

Response to Lakshminarayanan. 2007. "Using Citizens to Do Science Versus Citizens as Scientists"

Science Explicitly for Nonscientists

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In response to our paper Citizen Science as a Tool for Conservation in Residential Ecosystems, Lakshminarayanan (2007) calls attention to the importance of examining the nature of the relationship between those who collect scientific data and those who use the data for professional scientific purposes. Our initial paper proposed a method of community science that would change the way the public relates to values and protects the natural world (Cooper et al. 2007). Here we want to emphasize another strength of community science, including citizen science, namely, its potential capacity to change public perception of the value of science to individuals and to society. We want to explain how this transformational facet of citizen science relates to Lakshminarayanan's (2007) valuable comments.

Given the lack of recruitment into science professions such as ornithology in India (Shyamal 2007), the debatable possibilities of biopiracy (Agosti 2006), and reported lack of conformity to the Organisation for Economic Co-operation and Development (2007) recommendations for data sharing (Shyamal 2007), ethical concerns about the nature of public participation in research, such as occurs via citizen science, are of central importance to the advancement of science.

However, Lakshminarayanan (2007) framed arguments of inequities in citizen science in the context of an example from the 19th century of the conflict arising when scholars in Britain involved people in their colonies in the centralized data collection without having facilitated their induction into the scientific profession. In this context, Lakshminarayanan (2007) made a case that citizen

science should treat citizens as scientists on equal terms.

Discrepancies in the perception of fair treatment may arise from differences in objectives of the projects and the opportunities available to citizens, which in turn differ with societal, political, and socioeconomic conditions. In our paper, we discussed Citizen Science paradigms tailored primarily to societies in which there are many opportunities for citizens to enter scientific professions but comparatively fewer venues for citizens to be involved in science as nonprofessionals. A society's capacity to solve collective problems may be improved when its citizenry has confidence in science and an understanding of the scientific method. As Sagan (1996:26) pointed out, "We've arranged a global civilization in which most crucial elements (...) profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster." People in nonscience professions gain science literacy through participation in Citizen Science (Krasny and Bonney 2005, Evans et al. 2005). We acknowledge that the program objective of providing explicitly informal science education could often lead to project designs that might not foster advanced research professions in developing nations. Ironically, the scientific research topics that are best facilitated via Citizen Science, namely describing large-scale patterns, may be more pressing in developing nations in which, for example, ornithologists may undertake advanced research projects without well-established descriptive foundations (Shyamal 2007)

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Lakshminarayanan (2007) calls for open access to data and the freedom for all to conduct science, with which we whole-heartedly agree. Citizen science programs can facilitate the public use of collective data in a number of ways, including some of our approaches at the Cornell Lab of Ornithology: educating participants to be fluent in the scientific method, facilitating the networking of participants so that they can learn from each other, and providing online tools that allow the public to access and use of their own data and the collective data (see <http://www.nestwatch.org>, <http://feederwatch.org>, and <http://www.ebird.org>). By crafting user-friendly data analysis and visualization tools, we feel that projects come closer to the objectives of democratizing science. As discussed in our initial paper, the worthwhile goal of involving citizens in every step of the research process is easier with small, local projects, and is often sacrificed to achieve broad geographical representation in data collection.

There are many community science methodologies that vary in their capacity to reach varied and laudable goals such as educating and empowering people to address scientific questions that interest them, educating people first-hand about conservation issues, connecting urban populations with nature, centralizing critical information on the distribution and abundance of organisms, and bringing people into scientific professions. We advocate thoughtful application of a range of approaches, all of which contribute to the greater good.

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/vol13/iss2/resp1/responses/>

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