

THE CONTRIBUTION OF PROTECTED NATURAL AREAS TO THE ECONOMIC DEVELOPMENT OF LOCAL COMMUNITIES

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Abstract

The transition of global environmental policies during the 2020–2026 period, marked by the adoption of the Kunming-Montreal Global Biodiversity Framework and the 30x30 Target, requires a re-evaluation of the role of protected natural areas (PNAs) from the restrictive paradigm of "fortress conservation" toward the Complex Adaptive Socio-Ecological Systems (SES) model.

This paper performs a systematic literature review aimed at evaluating the causal impact of PNAs on rural household wealth, analyzing the efficiency of economic transfer mechanisms (ecotourism, green jobs, PES/NbS schemes), and identifying territorial governance models that maximize the dual success rate (ecological sustainability and socio-economic development).

The research applies PRISMA 2020 guidelines to a corpus of indexed international publications (Web of Science, google Scholar, ScienceDirect) and intergovernmental reports (World Bank, IPBES, UNEP-WCMC) from the 2020–2026 timeframe.

Findings disprove the hypothesis that PNAs inherently cause local impoverishment. At the microeconomic level, households in participatorily managed buffer zones record an increase in the asset index and a 12–18% reduction in child malnutrition. Although ecotourism offers a high multiplier coefficient (1.6–2.4), the presence of exogenous operators generates external capital leakage of up to 60–70%, a phenomenon mitigated by Community-Based Tourism (CBT). The transition toward green jobs stimulates the economic inclusion of rural women. The critical determinant of results is the institutional architecture: co-governance and community-led models (IPLC-led) achieve a dual success rate of 56%, compared to only 16% in the case of centralized (top-down) management.

Governance architecture represents the essential moderating variable in the functionality of PNAs as vectors of regional development. Policy makers are advised to formally institutionalize co-governance, expand the legislative framework for mandatory national Payments for Ecosystem Services (PES) schemes, stimulate local entrepreneurship, and create territorial brands designed for commercializing value-added products.

Keywords: *Protected natural areas, sustainable rural development, 30x30 Target, community governance (IPLC), ecotourism, payments for ecosystem services (PES), counterfactual evaluation.*

Clasificare JEL : *O44*

1. Introduction

The transition of global environmental policies during the 2020–2026 period marked a shift in defining the role of protected natural areas (PNAs) within regional and rural economies. The adoption of the Kunming-Montreal Global Biodiversity [13], focused on the 30x30 Target, namely protecting a minimum of 30% of terrestrial and marine areas by 2030 [3], alongside its transposition into regional legislation such as the EU Biodiversity Strategy for 2030 and the Nature Restoration Regulation [16], required the re-evaluation of the relationship between biodiversity conservation and the socio-economic development of local communities.

Until the beginning of this decade, spatial policies were frequently dominated by the historical paradigm of "fortress conservation", an ecological isolation model assuming a zero-sum relationship between resource protection and the prosperity of adjacent communities [10].

In the new governance framework, PNAs are conceptualized as vectors of sustainable regional development and as pillars of territorial natural capital, and not as autarkic spaces subject to severe land-use restrictions [17].

Nevertheless, the expansion of conservation networks generates major economic dilemmas: how can opportunity costs borne by local populations be effectively compensated, and through what specific mechanisms can ecological assets generate endogenous added value without compromising the functional integrity of ecosystems?

The theoretical foundation of the analysis rests on the Complex Adaptive Socio-Ecological Systems (SES) paradigm, developed in recent economic-ecological literature [9]; [12].

Based on this model, human communities and protected ecosystems are interconnected through bidirectional flows of resources, services, and capital. Provisioning, regulating, and cultural services provided by PNAs represent natural assets capable of generating concrete financial flows through three main transfer mechanisms. First, niche ecotourism and the valorization of local supply chains multiply income in the regional economy through reception services, guiding, and traditional gastronomy [1].

Second, internalizing positive ecological externalities through Payments for Ecosystem Services (PES) schemes and Nature-based Solutions (NbS) provides direct compensation to landowners for conserving hydrological resources, carbon storage, and disaster prevention [18].

