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Conflict and conservation: On the role of protected areas for environmental justice

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ABSTRACT

When are protected areas drivers of environmental injustices and conflict, and under which circumstances may they support customary users in protecting their lands and livelihoods against extractivist development? We address these questions by analyzing the diverse roles that protected areas play in the context of environmental conflicts. We build a global database of 474 environmental conflicts in protected areas by overlapping data from the World Database of Protected Areas and the Global Atlas of Environmental Justice. Through descriptive statistics and content analysis, we characterize the intersections between the two databases and discuss those cases where protected areas play an important role in the origin, dynamics, or outcomes of the conflicts. Our findings show that growth-oriented extractivism and development are major drivers of conflicts in protected areas, where these latter can both jeopardize and support environmental justice. While several cases describe protected areas as drivers of injustices and conflicts, they can also become tools that support peoples' struggles against controversial extractivism and development projects. The diversity of possible interactions between conflict configurations, movement claims, and forms of conservation thus require a nuanced understanding of the complex implications of protected areas for environmental justice.

1. Introduction

The effectiveness of protected areas (PAs) to serve not only biodiversity conservation but also to support livelihoods and address social justice concerns of customary land users is not a given. Civil society groups and social movements have taken different stands regarding the conditions and the extent to which PAs should be further expanded globally. For instance, in September 2021, on the streets of Marseille, a coalition of organizations and activists concerned with agrarian and environmental justice protested against the International Union for the Conservation of Nature (IUCN) World Conservation Congress' '30 × 30' motions to increase global surface cover of PAs from the current 16% (UNEP-WCMC and IUCN, 2023) to a target of 30% by 2030 (IUCN, 2021a, 2021b; OLON, 2021). Gathered at the first international Congress 'to decolonize conservation' (OLON, 2021), they were denouncing land grabbing, human rights abuses, and corruption behind the designation of many PAs worldwide, and questioning the origins, meaning and desirability of conservation policies. Meanwhile, behind the doors of the IUCN World Conservation Congress, the IUCN's Indigenous Peoples' Organization Members presented a provocative countermotion to protect 80% of the Amazon rainforest by 2025 to secure their land rights (Farand, 2021; IUCN, 2021c).

This is just one example of how PAs may be arenas of debate and struggle over the social impacts of conservation programs. Several viewpoints emerge on the specific implications that PAs hold for local groups. Although the body of literature that considers more PAs as a necessary measure for conservation is vast, critical perspectives on conservation issues have been growing in number. While many authors are concerned with how and why the PA global estate should increase (Allan et al., 2022; Baillie and Zhang, 2018; Dinerstein et al., 2019, 2017; Maxwell et al., 2020; Venter et al., 2018, 2014; Wilson, 2016), political ecologists and critical geographers have been describing many

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PAs as contentious because of their links with neoliberal agendas, or as tools for control over resources, territories and peoples (Apostolopoulou et al., 2021; Brockington et al., 2008; Büscher et al., 2012; Peluso, 1993).

At the 2022 UN Biodiversity Conference (COP 15), 188 Nations recently agreed to the '30 × 30' target (CBD, 2022). Therefore, it is important to gain a better understanding of the implications of such a policy for people and the environment, not only to ensure biodiversity conservation, but also for supporting and protecting the rights and needs of people living within or close to PAs. The Rights & Resources Initiatives (2020) estimates that about 363 million people live in existing PAs worldwide. Allan et al. (2022) warn that 1.8 billion people live on land that should require conservation attention, and Schleicher et al. (2019) argue that at least 1 billion live in areas likely to be protected if the global conservation estate were to increase to 50% - as the 'Half Earth' movement[1] advocates for. Environmental justice (EJ) concerns arise as the establishment of PAs may imply radical changes in livelihoods and land uses. EJ in conservation encompasses but is not limited to questions of distribution (of environmental costs and benefits, rights and responsibilities), recognition (of different worldviews, epistemologies, identities), and participation (of all actors in decision making and resource management) (Martin et al. 2013, 2016; Shoreman-Ouimet and Kopnina, 2015). Warning bells especially ring for those cases where PAs have been associated with violence and violations of human rights, including forced evictions of customary groups from their traditional lands to set up conservation areas (Brockington and Igoe, 2006; Fanari, 2022; RRI, 2018; SI, 2022a; Tauli-Corpuz et al., 2020). This is happening even though the role of Indigenous Peoples and Local Communities (hereafter, IPLCs) has been widely recognized as crucial for ensuring effective and equitable conservation targets (Dawson et al., 2021; Ens et al., 2021; Garnett et al., 2018; Reyes-García et al., 2019).

In this context, it becomes important to better understand the specific implications of protected areas for environmental justice, particularly, when PAs may act as drivers of environmental injustices and conflict, and when they may contribute to protect and defend the rights of local groups, their livelihoods and claims for justice against extractivist development pressures. In this paper we aim to shed light on these questions by discussing 474 environmental conflict cases that intersect with PAs worldwide. We created this dataset by overlapping data from the World Database on Protected Areas (WDPA) and the Global Atlas of Environmental Justice (EJAtlas), the two largest global databases on, respectively, PAs and environmental conflicts currently available. While the resulting dataset represents a convenience sample of environmental conflicts occurring within PAs worldwide that has inherent data limitations, to the best of our knowledge, it enables the largest empirical analysis carried out so far.

Our analysis aims to address three issues. First, we characterize, through descriptive statistics, the intersections between environmental conflicts and PAs. We look at the conflict drivers within PAs and the types of PAs that are overlapping with environmental conflicts. Second, we aim to gain a deeper understanding of the specific role that PAs play in the origins, dynamics and outcomes of the environmental conflicts. We analyze a sub-sample of 107 cases in which different types of actors involved mobilize for, against or through PAs. This provides insights on who is able to take advantage of PAs, their underlying motives and their mobilization strategies. Third, we discuss the environmental justice implications of such mobilizations, with a particular focus on who gains and who loses because of PAs, and on the outcomes of mobilizing for or against PAs. This analysis nourishes the understanding of the conditions under which protected areas may jeopardize or serve environmental justice.

[1] See https://www.natureneedshalf.org and https://www.half-earthproject.org.

2. Background

2.1. Protected areas & environmental justice: The debate is alive

Globally, conservation policies and projects have been marked by controversial debates regarding questions of justice and sustainability.

Intergovernmental organizations, transnational NGOs and donor agencies dedicated to conservation policy, advocacy and funding recognize the positive role that PAs may play not only for environmental sustainability but also for supporting social justice and local livelihoods. They showcase initiatives, best practices, guidelines, and roadmaps in relation to sustainable human development, equitable distribution of natural resources, just governance mechanisms, rights of local communities, and human well-being in PAs (Borrini-Feyerabend et al., 2013; CIHR, 2016; Conservation International, 2022; Dudley and Stolton, 2022; GEF, 2022; UNESCO, 2021; WWF, 2020).

