/documents/responsible-data-agriculture>
- <http://openupguideforag.info/>
- Pesce, Valeria, Lisette Mey, Pauline L'Hénaff, and Carlos Tejo-Alonso. "A Survey of Data Standards for Land and Nutrition Data." *F1000Research* 7 (October 24, 2018). <https://doi.org/10.7490/f1000research.1116234.1>.
- Pesce, Valeria, Jeni Tennison, Lisette Mey, Clement Jonquet, Anne Toulet, Sophie Aubin, and Panagiotis Zervas. "A Map of Agri-Food Data Standards." *F1000Research* 7 (February 12, 2018). <https://doi.org/10.7490/f1000research.1115260.1>.