

Policy pointers

It seems self-evident that biodiversity supports poor people's livelihoods but few studies have sought to quantify this relationship. More evidence is needed, but demonstrating such links is technically challenging given the complexity of the real world.

Some bits of biodiversity have been better studied than others and more attention needs to be paid by researchers (and their funders) to non-forest ecosystems and to intangible components of biodiversity – genes, microbes, invertebrates.

Poor people themselves hold a potentially vast body of knowledge but this is not always amenable to 'scientific' documentation.

Policymakers should widen the scope of evidence-based policy both in terms of what is studied and what is accepted as evidence. This is particularly important when formulating high level conservation and development policies, such as will be enshrined in international sustainable development goals.

Poverty and biodiversity: evidence about nature and the nature of evidence

Much international lip service is paid to the apparently self-evident truth that preserving biodiversity is closely linked to alleviating poverty. Certainly, development planners should take biodiversity more seriously: mainstream development pathways continue to degrade natural environments and deplete valuable biodiversity resources. But a review summarised here shows that rigorous, documented evidence of whether, how, and how far biodiversity can alleviate poverty is surprisingly thin on the ground. Researchers and policymakers must do more to explore the complex relationships between biodiversity and poverty, which are often beneficial but which can also cause conflict or even harm. With development and conservation policy increasingly evidence based, these knowledge gaps must be filled not just by scientific studies, but by recognising other types of evidence including informal, traditional and oral knowledge.

Assumed value

There is an explicit assumption in international policy statements that conserving biodiversity can help in efforts to tackle global poverty. For example parties to the UN Convention on Biological Diversity agreed in 2001 "to achieve by 2010 a significant reduction of the current rate of biodiversity loss ... as a contribution to poverty alleviation",¹ and this is mirrored by the inclusion of biodiversity indicators as one element of measuring progress against the Millennium Development Goals. Indeed, a high level meeting at the September 2010 UN General Assembly further stressed the link, claiming: "preserving biodiversity is inseparable from the fight against poverty".²

This relationship is not, however, a self-evident

truth. As international policymakers discuss a new development framework for the next decade and a set of sustainable development goals (SDGs) it is important to explore what evidence underlies these claims, and where there are gaps in the evidence that need filling in order to maximise synergies between conservation and development. IIED and the UNEP World Conservation Monitoring Centre (UNEP-WCMC) recently undertook just such a study. The rest of this briefing draws on our joint review.³

What is biodiversity?

Biodiversity is one of those words that means different things to different people— 'nature', 'wildlife', 'rare species', 'rainforests', 'the Maasai Mara'. But biodiversity is also a scientific term

Preserving biodiversity is inseparable from the fight against poverty

that encompasses the variety of life — the sum total of the Earth's living resources. It is more than wildlife, more than nature even. Biodiversity ranges from individual genes to entire

ecosystems. According to the international Convention on Biological Diversity (CBD), biodiversity is “the variability among living organisms from all sources including, inter alia, terrestrial, marine and

other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.”

It is this quality of variability that makes biodiversity so much more than ‘just nature’. Variability means more options — different species might be useful for different types of medicines or foods; different crop varieties might adapt to varying soil types or climates. Variability also offers enhanced risk management — if one crop or food source is wiped out by disease there are others to fill its place; if one pollinating insect species declines, others are available.

Biodiversity also encompasses the wide variety of ecosystems that humankind depends on for crucial ecological services, and the even wider variety of genes and species that are needed to make each ecosystem function.

What is poverty?

Poverty is another term with many different definitions. The simplest usually relate to some level of material wealth — for example the first Millennium Development Goal, of eradicating “extreme poverty”, aims to improve life for the billion plus people whose income is less than US\$1 a day. However, poor people often do not define themselves in cash income terms — indeed the concept of cash is completely meaningless for some indigenous communities who live outside the cash economy. In many cases, issues such as power and voice, opportunity and a healthy environment are valued more highly than money. So it has become increasingly recognised that poverty is multi-dimensional. The World Bank, for example, describes poverty as “a pronounced deprivation in well-being. ... To be poor is to be hungry, to lack shelter and clothing, to be sick and not cared for, to be illiterate and not schooled.”⁴

What is evidence?

Using rigorously obtained evidence to inform decision making — something that has long been standard practice in medicine — has rapidly

gained popularity in a range of different domains, including international development and biodiversity conservation. So what is evidence? Wikipedia defines evidence as “everything that is used to determine or demonstrate the truth of an assertion”.⁵ This gives a lot of flexibility: information ranging from professional science reported in peer-reviewed journal articles to indigenous knowledge passed on orally can qualify as evidence.

There is considerable debate, however, as to which types of evidence are the ‘best’. Medicine, for example, puts a lot of emphasis on the methods used to gather evidence and gives the most weight to evidence derived from quantitative, randomised, replicated trials that isolate and ‘control’ variables so that their effects can be separately investigated. Evidence that is qualitative or does not have controls is given progressively less weight.

