



Green grabbing implications for human rights, equity and the ecological transition

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Abstract

Tackling the ecological crisis requires land-based conservation and renewable energy projects, yet many face local opposition. In this context, ‘green grabbing’—the appropriation of land and resources for environmental ends—has become a significant global concern. As the ecological transition gains momentum, this phenomenon is expected to intensify across sectors and regions. To understand why such projects may fail to obtain a social license to operate, we analysed 132 conflictive projects developed under green credentials to examine their impacts on human rights, equity, and environmental problem shifting, as well as the social responses they provoked. Paradoxically, 85% of the cases reported human rights violations linked to the environment, including threats to land and livelihoods, but also to rights over food, water, participation in environmental decision-making, Indigenous rights, and cultural and spiritual rights. 70% of cases reported profits for private actors and elites, yet only 5% directly benefited the wider local population. Surprisingly, 45% of cases documented negative environmental trade-offs, limiting their role in the ecological transition. This underscores the necessity for robust safeguards that uphold customary land and resource rights while advancing ecological goals. The findings highlight the need to shift from pro-business to pro-social justice regulatory frameworks in the governance of green land use projects to mitigate conflict. Community resistance appears not merely as opposition, but as a source of grounded, place-based alternatives that can inform more democratic, legitimate, and lasting sustainability transitions.

Keywords Green grabbing · Environmental human rights · Conservation · Renewable energies · Land acquisition · Ecological transition

Introduction

Sustainable land management is crucial for promoting ecological protection and regeneration, adapting to and mitigating climate change, and ensuring long-term sustainable resource provision (Critchley et al. 2023; Sanz et al. 2017). To achieve these goals, global land use strategies increasingly prioritise the expansion of conservation areas and allocate land to renewable energy production (IPCC, 2019). However, initiatives such as protected areas, reforestation efforts for carbon sequestration, and the development of

wind farms and solar parks, promoted as contributions to clean energy transitions, often require large tracts of land (Mongird et al. 2025; Scheidel and Sorman 2012; Schleicher et al. 2019; van de Ven et al. 2021). These interventions may disrupt local land use practices and infringe upon community rights and historical ties to the land (Franco et al. 2015; Hunsberger et al. 2017). The resulting changes in land control can have adverse outcomes for local communities, a phenomenon often described as *green grabbing* (Corson and MacDonald 2012; Fairhead et al. 2012; Klingler et al. 2024). In these instances, the pursuit of environmental goals has led to the deprivation of local populations’ access to essential resources. Consequently, many environmental projects causing green grabbing have faced substantial local opposition, through strategies that might transition from physical confrontation to organised nonviolent opposition (Kurniawan 2025), often failing to secure the required social license to operate.

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Various strategies are currently being developed to mitigate adverse impacts of green projects, particularly regarding their land requirements. For energy projects, these include multifunctional land use strategies such as agrivoltaics combining agriculture with photovoltaic infrastructures (Barron-Gafford et al. 2019), roof top solar installations (Zhang et al. 2025), or offshore windfarms (Shen et al. 2024). While these initiatives have the potential to reduce their overall land footprint, they currently complement land-based projects rather than substituting them, hence, land requirements and associated land use change impacts remain a concern (e.g. Mongird et al. 2025). Also, for conservation initiatives, multiple-use protected areas have increased substantially and are more likely to support equitable outcomes for local communities. Nevertheless, strictly protected areas continue to be developed and account for 45% of terrestrial protected areas globally, raising concerns over possible community impacts (Adams et al. 2023). Finally, conflicts over green projects spark not only because of their land use impacts, but also over a wide range of other concerns, including procedural injustices in their governance, lacking benefits distribution across involved groups, as well as violence and repression. This not only raises justice concerns but also limits the effectiveness of green initiatives in supporting the ecological transition, as projects marked by conflict may face delays (Lunstrum 2016), or be shelved entirely due to resistance from affected communities (Borpoudakis 2019; Lin 2019; Post 2023).

In this paper, we argue that a better understanding of the causes of opposition to projects implemented under green credentials—that is, environmental justifications used to legitimise interventions on land and other natural resources—can inform more just and sustainable ecological transition pathways. While diverse case studies have reported on specific green grabbing conflicts around the world, global systematic reviews have been limited to analysing the role of legal frameworks in shaping green grabbing (Esteve-Jordà and Scheidel 2025). No global review exists of the combined social, economic and ecological impacts, which would support a better understanding of why green projects spark conflicts. Here, drawing from Political Ecology and Critical Geography, we specifically focus on conflictive projects developed for diverse environmental ends to address the following research questions: (i) what are the environmental human rights implications of contentious green projects?; (ii) how are economic benefits distributed and what equity dimensions emerge?; (iii) what are the unintended ecological consequences of these interventions?; and (iv) what forms of social resistance and mobilization strategies do local communities employ in response?

To answer these questions, we conduct a systematic assessment of four main features of green grabbing. First,

we analyse the environmental human rights implications of contentious green projects. While these initiatives are ostensibly designed to improve environmental conditions, which ideally should support associated environmental rights, case study evidence increasingly indicates that diverse human rights are not always protected (Bastos Lima and Kmoch 2021; Cavanagh and Benjaminsen 2014). Secondly, we address the equity dimension in terms of the distribution of economic benefits in conflictive green projects. Inequity may cause not only local opposition and conflict (Albertus et al. 2018; Peters 2004; Wegerif and Guereña 2020) but sometimes leads to short-term profit-seeking and elite capture, further fuelling popular resistance (İnan and Albulut 2022). Thirdly, we review their reported ecological consequences beyond the specific green project aims. Cases have shown that green projects may not always yield sustainable outcomes on the ground, and may create new environmental problems, leading to trade-offs (Cárdenas 2012; Johnson 2014; Nustad and Sundnes 2013; Scheidel and Work 2018). Finally, we also describe the diverse forms of social resistance and mobilisation that have emerged in response to green grabs.

Our global review draws on a unique database that combines two of the largest sources of empirical evidence available: a systematic review of the existing green grabbing literature, and a systematic review of green land acquisition conflicts registered in the global Environmental Justice Atlas (EJAtlas) (Scheidel et al. 2023; Temper et al. 2018a, b). As a result, we analysed 132 empirical cases characterised by green grabbing since 2012. In “[Conceptual framework and methods](#)”, we outline the types of green credentials under which the analysed green grabs are developed, the relevance of studying green grabbing conflicts to inform more just and sustainable land use practices, the method used to identify environmental human rights that are violated or at risk, and our systematic review approach. “[Results](#)” presents the main findings, focusing on environmental rights due diligence, equity aspects, ecological performance, and social resistance in conflictive green projects. “[Discussion](#)” contextualizes these results, and “[Conclusion](#)” highlights key issues that need to be considered to achieve an ecological transition that is not only effective in environmental terms, but also respects environmental rights, equity and local understandings of sustainability and justice.

