



Data of Electric (Un)Availability in Brazilian Amazon's Extractive Communities

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ABSTRACT

This study aimed to assess the availability of electricity, its energy sources, and mean dispersion per area in traditional communities living in Amazon's extractive reserves. The data set showed a situational description of the sample, allowing thus future conclusions about the level of energy justice in these reserves. The study provided the following information: local geography, relevant to analyses of appropriate methods for energy supply of these localities; territorial extension of the sample and number of families in protected areas, used to calculate the mean number of families per hectare; territorial location of the investigated areas, revealing the permeability of the municipal political division in terms of geographic boundaries of the protected areas. The data presented in this study may be used for comparative studies in similar contexts.

Keywords: Energy; Protected Areas; Extractive Reserves; Brazilian Amazon.

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Access to adequate and reliable energy services which are also affordable, safe, environmentally benign, and consistent with socioeconomic development needs is a key element of sustainability (Ruales-Salcedo et al. 2018; United Nations 2015; Vera & Langlois 2007). In Brazil, the estimated number of people with no access to electricity is 12 to 20 million (Delina 2017; Reis & Santos 2014), which violates the principle of universal and efficient electric energy supply (Reis & Santos 2014), demonstrating the absence or inefficiency of public policies that ensure access to energy (Matos et al. 2011; Ali et al. 2018).

The communities living in Amazon's extractive reserves and acting as conscious administrators of these protected areas are an example of this energy demand (Blackman & Veit 2018). Although they need basic infrastructure for their subsistence, they live in localities where electricity supply through the conventional public energy system is geographically and environmentally infeasible (Liu et al. 2018; Andrade et al. 2011). Energy supply to Amazon's extractive communities is required for generating electricity as well as for fueling the engines of boats used for transportation of people and/or products and goods, which is often the only means of transportation from these remote localities to distant urban centers (Gómez & Silveira 2015; Sánchez et al. 2015; Andrade et al. 2011).

In view of this particular situation, this study aimed to assess the availability of electricity, its energy sources, and mean dispersion per area in traditional communities living in Amazon's extractive reserves. This will allow future analyses related to the achievement of Goal 7 of the 2030 Agenda for Sustainable Development, i.e., to ensure equal access to energy for all (United Nations 2015; Yang & Yang 2018).

The collected data are part of and support the doctoral research conducted by the first author of this article, which sought to identify the sustainability of Amazon's renewable biomass as bioenergy source. This data set provided panoramic information about the situation of energy availability in Amazon's extractive communities. A better application of the data may serve as a basis for decision-making and studies on energy supply of these communities.

DATA DESCRIPTION

The data consist of a table and its attached notes. They concern a population of 50 protected areas in the category of extractive reserves, 45 managed by the federal government and five by state governments. Of these, 16 federal reserves and one state reserve have published their management plans, which are the reference documents used for data collection. All these conservation units are included in the group of Brazilian Amazon's protected areas. Although federal law (Planalto 2002)

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determines the establishment of guidelines for elaboration and implementation of management plans, there is no structural standardization of the collected documents, which vary in terms of content and formatting. The data set provides a situational description of the sample in terms of availability of electricity and its energy sources for families living in extractive communities (Table 1, Data file 1), allowing thus conclusions about the level of energy justice in these areas. A description of mode of access to the communities (whether fluvial, terrestrial, or mixed) provided information about local geography, which is relevant for future analyses of the most appropriate methods for energy supply of these localities. The data sets generated and analyzed during the current study are available in the figshare repository: <https://doi.org/10.6084/m9.figshare.6953183> (Flores et al 2018).

Table 1. Overview of data files/data sets.

Label	Name of data file/data set	File types (file extension)	Data repository and identifier (DOI or accession number)
Data file 1	Situational energy panorama of Amazon's extractive reserves	MS Excel file (.xlsx)	Springer Nature figshare repository (https://doi.org/10.6084/m9.figshare.6953183)
Data file 2	Methodology description	MS Word file (.docx)	Springer Nature figshare repository (https://doi.org/10.6084/m9.figshare.6953183)

Source: The Author

In this study, data on territorial extension of the sample and number of families in the protected areas were used to calculate the mean number of families per hectare. This led to a territorial dimension of the spatial occupation of extractive reserves and, therefore, allows an analysis of the complexity of energy availability in Amazon's protected areas. Based on the territorial location of the investigated areas, the permeability of the municipal political division in terms of geographic boundaries of the protected areas was showed, expanding the application of this data set.

