



FEDERAL PROTECTED AREAS IN BRAZIL AND ITALY: A COMPARATIVE ANALYSIS

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ABSTRACT

Protected areas (PA) play a crucial role in preserving global biodiversity and ecosystem services. They ensure the protection of endemic species, preserve sensitive environments, and, in some cases, contribute to the livelihoods of local communities. Currently, there are 265,908 protected areas across 245 countries and territories, covering 16.64% of the planet's land and 7.74% of its marine areas. This article compares national legislation on PA in Brazil and Italy, evaluating their alignment with IUCN standards. In Brazil, Law No. 9,985/00, which establishes the National System of Conservation Units (SNUC), regulates protected areas, while in Italy, Law 394/91 guides the classification and management of these areas. The classifications of both countries were analyzed based on the framework established by the International Union for Conservation of Nature (IUCN) and its World Commission on Protected Areas (WCPA). Brazil's nomenclature shows greater similarity to the IUCN standard, although it is not fully adopted, and includes a greater number of classifications than the standard. Italy strictly follows the exact number of categories established by IUCN criteria and has a nomenclature that largely differs from the IUCN standard. Adopting a more standardized nomenclature between countries facilitates international comparisons and promotes a more effective exchange of knowledge on management practices.

Keywords: Environmental legislation; International comparison; Conservation

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ÁREAS DE PROTEÇÃO NACIONAL NO BRASIL E ITÁLIA: UMA ANÁLISE COMPARATIVA

RESUMO - As áreas protegidas (AP) desempenham um papel crucial na preservação da biodiversidade global e dos serviços ecossistêmicos, garantindo a proteção de espécies endêmicas, preservam ambientes sensíveis e em alguns casos, contribuem para a subsistência de comunidades locais. Atualmente, existem 265.908 áreas protegidas em 245 países e territórios, cobrindo 16,64% das terras do planeta e 7,74% das áreas marinhas. Este artigo compara a legislação nacional de AP no Brasil e na Itália, avaliando sua conformidade com os padrões da IUCN. No Brasil, a Lei nº 9.985/00, que institui o Sistema Nacional de Unidades de Conservação (SNUC), regula as unidades de conservação, enquanto na Itália, a Lei 394/91 orienta a classificação e gestão dessas áreas. As classificações de ambos os países foram analisadas à luz do modelo estabelecido pela União Internacional para a Conservação da Natureza (IUCN) e sua Comissão Mundial de Áreas Protegidas (WCPA). A nomenclatura brasileira mostra maior semelhança com o padrão da IUCN, embora não seja integralmente adotada, porém apresenta um número maior de classificações que o padrão. A Itália segue exatamente o número de categorias estabelecido pelos critérios da IUCN, e possui uma nomenclatura diferenciada do padrão IUCN em sua grande maioria. A adoção de uma nomenclatura mais padronizada entre os países facilita comparações internacionais e promove um intercâmbio mais eficaz de conhecimentos sobre práticas de gestão.

Palavras-Chave: Legislação ambiental; overseen by CONAMA (National Environmental Council), which comprises a
Comparação internacional; Conservação

1. INTRODUCTION

Protected areas are a crucial tool for the conservation of biomes, ecosystems, and species of fauna and flora. This is especially true due to the clear delineation of their boundaries and the regulation of land use and occupation based on local socio-environmental characteristics. Additionally, the management and governance objectives are defined according to the desired level of protection for each area. (Medeiros, 2006; Milano, 2001; Rodrigues, 2005). The global network of PA plays a crucial role in maintaining ecosystem services both directly and indirectly, benefiting populations at multiple scales (Reid et al., 2005). Currently, 265.908 PA are found worldwide, covering 245 countries and territories, corresponding to 16.64% of the terrestrial land surface and 7.74% of the marine cover (WDPA, 2021).

The International Union for Conservation of Nature (IUCN) and its World Commission on Protected Areas (WCPA) has developed a comprehensive framework for categorizing and managing PA, providing a globally recognized standard for conservation efforts. The first version of the regulations was created in 1994, when the IUCN defined the new international classification system for protected natural areas (IUCN, 1994), which was revised in 2008.

Brazil, a megadiverse country with ecosystems ranging from the Amazon rainforest to the Pantanal wetlands, has established a legal framework for PA through Law No. 9.985/00, known as the SNUC (National System of Conservation Units). This legislation has been instrumental in officially designated areas under the jurisdiction of the ICMBio (Instituto Chico Mendes de Conservação da Biodiversidade). The implementation of the system is

Plenary, CIPAM (Comissão Interministerial de Políticas para o Áreas Marinhas e Costeiras), Advisory Groups, Technical

Chambers, and Working Groups. The Minister of the Environment chairs the Council, and its Executive Secretariat is managed by the Executive Secretary of the MMA (Ministry of the Environment and Climate Change) (CONAMA, 2018).

