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Introduction

Although Brazil has an abundance of water resources, boasting 13% of the available fresh water of the planet (ANA, 2017), its distribution is naturally unequal. Water availability in Brazil depends largely on the climate and therefore, the risks of climate change, whether of anthropogenic or natural origin, could threaten supplies (Marengo, 2008). Population and demand for water in the SPMA are increasing. Such threshold situation has consequences to the availability and use of this resource (Gaviolli, 2013). Between 2014 and 2015, the Greater São Paulo experienced a severe drought, the worst in its history. Its main water systems were left depleted and with the lowest water levels ever recorded (ANA, 2015). Daily water rationing became part of the routine for many inhabitants of the region. Since then, more reservoirs have been under construction to capture more water in order to ensure water provision to the population, raising questions of whether technical solutions are preferred rather than a more sustainable management of the water resources. The watersheds within the São Paulo Metropolitan Area (SPMA) supply water to most reservoirs in the region. The state watershed plan lays out a set of strict constraints in legislation in order to protect and restore the watersheds, leaving the populations from those areas unable to develop economically or socially.

Research question an hypothesis

The demands imposed by legislation to Watershed Protection and Restoration Areas (WPRAs) is equally increasing welfare and rights of different social groups or is allowing an unrestricted access to resources by certain economic and political actors? In other words, are the needs of the poorest sectors of the population being overlooked in favor of the upper social stratum, industries and services? Moreover, the political choices implemented to guarantee water supply are taking into account the need to adapt to climate change?

The preservation of watersheds within the Metropolitan Region of São Paulo is done at the expense of the socioeconomic development of the WPRAs, in order to meet the demands of the economic center and its continuous growth.

Objectives

- To identify the dynamics of economic, social, environmental and institutional development of the municipalities located in WPRAs within the São Paulo Metropolitan Area.
- To determine in what dimensions (environmental, economic, social and institutional) the WPRAs are stagnant and where there have been improvements.
- To investigate the prospects of a sustainable development and socioeconomic inclusion for the WPRAs.

Study area

São Paulo Metropolitan Area: Population=21,242,939 (IBGE/2016). Total area = 7.946,96 km² distributed in 39 municipalities



Figure 1. Watershed areas and municipalities within SPMA, Brazil. (Adapted from Fundação FIA).