But for situations that do not lend themselves to laboratory conditions, such rigorous scientific evidence is more difficult to obtain. A further challenge is how to assess and incorporate evidence that is not generated through a scientific process at all, such as evidence from traditional or indigenous knowledge.⁶

What the evidence says

Time and funding — the usual constraints on any research project — limited our review of the links between biodiversity use and poverty to evidence that was already documented. And of course we had to be able to find the evidence in order to review it. This is where academic journal articles come into their own, since they are catalogued and easily retrievable from a variety of online databases. Experience from field practitioners, funders and poor people themselves is often undocumented (and even when it is documented, it can be hard to locate and retrieve in any systematic fashion).

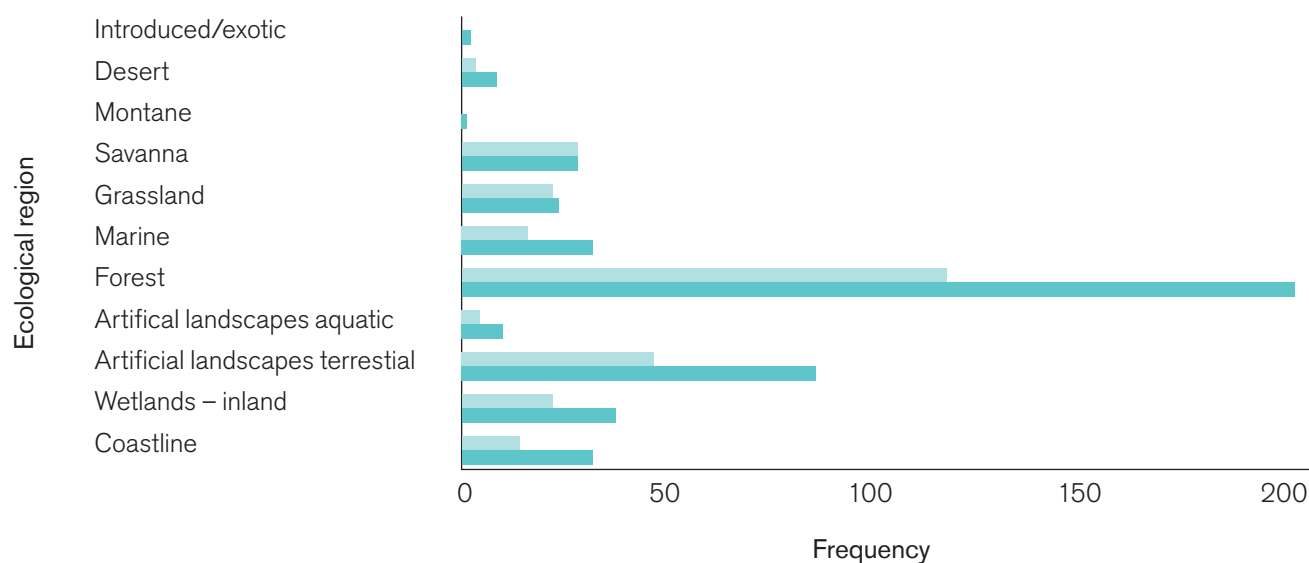
So our review was limited to evidence from formal literature — predominantly from scientific journals. Nevertheless, even within those constraints it revealed some interesting insights into what has been documented to date and where the key knowledge gaps remain.

We identified just under 400 studies that described poor people using biodiversity in some way. These were widely distributed, covering 27 countries from Africa, 16 from Asia, 13 from Latin America and three from Oceania. Ecological distribution was less well spread, however, with over half the papers focusing on forests and very few on mountains, deserts and artificial/exotic habitats. We found studies covering many different components of biodiversity use from

Distribution of studies in different ecological habitats

■ = total dataset meeting primary inclusion criteria (n = 387)

■ = subset with a measure of contribution of biodiversity to poverty (n = 248)



genes to ecosystems but the most common focus was on a particular type of resource (for example, trees or fish or medicinal plants) rather than on a named species or ecosystem. Non-timber forest products (NTFPs) were the most commonly studied component of biodiversity. And in most cases, it was the abundance or amount of these resources that made them important to poor people rather than anything to do with their variability.

The literature we reviewed noted biodiversity contributing to multiple different dimensions of poverty, but the most commonly cited contribution was to cash income. Other commonly studied dimensions were food security and asset accumulation, while the least commonly studied were energy, shelter and safe water. By far the most frequently recorded way for biodiversity and poverty to interact was through direct (that is extractive) use, for example harvesting NTFPs for household consumption or to sell. We identified remarkably few studies that documented biodiversity's role in underpinning crucial ecological processes and then drew conclusions about how these processes affect poor people's lives.