Unfortunately, the documentation of 'worst practices' in PAs is robust as well. Critical geographers, political ecologists, and environmental justice scholars have been questioning the very origins and implications of conservation programs and PAs, unveiling their relationship with neoliberal capitalism and neo-colonialism, particularly in the Global South (Brockington et al., 2008; Büscher et al., 2017, 2012; Duffy et al., 2019; Escobar, 1998; Igoe et al., 2010; MacDonald, 2010a, 2010b; Peluso, 1993; Tauli-Corpuz et al., 2020; West et al., 2006). Calling these authors 'conservation critics', Kopnina (2016) sums up their positions in four main points. First, they denounce the displacement of local communities from their land to make space for PAs. Second, they criticize the nature-culture discursive dichotomy that underpins the rationale for strict conservation PAs. Third, they maintain that those who really damage the biosphere are just an elite sector of society, instead of the whole of humanity. Fourth, they believe that social metabolism rather than population growth is the main driver of biodiversity loss. We add to these four arguments that conservation critics point to the embeddedness of many conservation programs in global capitalism, in such a way that conservation and neoliberal agendas are usually controversially intertwined (Apostolopoulou et al., 2021; Brockington et al., 2008; Igoe et al., 2010; MacDonald, 2010a, 2010b).

Labeling 'mainstream conservation' the other side of the debate, Brockington et al. (2008) describe it as a"dominant strain of conservation [whose] ideas and values […] are perhaps most clearly represented in the larger conservation organizations which dominate conservation funding" (ibid., p. 9). Critics of modern conservation programs are concerned with the trend in shifting control over territories and resources from local groups to state, private, or corporate actors after the designation of PAs - and denounce the related negative implications on human rights and access to land for IPLCs. Concerned with the claims of IPLCs and organizations dedicated to human rights advocacy, they have been labeling mainstream conservation projects as 'neoliberal' (Apostolopoulou et al., 2021), 'colonial' (Domínguez and Luoma, 2020), 'fortress' (Brockington, 2002; Brockington et al., 2008), 'militarized' (Duffy et al., 2019), arguing instead for more 'convivial' modes of protecting the biosphere (Büscher and Fletcher, 2020, 2019). From outside academia, civil society organizations like Survival International (2022), Rainforest Foundation UK, (2022) and Minority Rights Group International (2022b), among other environmental activists and groups have shared these views and uphold these terms and ideas in recent campaigns.

Besides conservation critiques, and despite considerable literature on EJ in PAs (Anaya and Espírito-Santo, 2018; Benetti and Langemeyer, 2021; Boillat et al., 2018; Dahlberg et al., 2010; Dawson et al., 2018; Martin, 2017; Martin et al., 2018, 2016; Mollett and Kepe, 2018; Rambaree, 2020; Ramutsindela and Shabangu, 2018; Ruano-Chamorro et al., 2021; Sims et al., 2022; Wienhues, 2018), the 'land sharing vs. land sparing' debate on what model of conservation is best suited for the preservation of biodiversity is vibrant, but not really framed in EJ terms

(Pearce, 2018). The main object of contention is the level of 'protectedness', i.e. how strict access to PAs should be, in order to best protect the world's biodiversity. Büscher and Fletcher's (2020, 2019) mapping of the various currents of thought within conservation debates tell us that most of the literature does not give enough space to critical views on protected areas and their implications for environmental justice. However, the heated discussion that their analysis recently provoked shows that the debate is alive, positions are diverging, and trends are nuanced (Büscher and Fletcher, 2022).

2.2. Environmental conflicts in protected areas

Despite being promoted as instruments of conciliation between humans and their environments, PAs are not exempt from social conflict. A sizable body of literature deals with 'conservation conflicts', i.e. those originating from the clash between human activities and biodiversity conservation objectives (Redpath et al., 2013; Young et al., 2010). Among reviews of the different framings of conservation conflicts (Baynham-Herd et al., 2018; Redpath et al., 2015, 2013; Young et al., 2010), Soliku and Schraml (2018) focus on PA conflicts. They identify various types and causes and include those related to human-wildlife interactions, restricted access to resources, exclusion from participation and information sharing, indigenous rights and beliefs, population eviction, relocation and resettlement, park benefits and revenue distribution, law, legislation and policy and agriculture and land-use conflicts. On a similar line, Rechciński et al. (2019) provide a conceptual framework to understand PA conflicts. Other authors focus on park authorities versus local people conflicts (de Pourcq et al., 2017; Mombeshora and le Bel, 2009; Vedeld et al., 2012), or on conflict management and resolution strategies and approaches (Castro and Nielsen, 2003; Madden and McQuinn, 2014; Soliku and Schraml, 2020).

The above literature considers many PAs as conflict drivers, or as spaces where social conflicts often occur. In the scope of the present research, we build on the work of these authors. We consider not only conservation conflicts occurring *because of* PAs, but also look at different kinds of environmental conflicts occurring *in* PAs and focus on the specific role that PAs play in such conflicts. The study of environmental conflicts is useful to understand issues of social justice related to environmental change and governance (Martinez-Alier, 2018; Scheidel et al., 2018). Building on both Temper et al. (2015) and Scheidel et al. (2020), we refer to environmental conflicts as social conflicts related to the environment, where actors mobilize against activities and resource uses posing significant social and environmental threats to them. In this article, we consider as causes of environmental conflict not only conservation-related projects, but also "development" (Escobar, 2011; Sachs, 1992) and "extractivist" (Grosfoguel, 2016; Gudynas, 2018; Svampa, 2012) projects, such as mining, plantations, mass tourism, water management, waste disposal, and related infrastructure (roads, ports, energy plants, etc.) that intersect with PAs. In summary, we include in our analysis diverse types of projects that may cause environmental conflicts, ranging from biodiversity conservation to resource and commodity extraction, use, management or disposal.

3. Methodology

3.1. Data sources and sample selection

To better understand the diverse ways through which environmental conflicts and PAs interplay, this study presents a qualitative and quantitative analysis of environmental conflicts located within PAs. We created our dataset by combining information from the two largest global databases available in the respective fields of inquiry: the Global Environmental Justice Atlas (EJAtlas) and the World Database on Protected Areas (WDPA).

The EJAtlas is a participatory mapping project created in 2011 to collect, systematize, and geolocate information around environmental conflicts worldwide (Martinez-Alier, 2021; Scheidel et al., 2020; Temper et al., 2018, 2015). The data collection and validation process is based on collaboration between the EJAtlas editors and researchers, other academic contributors and actors on the ground, including community-based activists, journalists, non-governmental organizations, among others. The WDPA is a collaborative mapping project too. Jointly established in 1981 by the UNEP and the IUCN, it is monthly updated with information on marine and terrestrial PAs periodically provided by governments, NGOs, academia, and industry (UNEP-WCMC and IUCN, 2021). When we downloaded the databases for analysis (May 2021), the EJAtlas contained information on 3,408 conflict cases, while the WDPA recorded about 266,000 PAs globally.

