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Between the Right to Nature and the Rights of Nature: Accessibility and Environmental Quality in Argentine Beaches

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ABSTRACT

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This study examines the relationship between accessibility and quality indicators along Argentina's Atlantic coast, addressing how improved beach access can promote inclusive enjoyment while potentially degrading fragile coastal ecosystems. With the Sun and Beach tourism model, beach development often enhances infrastructure and accessibility; however, the balance between the human right to nature, which ensures equitable access, and the rights of nature, which protect ecological integrity, remains a critical challenge. Using data from the 2025 Argentine Beach Quality Ranking, 37 beaches (urban, village, and rural) were analyzed to explore correlations between access and parking and indicators such as environmental quality, management, habitat, species, and heritage. Results reveal a clear urban–rural gradient: Accessibility declines, and environmental and management qualities increase in less developed areas. Urban beaches show weak or null associations between access and environmental factors, whereas village beaches demonstrate cultural value and ecological sensitivity; rural beaches retain high natural integrity. Findings emphasize the need for context-sensitive coastal governance that harmonizes accessibility with sustainability.

ADDITIONAL INDEX WORDS: *Coast, management, indicators, conservation.*

INTRODUCTION

Since the AD mid-20th century, coastal areas around the world have become preferred tourist destinations. Under the Sun and Beach paradigm, various localities along the Argentine coast were developed with resorts, hotels, private properties, commercial establishments, and access routes, with the beach serving as the central stage of attraction (Dadon, 2011). According to Micallef and Williams (2003), the ideal beach as a recreational-landscape resource should be sandy and clean, with shallow waters of pleasant temperature; easily accessible; and equipped with sanitary facilities, lifeguards, shade, and a small commercial area.

The quality of accessibility to beaches holds worldwide significance regarding beach certification systems, and it consistently presents as a key variable to be considered. The demand to improve access routes, public transportation, and parking facilities has been sustained as a fundamental right that guarantees inclusive access to nature, particularly for individuals with reduced mobility. Moreover, the characterization of the human right to nature (RtN) as the right to live in a healthy environment, have access to urban green spaces, and live in a balanced climate has been emphasized and supported. This recognition occurs not only based on environmental ethics but also through explicitly touristic interests because both residents and visitors place high value on the ease of access to natural landscapes, in addition to factors such as infrastructure, safety, and services (Alves *et al.,* 2023).

The incorporation of accessibility criteria fosters the full enjoyment and participation of people with disabilities, ensuring access to the shoreline and even to bathing areas, which is required by certifications, such as the Blue Flag program (Prats and Merino, 2023), based on cleanliness, safety, environmental education, and sustainable management. Nonetheless, increased accessibility may also result in the overexploitation of natural resources, especially within fragile ecosystems such as coastal environments. Enhanced access often facilitates urban development and stimulates mass tourism, which, in turn, can cause landscape degradation, ecosystem fragmentation, and the loss of natural habitats. Such processes undermine the rights of nature (RoN) because they prioritize human demands over the integrity of the natural environment. RoN is based on the idea that the natural world has inherent value and provides rights that should be recognized and protected and that observing those rights benefits a more sustainable relationship between humans and the biosphere, preventing its degradation or destruction (Alves *et al*., 2023).

In Argentina, this tension is found in many of the Atlantic coastal landscapes, where, despite natural capital constituting the principal foundation of tourism, urban and recreational development is prioritized, which produces negative effects on the environment. Beach tourism is a socioeconomic

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activity; its basic input and output are found in its landscape, which simultaneously involves the occupation and intensive use of the coastline (Ackerman, 2011). In Argentina, seaside resorts began as destinations for wealthy elites at the end of the AD 19th century. These settlements became popular among the broader public from the 1940s onward and reached their peak in the 1960s (Ackerman, 2011). As in Europe, the Argentine coastal landscape was primarily valued for contemplation, and sea bathing played a secondary role. This explains why tourism first succeeded in cities such as Mar del Plata and Miramar, which were located on cliffed coasts (Figure 1; Bertoncello, 2006).

Many coastal settlements emerged after 1940, which is closely associated with tourism as a form of real estate investment. This development created the need to integrate beach access into the existing road network. The institutionalization of paid vacations as labor rights, the rise in workers' income levels, and the expansion of mass transportation collectively stimulated the growth and democratization of tourism. Some locations adopted the garden city model with a small-town design that favors the presence of greenery, layouts with irregular shapes, and curved streets that respected the topography of the dunes. Others, which followed a traditional checkerboard design, maintained the presence of green as a distinctive quality of the place.

This article explores how different beach types—urban, village, and rural—differ in their overall environmental and cultural profiles to reveal underlying gradients linking accessibility with environmental quality and cultural–ecological values to better understand trade-offs between the RtN and the RoN.