Overall, the evidence strongly suggested a positive contribution of biodiversity to poverty alleviation. Having said that, it was notable that around a third of those studies reporting a benefit for poor people provided no measure or justification of that contribution (such as any measured increase in income earned, or

improvements in food security). And very few studies documented any causal link between biodiversity use and reduced poverty. In other words, most studies documented how the poor use, or are exposed to, biodiversity but did not assess how a change in biodiversity affected levels of poverty or wellbeing. So even these documented studies do not constitute really good evidence for the apparently self-evident truth that biodiversity helps alleviate poverty. And in fact, as noted below, biodiversity can even sometimes make things worse.

The good, the bad and the ugly

Our review highlights a number of gaps in the evidence base on how biodiversity affects poverty. More research — or better documentation — is needed in these areas.

- Biodiversity is more than a good. Most of the studies that we found framed biodiversity in terms of its value as a resource — in the form of specific goods that can be used to generate tangible benefits such as cash, food, fuel. Very few studies explored biodiversity's role in underpinning the ecosystem services poor people particularly rely on. Even fewer investigated the benefits of diversity as a form of insurance or adaptive capacity.
- Biodiversity can be bad. Our review highlighted some examples of conflict between biodiversity (wildlife) and people, such as elephants raiding crops, lions killing livestock, apes injuring people. But it only scratched the surface in

terms of the inconvenient truth that biodiversity can be your safety net yet it can also kill you. (Our review did not look for studies of how parasites, pathogens and disease vectors affect poor peoples' livelihoods, but it is worth remembering that these too are living organisms and so count as biodiversity according to the CBD definition.)

- While there is a large body of literature related to forest biodiversity, and especially to NTFPs, other ecological settings are poorly studied and have become the neglected 'ugly duckling' of biodiversity research. Drylands, in particular, are home to a high proportion of the world's poor, and these people's livelihoods depend on land and livestock.⁷ The importance of biodiversity — for fodder, fibre and medicines — seems obvious and warrants increased attention in development strategies for these areas.⁸

Just as certain ecosystems are more popular research topics than others, so are the more tangible components of biodiversity. We found few studies that dealt with genetic diversity, microbes or even invertebrates. The studies that have been undertaken to date barely scratch the surface in terms of the full complement of biodiversity.

Lack of evidence does not equate to a lack of links

So, is conserving biodiversity inseparable from the fight against poverty? Our review revealed a surprisingly patchy evidence base to support this claim. This is not to say that the lack of evidence disproves the claim, but rather that only a very small subset of biodiversity has actually been studied. And, where research has been done, very little has been structured to demonstrate causal links between using biodiversity and alleviating poverty.

What's more, there is potentially a vast body of knowledge — held by poor people themselves — that is not documented and is therefore unavailable for evidence reviews such as ours, or for influencing policy.

Policymakers need to be aware of this evidence bias when formulating conservation and development policy — such as that which will be enshrined in the SDGs. The scientific community can help to address the bias by paying greater attention to those components of biodiversity which are under-studied. But both policymakers and scientists need to give attention to how to integrate better the documented and undocumented, and the 'scientific' and 'traditional', in order to generate a much richer evidence base.

We are not alone in drawing this conclusion. The newly established Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)⁹ is mindful of the need to recognise multiple forms of evidence. At its second meeting in December 2013 it established a task force on indigenous and local knowledge systems that plans to develop a set of procedures for dealing with these systems in its scientific assessments. But such principles and guidelines must not be confined to improving IPBES assessments. A widespread effort is needed to make the evidence base on biodiversity and poverty both broader and stronger in order that policymaking at all levels — from international to local — is better informed.

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Notes

¹ Secretariat of the Convention on Biological Diversity (2002): Decision VI/26: Strategic Plan for the Convention on Biological Diversity. / ² www.un.org/News/Press/docs/2010/ga10992.doc.htm / ³ Roe, D et al. (2014). Which components or attributes of biodiversity influence which dimensions of poverty? *Environmental Evidence* 2014, 3:3 www.environmentalevidencejournal.org/content/3/1/3 / ⁴ World Bank (2001): World Development Report 2000/2001: Attacking Poverty. / ⁵ <http://en.wikipedia.org/wiki/Evidence> / ⁶ Raymond, C.M. et al. (2010) Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management* 91(8): 1766-1777. / ⁷ Millennium Ecosystem Assessment (2005). Ecosystems and human well-being: desertification synthesis. World Resources Institute, Washington DC / ⁸ Davies, J. et al. (2012) Conserving dryland biodiversity. IUCN, UNEP-WCMC, UNCCD www.unccd.int/Lists/SiteDocumentLibrary/Publications/drylands_bk_2.pdf / ⁹ <http://www.ipbes.net/>