On the other hand, Italy, known for its rich cultural heritage and diverse landscapes, has developed a distinctive approach to PA through legal frameworks and policies outlined in Law No. 394/91, which governs the classification of PA. These efforts are coordinated by the former MiTE (Ministero dell'Ambiente e della Sicurezza Energetica). The primary goal of these measures is to preserve Italy's unique natural and cultural assets while ensuring the sustainable management of its ecosystems for future generations.

The objective of this study is to conduct a comparative analysis of the nomenclature and management methods of conservation units in Brazil and nationally PA in Italy, evaluating them against the standards set by the IUCN. This comparison seeks to highlight the similarities and differences in the classification systems and management approaches adopted by both countries, while exploring the importance of standardization in conservation practices.

2. MATERIAL AND METHODS

The legislation was analyzed in both countries, and the data comes from the current laws and other legal instruments in force. In Brazil, Law No. 9.985/2000, known as SNUC, provides the legal basis for the establishment of protected areas. This law has seven chapters:

- I. Preliminary provisions;
- II. SNUC – Sistema Nacional de Unidades de Conservação;
- III. Categories of Conservation Units;
- IV. Creation, implementation, and management of Conservation Units;
- V. Incentives, exemptions, and penalties;
- VI. Of biosphere reserves;
- VII. General and transitional provisions.

In Italy, the establishment of protected areas is based on Law No. 394/91, coordinated by the former MiTE. This law is on the 6th update and published in Ordinary Supplement N° 144 to the Official Gazette N° 205, September 9, 2003. This legislation consists of four chapters, namely:

- I. General principles;
- II. National protected natural areas;
- III. Regional protected natural areas;
- IV. Final and transitional provisions.

The legislation regarding classification nomenclature and management regimes were compared both within the national frameworks of Brazil and Italy, as well as against the IUCN standards outlined in the 2008 publication Guidelines for Applying Protected Area Management Categories. This analysis aimed to identify key similarities and differences in the legal structures and management practices adopted by both countries, providing insight into the extent to which their systems align with international standards

3. RESULTS

The Italian PA law is structured as follows: Articles 1 to 7 outline the general principles, Articles 8 to 21 focus on national protected natural areas, Articles 22 to 28

address regional protected natural areas, and Articles 29 to 38 provide the final and transitional provisions. The Brazilian law is structured as follows: Articles 1 to 6 establish the general principles, Articles 7 to 21 cover the classification of conservation units, Articles 22 to 36 address implementation and management, Articles 37 to 40 outline incentives, exemptions, and penalties, Article

41 pertains to biosphere reserves, and Articles 42 to 60 provide general and transitional provisions.

The classification of the terrestrial protected areas was based on the different nomenclatures and goals represented (Table 1), according to the purpose of the area.

Table 01. Categories of protected areas on IUCN, Italian, and Brazilian national legislation.

Tabela 01. Categorias de áreas protegidas pela IUCN, legislação nacional Italiana e Brasileira.

IUCN	ITALY	BRAZIL
Ia Strict Nature Reserve	Nature Reserve	Ecological Station Ecological Reserve
Ib Wilderness Area	-	Area of Relevant Ecological Interest
II National Park	National Park Regional Park	National Park
III Natural Monument or Feature	-	Natural Monument
IV Habitat/Species Management Area	Other national protected areas Other regional protected areas	Wildlife Refuge Fauna Reserve National Forest
V Protected Landscape/ Seascape	-	Sustainable Development Reserve Environmental Protection area
VI Protected area with sustainable use of natural resources	-	Extractive reserve
Total of Categories	5	11

The IUCN categories have direct equivalents in both the Italian and Brazilian systems, though each country also has unique categories. For instance, IUCN's Ia (Strict Nature Reserve) corresponds to Italy's Nature Reserve and Brazil's Ecological Station and Ecological Reserve. However, some IUCN categories, such as Ib (Wilderness Area), lack direct equivalents in Italy's system. Conversely, Brazil has an Area of Relevant Ecological Interest, which may serve a similar function.

The Italian system's categories are not based on IUCN classifications, which explains the significant differences them.

Italy has fewer categories (5) than Brazil (11), reflecting a more streamlined approach. In Brazil, Wildlife Refuge, Fauna Reserve, and Environmental Protection Area categories address more specific management and conservation objectives. The wider variety of categories in Brazil suggests a more complex and nuanced conservation strategy, capable of accommodating diverse ecological and socio-economic contexts. In contrast, Italy's system is simpler, focusing on stricter conservation measures with less emphasis on sustainable use or community integration, concepts that are more often found in regional or continental classifications, rather than in

national categories.

Additionally, there are differences in management characteristics for these protected areas, as we can see, Italy has a different approach for National parks exclusively (Table 2).

