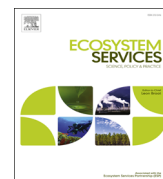




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# Ecosystem protection and poverty alleviation in the tropics: Perspective from a historical evolution of policy-making in the Brazilian Amazon

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## ABSTRACT

Despite increased intellectual and conceptual consideration of the linkages between ecosystem service (ES) provisions and poverty alleviation (PA) globally, there has been limited analysis of how these paradigms are used and framed in the regional context of policy-making. In this paper, we address this question by eliciting perspectives on the historical evolution of policies addressing the environment and poverty nexus in the Brazilian Amazon. Our analysis is twofold. First, through an analysis of policy context, we explore how multilateral and international programs have influenced and helped shape national and regional policy-making in the Amazon. Second, through our analysis of policy content, we provide an in-depth discussion of key ES and/or PA policies implemented in the Amazon. Furthermore, we analyze the operationalization of the policy, describe management options, and highlight their impacts on ES and PA. Our results show dichotomies between environmental programs and their social effectiveness, and between environmental and developmental agendas. More recently, however, some attempts have been made at delivering ES protection and PA jointly in policy-making. In conclusion, we provide a framework for policy analysis that can be applied to other tropical countries in the world. If Brazil is to keep its leading role in addressing the challenges of maintaining ecosystem service provision, while alleviating poverty in the Amazon, it must learn from its own experiences.

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## 1. Introduction

The Millennium Ecosystem Assessment (MEA) compellingly showed how the loss of services due to ecosystem degradation could lead to significant reductions in human well-being and intensification of poverty. In economies in transition and developing countries, the poor are often highly dependent on ecosystems for their livelihood. Such links between ecosystem services (ES) and poverty alleviation (PA) have been widely documented (MA, 2005; Poverty Environment Initiative, 2009). By quantifying the potential economic impact of ecosystem loss, both the MEA (2003) and The Economics of Ecosystems and Biodiversity (TEEB, 2010) brought increased policy attention to the importance of Ecosystem Services for Poverty Alleviation (ESPA). Since then, scholars have widely and critically engaged with this research agenda (Carpenter et al., 2009; Daw et al., 2011; Raudsepp-Hearne et al., 2010). The MEA in particular brings to the fore two key innovations: an anthropocentric perspective of ecosystems (by focusing on the services and benefits they provide to humankind) and a conceptualization of poverty that departs from a common singular, income-based notion of poverty.

While much attention has been given to the former (Costanza et al., 1997), it is only in recent years that attention has been paid to the latter. Poverty is interpreted as a profound deprivation of well-being, where well-being entails multiple constituents such as the basic material needed for life, freedom of choice, security, and health. This conceptualization draws upon the “voices of the poor” research by Narayan et al. (1999, 2000), which spanned 23 countries and highlighted commonalities of what poor people, across geographical regions and contexts, identify as constituting well-being (Narayan et al., 1999, 2000).

The close connection of forest ecosystems to “poor communities” provides a useful context to study linkages between ecosystem services and poverty alleviation. Statistics related to forests are compelling (FAO, 2009b). While 31% of the Earth’s land surface area is covered by forests (MEA, 2003), net deforestation losses account for nearly 13 million hectares annually—roughly the size of England (FAO and ITTO, 2011). Meanwhile, “more than 1.6 billion people depend to varying degrees on forests for their livelihood” (World Bank, 2004, p.16). Although the empirical basis for this quote has been questioned (Angelsen and Wunder, 2003), the fact that many of the world’s poor depend directly on forests for subsistence and as a dominant source of income is undisputed.

Globally, Brazil hosts about 30% of the world’s highly diverse forests (Alho, 2008). Amazonia itself is recognized as the largest continuous expanse of tropical forest on Earth, serving as habitat to 25% of all recognized terrestrial plant species (Bermingham et al., 2005). The role of the Amazonian forests in regulating hydrological cycles (Nepstad et al., 2008; Veiga et al., 2004), water quality, nutrient cycling, and biodiversity, as well as in providing cultural services (Azevedo-Ramos et al., 2006; Lima, 1999; Menton et al., 2009; Merry et al., 2006) has also been widely recognized. At the same time, the Amazon hosts 29% of the indigenous population of Brazil (IBGE, 2006) and a rich diversity of other ethnic

groups, including Afro-Brazilian communities, traditional inhabitants, and migrants from other regions of the country. While poverty in the Amazon may not be as acute as in some other parts of the world, the livelihoods of the poor residing in these areas are highly dependent upon, and sensitive to, changes in the provision of the prevailing ecosystem services. While 80% of the region (Hall, 2008; INPE, 2010; Ometto et al., 2011) remains relatively undisturbed, there is evidence that the provision of the services provided by these ecosystems may dwindle. Future projections suggest that up to 50% of Amazonian forests could disappear by 2050 in response to a possible secular change to a drier and hotter climate, the interaction between land use and climate, and increased anthropogenic activity (Davidson et al., 2012; Meir and Woodward, 2010; Ometto et al., 2011; Soares-Filho et al., 2006). Although land use change for food production has, in some cases, led to improved livelihood and poverty alleviation (Le Tourneau et al., 2013), the extensive change in forest cover in the Brazilian Amazon has not had a similar effect. Income-based poverty, as defined in IBGE (2010) affects 28.8% of the Brazilian population, while, in the Amazon, this percentage rises to 42% of the 25 million inhabitants (Aires, 2008; IBGE, 2010). The Human Development Index (HDI) further highlights this phenomenon. In the Amazon, the HDI for 2010 ranked 0.674, nearly 10% below that for São Paulo State (0.78) (PNUD, 2013).

Despite increased attention to the linkages between ecosystem service provision and poverty alleviation, there has been little analysis of how these paradigms are used and framed in the context of regional policy-making. Specifically, part of this study seeks to evaluate the influence of new paradigms (e.g.: ecosystem services) and their contextual incorporation into national policy.

In this paper, we attempt to address this question with two main objectives in mind: (1) to elicit perspectives on the historical evolution of how policy-making addressed both the environment and poverty, and (2) to analyze different policies, looking at their impact on ecosystem services (ES) for poverty alleviation (PA). In the next section, we present an overview of our research design that combines a review of the literature, an elicitation workshop, and analysis of policy content in the region. We then discuss our findings by looking at the international domains of policies that have converged with the evolution of national/regional policies addressing both the environment and poverty. The synergies and mismatches among the scales of these policies and their impact are taken into consideration in examining the implications that they have for the protection and maintenance of ES, and the reduction of poverty in the region.

## 2. Research design

The following section describes our research design and methodology. Three distinct sections are presented: (1) our data collection, (2) our analysis of policy context, and (3) our analysis of policy content.

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