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Can multifunctional livelihoods including recreational ecosystem services (RES) and non timber forest products (NTFP) maintain biodiverse forests in the Brazilian Amazon?

Sónia M. Carvalho Ribeiro [a,*], Britaldo Soares Filho [a], William Leles Costa [b], Laura Bachi [c], Amanda Ribeiro de Oliveira [b], Patricia Bilotta [d], Allaoua Saadi [e], Elaine Lopes [c], Tim O'Riordan [f], Humberto Lôbo Pennacchio [g], Lúcio Queiroz [h], Susanna Hecht [i], Raoni Rajão [j], Ubirajara Oliveira [k], Carlos Cioce Sampaio [l]

[a] Universidade Federal de Minas Gerais, Departamento de Cartografia, Centro de Sensoriamento Remoto, Programa de Pós-Graduação em Análise e Modelagem Sistemas Ambientais, Instituto de Geociências, Belo Horizonte, Brazil
[b] Universidade Federal de Minas Gerais, Universidade Federal de Minas Gerais, Centro de Sensoriamento Remoto, Instituto de Geociências, Belo Horizonte, Brazil
[c] Universidade Federal de Minas Gerais, Programa de Pós-Graduação em Análise e Modelagem Sistemas Ambientais, Instituto de Geociências, Belo Horizonte, Brazil
[d] Universidade Positivo, Programa de Pós-Graduação em Gestão Ambiental, Curitiba, Brazil
[e] Universidade Federal de Minas Gerais, Departamento de Geografia, Instituto de Geociências, Belo Horizonte, Brazil
[f] University of East Anglia, School of Environmental Sciences Norwich, UK
[g] Companhia Nacional de Abastecimento CONAB, Brasilia, Brazil
[h] Universidade Federal de Minas Gerais, Instituto Ciências Biológicas, Belo Horizonte, Brazil
[i] The Graduate Institute Geneva, Graduate Institute of International Development Studies, Genève, Switzerland
[j] Universidade Federal de Minas Gerais, Escola Engenharia, Belo Horizonte, Brazil
[k] Universidade Federal de Minas Gerais, Centro de Sensoriamento Remoto, Programa de Pós-Graduação em Análise e Modelagem Sistemas Ambientais, Instituto Geociências, Belo Horizonte, Brazil
[l] Universidade Regional de Blumenau, Programa de Pós-Graduação em Desenvolvimento Regional, Blumenau, Brasil; Universidade Positivo, Programa de Pós-Graduação em Gestão Ambiental, Curitiba, Brazil

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ABSTRACT

In this paper we use large scale spatially explicit modelling and case study based analyses to assess the links between recreational ecosystem services and the benefits for wellbeing of traditional livelihoods in the Brazilian Amazon. Our results show that, at the scale of the Brazilian Amazon, associations between recreational ecosystem services and extractivist activities of Brazil nut and rubber are very weak with no significant differences regarding Brazil nut ($p = 0.61$) and rubber ($p = 0.41$) income across the different tourism development classes. However, qualitative analysis of the case studies reveals that where there are multifunctional livelihoods, recreational ecosystem services are indeed helping to enhance non timber forest product extractivist social values that otherwise would be suppressed by prevailing "cattle ranching" lifestyles. We therefore support innovative ways to make both recreational ecosystem services and non timber forest products extraction not merely a juxtaposition of activities, but integrated into multifunctional livelihoods.

1. Introduction

Although there has been considerable effort to map and value ecosystem services from the Amazon, such as carbon, biodiversity, and water regulation services, the contribution of recreational ecosystems services (RES) has not received so much attention (Balvanera et al., 2012). There is, however, a widespread belief that carefully planned RES, if related to the natural, cultural and social significance of Amazon forests, are indeed important both for those

* Corresponding author at: Universidade Federal de Minas Gerais, Departamento de Cartografia, Centro de Sensoriamento Remoto, Programa de Pós-Graduação em Análise e Modelagem Sistemas Ambientais, Instituto de Geociências, Av. Antônio Carlos, 6627, Belo Horizonte - MG Brazil, CEP 31270-900, Brazil. Tel.: +55 31 3409 5449; fax: +55 31 3409 5410.
E-mail addresses: soniacarvalhoribeiro@cart.igc.ufmg.br, Sonia.carvalhoribeiro@gmail.com (S.M. Carvalho Ribeiro).

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undertaking recreation experiences in the biggest tropical forest in the world, and for the wellbeing of the traditional communities living in the Amazon. RES are able to develop local eco-socio-economies and socio-productive arrangements with the potential to contribute to the sustainable development of the Amazon (Sampaio, 2005). Challenging this widespread belief, Hoefle (2016) argued that there is little potential for tourism to foster multifunctional livelihoods, and consequently concluded that "tourism will not save the Amazon forests". However, we argue that the linkages among the extractivist activities associated with non timber forest products (NTFP) and RES particularly in the form of community based tourism (CBT) still need to be fully addressed, explored and mapped. There is thus a need for examining cases where there is (or where not) a multifunctional link across those two activities in the diversity of socio ecological systems in the Brazilian Amazon.