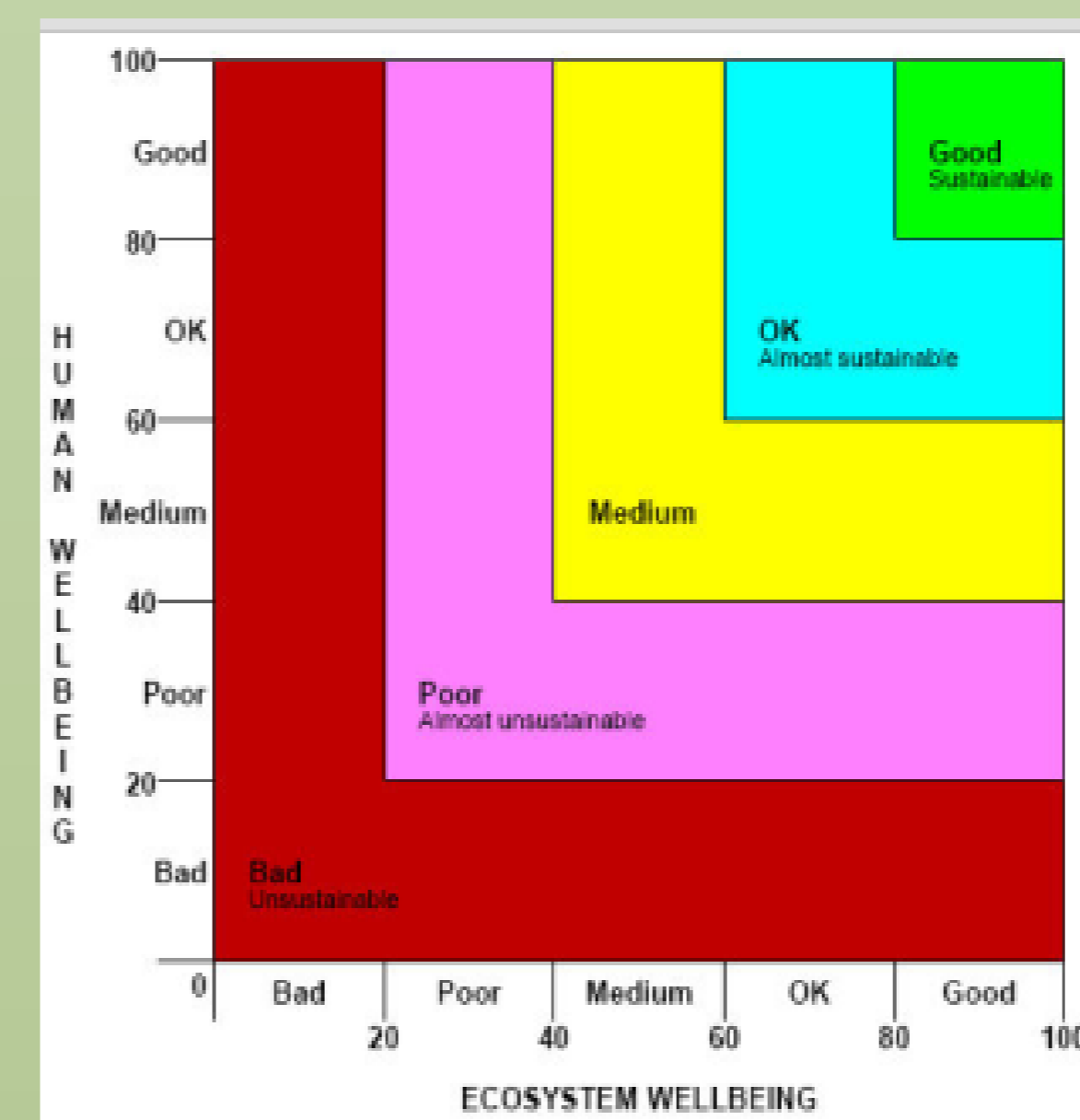
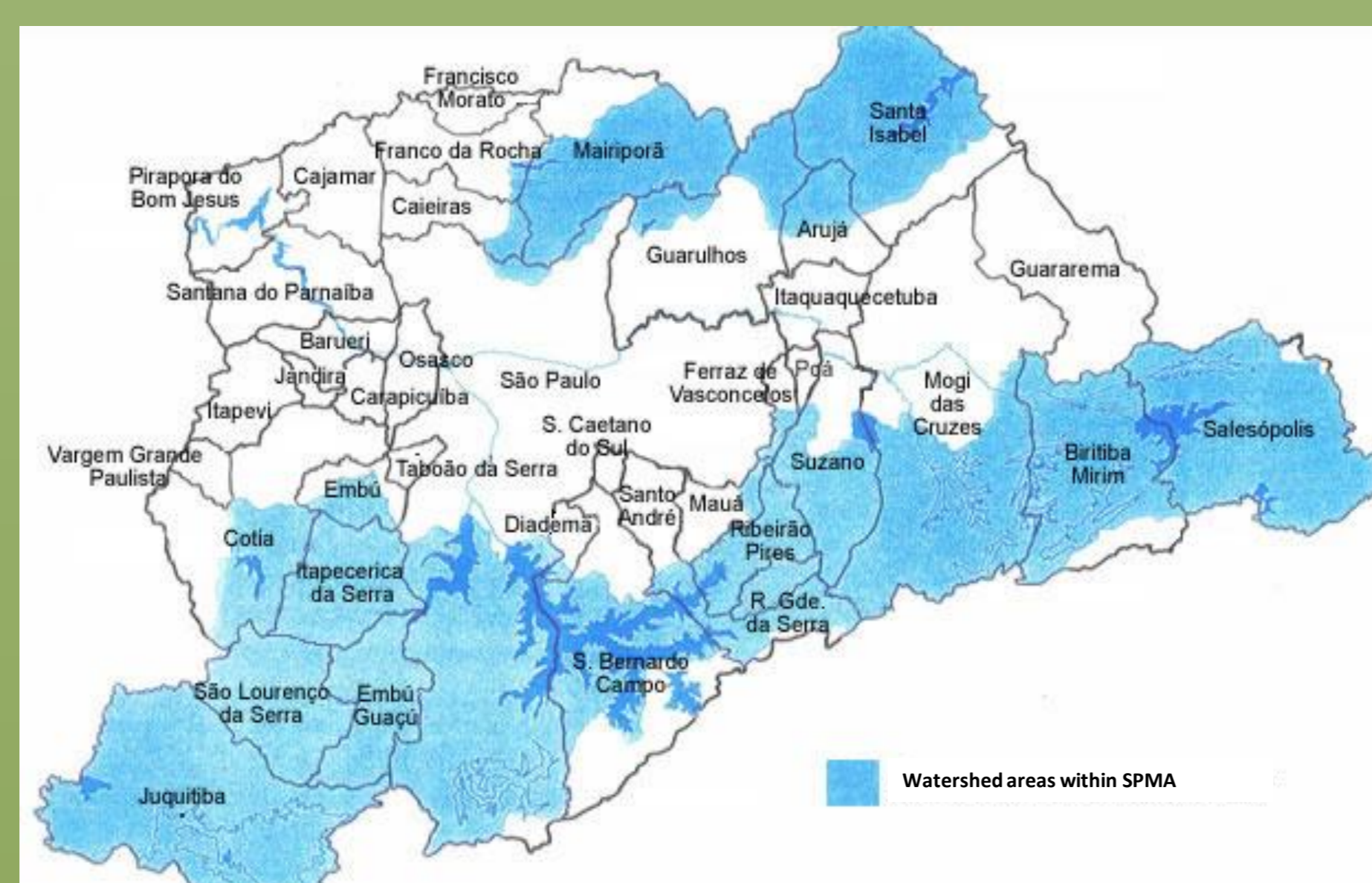


Figure 2. Barometer of Sustainability. The performance of human well-being and ecosystem well-being are placed on scales from 0 to 100, where red indicates an unsustainable situation ranging towards sustainable -> green color (by Prescott-Allen, in Guijt & Moiseev, 2001).

Content analysis to construct a database of sustainable development indicators for each municipality in the study area.

Sets of indicators are aggregated in thematic and dimensional indices, and performance scales are generated for each indicator.

Determination of the intervals corresponding to the scales of the BS for each indicator.

Aggregation of the social, economic and institutional dimensions for human well-being + environmental dimension for the well-being of the ecosystem = position of the municipality in relation to sustainable development

Analysis of results aiming at sustainable development models for the WPRAs

Expected Results

- Identification of indicators of sustainability in order to measure how well WPRAs are meeting the needs and expectations of its population and the environment, compared to the non-WPRAs within the SPMA.
- Qualitative analysis of how indicators and the methodology of the BS can be used to measure the sustainable development of a region.
- Identification of differences among municipalities within the four dimensions and enabling discussions around issues of sustainable

Methodology