The EJAtlas draws on different secondary sources, i.e.: academic papers, news articles, lawsuits, civil society reports, and others. Each type of source may produce reporting bias, such as selection bias (which cases are reported in these data sources?) and description bias (how are the events depicted?) (Earl et al. 2004). The use of multiple sources enables to cross-check information and reduce, to some extent, such biases (Sundberg and Melander, 2013). The use of local and non-academic data sources also offers advantages as they provide a grounded perspective on local conflict dynamics. However, the EJAtlas coverage depends on a variety of factors, such as the availability of contributors, access to public information and to local informants, and capacity for data moderation (Temper et al. 2015; Scheidel et al. 2020; Del Bene and Avila, 2023). If a region accounts for few cases or none, it does not necessarily mean there are no environmental conflicts. Missing coverage is frequently the result of lack of reliable information, or limited access to information because of remoteness, data accessibility, contentious social and political contexts, or lack of local contacts. Consequently, there is little information available on certain regions such as parts of Russia and Mongolia, Central Asia, and Central Africa. Another limitation of the EJAtlas is its temporal coverage: more than half of the conflicts start dates are later than 2008 (Scheidel et al. 2020). Regarding the WDPA, despite being the biggest existing PAs mapping project, the database is not necessarily representative of all PAs worldwide either. Its completeness strongly depends on data submission by PA managers and its subsequent digitalization (UNEP-WCMC, 2019).

The geographical intersection of environmental conflict reported in the EJAtlas and protected areas registered in the WDPA resulted in a total sample of 474 EJAtlas cases overlapping with 570 PAs.[2] We provide an overview in form of descriptive statistics of the specific types of conflicts and the type of PA in which conflict occurs based on information provided by the EJAtlas and WDPA, specifically including the variables (i) conflict category (covering general sector first level classification); and specific conflict causes (second level classifications), (ii) conflict intensity, (iii) PA designation, (iv) IUCN category and (v) governance type. For the analysis of the specific role that PAs play in the conflict, we conducted a qualitative and quantitative content analysis of the descriptive information available in the EJAtlas case datasheets (see 3.2 Data analysis). As this information was not provided with sufficient detail for all identified cases, we selected a sub-sample of cases adequate for this analysis. An initial screening of the 474 EJAtlas datasheets led to the exclusion of 367 cases, for which the existence of a PA appeared to be unexplained, irrelevant, or not reported in relation to the conflict description. We then used the resulting sub-sample of 107 cases to identify the specific roles that PAs play in environmental conflicts.

[2] The number of PAs is greater than the number of conflicts as a single conflict may overlap with more than one PA. Note that data on EJAtlas cases are stored as georeferenced points, while the WDPA stores information as two geospatial feature classes: polygons (~95%) and points (~5%). These latter were buffered with a radius corresponding to the area of the PA at issue, in order to transform them into polygons too. Thus, for a minor of cases (<5%) this may have resulted in conflicts being located in proximity of the PA, rather inside of it.

Fig. 1 shows the geographical distribution of the whole database (n = 474) and of the sub-sample of cases where PAs are reported to play a role in the conflict (n = 107). A complete referenced list of cases is provided in the Appendix. Most of the analyzed cases are located in Latin America (44%) and Europe (19%), while other regions are less represented. Historically, for those conflicts where a start date is noted, 17% began in the 1990s, 35% in the 2000s, and 23% in the 2010s. For those PAs where a designation date is noted, 46% were established before 2000, 30% in the 2000s, and 14% in the 2010s.

While our mapping is global in scope, its coverage is contingent on the strengths and limitations of the databases of departure. Particularly, the spatiotemporal distribution and types of the environmental conflicts and protected areas covered are not to be considered as statistically representative globally but reflect the distribution of cases within both datasets. In other words, the sample analyzed in this article can be considered as a convenience sample that is based on secondary data, shaped by the sources and choices of those involved in the primary data gathering process. Despite these limitations, it represents the largest sample currently available on environmental conflicts occurring within conservation areas and enables us to identify diverse ways through which PAs intersect with environmental conflicts.

3.2. Data analysis

Data were analyzed both qualitatively and quantitatively. First, we performed an inductive qualitative content analysis (see Elo and Kyngäs, 2008) of the descriptive text fields provided by the EJAtlas cases. Inductive qualitative content analysis is used to process qualitative data where previous knowledge on the topic is insufficient or fragmented, as in our case. The process is divided into three phases: preparation, organization, and reporting of data. Throughout the phases, data are codified and progressively arranged into categories, until the overall picture is describable through a conceptual map.

In our analysis of actors mobilizing in relation to PAs, we focused on the following questions: what is being mobilized, who is mobilizing, why actors mobilize, how actors mobilize. The categories that emerged from the coding process were divided into Main and Sub-categories (Table 1). The coding process was reiterated twice, until theoretical saturation was observed. Within the sub-sample of 107 cases where PAs were described to play a role in the conflict dynamics, we identified 174 'PA-related mobilization events'. A PA-related mobilization event is any acknowledged instance where the PA plays either a role as a *mobilizer* or as a tool that *is mobilized* by actors. The first is the case when actors mobilize because of a PA-related event, e.g. to support or oppose the designation or removal of a PA. The second refers to cases where the PA is mobilized to promote a certain interest, e.g. when a specific actor uses a PA as leveraging discourse within an advocacy campaign, or as a policy instrument, etc. Therefore, each event is distinguishable as a univocal combination of the sub-categories at play, namely, the type of actor mobilizing, plus the object, purpose and form of mobilization.

For each event, we also identified whether the actor's mobilization could improve specific issues relevant for EJ. To do so, we analyzed the descriptive information in the EJAtlas field '*Do you consider this an environmental justice success? Was environmental justice served?*'. The information provided in this field reflects the subjective views of the EJAtlas case contributor whether aspects of EJ could be enhanced, considering the case specific movements' claims, impacts and conflict dynamics at play.

Finally, we performed a quantitative analysis of the variables available through the EJAtlas and WDPA datasets (i.e., conflict category, IUCN Category, PA designation, etc.), as well as of the categories identified through the content analysis for the sub-sample (i.e., events, actors, purpose, forms of mobilizations, and EJ implications). We use descriptive statistics to report the frequency of observations and thus characterize our convenience sample in the Results section.

4. Results

4.1. Intersections of environmental conflicts and protected areas

The overlapping of the EJAtlas and the WDPA results in a set of environmental conflict cases that are not necessarily driven or caused by conservation areas, and take place in a diverse range of PAs typologies.

Fig. 2 reports the occurrence of variables characterizing conflicts and PAs across the sample (n = 474). In 89% of the EJAtlas cases, the contributor classified the case under an EJAtlas category other than 'biodiversity conservation conflicts'. Within the 11% of cases under this latter category, 'PA designation' was noted in about 60% of the cases as a relevant driver of conflict. This percentage decreases to 26% if we look at the entire sample of the different conflict categories. In other words, most of the analyzed conflicts develop around resources and commodity extraction, use, trade or disposal, or infrastructure and industrial-level