Conceptual framework and methods

Types of green credentials

Cases of green grabbing generally involve context-dependent conflicts over projects developed for diverse

environmental ends, associated with the dispossession of local groups from resources and lands (Fairhead et al. 2012). Here we include specifically those cases as green grabs that the authors of the reviewed literature explicitly highlighted as such. This includes projects and initiatives that have been developed under diverse *green credentials*, and which have sparked local conflict over access, control or governance of land and other resources. We define *green credentials* as the environmental justifications —whether discursive, regulatory, or policy-driven— used to legitimise interventions in land use. These credentials may serve as both rhetorical tools and institutional mechanisms to frame interventions as environmentally beneficial, even when they may lead to socio-ecological conflicts or dispossession. Based on our iterative review, we identify the following broad types of green credentials commonly invoked across the literature, although they are not necessarily mutually exclusive, as projects may combine multiple green credentials:

- A. Conservation-oriented credentials: These include claims linked to biodiversity protection, ecosystem restoration, or land preservation, often materialised through the designation of protected areas or conservation corridors. For instance, some cases in Latin America and Africa involve the enclosure of territories under the guise of wildlife conservation, frequently impacting Indigenous and peasant communities (e.g., Asaka 2019; Holmes 2014; Snijders 2012).
- B. Climate change mitigation credentials: Interventions in this category are framed around the need to sequester carbon or reduce greenhouse gas emissions, often through afforestation, reforestation, or REDD+ schemes. These projects are legitimised through climate policy tools and carbon markets (e.g., Cormier-Salem and Panfili 2016; Lund et al. 2017), yet they have raised concerns about elite capture, exclusion of customary users, and the commodification of carbon.
- C. Clean energy or energy transition credentials: This category includes large-scale renewable energy developments, such as wind farms, solar parks, and hydropower plants, justified by their contribution to decarbonisation or sustainable development goals. Although these projects may not aim to enhance local environmental quality, they are presented as green solutions to the climate crisis (Dunlap 2018a; Knight 2017). In some cases, however, they lead to land dispossession, ecosystem degradation, or encroachment into protected areas (*un-green grabbing*, in the terms of Apostolopoulou and Adams (2015).
- D. Other green credentials: a residual category covering all other cases that were explicitly identified by the authors of the reviewed literature to be related to processes of

green grabbing because of their links to diverse sustainability agendas (e.g. cases linked to ecotourism, sustainability-certified food, rubber and timber production, and others).

While conservation, climate mitigation, and renewable energy projects differ substantially in their objectives, governance, and material forms, we analyse them here together under the green grabbing framework due to their common claims to support environmental agendas, and their shared characteristic of leading to local conflict and exclusions from land resources. Each type of green credential may produce distinct dynamics, such as enclosure in conservation projects, commodified land control in climate schemes, or large-scale land occupation in renewable energy developments. Throughout the paper, we acknowledge these differences by illustrating them with qualitative examples from the reviewed literature, to avoid oversimplifying the diversity of experiences while still tracing the broader political and distributive logics that underpin green grabbing across contexts.

Socio-environmental conflicts: a lens to understand opposition to green projects

To understand why some projects developed under green credentials fail to secure the social license to operate, we examine the associated socio-economic and ecological conflicts. Analysing these tensions offers grounded information for uncovering the causes of local opposition and resistance linked to the project impacts as perceived by local communities (Temper et al. 2020). Conceptually, we build on conflict studies within political ecology and sustainability sciences, which view conflicts not merely as social disruptions to be avoided but as meaningful political responses to social-environmental problems (Scheidel et al. 2018). In such disputes, local actors highlight overlooked impacts and articulate diverse, place-based perspectives on environmental and social management, often in stark contrast to the approaches and claims of project developers (Bontempi et al. 2023). Actors involved in local opposition may defend the values, livelihood needs, and local land-use histories of more marginalised groups, whose perspectives are often underrepresented in project design (Temper et al. 2018a, b).

Beyond these locally grounded factors, research has also identified broader psychological and social frameworks that shape responses to green projects. One strand of scholarship has critiqued the explanatory limits of NIMBYism (Not In My Back Yard), and instead emphasised the role of place attachment and place identity in shaping local responses to “green” projects (Devine-Wright 2005, 2009). Another strand, rooted in political ecology and critical

geography, shows how so-called neoliberalist developments can reproduce dynamics of dispossession and territorialisation, prompting local resistance. This includes analyses of “green” projects as forms of accumulation by dispossession (Harvey 2005), such as Siamanta and Dunlap’s (2019) cases in Greece and Mexico, or Dunlap’s work on infrastructural colonisation and grassroots mobilisation (Dunlap 2020). A further line of inquiry examines technology acceptance at broader societal levels, distinguishing between social, market and political acceptance (Wüstenhagen et al. 2007). These strands highlight, from different perspectives, that resistance may not solely reflect opposition to environmental goals per se, but rather a defence of place-based meanings, affective ties to land, and perceived threats to identity and community continuity (Devine-Wright 2022; Segreto et al. 2020).

Thus, the study of conflicts over alleged green projects provides a lens to examine the tensions between formal project impacts, aims and claims and the demands and realities faced by local communities who bear the social, cognitive, affective, economic and ecological consequences on the ground. It reveals the challenges that projects with environmental ends face in obtaining genuine community support and highlights the importance of considering local needs and understandings of sustainability (see Hunsberger et al. 2017).

Undoubtedly, the diverse impacts caused by conflictive green projects can conceptually be grouped and interpreted from diverse theoretical perspectives, as the reviewed case studies show (Supplementary Table S3). To synthesise knowledge from these diverse case studies, we centred our review on reported empirical impacts, categorising them pragmatically into three dimensions: social, economic, and ecological implications. For social impacts, we specifically examined those with direct implications for environmental human rights, as projects with environmental objectives should prioritise compliance with rights linked to their management practices. For economic impacts, we focused on equity in the distribution of benefits and burdens. For ecological impacts, we aimed to understand potential trade-offs and problem shifts across environmental dimensions (see “Environmental human rights” for further details).

We recognise that these categories are heuristic and inherently interconnected, requiring an understanding of their overlaps (e.g., environmental impacts may give rise to environmental human rights concerns). Additionally, we acknowledge that our focus on environmental human rights, economic equity, and ecological trade-offs does not encompass all potential sources of opposition to green projects. However, we believe that systematically examining evidence across these dimensions provides valuable insights for a wide range of stakeholders, including policymakers,

project developers, researchers, and civil society concerned with the ecological transition. These findings help illuminate common reasons why some green projects struggle to secure a social license to operate.

Environmental human rights

As the recognition of environmental rights as human rights continues to evolve within international law and policy, conceptual clarification is necessary. A significant milestone in this process was the UN General Assembly’s declaration on 28 July 2022 (A/RES/76/300), affirming that everyone has the right to a healthy environment. Currently, more than 80% of UN member states (156 out of 193) legally recognise the right to a safe, clean, healthy, and sustainable environment, reflecting a growing global commitment to environmental human rights. In this evolving context, the International Court of Justice issued in 2025 its Advisory Opinion (No. 2025/36 23 July 2025) on States’ obligations in relation to climate change, contributing to the progressive clarification of international legal duties in light of the climate emergency.