Beaches, Dunes, and Ecosystem Services

Beaches and their adjacent dune landscapes provide multiple benefits that must be preserved. International literature on ecosystem services in coastal environments has focused on provisioning and cultural services, particularly recreation and tourism, as well as regulating services that are often evaluated through the effects of storms and extreme events. These evaluations consider the physical dimension and economic consequences for affected societies (Faggi and Perelman, 2023a).

Coastal vegetation also provides key ecosystem services by acting as a natural defense system, ensuring shoreline protection. Speake, Carbone, and Spetter (2020) emphasize that due to the complexity of coastal areas and the multiplicity of activities they host, it is essential to develop assessments capable of reflecting the ecological continuity between adjacent ecosystems.

Areas dominated by nature (*e.g.,* reserves, marshes, vegetated dunes) play a critical role in maintaining coastal dynamics. These areas contribute to sand supply for beaches, hydrological regulation, and freshwater availability through rainwater infiltration and sediment capture. They also serve as vital habitats, especially when preserved in pristine or seminatural conditions, providing refuge for diverse species of flora and fauna (Faggi and Perelman, 2023b).

Oliveira *et al*. (2024) developed a framework that uses quality ranking to evaluate and classify urban, village, and

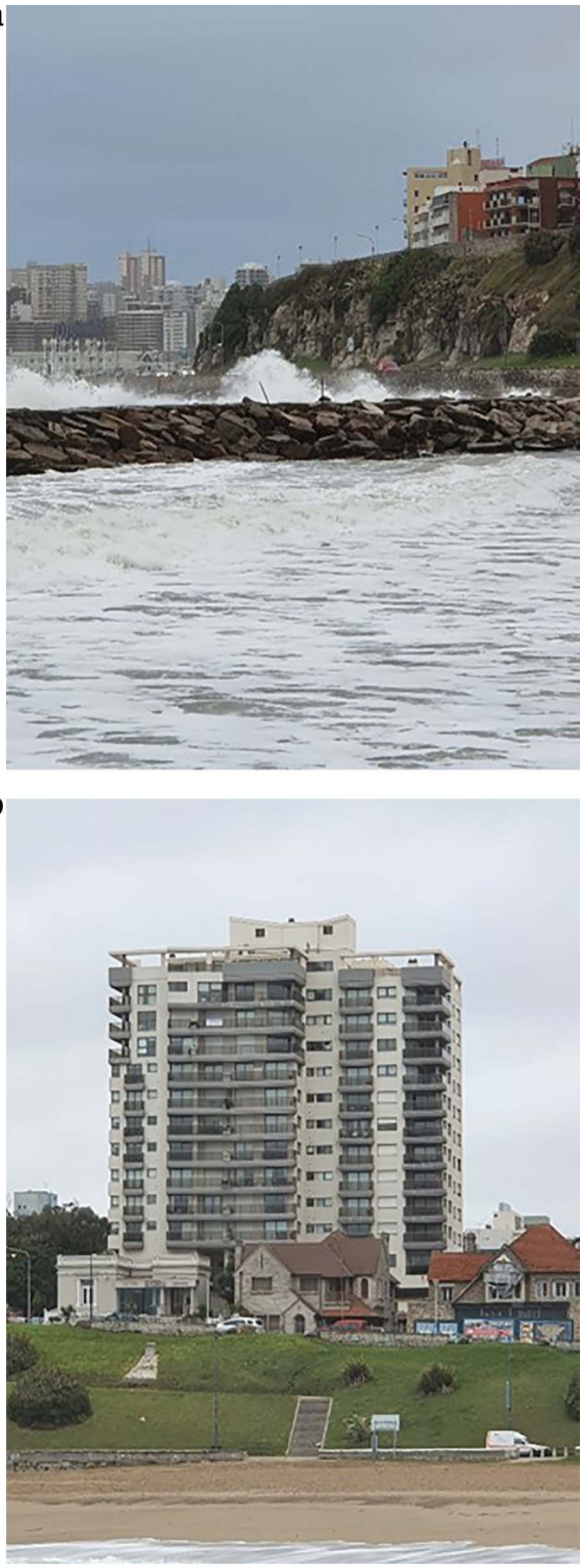

Figure 1. Mar del Plata: sandy beaches bordered by cliffs.