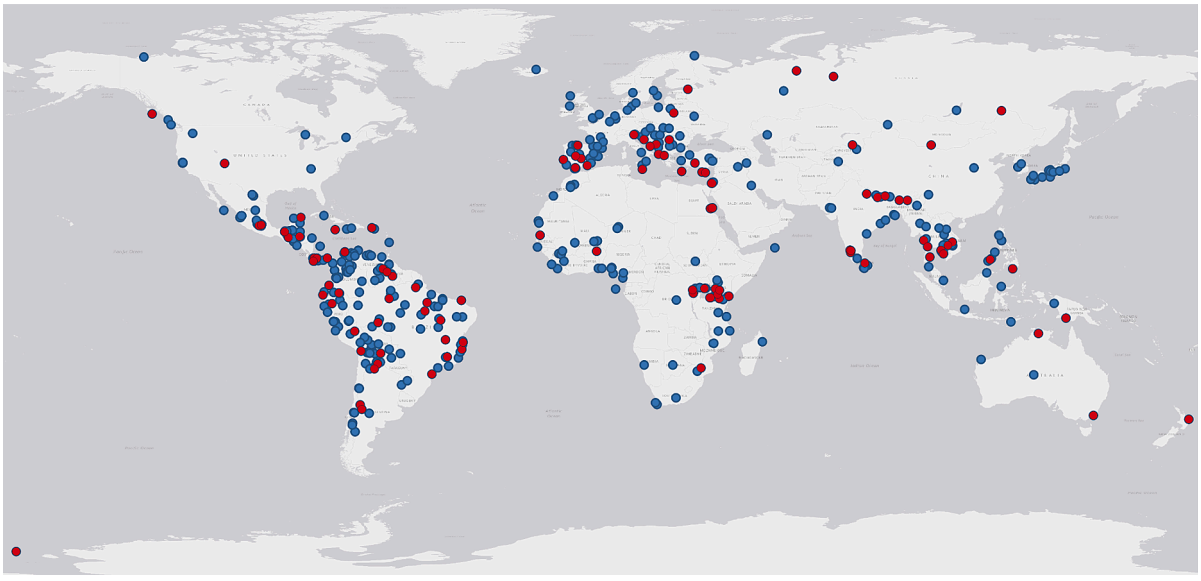

Fig. 1. Geographical distribution of the sample of analyzed environmental conflicts located in protected areas (n = 474). Red cases indicate the sub-sample analyzed to identify the specific roles that protected areas play in environmental conflicts (n = 107).

Table 1
Conceptual mapping of categories from the content analysis of environmental conflicts occuring in PAs.

Dimension	Main Category	Description of Main and Sub-categories*
What?	**Object**	Describes whether the actor mobilizes in favor or against a PA, or through the promotion of a PA/PADDD **Pro-PA mobilization**: when the actor is in favor of or directly mobilizes a PA designation (institution), protection (defense of), enforcement (use of a previously existing PA; or issues of how and by whom the area should be best governed), upgrading (increase in the level of protection), upsizing (increase in size) or management. **Pro-PADDD mobilization*****: when the actor is in favor of or directly mobilizes a PA downgrading (decrease in protection level), downsizing (decrease in size) or degazettement (removal of the PA from the map).
Who?	**Actor**	The type of actor who is mobilizing in favor or against, or mobilizes the PA-related event **Governmental**: State actor holding legislative or executive powers (national, regional or local governmental body or authority, or PA management body); **Intergovernmental**: intergovernmental organization (includes UNEP, UNESCO, IUCN, The World Bank); **NGO**: single or coalition of local, national or international non-governmental organizations; **IPLC**: indigenous people and local communities, as defined by IPBES (n.d.); **Corporate**: national or transnational private companies, corporations or industrial groups; **Other**: other types of actors that do not fall into previous categories. Example: "*wildlife experts*" (EJAtlas, 2014a); "*landowners*" (EJAtlas, 2016a); "*environmental lawyer*" (EJAtlas, 2014b); "*mountaineers*" (EJAtlas, 2016b), among others.
Why?	**Purpose****	The main acknowledged reason behind the object of mobilization**: **Biodiversity Conservation**: to preserve biodiversity or the environment, including specific flora or fauna species. *Example: "The park has been instituted mostly as a project to protect the population of the endangered mountain gorilla*" (EJAtlas, 2019a); **Governance Control**: to shift political power in favor of a type of actor to grant this latter control of the territory and its resources. *Examples: "Scholars have referred to this as a form of internal colonialism, and point to the nationalization of forest and grazing land with the imposition of protected areas as a key strategy used by the state in the imposition of ecogovernmentality*" (EJAtlas, 2019b); **Favor Extractivism Or Development**: to enable problematic, controversial or conflictive extractivism or development projects. *Example*: "*the declaration of the protected area is related to the government's interest in dispossessing them of their territories in order to provide the land to foreign companies and encourage private investment for hydroelectric megaprojects"* (EJAtlas, 2015a); **Halt Extractivism Or Development**: to block problematic, controversial or conflictive extractivism or development projects. *Example*: "*the Spanish Ministry of Agriculture […] has designed a plan to build a luxury resort that includes the construction of a five star hotel, a private airfield, two golf courses and an industrial processing plant for cork. […] On the one hand, the Andalucian Regional Department of Environment plans to initiate immediately the expansion of the Alcorconales Natural Park, implying that 100% of the public property will be protected under the Natural Park label. This extension intends to block the developmental plans that the State had designed for The Almoraima"* (EJAtlas, 2014c); **Protect IPLCs**: to act in the interest of indigenous people and local communities. *Example: "As a head of the Sindicato dos Trabalhadores Rurais (STR), he had dedicated his life to the support of expropriated families and had been an advocate for land reforms and the establishment of protected areas and extractivist reserves in the Tucuruí area*" (EJAtlas, 2019c); **Other**: other motives that do not fall into previous categories. *Example: "the government of Nepal introduced legal reforms to address conflicts between park management and locals nationally, and introduced the policy of managing the peripheral villages as buffer zones to be jointly managed by buffer zone residents and park administration*" (EJAtlas, 2019d).
How?	**Form**	The way in which the PA-related event is mobilized: **Advocacy**: when the PA or PADDD is used as an advocacy tool to support the actor's purpose; or similarly when the actor pleads in support of the PA or PADDD. *Examples*: "*the NGO asks to cease all logging activity in wildlife sanctuaries*" (EJAtlas, 2014d); "*… actively launched activities for raising awareness and conducted letter writing campaign, arguing that implementation of the project will set a dangerous precedent for demands for excisioning parts of National Parks*" (EJAtlas, 2019e); **Policy**: when the PA or a PADDD event is enacted by an actor through a policy. *Example: "was designated as a National Park by Presidential Decree"* (EJAtlas, 2021); **Judicial**: when the event entails the intervention of an administrator of justice (judicial authority). *Example "They filed two cases in the High Court of Kenya: first, to challenge the governm't's decision to degazette the park without following due process of the law and, secondly, to set an injunction on the decision so that Amboseli would maintain National Park status"* (EJAtlas, 2019e); **Financial**: when the PA-related event is channeled through the mobilization of funding. *Example: "The project would be financed by the share of the World Bank loan assigned to Croatia for establishment of the NATURA 2000 network of protected areas"* (EJAtlas, 2016b); **Other**: other forms of mobilization that do not fall into previous categories. *Example: "Poachers […] removed signs that say 'Park Boundary. Hunting Prohibited', and modify them so they say only 'Hunting'."* (EJAtlas, 2020a).

* Each category contemplates N/A as a sub-category, which applies when the information is not available or sufficient to be categorized.

** The sub-categories should be considered as prevailing purposes at play, deductible from the frame of the case by the contributor. When multiple purposes are mentioned for a same action (e.g. protect livelihoods of IPLCs, plus opposing mining) separate events were considered.