The Amazon forest is well known for its hostile environment, humidity, plagues and diseases that hinder tourism development and the consequent capturing of RES. The Amazon is also a hotspot of biodiversity, holding rich cultural heritage, which can provide unique recreational opportunities. For example, ecotourism has proved successful in Madre de Dios Department of Peru (Kirkby et al., 2010). A body of research has shown that a niche of medium to high class tourists are looking for leisure experiences not only associated with "nature". Critically they also seek contact with traditional communities, aiming at "absorbing" local cultures, eating local food, and experiencing locally-produced knowledge and traditions (Sampaio and Coriolano, 2009; Sampaio, 2005). Community based tourism (CBT) is able to provide such recreational experiences. CBT has evolved from well-known tourism experiences such as cultural tourism, ethnotourism, ecotourism and agrotourism (Sampaio and Coriolano, 2009; Sampaio, 2005). What distinguishes CBT from other types of tourism is that in CBT "entrepreneurs" are people inspired by communitarian ideologies. According to Brazilian Law[1], traditional communities include indigenous tribes, "quilombolas", extractivists, and small agroforestry farmers. In Brazil, there are about 234 indigenous groups encompassing over 605,518 families occupying an approximate area of 106 million ha, plus 54 000 extractivist families living in 12 million ha of extractive reserves (MMA, 2009).

For centuries, these traditional communities have used and traded raw materials from the surrounding forests as part of their livelihoods (Levis et al., 2017; Scoles and Gribel, 2015). Extractivist landscapes can offer tourists a diversified portfolio of "local" food and drinks, of which the anti-oxidant açai, the revigorating cupuaçu and guaraná, and the exquisite Amazon fish pirarucu are but few examples. In addition, the Amazon's cultural traditions provide an important contribution to RES. Appreciating particular cultural experiences, such as sensing the landscape identity of different socio-cultural groups (e.g. rubber tappers), as an element of traditional ecological knowledge of the Amazon forest (Gomes, 2009; Gomes et al., 2012) is one example here. Amazonian mythologies, such as listening to the legendary story of the pink dolphin "boto" believed to be the father of all single mothers' children, or the particular visions of the Santo Daime sect in Acre, are important learning experiences for tourists and native peoples alike. NTFP extractivist activities and RES, particularly CBT, can therefore contribute to the multifunctional use of native forests. These synergies link provisioning (collection of NTFP) and cultural (landscape identity, recreation) ecosystem services (ES). As such, they are not a juxtaposition of activities that occur in parallel (Hoefle, 2016). They need to be explored as a basis for multifunctional livelihoods.

Despite decades of analyses regarding the role of NTFP in sustaining traditional livelihoods, as well as in reducing deforestation, controversies as to their viability remain (Hecht, 2013; Homma, 2008; Humphries et al., 2012; Peters et al., 1989). Traditional extractivist activities, such as rubber tapping, have been discontinued or are progressively declining (Gomes et al., 2012; Hecht, 2013; Jaramillo-Giraldo et al., 2017). To enhance livelihoods associated with NTFP, the primary policy lies in incentivising product market chains. The "products" of extractivist landscapes are regarded in Brazil as outputs of sociobiodiversity (MMA, 2009). The problem is that, even though government guarantees a minimum price for these products, in some areas there is no market (no traders of NTFP). To make matters worse, the market prices offered at the international "commodity" market do not reward extractivists either economically or socially, as there are still unbalanced power relations in the market chains of NTFP (Hecht, 2013). Furthermore, the services provided by non-market cultural attributes, as well as traditional ecological knowledge have not yet being properly valued and included into decision making. Even with support from public policies, the values from NTFP extractivist activities have been decreasing. As a result, a cattle ranching "ideology" has prevailed, profoundly transforming traditional Amazon livelihoods (Gomes, 2009; Gomes et al., 2012). The cattle ranching lifestyle, which generates higher rents, is culturally entrenched in the frontier regions of the Brazilian Amazon (Bowman et al., 2012) (average annual rents per ha of cattle ranching, intensive and extensive systems, range from USD 80 to USD 500, respectively see http://csr.ufmg.br/pecuaria/pdf/contexto.pdf (accessed February 2018)) .

So far, little attempt has been made to find viable solutions for valuing NTFP traditional livelihoods, limiting the scope for assessing one of the most prominent land use issues in the tropics. The conundrum is how to reconcile socio economic development with forest conservation. Creating synergies between RES and NTFP extractivist activities could promote this agenda. RES and extractivist activities build upon the natural and cultural qualities that are intrinsic to the core, biodiverse, Amazon forest.

Initiatives to promote ecotourism (associated with experiences in the wild), CBT-community based tourism (associated with involvement of tourists in activities of daily lives of communities) and community tourism (providing knowledge on local livelihoods but not embedding tourists into indigenous life styles) in the Amazon have expanded over the past 20 years, involving an increasing number of forest families (Section 3.2). Acquiring meaningful values for these services is problematic because data on RES and tourism development initiatives is scattered across different institutions. Mapping productivity and rents associated with extractivist livelihoods also face similar difficulties. In order to fill in this gap, our study provides both i) a global overview of tourism and extractivist dynamics in the Brazilian Amazon, and ii) a comprehensive review of the relevant case study literature exploring the links between RES and the benefits for human wellbeing in NTFP extractivist landscapes also in the Brazilian Amazon. Our major research questions are:

1. How much are RES/tourism and extractivist activities of rubber and Brazil nut geographically differentiated across the Brazilian Amazon?
2. Are there significant differences between the rents of Brazil nut and rubber across the different types RES/tourism classes?
3. What evidence do we have about the links between RES/tourism and the benefits for human wellbeing in NTFP extractivist landscapes in Brazilian Amazon?

[1] Programa Nacional de Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais (PNPCT) N 6040, 7 Fevereiro 2007.

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