Table 1. *Types of beaches considered for application in the beach indicator.*

Type	Description
Urban beach	Located within or adjacent to an urban area, with free access, well-established public services, and a clearly defined central business district
Village beach	Located outside the main urban area and associated with a small but permanent population; small-scale community services; able to be reached by public or private transport
Rural beach	Located outside urban or village settings; not easily accessible by public transport and few or no facilities; little or no development along the beachfront, although a few houses may be present

rural beaches (Table 1). The beach-quality analysis incorporates four dimensions (*i.e.* recreation, protection, health aspects, conservation) and 20 categories. Each category is measured using indicators, which are scored on a scale of 1 to 5. Unlike purely tourist-oriented classifications, which are based on subjective perceptions, this ranking proposes a deeper understanding of coastal areas that considers attributes such as bathing quality, biodiversity, accessibility, safety, infrastructure, climate resilience, and ecosystem services. The beach, therefore, is understood as a dynamic socio-natural system where its value transcends leisure and encompasses multiple and significant environmental and sociocultural functions. Since Oliveira proposed this tool, it has been increasingly applied every year in Latin America and other countries (Oliveira and Botero 2023, 2024, 2025). From 2023 to today, data have been generated to be analyzed from different perspectives; results will be especially useful for monitoring and management. This article analyzes some of the data from 37 beaches in Argentina in 2025.

METHODS

This article uses the Argentine-scored urban, village, and rural beaches included in the 2025 Ranking Framework Dataset (Figures 2–4; Oliveira and Botero, 2025). The data include

Figure 2. Pinamar: urban beach in Buenos Aires.

Figure 3. Valeria del Mar: village beach in Buenos Aires.

analysis of 37 beaches to explore relationships between accessibility and environmental indicators within the conceptual framework of the RtN and the RoN. Spatial distribution of the sites covers Argentina's Atlantic coast, encompassing both dune and cliffed systems across the Buenos Aires and Patagonian sectors, which is where most Sun and Beach tourism develops. The reliability, sampling method, and validation of this database are found in the published rankings (Oliveira and Botero, 2023, 2024, 2025).

To examine the potential effects of increased accessibility on environmental and socioecological factors, six variables from the recreation and conservation sections of the ranking were selected: access and parking (AC), environmental quality (EQ), management actions (MG), habitat (HA), species (SP), and heritage (HE). Each variable was scored on a scale from 1 (poor) to 5 (excellent) according to standardized evaluation protocols (Oliveira and Botero, 2023, 2024, 2025).

To synthesize complex multivariate data (AC, EQ, MG, HA, SP, HA) into a smaller number of interpretable dimensions, a principal component analysis (PCA) was conducted to identify the main patterns of variation among Argentine beaches based on environmental, management, ecological, and accessibility indicators. Analysis of 37 beaches that were classified as urban ($n = 27$), village ($n = 10$), or rural ($n = 6$) examines relationships between the AC factor and multiple environmental and social variables (EQ, MG, HA, SP, HE; Table 2).

The variables included AC, which identifies the type of entrance and the availability of nearby parking. Graduation varies from stairs, private transportation, no parking with access to a clear path, diverse transportation, and abundant public parking. The EQ variable includes the assessment of the overall quality of the environment, which involves identifying noise, air pollution, and eutrophication; history of significant environmental impacts, pristine area; no urbanization; and no disturbance or contamination nearby.

The MG variable includes identification of public instruments and regulations on the use and conservation of the beach, which involve clear and visible code of conduct, tested

Figure 4. Centinela del Mar: rural beach in Buenos Aires.

and implemented beach regulations, educational activities with high institutional commitment, and presence of protected areas nearby. The HA variable is used to assess the status of beach habitats and the risk of ecosystem collapse.

The SP variable incorporates the examination of the richness and abundance of species in an area and identification of the presence of native and invasive species. The HE variable involves assessing the presence of geological, cultural or historical heritage.

The study focused on reconciling accessibility with ecological protection, so the selected variables were grouped *a priori* into two conceptual clusters, reflecting the dual frameworks guiding the analysis (Figure 4).

This categorization enabled the PCA to empirically test how RtN- and RoN-oriented attributes co-vary across different types of beaches (urban, village, and rural), allowing the multidimensional gradient between anthropocentric and ecocentric values to be quantified (Figure 5).

RESULTS

Figure 6 shows that along the urban–rural gradient, decreasing mean values of AC occur in contrast to the other variables that increase as they move away from the urban area. Rural beaches, being the most remote and immersed in a rural landscape, are the least accessible, but they reach, except in habitat, the highest values in the variables considered.

The first principal component (PC1; 52.7%) separates beaches primarily by environmental and management quality *vs.* accessibility (Figure 7). All variables load positively, and areas scoring high here are well equipped, accessible, and well managed. High scores occurred in urban centers, such as Pinamar Centro or Puerto Madryn. The second principal component (PC2; 18.7%) differentiates beaches by the natural-environmental *vs*. built contrast and distinguishes rural beaches (*e.g.,* El Doradillo) from urban ones (*e.g.,* Las Toninas). Positive loadings of the variables occurred for MG, HA, SP, which showed more natural and rural qualities, whereas negative loadings were found for AC and EQ and are linked to more infrastructure and urban features. The third principal component (PC3; 11%) is possibly related to HE-separating destinations with strong cultural or ecological heritage where sites (*e.g.,* Mar Chiquita, Cariló) tend to plot higher. Table 3 shows how strongly each variable contributes to PC1, PC2, and PC3.