At a regional level, the Inter-American Court of Human Rights Advisory Opinion OC-23/17, of November 15, 2017, underscored state obligations concerning the environment within the framework of the protection and guarantee of the rights to life and personal integrity under the American Convention on Human Rights (Pact of San José). More recently, in its Advisory Opinion OC-32/25 (2025), the Inter-American Court of Human Rights characterised the climate crisis as a human rights emergency, recognised a right to a healthy climate, and clarified States’ obligations to prevent and address its impacts, particularly concerning vulnerable groups and environmental defenders. Moreover, several interregional agreements recognise the close connection between the environment and human rights, such as the Aarhus Convention, the Escazú Agreement, the African Charter on Human and Peoples’ Rights (Art. 24), or the San Salvador Protocol (Art. 11). However, there is no single, comprehensive international treaty or declaration that explicitly defines or acknowledges environmental rights. This absence makes it difficult to determine which human rights should be considered environmental, a question that has largely been addressed through constitutional provisions and judicial interpretations at the national level. Such interpretations are often shaped by regional legal frameworks and domestic traditions (Boyd 2012; John Knox 2018).

In this article, we focus on the human rights most frequently threatened by environmental changes linked to green grabbing. Specifically, we consider rights recognised in international human rights frameworks that are closely tied to environmental protection and sustainability. This

does not exclude the possibility that other rights may be at risk in specific cases of green grabbing. The rights examined include the Right to Land, the Right to Water, the Right to Livelihood, the Right to Food, the Right to Participation in Environmental Decision-Making, Communication Rights, Cultural and Spiritual Rights, and Indigenous rights. Supplementary Table S1 provides a summary of these rights frameworks and how they may be affected by green grabbing.

Systematic review

This study conducts a global systematic review by integrating the two largest available sources of empirical evidence: a systematic literature review of the existing green grabbing literature and a systematic review of conflictive land acquisition cases for projects with environmental ends registered in the global Environmental Justice Atlas (EJAtlas). We first carried out the main systematic literature review in the Web of Science to get a better understanding of the type of projects and credentials linked to green grabbing. During the revision process, we conducted an additional literature search in Scopus to assure comprehensiveness (see below). We also complemented our literature database with relevant cases from the EJAtlas. We combined the two data sources to increase the empirical evidence underpinning this global review, thereby reducing coverage gaps across geographic regions. While the two data sources differ in their use of definitions, filter and search options, both data sources include empirical cases that can be described as “green grabs” in line with our approach: empirical conflicts over projects established under diverse green credentials (see “Types of green credentials”). Furthermore, both data sources involve an external review and editorial process in which empirical data are reviewed before being published, assuring quality.

Systematic literature review (SLR): The SLR design followed the PRISMA guidelines and was informed by an initial literature screening. After confirming that no previous systematic literature reviews had addressed this topic, we conducted a search on 8 January 2024 in Web of Science using the search term (‘green grab*’). The search period covered the period from 1 January 2012 (when the first studies were published) to 31 December 2023. Our aim was to identify all peer-reviewed articles and book chapters published in that period that included this term and its spelling variations (i.e., green grab, green grabs, green grabbing, etc.) in the title, abstract, or keywords. The same search was performed during the paper’s revisions (on 18 July 2025) in Scopus to supplement any studies not contained in the Web of Science, using the same keyword string and search period. This resulted in 116 studies, of which seven described more than one case. Our unit of analysis was site-specific empirical cases; therefore, we excluded studies that:

(a) were primarily conceptual; (b) did not sufficiently frame or interpret the case as an instance of green grabbing, either explicitly or through alignment with the green credentials framework; (c) lacked adequate empirical detail; or (d) described cases older than 2000. 43 studies were removed, resulting in a sample of $n=87$ empirical cases (see Supplementary Table S3).

We acknowledge that a broader range of cases in the literature could arguably be analysed through the lens of green grabbing, even if they are not explicitly labelled as such. Nevertheless, we deliberately narrowed our search to publications that explicitly employ the term *green grabbing*. This choice allowed us to focus on cases in which authors themselves recognised and framed the socio-environmental impacts of land-based environmental interventions as forms of dispossession or conflict affecting local communities, in line with the concept proposed by Fairhead et al. (2012), which emphasises appropriation under environmental justifications. In general, researchers determined whether an appropriation was based on green credentials by examining the stated goals and discourse used by project proponents (e.g., governments, NGOs, corporations), as well as by tracing the regulatory frameworks or incentive mechanisms (such as REDD+, carbon offset schemes, or clean energy subsidies) under which these projects were developed.

Systematic review of EJAtlas cases: Unlike the literature, the EJAtlas does not explicitly label cases as “green grabs”. However, the platform provides filter options to identify conflicts over land-use projects implemented under green credentials, in line with those identified in the SLR (See “Types of green credentials”). To select these cases, we filtered the database for: “Type = ‘land acquisition conflicts’ AND (‘Agro-fuels and biomass energy plants’ OR ‘REDD/CDM’ OR ‘Windmills’ OR ‘Mega-project solar plants’ OR ‘Geothermal energy installations’ OR ‘Dams and water distribution conflicts’ OR ‘Wetlands and coastal zone management’ OR ‘Establishment of reserves/national parks’) AND ‘Conflict start date $\geq$ 2012’”¹. This resulted in 74 cases. After manual screening of each case, we excluded those that (a) did not provide information on green grabbing (e.g., projects with environmental ends did not cause the conflict); (b) did not provide sufficient case details;

¹ Given the differences in the two databases used, specifically regarding the absence of “green grabbing” as a filter option for cases in the EJAtlas, we have chosen 2012 as a lower-end cut off year for the EJAtlas search to ensure coherence and relevance of reviewed cases for contemporary green grabbing debates. The year 2012 coincides with the year when green grabbing as a concept first emerged in the literature, hence, all included EJAtlas cases can be temporarily related to emerging green grabbing concerns. Furthermore, the year coincides with the consolidation of the Green Economy concept following the UN Rio+20 conference in 2012. Subsequently, green credentials were more commonly employed in projects with environmental ends, such as those covered by the EJAtlas.

(c) countrywide conflicts not linked to a specific project (e.g. conflicts over domestic legislations). 29 cases were removed, resulting in a sample of $n=45$ cases (Supplementary Table S4).

Analysis and sample characteristics: We combined the empirical cases from both reviews into a global database of $n=132$ cases. The coding was conducted manually by the authors, having a background in environmental law, environmental sciences and political ecology. Following a pilot coding with six papers (three per author), we refined and expanded the coding framework. The studies were then distributed among the authors for final coding. In cases of doubt or ambiguity, the content was discussed and reviewed jointly to ensure consistency. We coded the cases qualitatively and quantitatively regarding: (1) threats to environmental human rights resulting from reported project impacts; (2) distribution of economic benefits generated by the project across stakeholders; and (3) reported environmental benefits and trade-offs. Finally, we also report on the social responses of locally affected groups, that have been documented in the empirical cases. For a definition of coded variables, see Supplementary Material, Table S2. For quantitative analyses, we used descriptive statistics. Figure 1 reflects the sample distribution of our database. Limits to data representativeness, which are addressed in the discussion section, apply due to possible sample biases in case reporting, common in literature reviews and EJAtlas data (cf. Scheidel et al. 2023).