*** For more information on PADDD, see Mascia and Pailler (2011) and https://www.padddtracker.org/.

facilities construction, whereas PAs are not identified as playing a key role as conflict cause. Conflicts are reported mainly as medium (street protests, visible mobilization, etc.; 42%) and high intensity (widespread, mass mobilization, violence, arrests, etc.; 30%).

The sample suggests that a large variety of types of PAs overlap geographically with environmental conflicts. 137 different PA designations are counted, the most frequent ones are National Parks, Ramsar Sites, Biosphere Reserves, Sites of Community Importance within the Habitats Directive, and Special Protection Areas within the Birds Directive, each ranging between 6 and 12% of the whole set of PAs. If we

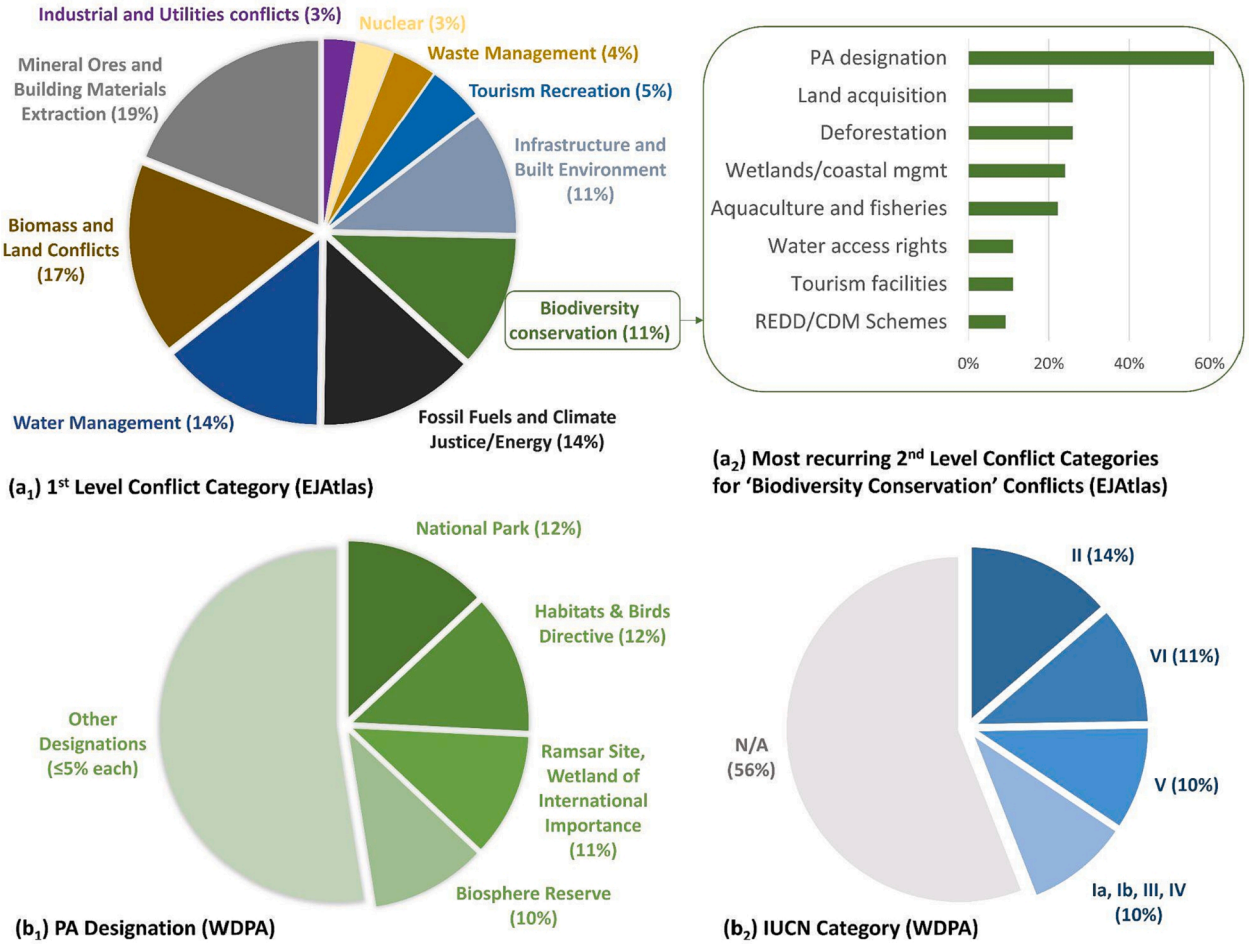

Fig. 2. Characterization of the overlap between the EJAtlas and the WDPA (n = 474), in terms of occurrence of (a_1) First level conflict category (EJAtlas); (a_2) Second Level Conflict Category within 'Biodiversity Conservation Conflicts' (EJAtlas, n = 54); (b_1) PA designation (WDPA); (b_2) IUCN Categories (WDPA).

look at the IUCN classification, in 56% of the sample the category is not reported, assigned or applicable. Categories II (National Parks), VI (PAs with sustainable use of natural resources), and V (Protected landscape or seascape) make up most of the remaining part, with a similar share: 14%, 11%, and 10%, respectively. Cases of conflict within formally recognized Indigenous areas and territories are present in merely 3% of the PAs sample (17 cases), which is also reflected in the figures on governance type. Besides the 26% where this latter information is not reported, 66% of PAs are managed by national, regional, or local governmental authorities, about 5% by NGOs, private landowners or labeled as co/joint-management, while only 3% by IPLCs. In 30% of the PAs, information on governance is not available.

4.2. *What role do protected areas play in environmental conflicts?*

As explained in Section 3.2, a sub-sample of 107 cases provides information on the diverse roles that PAs play in the origin, dynamics, or outcomes of environmental conflicts. Within this sub-set, we find 174 distinct PA-related mobilization events, in which the PA plays either a role as a *mobilizer* or as a tool that is *mobilized* by actors. Table 1 provides an overview and description of the categories that resulted from the content analysis and conceptually maps the variables at play: the object of the mobilization, the type of actor who mobilizes, the reported motive of the mobilization, and the way in which the mobilization occurs.

The emerging picture is diverse in terms of objects, actors, purposes, and forms of mobilization found to occur in relation to PAs. The object of contention is not only limited to the establishment or removal of a PA. Issues around PA management, defense, enforcement, up/downgrading, up/downsizing are at the center of disputes too. On the list of actors involved, the range includes individuals, organizations, and institutions of all kinds, mainly grouped under the categories governmental, intergovernmental, NGOs, IPLCs, and corporate actors. They mobilize for, against or through PAs for various reasons, which go beyond mere biodiversity conservation and encompass matters of extractivism, development, governance, control, and peoples' stewardship. Based on the content analysis, we categorized the forms through which they mobilize under the following dimensions: advocacy, policy, judicial, financial, and others.