Urban beaches cluster had high AC and low EQ/MG/HA/SP values. Lower PC1 is linked to lower ecological performance; it is a highly accessible, tourism-driven area that prioritizes recreation (RtN), but it also shows ecosystem stress. Village beaches are transitional, with moderate PC1 and high PC2, showing balance between culture and environment. Transitional zones with both cultural identity and moderate environmental health display the best balance between access and sustainability (Figure 8). Rural beaches dominate the high PC1 region, having strong ecological integrity but limited accessibility. They are examples of remote, pristine

Table 2. *Beach variables considered in this study.*

Urban	AC	EQ	MG	HA	SP	HE
Las Grutas	2.2	2.67	2.5	2.5	2.67	4
Monte Hermoso	3	2.67	3.5	3.5	3.00	3
California Beach	3	2	2.5	2.5	2.67	1
Costa Esmeralda	2.4	3.67	4	4	2.33	3
Reserva Puerto	3.56	3.67	3.45	3.45	3.84	1.95
Las Toninas	3.6	3.67	1.5	1.5	3	1
Mar del Tuyu	3.4	3	1	1	2.33	1
Miramar centro	4	3	3	3	1.33	4
Ostende	3.8	4.33	3.5	3.5	3	4
Parquemar	4	3.67	3	3	1.33	3
Pinamar centro	4	4	3.5	3.5	2.67	1
Acevedo	3.6	3.67	1	1	3	3
Constitución	3.6	3	1.5	1.5	2.67	1
Playa Grande	3.7	3.67	1.5	1.5	1.67	2
Playa Popular	4.2	1.67	2.5	2.5	2	1
Puerto Cardiel	4	3.67	2	2	1.33	1
Puerto Madryn	4.2	3	3	3	3	4
San Sebastián	3.8	4	2	2	2	1
Santa Teresita	3.6	3	1.5	1.5	3	1
Sun Rider	3.4	3	2.5	2.5	1.67	2
Varese	4.2	2.33	3.5	3.5	2.33	2
Village	AC	EQ	MG	HA	SP	HE
Aguas Verdes	2.6	5	1	5	4	1
Cariló	3	5	3	4	3.33	3
Costa del Este	3.2	5	1	5	4	1
Hijos del Mar	3.8	4.33	3	3	3	4
La Boca	2.2	2.33	2	3	4.67	2
Mar Chiquita	4	4.67	5	5	3.67	5
Playa Alfar	3.2	3.67	1.5	3	3.67	2
Playa Serena	3	4	1	4	3.67	2
Puerto Pirámides	2.8	4	4	5	4.33	3
Valeria del Mar	2.8	5	3.5	5	4	1
Rural	AC	EQ	MG	HA	SP	HE
San Cayetano	3	4.33	2.50	3.00	4.67	5
La Caleta	2.2	3.67	1.50	3.00	4.67	5
Centinela del Mar	2.4	5.00	4.50	4.00	5.00	5
El Doradillo	3	5.00	5.00	5.00	4.67	5
Las Canteras	2.8	5.00	5.00	5.00	5.00	5
Punta Perdices	2.2	4.33	4.50	5.00	4.67	5

AC = access; EQ = environmental quality; MG = management; HA = habitat; SP = species; HE =heritage

ecosystems with strong ecological integrity (RtN) with minimal human impacts.

DISCUSSION

The multivariate approach effectively integrated ecological, management, and sociocultural dimensions, allowing for the visualization of Argentine beaches along a continuum from human- to nature-centered systems (Figure 9). The PCA revealed two dominant gradients structuring this variability.

PC1, explaining more than one-half of the variance, represented an EQ–AC gradient, where high AC was inversely related to EQ, MG, and ecological integrity (HA, SP). This gradient clearly distinguished urban beaches, which are characterized by dense infrastructure and recreational pressure, from rural beaches, which remain less accessible but exhibit higher ecological quality. PC2 reflected a cultural–ecological gradient, separating beaches with strong HE and cultural attributes from those with higher biodiversity and natural values. Together, these axes illustrate the multidimensional trade-offs between human access and environmental preservation along Argentina's Atlantic coast.

Urban beaches clustered at the low end of PC1, confirming that intensive accessibility often coincides with environmental degradation and weak governance. These settings, dominated by the Sun and Beach tourism model, prioritize recreation and economic returns, aligning with the RtN framework, which emphasizes human access and enjoyment of natural environments (Alves *et al.*, 2023). In contrast, rural beaches, with limited accessibility but higher environmental quality and biodiversity, embody the RoN perspective, recognizing the intrinsic value and autonomy of ecosystems (Portela and Thays, 2022).