In Italy, the management of protected areas is more specific, with a particular focus on National Parks, managed under a Park Plan, while other categories are handled through a Territorial Coordination Plan. The Park Plans are reviewed every 10 years, suggesting frequent processes for evaluating

Table 02. Management in protected areas

Tabela 02. Gestão nas áreas protegidas

Measures	ITALY		BRAZIL
Categories	National Parks	Other Categories	All categories
Name	Park Plan	Territorial Coordination Plan	Management plan
Validity of the plan	Review every 10 years	-	Unlimited validity
Coverage	All national parks	All regional parks	Present in 53% of the conservation units

and adjusting management practices. For Brazil, the Management Plan applies to all categories of protected areas, reflecting a more universal and comprehensive approach to conservation management, but it has unlimited validity, which implies a need for ongoing updates and flexibility to adapt to environmental, political, and social changes.

Different authorities in each country manage the establishment of PA, in Italy, as outlined in Article 3 of Law No. 394/91, the responsibility lies with the MATTM (Ministero dell'Ambiente e Della Tutela Del Territorio e Del Mare), the European Commission, universities, researchers, six regional presidents, and autonomous evaluators. In Brazil, the ICMBio (Instituto Chico Mendes de Conservação da Biodiversidade) under the MMA (Ministério do Meio Ambiente e Mudança do Clima), is the primary authority, as stipulated in Article 22 of Law No. 9.985/2000.

4. DISCUSSION

The different timelines of these legislative

frameworks could influence the results of the analysis, as we see the Italian law was created before the IUCN standardization, meaning it was not initially designed with IUCN categories in mind. The fact that Italy did not explicitly update its law following IUCN recommendations may reflect either a different approach to conservation or a slower pace of adaptation to international standards. Similarly, Brazil's law, established in 2000, was developed in the context of an evolving global conservation framework, its alignment with the IUCN standards may have been influenced by both domestic conservation needs and the growing recognition of IUCN's classifications. This temporal difference between the creation of the legal frameworks and the subsequent development of the IUCN standards is crucial, as it may have affected the way each country's system was structured and its alignment with international norms.

Italy boasts a unique landscape, rich in beauty and culture, and is home to a vast network of protected areas. The concept of these areas arises from the need to preserve regions from the gradual erosion of the

original ecological balance that characterized the territories when they were still intact, before being degraded—primarily due to irresponsible human activities. To counter this, it is essential to limit the uncontrolled exploitation of natural resources by safeguarding areas that reflect ecological equilibrium (Lausche, Burhenne, 2009; Saviano et al., 2018).

The Global Environment Facility Benefits Index (GEFBI) is an indicator designed to assess a nation's biodiversity potential, considering factors such as local fauna and flora, endangered species, and habitat diversity (Pandey et al., 2006). This index underscores Italy's remarkable variety of biogeographic regions, positioning it as the European nation with the highest species diversity (MATTM, 2014). Italy is home to 1,300 animal species and 759 plant species (IUCN, 2013). Additionally, Italy contains the largest network of protected areas within the Mediterranean bioregion, covering 20% of its total territory. Moreover, Italy pioneered the implementation of an environmental management system (EMS) for protected areas in Europe, known as *Parchi in Qualità* (Abreu, 2011).

The IUCN defines National Parks as protected areas of Category II, that is, large natural or near-natural areas set aside to protect ecological processes on a large scale, along with the species and ecosystems characteristic of the area, which also provide a foundation for spiritual, scientific, educational, recreational, and visitation opportunities compatible with the environment and culture (Dudley, 2008). Italy's National Parks, with their relatively large average size, constitute a system that supports numerous size-dependent aspects of floristic, vegetational, and landscape diversity. This system is crucial in preserving biophysical heterogeneity and old-growth forests, particularly due to its relatively even distribution across ecoregions (Capotorti et

al., 2012). The exclusivity of management plans for national parks in Italian legislation underscores the significance of these areas, which have 26 parks distributed across the country (MASSE, 2022).

Notably, the predominance of PA compatible with Category V – Protected Landscape/Seascape – both in Italy and across Europe- results from the extensive alteration of natural biomes by human activity, particularly due to the progressive intensification of urbanization since the medieval period. This explains the relatively low biological diversity compared to the realities of Brazil (Pelizzaro et al., 2015).

According to data from the Food and Agriculture Organization (FAO, 2017), Brazil hosts the greatest biodiversity on the planet, accounting for 20% of the world's total species. The country is home to approximately 116,839 animal species and 46,355 plant species. As a mega-diverse nation, Brazil bears a significant global responsibility for safeguarding its vast natural biomes, including the Amazon Rainforest—the largest tropical forest on Earth—and the Atlantic Forest and Cerrado, both recognized as a biodiversity hotspot (MMA, 2021).