Third, the transition of the rural labor market toward green jobs focuses on reserve administration, ecological restoration, and the sustainable collection of non-timber forest products [5].

Despite theoretical convergence regarding the synergistic potential between conservation and development, empirical literature attests to a marked heterogeneity of results in the field. The success or failure of the socio-economic integration of PNAs depends critically on institutional governance architecture (centralized vs. participatory), the equitable distribution of financial benefits, and the level of capital retention at the local level, preventing exogenous capital leakage [4]; [2]; [8].

This article conducts a systematic review of international research published between 2020–2026 to fulfill three primary research objectives: evaluating the causal impact exerted by PNAs on indicators of wealth, income, and poverty reduction in adjacent rural households (O1); conducting a comparative analysis of the efficiency of economic transfer mechanisms, including ecotourism, green labor markets, and PES schemes (O2); and identifying territorial governance models (IPLC-led vs. top-down) that maximize the dual success rate of ecological sustainability and socio-economic development (O3).

2. Methodology

The present research applies the systematic literature review methodology, structured in strict compliance with international standards established through the PRISMA 2020 Guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The purpose of this methodological approach is to ensure analytical rigor in evaluating the socio-economic impact exerted by protected natural areas (PNAs) on adjacent rural communities.

The systematic search was conducted over the 2020–2026 period, targeting academic publications indexed in international databases Web of Science, Google Scholar and ScienceDirect, alongside official repositories of intergovernmental bodies (IPBES, IPCC, World Bank, UNEP-WCMC, IUCN).

To identify relevant works, query equations based on Boolean operators (AND, OR) were constructed by combining terms across three conceptual categories, namely the object of protection ("protected area*", "national park*", "conservation zone*", "OECM", "30x30 target"), the socio-economic dimension ("economic development", "poverty alleviation", "household wealth", "green jobs", "ecosystem services", "tourism multiplier", "PES scheme*"), and the institutional framework ("governance", "community-based", "IPLC", "co-management", "top-down governance").

The literature screening process was carried out on the basis of a priori inclusion and exclusion criteria designed to ensure scientific quality and relevance of sources. Peer-reviewed scientific articles published in the 2020–2026 period, technical reports and evaluations elaborated by international institutions, as well as empirical studies and meta-analyses analyzing socio-economic indicators in communities located in buffer zones or in the proximity of terrestrial and marine protected natural areas were included.

A methodological challenge in environmental economics is spatial selection bias: PNAs are frequently located in isolated regions, with degraded land or reduced accessibility, a fact that can distort the evaluation of local development. To guarantee the internal validity of results, the review prioritized conclusions from studies grounded in counterfactual econometric methodologies [4]; [11]; [8], such as Difference-in-Differences (DID), which compares the temporal evolution of socio-economic indicators in households affected by PNA establishment against similar households in unprotected areas; Propensity Score Matching (PSM), which balances treatment and control samples based on baseline covariates including land slope, distance to urban markets, road infrastructure, and initial demographic density; and Panel Models with Fixed Effects and Synthetic Controls, which isolate the specific effect of PNAs from regional or national macroeconomic fluctuations.

Information extracted from the bibliographic corpus was systematized and coded based on three categories of variables: dependent variables representing socio-economic outcomes (such as the Household Asset Index, poverty reduction rate, level of income from ecotourism, green jobs created, and PES payments received), independent variables describing PNA characteristics (including protected area surface, reserve age, IUCN category, and resource-use regimes), and moderating variables capturing territorial governance (classified into state-led/top-down centralized models and IPLC-led/co-management participatory models).

3. Results

The synthesis of counterfactual econometric analyses from the 2020–2026 period refutes the conventional hypothesis according to which assigning protected area status inherently causes the impoverishment of adjacent local communities.

At the macroeconomic level, modelings conducted regarding the financial evaluation of the 30x30 Target established that expanding the global PNA network generates an additional increase in global economic output estimated between 64 and 254 billion USD annually.