Village beaches occupied an intermediate position, showing moderate accessibility coupled with high heritage and management scores. These sites (*e.g.,* Cariló, Mar Chiquita, Hijos del Mar) illustrate how cultural heritage and ecological protection can coexist through deliberate planning and participatory governance. Cariló's protected landscape, designed under Garden City principles, and Mar Chiquita's

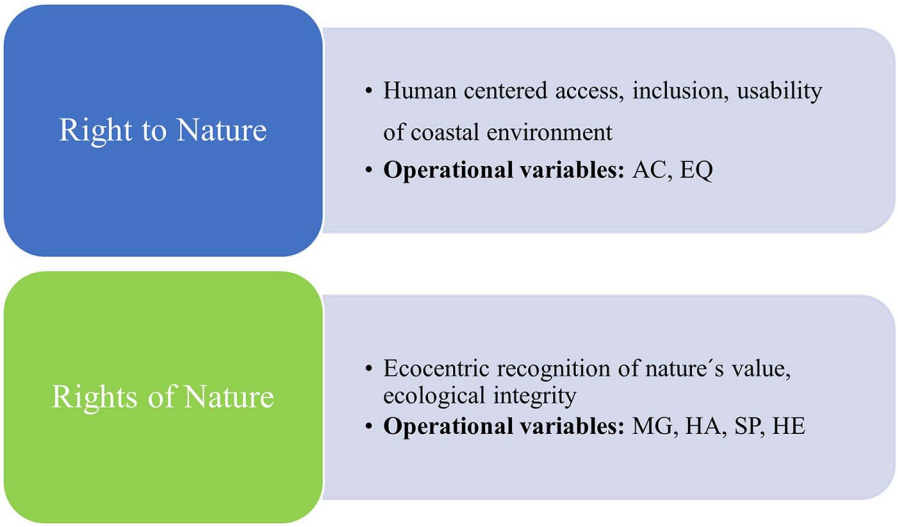

Figure 5. Conceptual clusters to analyze right to nature and rights of nature.

designation as a United Nations Educational, Scientific, and Cultural Organization Biosphere Reserve exemplify sustainable coastal development that integrates biodiversity conservation with controlled visitor access (Di Giacomo, 2005). The resilience of these settings, often maintained through small-scale but consistent governance actions, demonstrates the potential for reconciling tourism with environmental stewardship (Botero *et al*., 2015; Faggi and Perelman, 2023a).

Environmental awareness in Argentina gained prominence only in the AD late 20th century, after most coastal cities were already consolidated. The unregulated expansion of urbanized areas has since led to habitat degradation and biodiversity loss (Dadon, 2009). Despite this, municipal planning has often overlooked the protection of natural areas; this oversight undermines ecosystem services, coastal restoration, and sustainable tourism potential. Integrating conservation priorities into strategic coastal management is therefore essential for maintaining ecological integrity and destination competitiveness (Aguiló, Alegre, and Sard, 2005).

The PCA findings underscore that accessibility provides advantages and disadvantages: It is essential for social inclusion but potentially harmful to ecological resilience when unregulated. Sustainable coastal governance in Argentina must therefore integrate both human and ecological rights, ensuring equitable access while safeguarding environmental functions. Strengthening management capacity, promoting

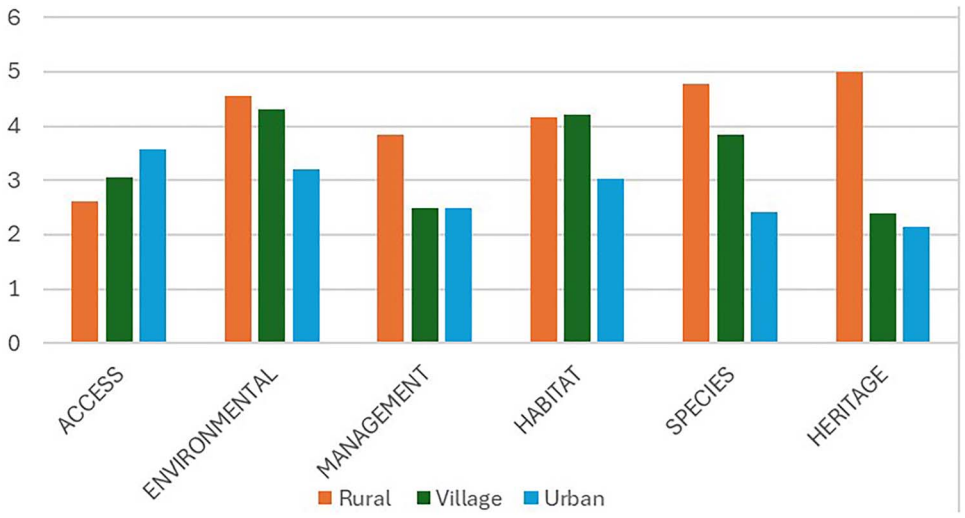

Figure 6. Mean values of the compared variables in urban, village, and rural beaches.