According to SNUC (2000, Art. 7) and ICMBio (2014), Brazilian conservation units are divided into two groups with distinct characteristics: Strict Protection Units (Law No. 9,985 of July 2000, Art. 8) and Sustainable Use Units (Law No. 9,985 of July 2000, Art. 14). Together, these groups comprise a total of 12 categories of conservation units, whereas the IUCN defines only 7 categories. This greater number of categories in Brazil can be attributed to the country's high environmental and social complexity, which demands a diverse range of management tools to address the unique challenges of conserving its natural heritage and promoting the

sustainable use of its resources. According to Salvio et al. (2018), Brazil ranks as the second country in South America with the highest number of conservation categories, surpassed only by Venezuela, which has 26 categories, however, only 6 of them are recognized under the IUCN standard.

PA adopt various approaches and procedures for designation, depending on the country. The IUCN's approach is merely a recommendation, and each country can adjust it in different ways within its national legislation. A key role of such legislation is to articulate the relative priorities of environmental, economic, and social objectives. While these guidelines stress the need for integration among all three purposes, it is valuable to have a clear statement that, when an unavoidable conflict arises, environmental protection should take precedence (IUCN, 2002).

For the management plan of PA, Italy has specific plans such as the Park Plan for national parks, reviewed every 10 years, ensuring periodic updates that reflect socio-environmental changes and emerging needs, but only for this category. In contrast, in Brazil, the Management Plan, which encompasses all categories, does not have a defined timeline for revision, potentially compromising its adaptability over time. Furthermore, while plan coverage in Italy is comprehensive for national and regional parks, in Brazil, only 53% of conservation units have implemented management plans, revealing significant gaps in management effectiveness. These differences highlight the importance of structured and regularly updated planning as an essential tool for environmental protection, underscoring the need for improvements in Brazilian policies, particularly regarding the scope and periodic review of management instruments (Marques, Nucci, 2007; Barros et al., 2019).

The governance of protected areas defines

the interactions, structures, processes, and responsibilities within these areas. According to IUCN (2017), although governance regimes in protected areas vary widely, there are four defined types: government-led governance, shared governance, governance by private institutions, and governance by indigenous peoples and local communities. In Brazil and Italy, national protected areas are managed by ICMBio, MMA, and MiTE (formerly MATTM), respectively.

Several studies have compared PA across countries in regions, legislation, coverage, and effectiveness. Notable examples include the research of Sehli et al., (2014), Salvio et al., (2018), Mammides et al., (2021), and others. For instance Miller-Rushing et al., (2017) compared China's Natural Reserves with the United States National Parks, emphasizing the similarities in their conservation strategies despite differences in classification mechanisms within the IUCN framework. The study revealed that both countries manage their PA through centralized government agencies, supported by well-established legal frameworks and coherent policy systems. This highlights the effectiveness of integrated governance structures in achieving conservation goals, regardless of variations in classification systems.

Similarly, Pelizzaro et al. (2015), in their study on the management of PA in Brazil, the United States, Italy, South Africa, China, Georgia, and Australia, identified that the IUCN Category II (National Parks) is the most commonly adopted classification among these countries. This category is present in all the nations analyzed, followed by Category III (Natural Monument). The study also concluded that Australia and Georgia are the only countries fully aligned with the IUCN standards.

In summary, the comparison between the protected area systems of Brazil and Italy

highlights how historical, social, and ecological contexts shape national conservation frameworks and their alignment with IUCN guidelines. While Brazil's extensive biodiversity and socio-environmental complexity necessitate a broader range of conservation categories, Italy's approach reflects its long history of human-environment interactions and its role within the European conservation network. Both countries exemplify the flexibility of the IUCN framework, which allows for adaptation to local realities while providing a global reference for conservation efforts.

5. CONCLUSION

Standardization with the IUCN offers significant advantages, such as facilitating global communication, aligning with widely recognized guidelines, and promoting comparability between countries. However, it also presents limitations. In Brazil's case, the diversity of categories allows for greater flexibility to address specific conservation and sustainable use needs but may hinder alignment with IUCN definitions. In contrast, Italy's absence of certain categories, such as areas for the sustainable management of natural resources, may limit the integration of local communities into conservation strategies.

Therefore, while standardization with the IUCN contributes to more cohesive global environmental governance, its implementation requires adaptations to account for the environmental, social, and cultural realities of each country. A hybrid model that combines the benefits of standardization with the flexibility needed to respect national contexts could be the most effective approach to strengthening conservation and the sustainable use of natural resources, while also fostering knowledge exchange and the management of protected areas among countries.

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AUTHOR CONTRIBUTIONS

Silva, A.C. da: Writing, investigation, editing, and project administration; Cosmo, N.: Supervision, validation, and review; Galvão, F.: Supervision and review.

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