The following section presents the results of the systematic review. After briefly characterising the sample in

terms of geographical and sectoral coverage, we discuss our findings regarding environmental human rights impacts, economic benefits distributions, ecological trade-offs, and social responses. For each section, we provide descriptive statistics derived from the review and a brief explanation of the variable under discussion. For a better illustration of the impact discussed, we provide short empirical examples from our review database.

Results

Our systematic review of 132 documented green grabbing conflicts across 52 countries since 2012 (Fig. 1) reveals that the majority have been reported in Latin America, South Asia, and East Asia. Note that four cases involve more than one country (e.g. cross-border conservation zones). This distribution reflects a geographically diverse pattern, encompassing both Eastern and Western regions. However, notable data gaps exist in Northern and Sub-Saharan Africa, Russia, Mongolia, and Central Asia, which we attribute to a lack of documentation rather than an absence of conflicts. The most frequently involved sectors are renewable energy projects (47%), including hydro, solar, wind, and biofuels, and conservation initiatives (42%), such as national parks, REDD+, and reforestation projects. The remaining 11% are comprised of diverse cases (ecotourism, sustainability-certified food, rubber and timber production, infrastructure linked to sustainable development agendas, critical mineral

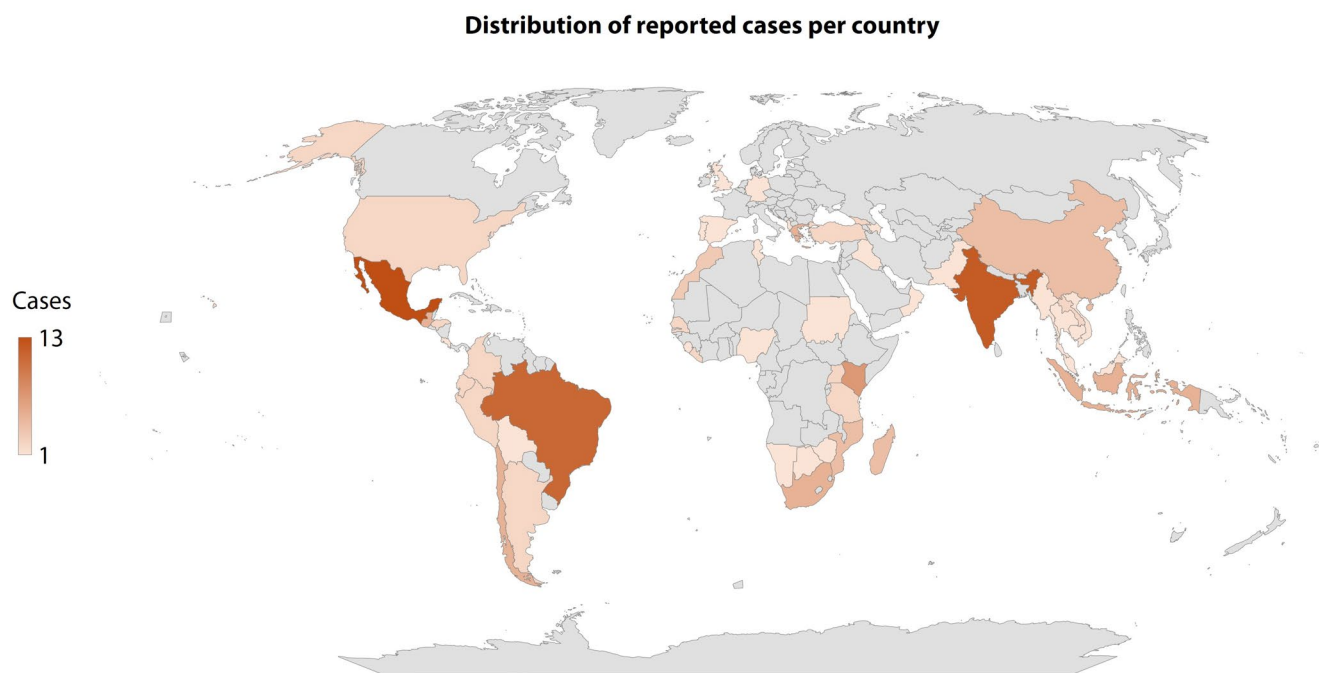


Fig. 1 Map of green grabbing conflicts analysed ($n=132$)

mining) that we include because the authors have explicitly linked them to processes of green grabbing.

Green grabs and environmental human rights

Results from our review show that the impacts of the projects associated with green grabbing threatened at least eight different environmental human rights recognised in international conventions (Fig. 2). 74% of cases reported local means of subsistence being compromised, violating the Right to Livelihood, recognised in Article 6 of the International Covenant on Economic, Social and Cultural Rights (ICESCR). By disrupting traditional means of sustenance, such as farming and fishing, cases show that green projects may plunge communities into economic precarity, often without providing viable alternatives and diminishing their resilience. One example is a wind farm project supported by the Clean Development Mechanism (CDM) in the Kalpavalli community forest (India). It involved the construction of roads, restricting access to pasture and livelihood opportunities, ranging from the production of grass brooms to the

sale of dates and toddy (palm wine) (EJAtlas ID 2204, see Table S4).

Land dispossession emerged as a central issue, with 85% of cases reporting some form of it, directly threatening the rights of local populations to own, use, and control land. These rights are protected under both Article 17 of the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP), and Article 17 of the Universal Declaration of Human Rights (UDHR). Displacement from ancestral lands not only strips communities of their physical space can also undermine their cultural and spiritual ties to the land, elements that are crucial for Indigenous and rural peoples. In this sense, other severely impacted rights include those specifically protecting Indigenous Peoples. In 48% of cases, Indigenous rights, enshrined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), were infringed upon. This includes violations of their rights to self-determination, free prior and informed consent (FPIC), and the ability to manage their own resources, which are critical to their survival and cultural integrity. Baletti (2012), for example, mentions how people associated with loggers and