Fig. 3a shows how often we observe these different types of actors, the forms of mobilizations they employ, and the purposes that motivated their mobilizations across the 174 PA-related mobilization events. We often find 'pro-PA' mobilizations where actors are positive about and/or pursue the establishment of an PA, or employ it as a tool for mobilization. However, also 'pro-PADDD' instances where actors promote a downgrading, downsizing or degazettment of a PA are not missing. In most of the records governmental actors, NGOs and IPLCs are those mobilizing in relation to PAs, but we also count intergovernmental organizations and corporations, among others. PA(DDD)s are mobilized to halt but sometimes also to favor controversial extractivist or development-led projects. Actors mobilize in relation to PAs also for biodiversity conservation, control of territory and resources, or the protection of IPLCs, among other purposes. Finally, actors mobilize because of or through PAs mainly by means of advocacy, policy, financial or judicial instruments. None of these actions related to PAs are reported to involve the use of direct physical violence.

The picture is diverse when we look at the complex interplays

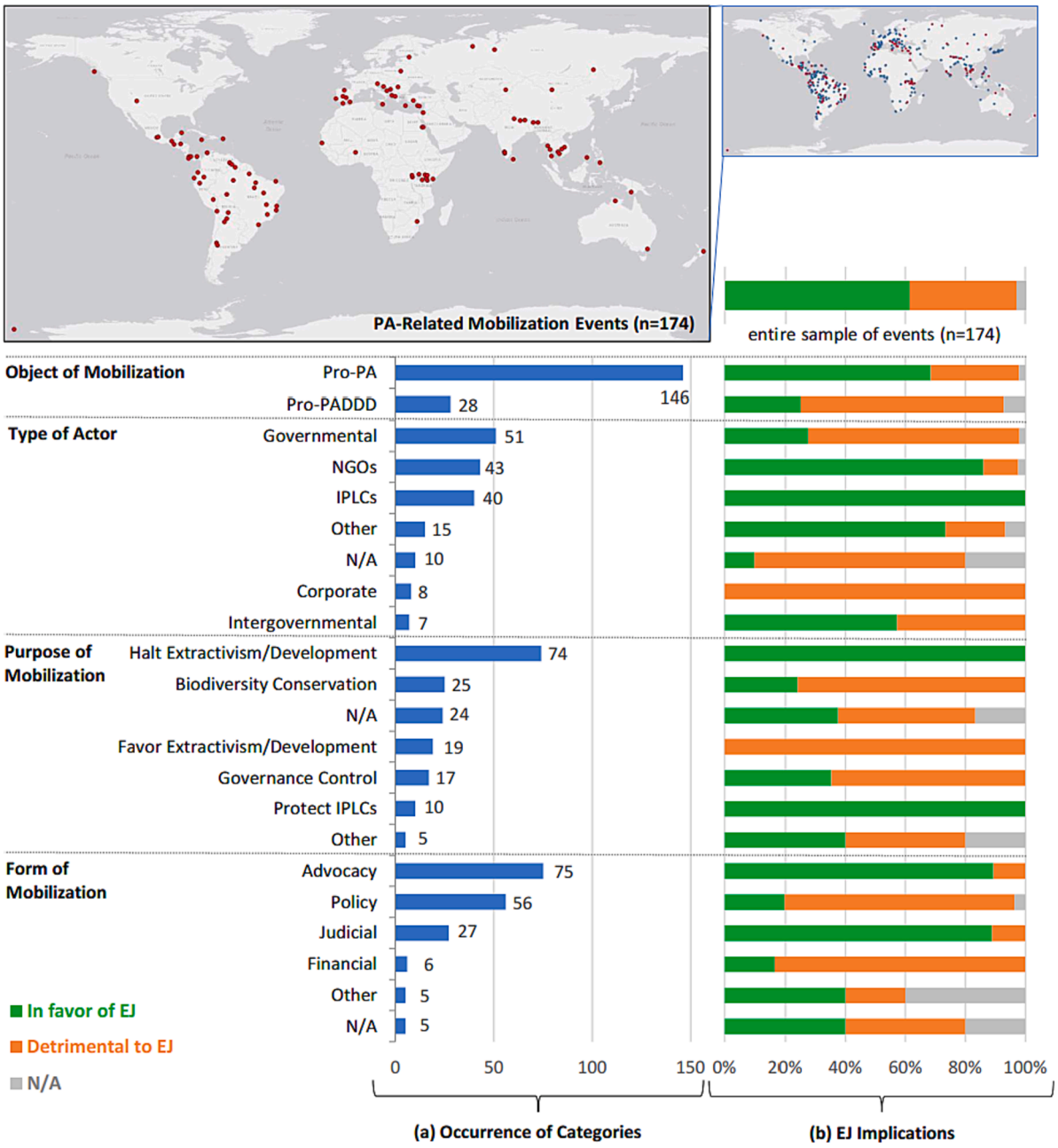

Fig. 3. Overview of the sample of PA-related mobilizations (n = 174), in terms of (a) occurrence of sub-categories (number of registered events) and (b) the association between sub-categories and implication for environmental justice (EJ) as percentage of the total number of corresponding events. 'N/A' means that no information available for this variable.

between these variables, even within a single conflict case. The dendrogram in Fig. 4 shows how the sub-categories actors and object, form, purpose of mobilizations interplay across the sample of n = 174 events. We prioritized an actor-based view because it is useful to understand how and why different actors may take advantage of PAs to pursue their own agendas.

We find that governmental actors not only promote (observed in 36 events) but also attempt to downgrade, downsize or degazette existing PAs (15 events). Interestingly, in four conflict cases, actors governing at different levels (e.g. national vs. regional vs. local) clash by mobilizing differently for, against or through the same PA. The case of the Bears Ears National Monument (Utah, US) is illustrative: in December 2017, former President Donald Trump reduced its size by 85% in favor of mining industries, just one year after the PA was designated by his predecessor Barack Obama (EJAtlas, 2020b). While governmental actors may mobilize PADDD events for enabling extractivism or controlling resources (13 events), this is not always the case. In the case of Mudumalai Tiger Reserve in India, the Ministry of Environment and Forests took legal action against the State government because of a PA that would have served as an elephant corridor and taken over local farmers' land (EJAtlas, 2019f). When governmental bodies promote a PA, the panorama of motives reported in our dataset includes diverse reasons, such as aims to protect biodiversity and communities (17 events), but also control over governance and resources (8). In three conflict cases, we also find the PA to be mobilized by a governmental actor to favor problematic extractivist or development projects (EJAtlas, 2016b, 2017a, 2019a). Here the EJAtlas contributor frames tourism development as an extractivist industry that is favored through the PA. A main form of mobilization for governmental actors is through policy (42 events).

Fig. 4. Dendrogram of the actors involved in PA-related mobilizations, their aims and purposes, and the forms of mobilization used to achieve them (n = 174 events). The columns indicate the relationships between: type of actor; object of the mobilization; purpose of mobilization; form of mobilization. The color of the circle indicates the EJ implication of the mobilizations. The bigger the circle, the higher the number of observed events across the sample.

With regard to NGOs, our sample mostly includes cases where they stand for PAs (42 events), to halt conflictive extractivist or development projects (29) or for biodiversity conservation reasons (7), mostly by means of advocacy (26) and judicial forms (12). One event also shows when coalitions of NGOs advocate against human rights violations because of the PA enforcement, in favor of Indigenous communities in Nepal's Bardia National Park (EJAtlas, 2019d).