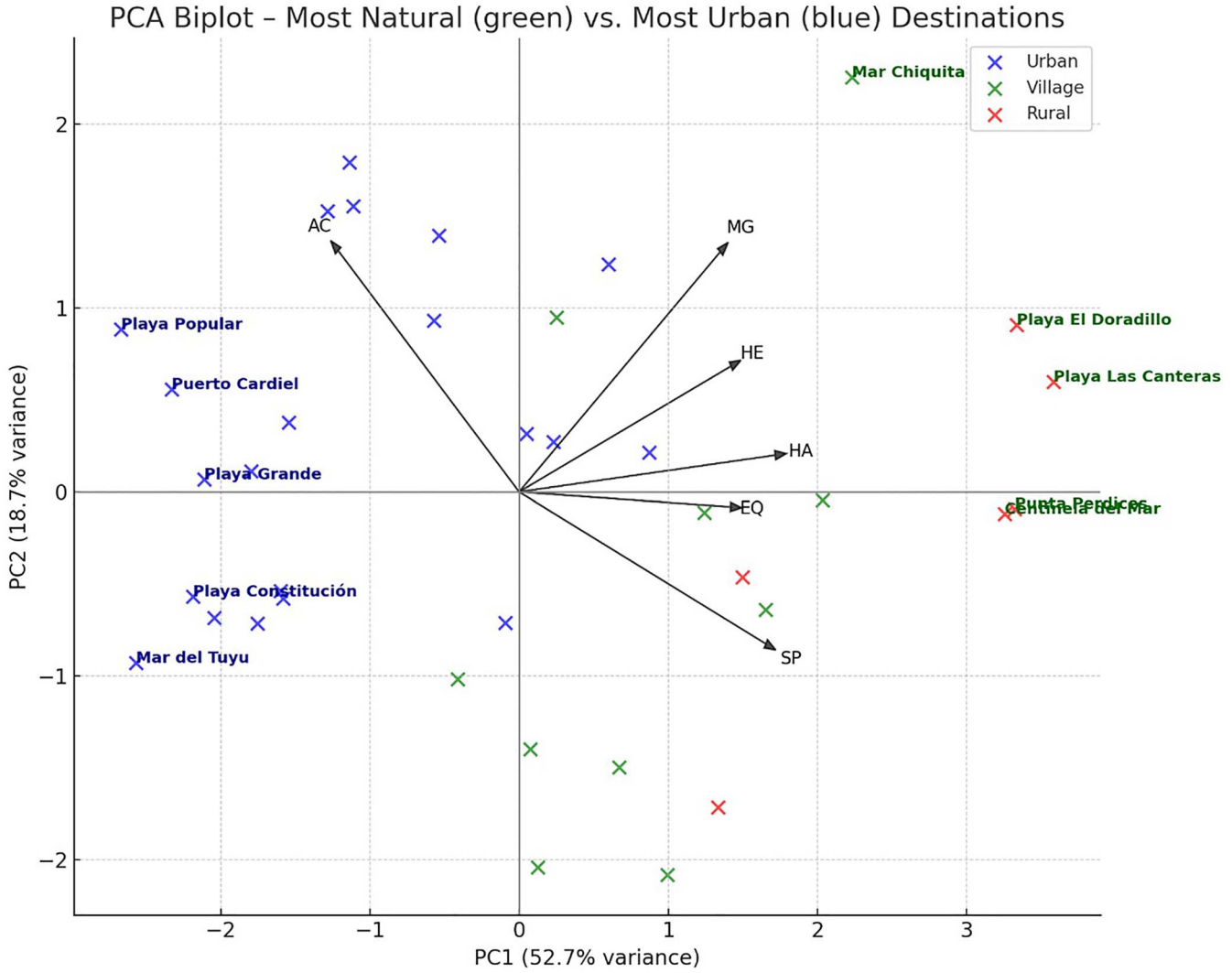

Figure 7. Principal component analysis biplot for the Argentine beach dataset. Left: Urban beaches with high AC and low EQ/MG scores. Right: Rural and village beaches showing low access but high EQ, HA, and SP scores. AC = access, EQ = environmental quality, MG = management, HA = habitat, SP = species.

responsible tourism, and preserving natural buffers such as dunes and vegetation are key strategies for achieving this balance.

