The Value of Public Participation in Ecological Research (PIER)

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Citizen Science in Ecology

Members of the public play a major role in ecological research today through **citizen science (CS).** From local, community-led research collaborations to huge online platforms, ordinary people are contributing vast amounts of biodiversity data, shaping the research questions asked and methods used, and generating knowledge about their natural surroundings.

Does public participation make a positive contribution to ecological research? What is the *epistemic value* of CS?

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Directing Ecological Research

Birdwatching data are...

- useful for studying species distribution, migration, and other phenomena at large spatial and temporal scales
- not so useful for studying population sizes, behaviour, or intra- and interspecific ecological relations

Big CS biodiversity data can enable ecologists to answer novel and important questions, but they also **risk creating blind spots**.

A Case Study: eBird India

eBird is a global birdwatching data platform developed by the Cornell Lab of Ornithology. eBird is the biggest contributor of biodiversity data worldwide.

India is the third largest eBird contributor. eBird India's success and its location outside the traditional birdwatching areas of North America and Britain make it a perfect case study for understanding how big CS plays out in practice.



Can Big CS Enhance Epistemic Diversity?

For many, the epistemic value of CS lies in its contribution to epistemic diversity. Highly collaborative research with local communities allows a greater variety of perspectives to contribute to scientific practice and generates novel research questions, approaches, interpretations, and findings.

Enabling Diverse Forms of Participation

Big CS might look like just data collection for professional scientists. Yet **there are many ways people participate in big CS**:

- acquiring skills related to species identification and ecological data
 evaluating, curating, and making use of data
- conducting biodiversity surveys to support local conservation claims These forms of participation may have divergent consequences for epistemic diversity. For instance, they may enforce a single global taxonomy but also enable diverse research questions and methods.

A New Framework for Big CS

Existing frameworks for evaluating CS do not sufficiently recognise the diversity of communities, contexts, and purposes in big CS.

 E.g., adequacy-for-purpose frameworks for data tend to assume a single purpose; yet big CS has many purposes that place conflicting demands on data

Understanding the epistemic value of big CS for ecology demands a **new framework** that incorporates **multiple dimensions**. Composition of the Diversity and allocation of

Epistemic diversity is diversity in factors relevant to knowing and knowledge making, including background assumptions, theories, perspectives, research questions, methods, models, materials, etc.

But what about "big" CS? Big CS projects like eBird and iNaturalist amass huge amounts of biodiversity data from thousands of volunteers. Yet big CS typically involves limited and regimented participation aimed at data production for professional science.

Can big CS nevertheless contribute to epistemic diversity?

Methodological Approach

My approach is **integrative**, **intersectional**, and **hermeneutic**. I have started conducting participant observation and interviews with ecologists, coordinators and participants involved in eBird India.





 examining intersecting dimensions of gender, class, education level, language, and ethnicity developing claims iteratively throughout the process of sourcing, interpreting, and communicating empirical data

Integrative













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