Our sample reports cases where IPLCs mobilize both in support of (36 events) and against (4 events) PAs. They mobilize in relation to PAs to halt problematic extractivism and development projects (26 events), gain control over the territorial governance (6 events) or to protect themselves (4 events). All reported cases where IPLCs mobilize for advancing control over the territory, they struggle for the demarcation of land as Indigenous land or community conserved area, with the exception of one case, where and Indigenous group opposed to a Biosphere Reserve that would limit their resource use rights (EJAtlas, 2015a). Both advocacy (32) and judicial (4) actions appear as important strategies for them.

Out of the 8 recorded events associated with corporate actors, we find both mobilizations against as well as for PAs. In the first case, they mobilize against PAs to enable extractivist activities. One example is the case where the Russian company Surgutneftegas allegedly commissioned a scientific report to legitimize the downgrading of the Numto Nature Preserve and consequently allow for oil drilling on protected wetlands (EJAtlas, 2019g). In those cases where corporate actors support PAs through funding or other means, the reported motive has been biodiversity conservation as an offsetting or compensation measure against the environmental impact of their activities (EJAtlas, 2020c, 2019h, 2018a, 2018b).

Last but not least, PAs might not only act as drivers of conflict, or as tools to be mobilized to promote diverse people's interests. PAs can also emerge as outcomes of environmental conflicts, as observed in 34 cases. Emblematic in this sense is the case of Jeanette Kawas National Park in Honduras, which was named after an environmentalist who was murdered because she defended the territory from the palm oil industry (EJAtlas, 2017b).

4.3. Environmental justice implications

The diverse forms of actors' mobilization in relation to PAs has important implications for EJ. For instance, the fact that local activists managed to block large-scale mining by fighting for the designation of the Tost Mountain Nature Reserve in Mongolia was considered by the case contributor to have enhanced EJ (EJAtlas, 2020d). However, our database also contains testimonies of serious human rights violations and violence of various kinds perpetuated in the name of conservation programs. Cases of 'green militarization' like the Indian Kaziranga National Park show how PAs can be related with severe environmental injustices (Dutta, 2020; EJAtlas, 2017c; Fanari, 2022).

Fig. 3b and 4 are colored according to how EJAtlas case contributors evaluated the case in relation to EJ concerns. Green and orange refer to situations where the PA-related mobilizations were reported as carrying respectively positive and negative implications for EJ. When there was insufficient information to attribute such a value, we coded the event as 'N/A', in gray. Despite depicting events divided into those that favor and those that are detrimental to EJ, we acknowledge the complex processes at play that are not captured by this classification. Specifically, this attribute strongly depends on the case contributors' subjective understanding of the conflict (see Section 3.1).

Overall, the two Figures describe our dataset as composed of events where the EJAtlas contributor depicts a context where the PA is mobilizing or being mobilized either in favor of EJ (107 events) or against EJ (62 events). In a minor set of events, such a judgment is not straightforward. The same pattern is recognized when we look at a single subcategory: different types of objects, actors, purposes, and forms of mobilization count of positive, negative, and neutral judgments on the EJ implications, for a single event.

Not only pro-PA mobilizations are considered to work in favor of EJ, like in the case of the Nairobi National Park, where a committee composed of NGOs and intergovernmental organizations was formed to oppose the decision to build a highly impacting highway across the PA (EJAtlas, 2019e). We also find cases where mobilizing pro-PA does not imply a favorable EJ outcome. We can cite here the case of Venezuela's governmental agencies imposing the Canaima National Park at the expense of local communities, whose ancestral use of controlled forest fires was subsequently restricted by the PA administrators (EJAtlas, 2016d). We record cases of fortress or militarized conservation (e.g. EJAtlas, 2019f), or PADDD events aimed at making space for extractive industries (e.g. EJAtlas, 2014e), but also cases where governments mobilize PAs in positive EJ terms. We can mention the example of President Lula's government, which in 2009 created the Cassuruba Reserve in Brazil "as a result of popular pressure" to defend the land from extractive industries (EJAtlas, 2014f).

NGOs mobilize in favor of EJ (37 events), but also can support highly controversial PAs. Illustrative is the case of the Wildlife Conservation Society supporting the designation of Myanmar's Tanintharyi Nature Reserve. The reserve was funded by major gas companies as compensation for the construction of pipelines in the region and was reported to displace Indigenous communities from their ancestral lands (EJAtlas, 2018b).

On the same line, biodiversity conservation as a purpose is linked to diverse EJ implications. Interestingly, 19 events having biodiversity conservation as aim appear as detrimental to EJ. In this sub-set, we find the above-mentioned cases of fortress/militarized conservation and programs of environmental impact compensation through offsetting, including wildlife conservation areas like the highly contested Wayanad Wildlife Sanctuary in India, meant to be upgraded to a Tiger Reserve but failing recognition of IPLCs' land rights (EJAtlas, 2019i). Governance control through PAs is a purpose that support (6 events) or threaten (11 events) EJ, depending on who is striving for controlling what or whom.

In our sample, the mobilization of PAs as advocacy tools is frequent among IPLCs (32 events) and NGOs (27). This usually favors EJ (67), as a case in Nairobi illustrates, where people mobilized by wearing T-shirts and carrying banners saying "don't rape our National Park", to protest against the construction of a railway line (EJAtlas, 2017d). However, advocacy can also be detrimental for EJ, for instance, when the PA(DDD) at dispute enables extractivism (4 events). It is not uncommon for PAs to be 'brought to court' for the sake of EJ (see for example EJAtlas, 2016c, 2015b, 2014g). However, the use of the rule of law is not necessarily reported as enhancing EJ: in the case of PAs in Brazil's Raposa Serra do Sol, for instance, landowners appealed to the Supreme Court, contesting the demarcation of the territory for Indigenous governance (EJAtlas, 2016a). Also the EJ implication of PA(DDD)s mobilized through policy instruments is found to be diverse, mainly depending on the purpose of the action or its consequences on IPLCs. PAs mobilized through financial means from large institutions, like the World Bank-funded Tana River Primate Reserves in Kenya (EJAtlas, 2014h), are often reported as carrying negative EJ implications (5 events). However, locally-sourced funding can also work in favor of EJ, as in the case of Puerto Rico's Las Cucharillas Marsh, where the Communities United Against Contamination struggled to purchase about 500 ha of the region to ensure its protection through fines to local polluting industries (EJAtlas, 2017e).

Finally, all events mobilized by IPLCs against extractivist or development projects, or aimed at protecting IPLCs are described to have enhanced EJ concerns. Oppositely, corporate actors and mobilizations in favor of extractivism or development-led projects are reported in all events as detrimental to EJ. Corporations are found to promote highly controversial conservation-offsetting programs, meant to compensate for environmental damage somewhere else, as is the case of land grabbing through the registration of Legal Protection Reserves by agribusiness companies on community lands in Brazil's Matopiba region

(EJAtlas, 2020c). In other cases, as mentioned before, they are in favor of PADDDs designed to allow conflictive extractivism and development projects.