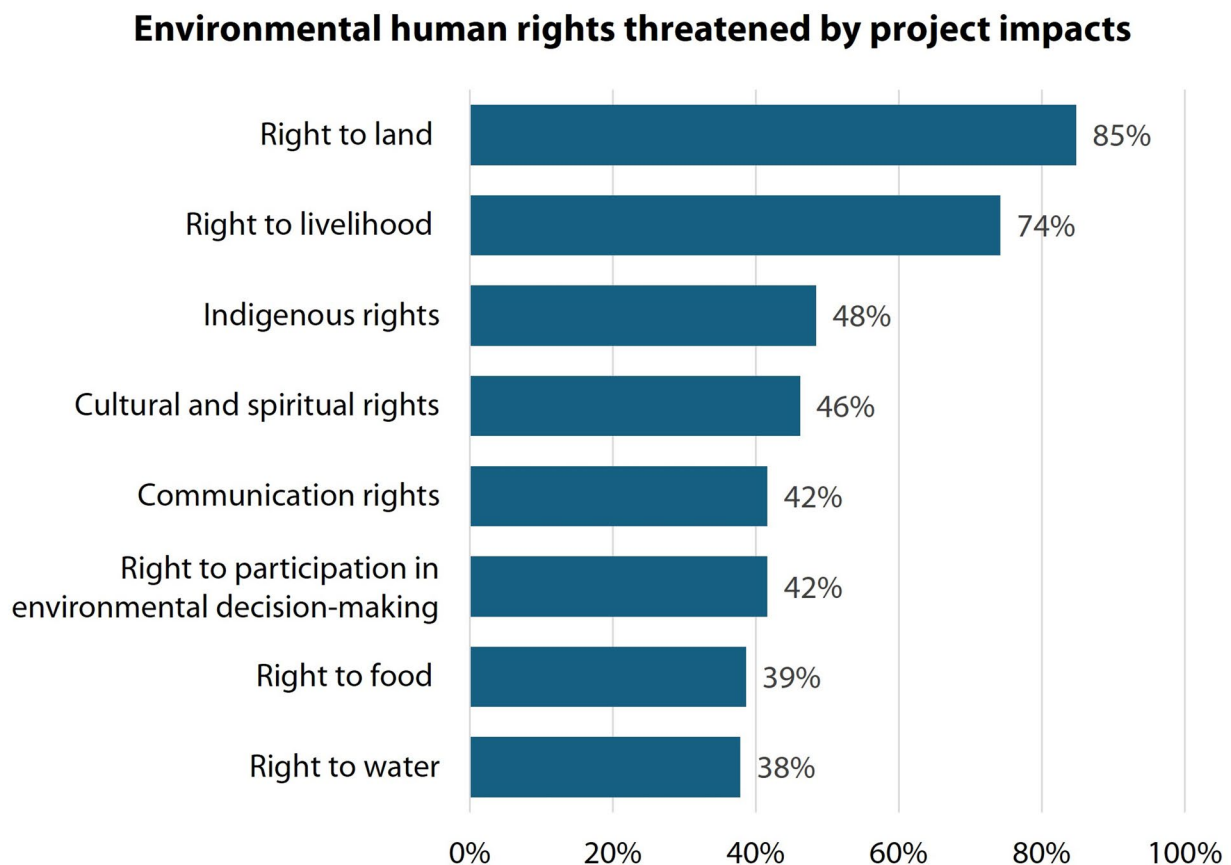


Fig. 2 Environmental human rights threatened by reported project impacts. ($n=132$)

soy growers of Gleba Nova Olinda (Brazil) tried to discredit the demands of the Borarí people by kidnapping and beating their spokespersons and terrorising their communities. Johnson (2014), meanwhile, recounts how the occupation of Afro-Ecuadorian lands by palm oil companies in Esmeraldas (Ecuador) provoked conflicts between the Chachi and Awá peoples and reduced their access to and control over vital resources through intimidation tactics, destruction of homes and even killings.

In 46% of cases, it is reported how green grabbing undermines Cultural and Spiritual Rights, recognised both in the International Covenants on Economic, Social and Cultural Rights (ICESCR) and on Civil and Political Rights (ICCPR). Projects, reported to displace traditional communities from their land, often disrupt their cultural heritage which can cause profound psychological and communal damage. For instance, the Aguas Zarca Hydroelectric Project, claimed to produce renewable energy, threatened the Gualcarque River, a sacred site for the Lenca people of Mayan heritage, where the spirits of Indigenous girls are believed to reside and which is considered a legacy of Cacique Lempira, who defended these lands against Spanish colonisation (EJAtlas case ID 1368). The conflict resulted in the tragic murder of human rights activist Berta Cáceres, who defended the Lenca people and land. The project was never completed. The case stimulated global debates on the urgent need to protect environmental human rights defenders.

Communication Rights (arts. 19 UDHR and ICCPR) were threatened in 42% of cases, where affected communities reported difficulties in accessing information, voicing their concerns, or seeking redress. Similarly, 42% of cases highlighted violations of the Right to Public Participation in Environmental Decision-Making, a right codified in the Aarhus Convention and the Escazú Agreement, among other interregional agreements. Vázquez-García and Sosa-Capistrán (2021) illustrates how, in an *ejido* (a form of communal land tenure in Mexico) in Zacatecas, Mexico, the privatisation of communal land for renewable energy production led to the exclusion of women from decision-making concerning land management, resulting in their broader marginalisation and alienation. Even *ejidatarias* (women with full land rights) were sidelined, as corporations negotiated exclusively with a small group of men who disregarded their rights to participate in assemblies, voice concerns, and access economic benefits from land rentals, further exacerbating gender disparities.

Basic subsistence rights like the Right to Food and the Right to Water were compromised in a considerable proportion of cases. Specifically, 39% of cases reported threats to the Right to Food, as agricultural lands are often repurposed or depleted due to unsustainable “green” development projects, jeopardising nutrition security. For instance,

the commodification of baobab fruit in Senegal’s Boundou Region resulted in a hunting ban and reduced access to grazing lands, both critical resources for local communities’ nutrition. This shift also led to a decline in milk production, worsening family malnutrition and threatening community survival (Owolodun and Merten 2023). Similarly, 38% of cases document impacts linked to violations of the Right to Water, in which communities lost access to clean and safe water sources. Such is the case of “green” mining and logging in the Saracá-Taquera National Forest in the Brazilian Amazon, where tax incentives for logging companies to obtain FSC certification resulted in the contamination of ancestral streams, causing illnesses among local communities who relied on them for drinking water (Nepomuceno et al. 2019). In other cases, water has become scarce or less accessible or affordable due to changes in water use brought about by green projects, such as carbon offsetting in Mount Elgon National Park, in eastern Uganda (Cavanagh and Benjaminsen 2014).

Green grabs and economic equity

The economic benefits derived from projects associated with green grabbing appear unevenly distributed (Fig. 3), favouring private entities and powerful local actors over wider community benefits. According to our database, 70% of cases reported direct financial gains for private project developers, including corporations and consultants, with an additional 10% documenting indirect benefits. Host governments also gained notably, profiting directly in 45% of cases, often through tax revenues, and indirectly in 30%, e.g. benefiting from improved infrastructure, job creation, and ecotourism linked to protected areas. One example is Greece’s post-2008 experience with photovoltaics and “financial green grabbing” (Siamanta 2019), where a range of actors—including environmental NGOs, the Greek state, key renewable energy players, banks, media, PV companies, and multinational manufacturers—collaborated to frame renewable energy as a national interest, while profiting from the sector’s expansion, even in protected areas. This case also shows that, depending on the context, some projects can embody both *green* and *un-green grabbing* dynamics, a form of land or resource grabbing that involves the exploitation and appropriation of protected natures (Apostolopoulou and Adams 2015).