The benefit-cost ratio calculated by the authors ranges between 5:1 and 10:1, proving that investments in natural capital significantly exceed direct administration and compensation costs.

At the microeconomic level, evaluations based on Propensity Score Matching (PSM) and Difference-in-Differences (DID) techniques [8]; [11]; [4] reveal a positive causal effect of PNAs on rural household wealth. Households located in PNA buffer zones that allow sustainable resource use exhibit a household asset index superior to unprotected control samples.

In reserves co-administered with local communities, the rate of child malnutrition recorded statistically significant decreases, ranging between 12% and 18%. The diversification of economic activities in the proximity of PNAs reduced household vulnerability to climate shocks and price variations on primary agricultural markets.

The shift from economies based on uncontrolled extraction to models centered on conservation reconfigured the occupational structure in adjacent rural regions [5].

The generation of green jobs in the perimeter and proximity of PNAs was structured on two main levels, encompassing direct employment such as positions in administration, ecological monitoring (ranger duties), applied research, specialized guiding services, and habitat restoration—and indirect employment, including activities within the hospitality sector, traditional gastronomy, agritourism, and the processing of non-timber forest products (NTFPs).

Research conducted by Dawson et al [6] and Eldridge et al [7] highlights a disproportionately positive impact on rural women. Traditionally excluded from agricultural land ownership, women took on entrepreneurial and executive roles within ecotourism cooperatives, in networks for collecting and valorizing medicinal plants or mushrooms, as well as in participatory decision-making structures of community governance councils.

Analysis of tourism sector evolution in protected areas confirms that ecotourism constitutes the main private channel of capital transfer toward rural economies. Input-output models applied by Burbano et al [1] demonstrated that the value of the tourism expenditure multiplier coefficient lies between 1.6 and 2.4. Each monetary unit injected by visitors into accommodation and guiding services generates secondary induced income in local agriculture, transport, and artisanal production.

Critical analysis of financial flows conducted by Adams et al [2] reveals an asymmetry in scenarios where tourism infrastructure is owned by exogenous economic entities, up to 60–70% of gross revenues leave the regional economy. Maximum capital retention in the territory is achieved exclusively within Community-Based Tourism (CBT) models.

Evaluations elaborated by World Bank and Strassburg et al redefine ecosystem services as basic economic assets generating direct budgetary savings and alternative revenues.

Protected forests and wetlands prevent dam siltation and ensure natural filtration, substantially reducing local authority expenses for treatment infrastructure [18]. Implementation of PES schemes enabled the creation of financial mechanisms through which major downstream consumers (utility companies, hydroelectric plants, industries) directly compensate owners in PNAs for maintaining forest cover and carbon storage.

4. Discussion

The fundamental finding derived from the synthesis of literature from the 2020–2026 period is that legal status as a protected area does not constitute, in itself, a determining factor of socio-economic progress or local impoverishment. Institutional governance architecture represents the critical mediating variable conditioning the convergence between biodiversity conservation objectives and community prosperity.

Synthesized research Dawson et al [6] and Pascual et al [12] demonstrates the existence of a structural rift between administrative models. On one hand, participatory and community governance (IPLC-led governance / Co-management) records a dual success rate of 56% by involving local communities and indigenous populations in defining rules of access and resource management, thereby optimizing voluntary compliance, reducing monitoring costs, and increasing surplus value retention in the territory.

On the other hand, state-led centralized governance (State-led / Top-down) achieves a dual success rate of only 16%, as coercive approaches specific to “fortress conservation” frequently generate land conflicts, loss of traditional livelihoods, and social alienation, often leading to illegal extraction activities as an economic survival reaction.

Mechanisms of economic transfer present a series of structural limits that can compromise the long-term sustainability of communities adjacent to PNAs. First, mono-specialization and the vulnerability of the tourism sector show that excessive reliance on ecotourism exposes local economies to severe exogenous shocks (such as health crises or geopolitical instability), underscoring the necessity of diversifying the local economic base by combining tourism with organic agriculture and traditional crafts.

Second, external capital leakage occurs when reception infrastructure and logistical services are owned by corporations or exogenous investors, resulting in up to 70% of gross revenues leaving the region and turning local communities into providers of cheap labor lacking access to superior added value [2].