For the construction of this documentary descriptive study, information was collected from two official digital databases of the Brazilian government and one digital repository of a public interest civil society organization: (i) National Registry of Conservation Units of the Brazilian Ministry of the Environment (MMA 2018); (ii) Dynamic Panel (ICMBio 2018a) and Management Plans (ICMBio 2018b) of the Chico Mendes Institute for Biodiversity Conservation (ICMBio), an independent agency responsible for managing protected areas in Brazil at the federal level; and (iii) Social and Environmental Institute (ISA) (ISA 2018). Public digital databases provide researchers with broad access to data.

In the National Registry of Conservation Units, a report was generated identifying (i) the extractive reserves included in the sample, as well as their (ii) date of creation, (iii) municipal and state location, (iv) area in hectares and (v) publication of management plans, which consist of technical

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papers regarding management of protected areas in Brazil. The information was accessed through the “Search - Conservation Unit” option, using three restrictive parameters: management category (extractive reserve), administrative sphere (federal and state) and biome (Amazon). The generated report identified a population of 50 protected areas in the extractive reserve category (45 managed by the federal government and five by state governments). Of these, 16 federal reserves and one state reserve have published their management plans.

As the agency responsible for managing protected areas in Brazil at the federal level, ICMBio assisted with data collection from the 45 federal extractive reserves. The ICMBio’s Dynamic Panel provided data on the number of families living at the federal conservation units included in the study. These data were retrieved from the “social and environmental actions” thematic group (ICMBio 2018a), by individually selecting the protected areas that had already been identified in the National Registry of Conservation Units of the Brazilian Ministry of the Environment.

The ICMBio’s management plans (ICMBio 2018b) were used for obtaining the following variables regarding the extractive reserves: (i) mode of access; (ii) energy availability; and if it is available, (iii) energy source (fossil, renewable or public power distribution network). For downloading the technical papers, the federal protected areas included in the sample were individually searched using the “list of conservation units with management plan” option. The management plan of the Rio Gregório Extractive Reserve, a state protected area, was obtained from the ISA’s digital repository (ISA 2018), where the variables mentioned above were collected. The data file was elaborated using Microsoft Office Excel software.

A total of nine variables were collected, five from the National Registry of Conservation Units and four from ICMBio's database. The detailed description of the methods used for collecting data is found in Data file 2 (Table 1, Data file 2).

DECLARATIONS

AVAILABILITY OF DATA MATERIAL

The data described in this Data note can be freely and openly accessed on Springer Nature figshare repository. Please see table 1 and reference list for details and links to the data.

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Dados da (In)Disponibilidade Elétrica nas Comunidades Extrativistas da Amazônia Brasileira

RESUMO

O objetivo do estudo foi verificar a disponibilidade de eletricidade, e suas fontes energéticas, bem como a média de dispersão por área nas comunidades tradicionais das Reservas Extrativistas Amazônicas. O conjunto de dados apresentou descrição situacional da população da amostra permitindo futuras conclusões sobre o nível de justiça energética dessas áreas. O estudo disponibilizou informações sobre: geografia local, relevante para análises quanto à métodos adequados para suprimento energético dessas localidades; dimensão da extensão territorial da amostra e o número de famílias das áreas protegidas, permitindo o cálculo da média quantitativa do número de famílias por hectares; localização territorial das áreas investigadas, revelando a permeabilidade da divisão política municipal quanto as fronteiras geográficas das áreas protegidas. Os dados apresentados no estudo podem ser utilizados para estudos comparativos em situações análogas.

Palavras-Chave: Energia; Áreas Protegidas; Reservas Extrativistas; Amazônia Brasileira.

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