Local elites, such as landholders, *caciques* or political party leaders, were also able to benefit from these projects directly in 42% of cases, sometimes because of their preferential position to obtain project benefits (Dunlap 2017, 2018b). Indeed, individuals and corporations with financial resources or political connections can acquire land or natural resources more easily, while less powerful groups

Economic benefits distribution across actors

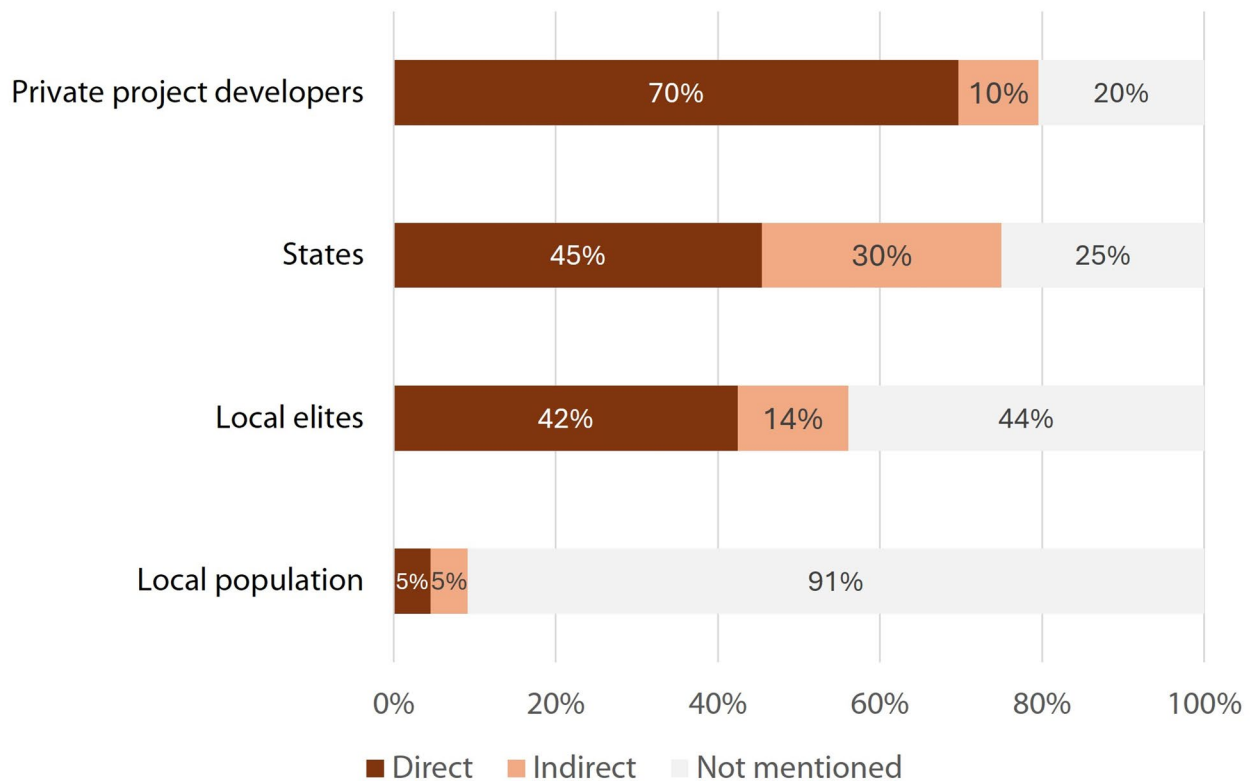


Fig. 3 Distribution of economic benefits across actors. ($n=132$)

lack the financial means or political influence to secure their access to resources or obtain new ones (Franco and Borrás 2019). Such is the case of the Bii Hioxo wind farm in Juchitán (Mexico), where local elites have been able to stabilise and manage the areas of interest with “soft” interventions, through foreign aid disguised as “civil aid and community development” (Dunlap 2018a).

Wider benefits for local communities are rarely documented, with over 91% of cases reporting no positive impact. On the contrary, many contested green projects impose substantial economic burdens, particularly on historically marginalised groups such as Indigenous Peoples and local communities (IPLCs) involved in 70% of cases. Adverse economic impacts were noted, including loss of vital resources such as land, access to forests, and wildlife (Asaka 2019; Okojie et al. 2015; Sanchez-Ayala and Areiza-Tapias 2019). In some cases, resource conflicts arose over the unfair distribution of rents and access to common lands, exacerbating tensions within communities (Astuti and McGregor 2017). In other cases, privatisation fragmented land and disrupted traditional livelihoods, leading

to reduced agricultural productivity. The wind turbines installed near homes in La Ventosa (Mexico) exemplify how this has caused discomfort and enclosed the town, limiting access to land and resources. Rather than benefiting locals, the project has led to resource scarcity and rural gentrification (Dunlap 2017; Rignall 2016). Some cases also illustrate how large-scale renewable energy projects can fail to create meaningful employment for local populations. In India, for example, Stock (2022) reports how solar parks primarily employ highly skilled municipal engineers, excluding local workers from economic benefits.

Green grabs and the ecological transition

Paradoxically, despite being developed under green credentials, projects associated with green grabbing conflicts tend to perform poorly regarding local ecological benefits (Fig. 4). Only 19% of cases explicitly reported tangible benefits beyond the specific project purpose, such as reduction of environmentally damaging investments, increased ecological awareness, or erosion control and preservation

Environmental impacts beyond specific project aims

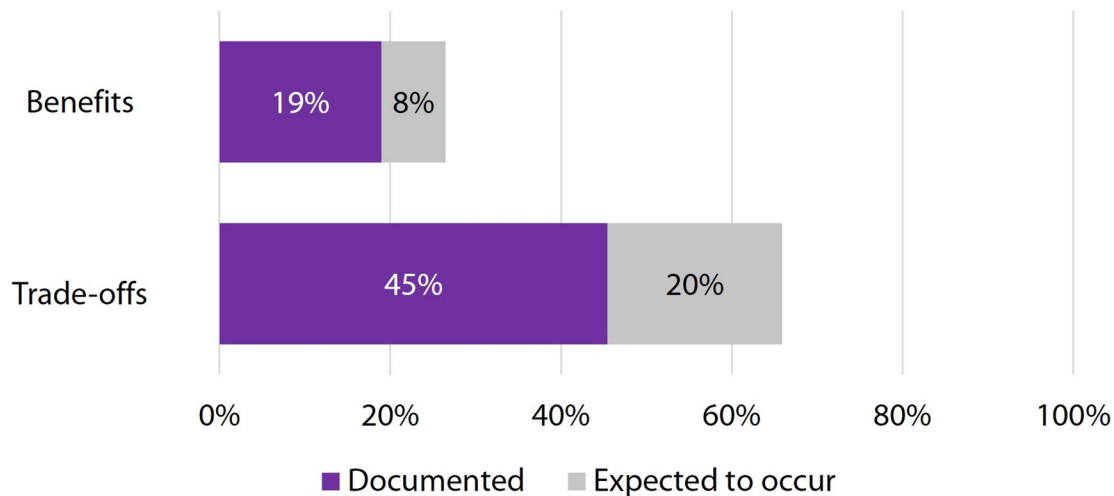


Fig. 4 Environmental benefits and trade-offs beyond specific project aims ($n=132$)

of habitats and biodiversity, while another 8% expected to bring future benefits. Some projects have enabled habitat expansion, improved carbon sequestration, and reduced atmospheric CO₂ through reforestation and sustainable land use practices. For example, the establishment of protected areas, community-based forest management, and wildlife-focused programs, such as rhino and elephant poaching prevention (e.g., Bersaglio and Cleaver 2018; Massé and Lunstrum 2016), helped safeguard charismatic species and ecosystems. Additionally, these projects may reduce agrochemical use and support soil and water restoration (Urzedo et al. 2020). Environmental education and awareness further encourage sustainable practices, such as in conservation and forestry activities in Los Esteros del Ibera, Argentina (Busscher et al. 2018).

