

Incorporating values into biodiversity assessment and monitoring – an introduction to some current issues

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Statement	Challenges
<p>Wide participation in biodiversity assessment is quite feasible There are no fundamental barriers to the participation of stakeholders from widely different backgrounds in biodiversity assessment and evaluation.</p> <p>All people share fundamental perceptions of biodiversity Perceptions of what “biodiversity” is (e.g. the existence of distinct taxa, and recognition of the diversity of taxa (rather than just the abundance of particular useful taxa)), reflect fundamental human abilities and understandings that are not exclusive to those from certain backgrounds or cultures.</p>	<p>Differences exist amongst stakeholders in their valuation of biodiversity Whilst there may be major differences amongst stakeholders, this is often variation in the weight given to different shared values, e.g. utility, aesthetic or existence value, rather than particular values being exclusive to one or other stakeholder group. For example, in certain Amazon communities men are more involved in NTFP-collection than women (e.g., collecting Brazil nuts), while women are usually more involved in NTFP-processing (e.g., shelling nuts): both genders value the resource but may have different perspectives on it.</p> <ul style="list-style-type: none"> • How widespread are patterns like these? • More broadly, to what extent are differences amongst stakeholders (based on, e.g., gender, age, occupation) predictable across the whole human experience, or are local patterns always determined by a special set of local circumstances?
<p>Participation requires effective communication Participation in biodiversity conservation and management, at various stages from policy development to practical implementation, requires the participants to be able to communicate about the values that biodiversity holds for them.</p> <p>This raises methodological questions, e.g.:</p> <ul style="list-style-type: none"> • At what scale should value be measured, e.g. individual, family, gender, community? • Should sampling be stratified by gender, age, occupation, etc.? Who should do the stratification? • Should individual peoples' values be synthesised into a representation of community value, and if so how and by whom? • When forming a community index of value should the responses of individuals be weighted according to their experience, knowledge or social status? • Should assessment rely entirely on sharing of ‘knowledge’ by abstract discussion or also by direct observation of behaviour? 	<p>Differences amongst stakeholders create potential barriers to communication about biodiversity which must be addressed These differences span from finer scale perceptions of “biodiversity”, and identification of the components of biodiversity (e.g. which taxa are considered to be distinct), to how values are quantified and expressed. As a consequence, eliciting information from the relevant stakeholders about their biodiversity perceptions and values will often be an essential component of biodiversity assessment or monitoring.</p> <p>This raises methodological questions, e.g.:</p> <ul style="list-style-type: none"> • Who's taxa and names should be used in participatory inventory and in analysing and reporting results: global scientific or local ones? • Should expression of local biodiversity values be restricted to knowledge based on individuals’ personal observations or should it include their other knowledge (spanning from widely held cultural perceptions to anecdotal hearsay)?
<p>Local biodiversity assessment and valuation can be utilised in a wider context As well as the use of this information within the cultural context of the community where it is held, it can also be formally represented in ways that enable it to be used in a wider context (e.g. for national-level planning).</p> <p>This raises methodological questions, e.g.:</p> <ul style="list-style-type: none"> • Which participatory techniques do provide a viable means for quantification of local people’s valuations, as well as scientific ones, for assessment at a broader scale? • Can biodiversity assessments based on local taxa 	<p>The needs of wider-scale analysis should not dictate methods to local participatory biodiversity assessments Divergence in biodiversity values amongst stakeholders and communities may alter the purposes for which they carry out biodiversity assessments and, consequentially, the methods that they choose for the assessment. There may be conflicts with the interests of those (e.g. some scientists or conservation planners) who wish biodiversity assessments to be carried out with the same standardised methods across all locations, so that directly comparable data may be obtained for comparative analysis. Therefore, if one purpose of the assessment is to contribute to wider analyses, this needs to be agreed by all stakeholders from</p>