Table 3. *PCA loadings table, correlations between variables and principal components.*

Variable	PC1	PC2	PC3
AC	+0.42	−0.34	+0.18
EQ	+0.45	−0.19	−0.30
MG	+0.39	+0.47	−0.22
HA	+0.40	+0.49	−0.12
SP	+0.33	+0.45	+0.52
HE	+0.37	−0.29	+0.71

AC = access; EQ = environmental quality; MG = management; HA = habitat; PCA = principal components analysis; SP = species; HE = heritage

The relative isolation of rural beaches, accessible mainly by private transport, suggests that current visitation levels are insufficient to cause measurable ecological effects. However, these sites remain vulnerable to future accessibility improvements or unregulated tourism growth, which could erode their pristine conditions if not managed proactively.

Ultimately, the urban–rural gradient empirically grounds the conceptual tension between RtN and RoN. Urban beaches reflect anthropocentric values where nature serves recreation, whereas rural beaches embody ecocentric principles prioritizing intrinsic ecological worth. Village beaches demonstrate that coexistence is possible through ecosystem-based management integrating recreation, education, and conservation goals. As Botero *et al.* (2015) note, effective beach management must balance natural, socioeconomic, and cultural resources and assign differentiated functions to

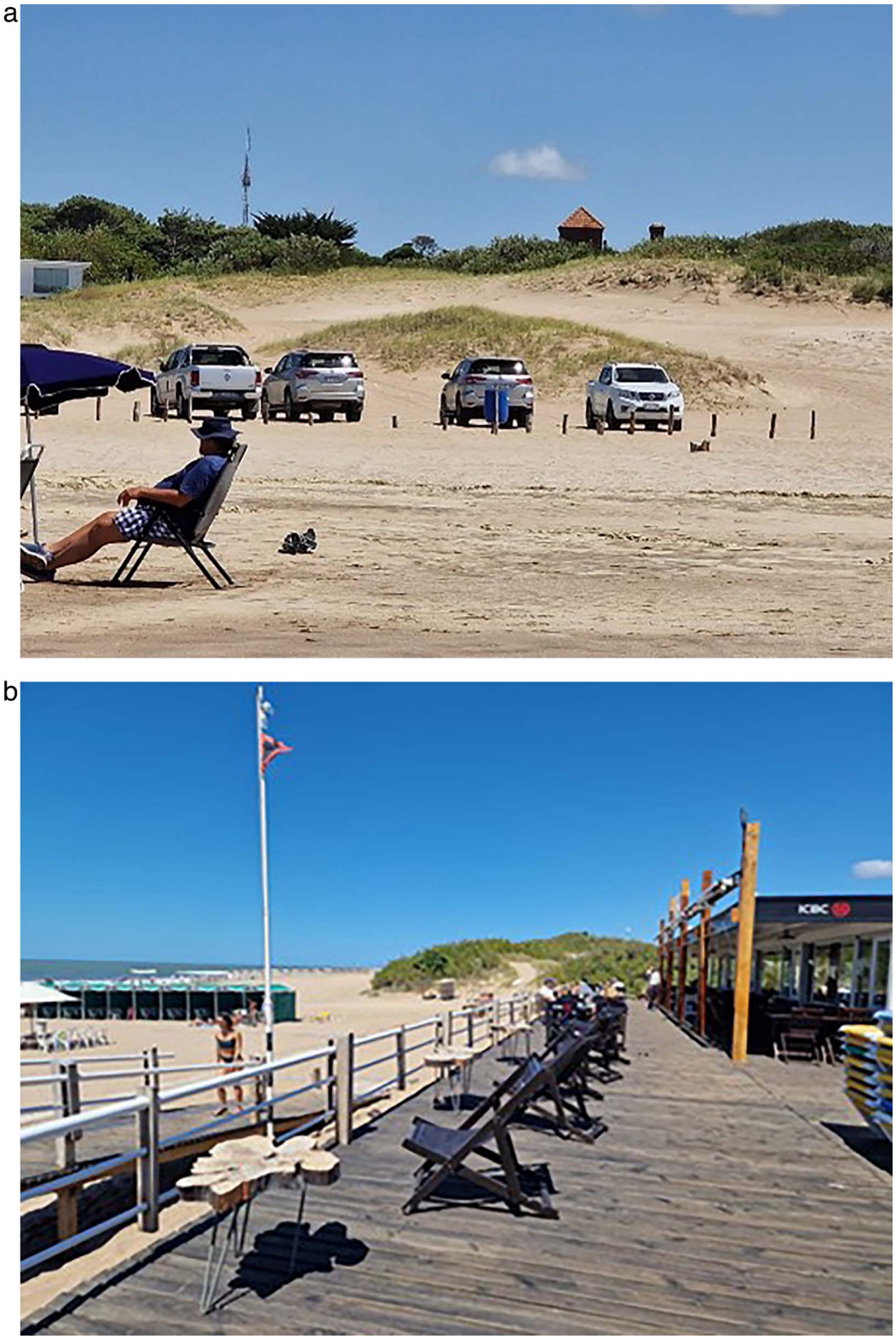

Figure 8. Cariló: A village sandy beach with vegetated dunes.