However, 45% of projects are associated with severe environmental trade-offs and degradation, while another 20% mention future risks thereof. Among them are large-scale deforestation, pollution of water bodies, soil and air, habitat loss and fragmentation, or wildlife displacement. Expansion of agriculture and tree plantations, such as oil palm or acacia, may displace native species (e.g., Cárdenas 2012; Siamanta and Dunlap 2019), homogenise landscapes (e.g., Holmes 2014; Scheidel and Work 2018) and reduce legal reserves (e.g., Baletti 2012). Infrastructure developments, such as coastal tourism complexes and large-scale renewable energy installations, can disrupt ecosystems by fragmenting habitats, degrading water quality, and altering hydrological dynamics (e.g., Pye et al. 2017; Rao 2018;

Scheidel and Work 2018; Vandergeest et al. 2015). Additionally, excessive pesticide use may degrade soil quality and affects local flora and fauna (e.g., Bastos Lima and Kmoch 2021; Le Billon 2021). Some conservation and certification initiatives have been criticised for inadequate environmental assessments and poor sustainability practices, leading to ecosystem instability and potential species extinction (e.g., Nepomuceno et al. 2019).

Struggles against green grabs

Green grabbing impacts a broad spectrum of individuals and groups, ranging from peasants and tenant farmers over agricultural labourers, forest-dependent people, pastoralists to Indigenous and traditional communities, who may be vulnerable to displacement and livelihood deprivation. The literature shows that the impacts imposed on them tend to trigger social responses and contestations in forms of protests, petitions and other forms of mobilisations. Given the frequent affectation of Indigenous Peoples and local communities in green grabs, it is unsurprising to see them involved in many resistances, sometimes in ad hoc alliances with other actors. Such is the case of the Movement in Defense of Life and Culture on the Arapiuns River in response to the effects of Ordenamento Territorial in Brazil (Baletti 2012) or the Assembly of Indigenous Peoples of the Isthmus in Defense of Land and Territory in resistance to the development of wind farms in Oaxaca, Mexico (Alonso Serna 2022).

Such struggles are often supported by NGOs and other coalitions. For example, in Crete, Greece, the Pan-Cretan Network Against Industrial Renewable Energy Sources (PCNAIRES) was created in 2009 as a group of 105 local associations, collectives, movements, and numerous individuals to carry out actions against the installation of renewable energy projects (Siamanta and Dunlap 2019). In some cases, they were backed by larger grassroots movements (such as *Unión Campesina*), trade unions (such as Rural Workers' Union), international and national environmental NGOs (such as Greenpeace and WWF), neighbouring community councils and human rights activists. Scientific institutions and university associations were also involved in some resistance cases. For example, the Responsible Investment at Harvard Coalition, formed by members of the academic community, organised an event with the local action group *Guardianes del Iberá* to discuss the problems caused by Harvard Management Company's forestry operations in Esteros del Iberá, Argentina (Busscher et al. 2018). They encompass objections to large-scale development initiatives, defiance against privatisation efforts, resistance to forced displacement and environmental degradation, calls for the protection of cultural heritage and ancestral lands, and the insistence on respect for cultural and spiritual traditions. Some also emphasised the need for genuine community empowerment to ensure control and autonomy over resources and independence from green projects.

Among the variety of strategies and tactics employed, many studies documented physical actions such as blockades and barricades of highways, rivers, and roads and the seizure of goods (Post 2023; Priestley 2021; Scheidel and Work 2018). Baletti (2012) even reports that, in a bid to protect Indigenous lives and culture, activists set fire to two barges carrying illegal timber in western Pará (Brazil), resisting zoning policies, the expansion of private property rights, and so-called sustainable extractive programs. Resistance efforts also include the continuation of customary activities that became illegal through new regulations and projects, such as night grazing (Bersaglio and Cleaver 2018; Pas and Cavanagh 2022), fishing and hunting (Wieckardt et al. 2022), construction of livelihood assets (Lin 2019), or theft of company-owned goods and resources (Milgroom 2015). In addition, there were instances of public protests, mass demonstrations and organised marches (Apostolopoulou and Adams 2015; Devine 2018), as well as occupations in public institutions and private complexes (ranches, conservancies, farms...), both locally and nationally (Pas and Cavanagh 2022; Stock 2022). Some communities, organised in consortia, committees and cooperatives, entered into negotiations —sometimes including bribery— with companies or government agencies to assert their rights and demands (Cárdenas 2012; Forget and Bos 2022);

others opted for non-commitment through boycotts, strikes or silence (Gargallo et al. 2022; Stock 2023). Some communities also resorted to petitions, public letters, signature collections, declarations and media campaigns (Lin 2019; Rignall 2016).

Some cases also describe the acquisition of land or reserves by NGOs to prevent them from being grabbed —through donations, auctions, fairs, etc.— and their conversion for environmental education or collective ownership (Castro-Arce and Vanclay 2020; Holmes 2014). Others note the publication of ecological impact reports that visibilised the threats posed by green projects (Bormpoudakis 2019). Finally, certain cases also challenged the romanticised imagery of harmonious, profitable conservation that dominates global environmental agendas (Cavanagh and Benjaminson 2014), while others fostered global awareness of green grabbing through the formation of transnational solidarity networks spanning religious, Indigenous, peasant, feminist, human rights, and environmental spheres (Rocheleau 2015).

Discussion

Our systematic review synthesised 132 empirically documented cases of green grabbing worldwide, exposing diverse concerns surrounding projects pursued under green credentials that have triggered local conflicts. It is important to note that our sample focuses exclusively on conflictive cases and does not speak for green land-use projects implemented without local resistance or dispute. Furthermore, the use of secondary data from different contributors entails certain sample limitations, common to systematic reviews. This includes uneven geographic coverage: we lack information of large parts of Africa, Central Asia, Russia, and limited information in Northern America and Europe. Therefore, our findings do not speak for these regions yet highlight an important geographical research gap. Moreover, data from different authors may be subject to selection biases regarding the details of the impacts of conflictive projects they have chosen to document. Most likely, more impacts have occurred than those that were documented. Therefore, the provided impact statistics represent a conservative lower boundary of impacts occurring in conflictive green projects. Finally, given that the concept of green grabbing emerged within the critical social sciences, the reported environmental benefits and trade-offs are possibly under-reported, as authors frequently focused more centrally on the social dynamics shaping green grabbing. These specific sample characteristics and the mentioned limitations should be considered when interpreting the results. Nevertheless, our review offers important insights into why certain environmental projects, even those with potential ecological

benefits, often struggle to obtain the social license necessary for their long-term success.