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<p>contribute directly to global assessments, or must they first be represented in terms of scientific taxa?</p>	<p>the start.</p>
<p>The important recent advances in ecological economics should influence biodiversity assessment</p> <p>In the last few years the rapidly developing interdisciplinary field of “ecological economics” has made many important advances in the valuation of the breadth of biodiversity benefits in a way that does enable them to be incorporated into formal quantitative economic analyses (see, e.g., Edwards-Jones, G., Davies, B. & Hussain, S. (2000), <i>Ecological Economics an Introduction</i>). It is critical that biodiversity assessment methods be updated in the light of these advances, if the results are to have the greatest possible impact on policy.</p> <p>Spiritual values are important</p> <p>Whilst spiritual values may be amongst the hardest to communicate and assess, it is critical that they are not overlooked. They are often amongst the most important motivational factors determining people’s management and conservation of biodiversity.</p>	<p>There are problems in assessing indirect biodiversity values</p> <p>Recent literature promoting biodiversity conservation has proposed a wide diversity of biodiversity values. Whilst some of these are directly and unambiguously linked to biodiversity <i>per se</i> in other cases the link is more tenuous, e.g. ecosystem services such as soil and water conservation, and carbon stores and sinks. At the core of this rests a major current debate in ecological science, the functional role of biodiversity: Which system properties are dependent on biodiversity and which not? Are all components of biodiversity essential for maintenance of these services or are some components functionally redundant?</p> <p>This scientific uncertainty presents a major challenge for biodiversity assessment and monitoring, particularly as recent work in ecological economics has indicated that a number of the indirect environmental services provided by biodiversity have a greater value than more tangible benefits. The components of biodiversity most often implicated in these services are sometimes those that are hardest, in practical terms, to assess (e.g. micro-organisms and detritivorous invertebrates). Whilst it may be possible to assume that their diversity and degree of functional redundancy will be directly linked to that of more easily measured taxa (such as higher plants) there is no strong theoretical basis for this. Nonetheless, the use of surrogates for full biodiversity assessment (e.g. higher taxa (genera, families etc.) or indicator groups (such as birds)) is the subject of much current interest.</p> <p>From this an over-riding question emerges:</p> <ul style="list-style-type: none"> • Depending on its purposes, to what extent can an assessment be confined to the biodiversity itself (and all the relevant values deduced from that)? Or, which of the indirect values need to be assessed independently? For example, should biodiversity assessment be widened to include forest biomass and carbon density estimation? <p>Direct parallels can be found in assessing local people’s valuation:</p> <ul style="list-style-type: none"> • Is it desirable to combine the different elements of local biodiversity value into a single index; or is it better to concentrate on eliciting and quantifying these elements separately? Which will provide a better basis for extrapolating from an assessment up to wider habitat and landscape scales?

Biodiversity is more than just species richness

Too often people consider that “biodiversity” is synonymous with “species richness”. The value of biodiversity present in an area may be linked to many more of its attributes than simply the number (richness) of species present. Of particular importance is the relative abundance (or evenness) of the species. This may be of great importance to scientific values (e.g. vulnerability of the populations of the species, the genetic diversity they may contain, or their potential role in the ecosystem). It is also very important for local values, e.g. in terms of the utility of the species (to what extent can they meet the community’s needs for a certain commodity, or the risk that they may be lost from a community’s land). Further, the actual *composition* of species present is clearly of great significance to communities, scientists, and conservationists. Important special cases include the presence of globally rare and restricted-range species (or “endemics”) and large vertebrates (“charismatic megafauna”). These tend to be of interest from international and national perspectives and sometimes from local perspectives too if such species represent important cultural symbols (e.g., the rare spectacled bear in some Andean highland communities, or the tree *Cylicomorpha solmsii*, which is endemic to the Cameroon highlands forests and is highly valued in local communities due to the storage of water and bees’ nests in its hollow stems).

Assessment of animal biodiversity

It is unsafe to assume that animal biodiversity can be extrapolated from assessment of plant biodiversity or vice versa. In many contexts they are regulated by different forms of human impact and need to be assessed separately. Local participation is even more important in the assessment of animals than it is for plants because of the huge problems in making rapid scientific surveys of mobile and shy animals. Hunters, who may themselves threaten animal biodiversity can, nonetheless, be valuable participants in its assessment. However, there is a lack of: (a) methodology for participatory animal monitoring and (b) locally relevant field guides which use field characters (many of them behavioural) to facilitate the recognition and naming of animals.