5. Discussion

The high number of environmental conflicts overlapping with PAs discussed here illustrates various ways how conservation programs are also subject to social conflict. In this context, it is important to better understand the diverse kinds of conflict at stake. As the literature on PAs conflicts largely discusses conflicts caused by PAs, the results presented here show that there are many cases where PAs are not among the main drivers of conflicts but become the social, geographic, and political arenas in which diverse forms of struggle against extractivism emerge and unfold. Our empirical evidence builds on the body of research documenting threats to PAs (Golden Kroner et al., 2019; Mascia et al., 2014; Mascia and Pailler, 2011; Thieme et al., 2020). In line with this literature, our results illustrate how industrial-scale human activity is a major menace to PAs as biodiversity conservation projects. These authors also call for a better understanding of the origins and enabling conditions, trends, social mechanisms, and consequences of human activities touching 'protected' territories. Scholars from ecological economics argue that an increasing, capitalism-driven social metabolism is at the root of expanding extractive industries (e.g. Martinez-Alier et al., 2010). According to this argument, more environmental conflicts are likely to arise unless growth-oriented market forces are addressed.

Our sample only offers limited information on how the type of PA is linked to specific conflict dynamics. To better understand whether and how the types of PAs influence the characteristics of environmental conflicts, further research is needed. A qualitative analysis of smaller samples of similar conflict contexts, where different types of PAs are at play, may deepen our understanding of the extent to which specific PA characteristics shape, and are being shaped by, environmental conflict dynamics. Furthermore, the low coverage of territories and areas formally conserved or entitled to Indigenous Peoples and Local Communities (e.g. ICCAs, Indigenous land) in our dataset skews our understanding towards areas governed or managed by state actors. Similarly, our approach is limited in exploring the role that time and space dimensions play in relation to the designation of PAs. In this sense, future research could focus on how conflicts develop over time and how they are linked to the specific moment when PAs have been established, or on specific geographical locations inside the PA - as many PAs are split into zones with different protection levels (e.g. Biosphere Reserves are divided into buffer, transition, core). Finally, while this research has focused on environmental conflicts located within PAs, further research could also look at conflicts located closeby, but outside their borders, as also in these cases the development of conflict and conservation may have shaped each other.

The qualitative analysis of descriptive information contained in the EJAtlas datasheets has helped us to better understand how PAs can act as a conflict player. Although in our sample PAs are not necessarily recognized as taking part in the conflict dynamics, we have seen the multifaceted ways in which PAs may play a role in the origins and dynamics of environmental conflicts. They can be the object of dispute or an outcome of it. We consider the perspective of PAs as conflict players as a contribution to the nexus between political ecology of environmental conflicts and conservation studies. We argue that it is both useful and desirable to look at PAs as a relevant non-human player within conflicting socio-ecological environments, a politicized and politici*zable* actor equipped (or not) with the power to drive the situation toward specific human interests. What interest they support is a main question at stake.

The fact that in our sample many pro-PA mobilizations work positively in EJ terms supports the idea that PAs hold the potential to be useful tools for customary land users affected by conflictive development and extractivism. Successful strategies that employ PAs against extractive industries, or cases where the establishment of a PA could support EJ, are sources of inspiration. In this sense, it becomes important to explore proposals of conservation theories that put equity and justice as core issues. For instance, 'convivial conservation' scholars and initiatives offer many reflections in this direction (Buscher and Fletcher, 2019, 2020).

At the same time, the large number of pro-PA mobilizations detrimental to EJ produce severe concerns. It supports the thesis of conservation critiques that PAs create geographies where injustice is perpetuated, even by means of violence, to the benefit of powerful elites such as corporate and governmental actors at the expense of vulnerable sectors of society such as local customary groups (Anaya and Espírito-Santo, 2018; Brockington and Igoe, 2006; Dahlberg et al., 2010; Duffy et al., 2019; Fanari, 2022; RRI, 2018; SI, 2022).

The fact that PAs can produce opposite outcomes for EJ - i.e. as holding emancipatory potential for a just territorial stewardship vs. provoking severe threats to people and their territories – is reflected in the polarized debates about conservation, and may represent one among a number of factors explaining why conservationists with different perspectives think differently about PAs. Those who report best practices in PAs tend to think of the green side of our Figures, while critical conservation scholars speak loud about cases of injustice.

However, as our sample shows, the reality on the ground of environmental conflicts in PAs is complex and the roles that PAs play in diverse contexts of environmental conflicts is multifaceted. Various types of PAs, mobilized by diverse actors for different reasons and through different means will have different implications for EJ.

6. Conclusions

Our global mapping of 474 cases of environmental conflicts located in PAs shows what type of disputes are at stake in many kinds of PAs. This quantitative characterization was then followed by a qualitative analysis of a sample of 174 mobilization events across 107 conflicts where diverse actors mobilize for, against, or through PAs, which helped us to nuance the role of PAs as players influencing the origin, evolution and outcomes of environmental conflicts. The results provide enriching insights into the global interplay between PAs and environmental conflicts, and the role PAs play for environmental justice. In addition, the data interpretation opens up questions and paves avenues for future research for the benefit of both political ecology of environmental conflicts and conservation geography.

On one hand, the data confirm the thesis of critical scholars that PAs can be problematic in terms of EJ. The declaration of PAs can be a reason for disputes, ignite the clashes between actors, or be used to drive a conflict in favor of elite interests. Motives behind the designation of a PA include control over the territory and its resources or the compensation of negative environmental impact somewhere else. Similarly, alleged biodiversity conservation purposes do not necessarily work in favor of EJ, as they might align with interests of extractive or development industries.

On the other hand, not all PAs appear to be harmful to environmental justice. In many cases, environmental conflicts are related to problematic extractivism or development projects, and often the mobilization of PAs is acknowledged as a tool working in favor of EJ. In cases where people are threatened by development or extractivist projects, PAs might become a useful tool for land stewardship. And this is happening not only in the Global North, but also in the Global South - i.e. where PAs are most problematized in conservation literature. Moreover, the list of PADDD events that are mobilized as a license for controversial extractivism or development projects corroborates further the statement that PAs can constitute an obstacle to the advancement of detrimental extractivist or industrial activities.

This research contributes to the debates on the desirability and usefulness of PAs as both concepts and institutions. While conservation academics and practitioners tend to diverge on the desirability of more

PAs, our analysis comes in support of positions recognizing the nuances of PAs role in conflicts within conservation debates. PAs are tools, mobilized by different actors and interests. Thus, like every other tool, they can be mobilized for a more or less (un)just transition towards sustainability. As conservation scholars and practitioners, we should encourage intersectional understandings of conservation as a complex network of actors and embedded interests at play. Even if it is insightful to look at PAs in quantitative terms, it is crucial to qualitatively discuss their implications. Before asking how many PAs are needed, the question of what conservation model should be promoted must be addressed. The importance of considering the socio-political context in which PAs are embedded as institutions is crucial within conservation debates. Who gets to control access to territories and resources through PAs? What are the power relationships between the actors in play, and how do PAs shift their (im)balances? Political ecology, critical conservation geography and environmental justice scholarships can provide important contributions in this respect.

CRediT authorship contribution statement

Antonio Bontempi: Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Pietro Venturi:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Daniela Del Bene:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Arnim Scheidel:** Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – review & editing. **Quim Zaldo-Aubanell:** Formal analysis, Methodology, Visualization, Writing – review & editing. **Roser Maneja Zaragoza:** Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary material

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