



## Perceptions of priority issues in the conservation of biodiversity and ecosystems in India



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### ABSTRACT

We report on the results of a country-wide survey of people's perceptions of issues relating to the conservation of biodiversity and ecosystems in India. Our survey, mainly conducted online, yielded 572 respondents, mostly among educated, urban and sub-urban citizens interested in ecological and environmental issues. 3160 "raw" questions generated by the survey were iteratively processed by a group of ecologists, environmental and conservation scientists to produce the primary result of this study: a summarized list of 152 priority questions for the conservation of India's biodiversity and ecosystems, which range across 17 broad thematic classes. Of these, three thematic classes—"Policy and Governance", "Biodiversity and Endangered Species" and "Protection and Conservation"—accounted for the largest number of questions. A comparative analysis of the results of this study with those from similar studies in other regions brought out interesting regional differences in the thematic classes of questions that were emphasized and suggest that local context plays a large role in determining emergent themes. We believe that the ready list of priority issues generated by this study can be a useful guiding framework for conservation practitioners, researchers, citizens, policy makers and funders to focus their resources and efforts in India's conservation research, action and funding landscape.

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## 1. Introduction

Growing human populations and increased per capita consumption have resulted in unsustainable exploitation of earth's natural resources (Rands et al., 2010). At the same time, we are also witnessing directional changes in many large scale drivers of the earth system including increasing atmospheric carbon dioxide, rising temperatures and nutrient loading, all of which have the potential to exacerbate the ongoing loss of earth's biodiversity and to impact many aspects of human well-being (Rands et al., 2010; Steffens et al., 2011). Against this backdrop, there is an urgent imperative to understand the consequences of these changing environmental drivers and patterns of resource use for human societies and biodiversity conservation, and to develop ecological, environmental and social policies that are appropriately responsive.

Responding to this need, several recent initiatives have focused on identifying the most critical questions of ecological, conservation or policy relevance (Dicks et al., 2013; Ingram et al., 2013; Pretty et al., 2010; Rands et al., 2010; Rudd et al., 2011; Sachs et al., 2009; Sutherland and Woodroof, 2009; Sutherland et al., 2009, 2010, 2011a, 2013a, 2013b; Walzer et al., 2013). While many of the issues identified in these initiatives (Sutherland et al., 2009, 2011a, 2012, 2013a, 2013b) are broadly relevant across large spatial scales (e.g., global, continental), others are likely to be more or less relevant at smaller scales (e.g. countries, regions within countries) depending on local ecological or social conditions. Thus, national and region-specific assessments are particularly important for the development of research and policy that are appropriately tailored to local conditions. For example, ecological, political and social conditions differ between the developing and developed worlds in important ways, but most national assessments to date have taken place in the developed world (e.g. UK (Sutherland and Woodroof, 2009; Sutherland et al., 2010), USA (Fleishman et al., 2011) and Canada (Rudd et al., 2011)). Our objective in this country-level assessment was to identify perceptions of priority issues for the conservation of biodiversity and ecosystems in India, a developing country that is both highly populous and rich in biodiversity. With India's population of 1.2 billion people still growing, its rapid economic growth and aggressive development (Government of India, 2014; United Nations, 2006), all of which are escalating the demands on its natural resources and shrinking its wild lands, such an assessment to inform conservation research and policy for this region is particularly important. To the best of our knowledge, this is the first such large-scale assessment from the developing world.

Past initiatives to identify issues of ecological and conservation importance (Dicks et al., 2013; Ingram et al., 2013; Pretty et al., 2010; Rands et al., 2010; Rudd et al., 2011; Sachs et al., 2009; Sutherland and Woodroof, 2009; Sutherland et al., 2009, 2010, 2011a, 2013a, 2013b; Walzer et al., 2013) have developed effective participatory methods for these exercises. In this initiative, we drew upon these methodological guidelines (Sutherland et al., 2011b), with some modifications given our goals. While other such initiatives have typically used subject experts or practitioners as participants, in our study, we chose to go to a wider population of citizens and ask what issues they perceived as being of importance to the conservation of biodiversity and ecosystems in the country. This choice reflects our (authors) desire, as a group of ecologists, environmental and conservation scientists, to reach out to a wider representation of people in identifying what issues were perceived as important, and to avoid the biases resulting from our knowledge being skewed toward our specific areas of expertise. Furthermore, in a developing country like India, where there are profound debates over the use of public money for social welfare versus scientific research, or development versus conser-

vation, we felt that reaching out to the larger population to identify what they perceived as important was particularly significant. A list of priority issues generated in this manner, we reasoned, could be used by interested researchers and funders to target their efforts to issues that are prominent in the public consciousness or alternatively, to increase awareness of issues that they felt were important but were absent from public debates. Ultimately, such efforts will mean more concordance between researchers, funders, conservation practitioners, policy makers and citizens, which is a highly desirable outcome.

The goal of the study reported in this paper was thus to identify key areas that need to be researched for the conservation of biodiversity and ecosystems in India, as perceived by a diverse population of its citizens. To this end, we conducted a nation-wide survey, which we publicized widely in the electronic and print media (see Section 2 for details). Survey respondents were asked to list what they thought were the most important questions (up to 10) that needed to be addressed “to better manage and conserve biodiversity and ecosystems in India”. The questions generated through this survey were then categorized and collated by a group of ecologists, environmental and conservation scientists, using a defined set of rules (see Section 2 for details of survey and data collation). The final outcome of this work is a summarized list of questions of importance to the conservation of biodiversity and ecosystems in India. We were aware that our survey methodology was unlikely to evenly sample all the different sections of the Indian population. Given that (a) internet access is concentrated around urban areas, (b) respondents had to be literate to participate in the survey and (c) participation in the survey was voluntary, we expected survey respondents to be predominantly educated, urban-and sub-urban citizens with at least some interests in environmental issues, including some subject experts. While this is admittedly not a representative subset of the all the different sections of the population, we nevertheless felt that this study was an important step forward in widening the representation of citizens in the environmental and ecological dialog in the Indian context.

Our intended audiences for the outcomes of this study are conservation practitioners, researchers, policy makers and interested citizen groups who wish to direct their work toward conservation issues that are widely perceived as being relevant in India, as well as funding organizations that are seeking to identify priority areas to direct their resources. Additionally, we wanted to compare issues that emerged as being important for the Indian region with those that emerged as being important in other regions and globally, and we report on these noteworthy differences.

## 2. Methods

### 2.1. Survey design and implementation

The survey consisted of one question: “What do we need to know to better manage and conserve biodiversity, ecosystems and natural resources in India?”, to which respondents were invited to provide up to ten responses, phrased as questions. Participation in the survey was voluntary.

To enable respondents to understand the survey and provide informed and relevant responses, the cover page of the survey explained the background to the study and the survey form included (1) definitions of biodiversity and ecosystems, (2) fictitious example questions from other disciplines (e.g. public health and education) and (3) links to a website containing a detailed project description.

In addition to the ten responses, respondents were asked to provide information on their age, gender, geographic location, type of area they lived in (either urban, semi-urban or rural), monthly

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