

AVOIDED DEFORESTATION: NOT A GOOD MEASURE OF CONSERVATION IMPACT

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Statistics in FAO's Global Forest Resources Assessment 2015 reveal a substantial increase in global efforts to conserve forests over the past 25 years. For example, the global forest area designated primarily for biodiversity conservation increased by 40% (FAO 2015). Yet, concerns remain about the actual impact of protected areas on forest conservation, especially in the tropics (Miteva et al. 2012). Some protected areas might be just 'paper parks', no more than boundaries on maps and lacking the budget and staff to conserve the forests they contain. In other cases, protection might not make a difference for a different reason: parks might be in locations where threats to forests are low, so forests would have been conserved even without protection. Similar factors confound determination of the effectiveness of other forest conservation programmes, such as payments for ecosystem services and community-based management.

Economists have developed a powerful toolbox of impact evaluation methods, which can strip away confounding factors and reveal the effectiveness of forest conservation programmes (Ferraro & Pattanayak 2006, Miteva et al. 2012). Though varied, these methods have the common objective of identifying the causal effect of a programme on conservation outcomes: the difference between the observed outcome and the outcome that would have occurred in the absence of the programme (i.e. the counterfactual outcome). Avoided deforestation is by far the most common outcome measure used in impact evaluations of conservation programmes. Evaluation results are typically expressed as programmes having reduced deforestation by X hectares or Y per cent.

Determining the causal effects of conservation programmes is important given threats to tropical forests and the biodiversity they harbour, and the scientific progress made in developing methods that can determine this is impressive. For impact evaluations to yield results

that are useful for conservation decision-making, however, they must measure suitable conservation outcomes, and here is where most evaluations have fallen short. Avoided deforestation is not a good measure of conservation impact because it is a physical measure that ignores variation in the benefits and costs of conservation programmes. It indicates whether programmes conserve forests, but not whether the forests thus conserved are valuable for conservation or can be conserved without spending too much scarce funding.

The benefits of conservation programmes are linked to the values of the wide range of goods and services that forests provide. These values can vary greatly across locations (Vincent 2015b), for example with regard to carbon sequestration (Asner et al. 2010), watershed services (Pattanayak & Kramer 2001; Brauman et al. 2007) and biodiversity habitat (Gibson et al. 2011, Le Saout et al. 2013). Conservation costs can vary greatly too (Naidoo et al. 2006, Polasky 2008). The chief cost of conservation is usually the opportunity cost of alternative land uses, such as forgone profits from logging or agriculture. Some forests are costly to conserve because they are richly stocked with timber or are on land that is highly suitable for agriculture, while others are not.

From an economic standpoint, the objective of any conservation programme is to achieve the greatest conservation benefit at the lowest cost. The amount of avoided deforestation indicates conservation effectiveness in this benefit–cost sense only under very restrictive and unrealistic conditions, such as conservation benefits and costs not varying across forest tracts (Vincent 2015a). In fact, the situation is probably even worse: from a purely mathematical standpoint, the potential to achieve large reductions in deforestation rates necessarily occurs in locations with high deforestation rates, yet these are the very locations where benefit–cost ratios for

conservation are likely to be low (Vincent 2015a). Concluding that conservation programmes are more effective because they cause greater reductions in deforestation could thus be exactly the wrong conclusion if one cares about the benefits and costs of conservation.

If avoided deforestation is not a good measure of conservation impact, what would be better? A good first step for impact evaluations would be to use outcome measures that relate more directly to conservation benefits or costs. Consider the example of the UN Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). A typical impact evaluation of REDD would estimate the impact on reduced deforestation (emphasis on the first 'D'). The objective of the programme is to reduce greenhouse gas emissions, however, not deforestation, and emissions are not uniform across deforested sites. A more suitable outcome measure would be defined in terms of reduced emissions (emphasis on the 'E'). Given that the economic impact of an additional molecule of carbon dioxide in the atmosphere is independent of where the molecule was emitted, such a measure would be perfectly correlated with the climate-related benefits of the programme.

Impact evaluations could also be made more relevant by using outcome measures related to avoided degradation (the second 'D' in REDD), not just avoided deforestation. By neglecting degradation, evaluations are stacking the deck against forest conservation programmes, whose primary objective is not always to reduce deforestation. Malaysia illustrates this point. The federal government's National Forestry Policy designates a substantial forest area on steep slopes as Protection Forests. The intended protection is not so much protection against deforestation, in the sense of conversion to agriculture or other nonforest land uses (for which these locations are not well-suited), but rather protection against logging. If an impact evaluation that used avoided deforestation as the outcome measure were conducted for Malaysia's Protection Forests, it would likely find that negligible deforestation would have occurred in the absence of protection and, thus, conclude that protection was ineffective. This would be like concluding that the smallpox vaccine is ineffective because it

does not prevent AIDS. A proper evaluation of Malaysia's Protection Forests would instead use an outcome measure related to the presence or intensity of logging. A similar point can be made about conservation programmes whose purpose is to reduce poaching: a lack of impact on deforestation or degradation would not mean that the programmes are ineffective, for the simple reason that avoiding those outcomes is not their purpose.

Moreover, by neglecting forest degradation, impact evaluations are ignoring a conservation issue that might be globally more important than generic deforestation, namely, the loss of primary forests (Mackey et al. 2014). These unlogged, virgin forests are globally significant repositories of biodiversity (Gibson et al. 2011) and carbon (Asner et al. 2010), and their area is declining at an annual percentage rate that is nearly triple the annual global deforestation rate (FAO 2010). Logging, not agricultural conversion, is the main cause of their decline (FAO 2010). Forests typically remain after logging, but their high conservation value for biodiversity, carbon and other ecosystem services has been degraded. There is an urgent need for impact evaluation of programmes that aim at protecting primary forests.

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