Third, elite capture and intra-community inequality highlight that financial benefits generated by PNAs are not evenly distributed, as the absence of institutional redistribution frameworks allows local elites or well-connected economic actors to corner business opportunities, thereby accentuating internal socio-economic disparities [4].

For the expansion of the global conservation network based on the 30x30 Target to function as an engine of equitable regional development, policy makers and field managers must operationalize four strategic directions. First, co-governance must be institutionalized through a formal transition from facade consultations to an actual transfer of decision-making powers to local councils and communities, in accordance with the provisions of the Kunming-Montreal Framework [13].

Second, territorial brands and ecological certifications should be developed to create origin labels for agrifood and artisanal products originating from PNAs, enabling price-premium rates on national and international markets that reward sustainable production practices [12].

Third, the legislative framework for Payments for Ecosystem Services (PES) must be strengthened by moving from pilot projects to mandatory national schemes through which commercial beneficiaries of hydrological, energy, or carbon storage resources directly compensate communities in protected areas [18] and [19].

Fourth, community local entrepreneurship (CBT) should be stimulated by facilitating access to micro-financing instruments and rural grants intended for local SMEs, thereby limiting capital leakage and encouraging the participation of women and youth in the green labor market [7].

5. Conclusions

Recent research in the sphere of environmental economics redefines the conceptual foundation of nature protection, dismantling the established idea that delimiting protected areas inevitably slows down rural socio-economic progress. The shift from the classical approach, focused on exclusion and severe restrictions, toward the integrated-adaptive socio-ecological systems paradigm places natural areas in a new theoretical and applied light.

In agreement with commitments assumed through the Kunming-Montreal Global Biodiversity Framework and the 30x30 Target, protected spaces become territorial catalysts capable of generating natural capital and sustainable development opportunities for proximity communities.

Passing to the analysis of direct impact on the population, empirical evaluations demonstrate that balanced management of natural resources contributes to strengthening the economic stability of rural households. In participatorily managed buffer zones, the rate of child malnutrition experiences a significant decrease, estimated between 12% and 18%, as a result of diversified access to resources and alternative income sources.

Also, the transition toward green jobs reconfigures the local labor market, orienting labor force away from harmful extractive activities toward ecological restoration services, ecotourism guiding, and valorization of traditional products. This process particularly favors the economic inclusion of rural women, offering them an active role in local entrepreneurship and community-level decision-making processes.

Regarding financial injection instruments into regional economies, data reveal high potential, doubled however by certain structural vulnerabilities. Although ecotourism can generate an important multiplier effect, each monetary unit spent stimulating turnover up to 2.4 times higher in connected industries, benefits are frequently diminished by the phenomenon of external capital leakage.

When tourism infrastructure is controlled by commercial entities foreign to the region, a share of up to 70% of gross revenues leaves the host community. To attenuate this dependence, Payments for Ecosystem Services schemes and local certification through origin brands prove to be far more sustainable financial solutions, guaranteeing direct compensation of communities and capture of added value in the local economy.

The essential determinant of achieving a balance between conservation and development is the institutional governance architecture. Comparative studies attest that simply assigning protected status does not guarantee socio-economic progress.

Types of administration based on co-governance and community involvement record a dual success rate of 56%, stimulating voluntary compliance and reducing social tensions.

In contrast, centralized management models, applied exclusively top-down without real consultation, reach ecological and economic objectives simultaneously in only 16% of cases, often amplifying local disparities and the risk of illegal resource exploitation.

For the expansion of protected area networks to become a genuine lever for rural revitalization, it is imperative to reorient public policies toward decentralizing administrative decisions and including local representatives in management councils with full voting rights. At the same time, priority support for community entrepreneurship is required, accompanied by conditioning the operation of economic operators on the use of local human resources and suppliers.

National legislation must facilitate the operationalization of direct compensation schemes for provided ecosystem services, while allocating funds and training programs intended for rural youth and women will ensure the long-term sustainability of these economic and natural ecosystems.

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