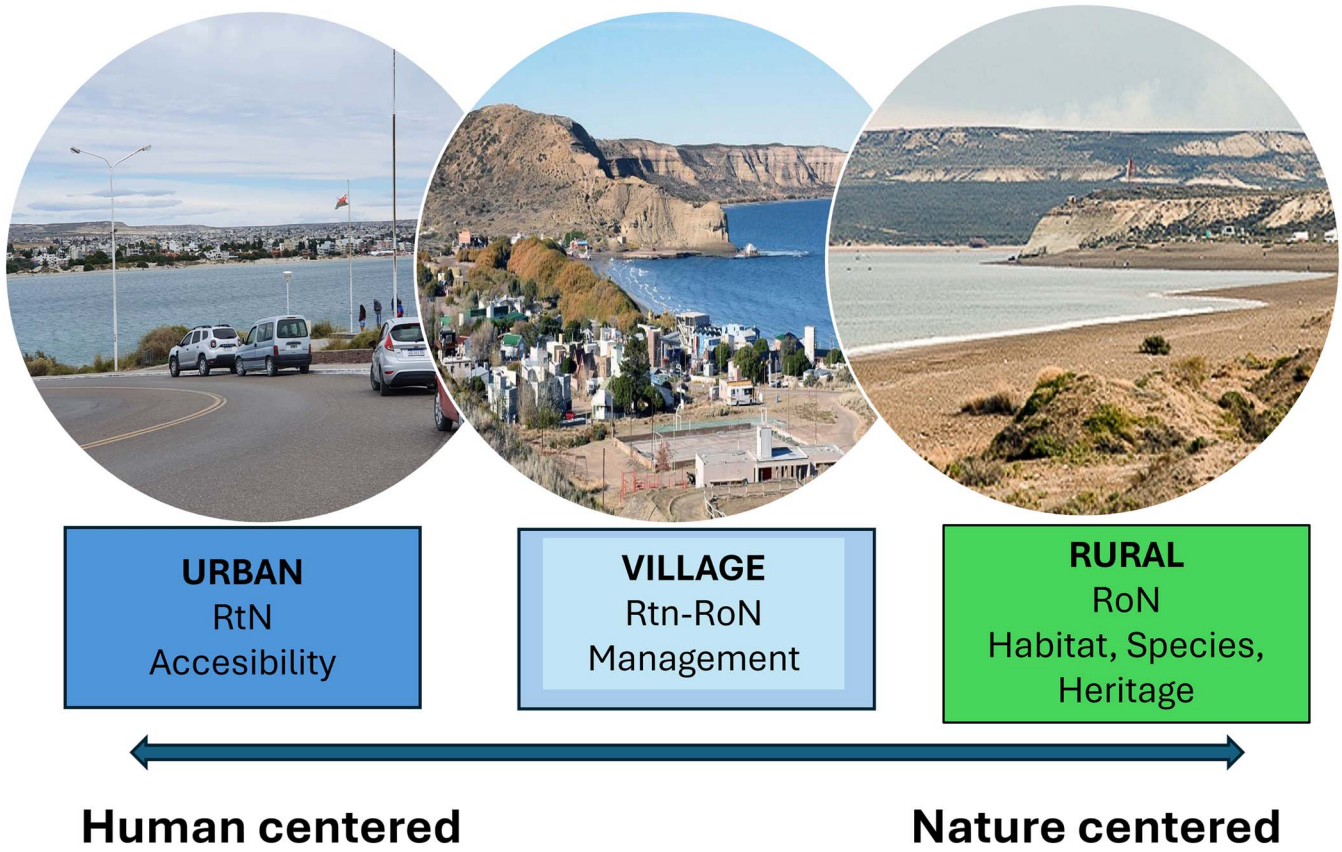

Figure 9. Conceptual model between right to nature and rights of nature along the urban to rural gradient (Madryn, Puerto Pirámides and Doradillo beaches, Patagonia).

each locality according to its ecological capacity and social context.

This study's findings are based on 2025 ranking data derived from eight evaluators and are specific to Argentina's Atlantic coast. Subjectivity in scoring and the limited spatial scope may constrain generalization to other coastal systems. Future research should extend this framework regionally and evaluate long-term dynamics to assess how governance interventions and tourism pressures reshape the RtN–RoN balance over time.

CONCLUSIONS

Coastal resorts exemplify the global tension between tourism development and ecosystem preservation. Accessibility and recreational infrastructure are essential attributes for competitiveness, but unregulated development can compromise ecosystem services and the integrity of coastal landscapes. Sustainable coastal management thus requires balancing tourism demands with the preservation of natural capital, ensuring that the rights of human communities and ecosystems are respected. This situation is exemplified by the village beaches, which, as shown by the results, constitute resilient environments, where the RtN and the RoN are effectively upheld.

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