First, the very high incidence of threats to the Right to Land and the Right to Livelihood, the latter depending frequently on access to land resources, underscores the importance to prioritise projects with reduced land requirements and land use impacts. For the energy sector, this may involve multifunctional installations (e.g. rooftop solar power; Zhang et al. 2025) to avoid competition with customary land uses. For the conservation sector, increased deployment of multi-purpose protected areas which are less restrictive of customary land uses is likely to support more equitable outcomes (Adams et al. 2023). Additionally, land tenure security can be strengthened and local economies further protected, especially for Indigenous Peoples and local communities (Franco et al. 2015). Healthy ecosystems serve as the backbone for local economies, sustaining livelihoods through activities such as agriculture, fishing, and tourism (Dunlap 2018b; Müller et al. 2023; Otten et al. 2020; Rocheleau 2015; Wieckardt et al. 2022). Green projects that do not consider local values, needs and land use histories can undermine the very foundation of human dignity and equality and the rights that should protect individuals and communities from exploitation and marginalisation. By sidelining community voices and interests, such initiatives perpetuate cycles of inequality and disenfranchisement, ultimately hindering efforts that could benefit both the environment and the communities that depend on it. Procedural injustices have emerged as a key concern, with nearly half of all cases signalling a lack of meaningful community engagement in project implementation. This dimension, as a core pillar of environmental justice, emphasises inclusive, transparent, and equitable decision-making processes, particularly for communities directly affected by environmental interventions (Schlosberg 2007; Walker 2012). Implementing inclusive decision-making processes that genuinely engage affected communities would improve procedural justice, fostering greater social acceptability for environmental initiatives (Amerasinghe et al. 2008; Canelas and Carvalho 2023; Liu et al. 2020; Stock and Birkenholtz 2021).

Second, the results reveal how conflictive green projects, particularly in the conservation and renewable energy sectors, often prioritise economic gains over the rights and well-being of local communities, with consequences for property, livelihoods and local sovereignty (German et al. 2017). On the one hand, the disproportionate benefits that accrue to private developers and powerful local elites, as well as inadequate community engagement and the marginalisation of local communities, underscore the need for more equitable project design and implementation. Weak regulatory frameworks and entrenched political and economic inequalities

exacerbate these issues, undermining the potential success of these projects. By prioritising the recognition of customary resource uses and rights, stakeholders can create frameworks that not only empower local populations but also ensure that they receive a fair share of the social, economic, and environmental benefits derived from green projects. Moreover, equitable benefit distribution would help bridge the gap between marginalised groups and powerful developers, thereby addressing systemic inequalities (Otsuki et al. 2017). Ultimately, these measures would contribute to a more sustainable and just ecological transition, aligning green projects with the rights and needs of local groups, and enhancing their resilience and capacity to adapt to changing environmental conditions (Cotula and Vermeulen 2011; Urzedo et al. 2020).

Third, despite being framed as environmentally beneficial, many projects associated with green grabbing demonstrate limited or even negative ecological outcomes. While some initiatives have supported habitat restoration, carbon sequestration, and biodiversity conservation, others have led to serious environmental trade-offs, including deforestation, pollution, habitat fragmentation, and the displacement of native species. Infrastructure developments often disrupt ecosystems and reduce their resilience, particularly when implemented without adequate environmental assessments. The adverse environmental performance is another source of local opposition, also, because ecological degradation can jeopardise cultural values and meanings inscribed in landscapes, environmental human rights and non-marketed incomes obtained from healthy ecosystems. Furthermore, such impacts raise concerns over environmental problem shifting, where unintended side effects generate new challenges across different sustainability dimensions and scales (Wood Hansen and Van Den Bergh 2024). These dynamics may stem from a failure to consider critical local factors, including the suitability of project locations and the appropriateness of the technologies deployed. In some cases, so-called green grabs may ultimately resemble, overlap with, interact or even collide in various ways with conventional land grabs or broader resource grabs (Busscher et al. 2018; Holmes 2014; Lunstrum 2016). Alonso-Serna (2022) has even talked about ‘value grabbing’, to highlight the conflicts leading to the creation of private property and the conflicts for the distribution of rents. And as Filer (2012) aptly notes, “*the puzzle is not so much the absence of a green land grab as the presence of a brown one*”, highlighting how environmental justifications can obscure more conventional extractive or profit-driven motives. Therefore, environmental agendas might not necessarily be the main purpose behind some projects but simply a means for their legitimisation (Otten et al. 2020).

Finally, the evidence of diverse and widespread resistance to green grabbing underscores the fundamental tensions between large-scale environmental initiatives and the rights, livelihoods, and autonomy of affected communities. From Indigenous coalitions and grassroots movements to transnational advocacy networks, these resistances challenge the economic and political structures that facilitate land dispossession and environmental injustices. The breadth of strategies—ranging from direct action and legal battles to alternative land governance models—reflects both the significance of these struggles and the resilience of those resisting (Urzedo et al. 2020). Crucially, these movements from below expose the contradictions inherent in dominant sustainability narratives, i.e., mainstream policy and development frameworks that prioritise technocratic, market-based, and growth-oriented solutions, often undermining social equity and ecological integrity (see Bigger and Webber 2021; Escobar 2008). Such approaches frequently sideline alternative knowledge, local participation, and justice-oriented practices.

To improve outcomes, there is a pressing need for enhanced social, economic, and environmental design, robust monitoring, and comprehensive project evaluation to promote more equitable and effective ecological transition processes (Cormier-Salem and Panfili 2016; Neimark and Wilson 2015; Owolodun and Merten 2023; Siamanta 2019). This involves a fundamental shift from sectoral, “pro-business” models to rights-based, “pro-social justice” regulatory frameworks that incorporate community engagement, equitable resource distribution, and the protection of environmental human rights (Franco et al. 2015, 2017; Müller and Pampus 2023). To effectively navigate these challenges, a rigorous, systematic and holistic approach is required—one that acknowledges cross-sectoral and cumulative project impacts (Baird and Barney 2017; Work et al. 2019), and more broadly, the interdependence of ecological health and human rights. Only meaningful community engagement, equitable resource distribution, and robust protection of environmental rights can pave the way for a just ecological transition that respects both human dignity and ecological integrity, thus mitigating the risks associated with green grabbing and ensuring that the pursuit of sustainability does not come at the expense of vulnerable communities.

Conclusion

As climate change and biodiversity loss intensify, initiatives such as conservation, reforestation, and renewable energy projects are increasingly promoted as urgent responses to the ecological crisis. While in many instances such initiatives could positively support both environmental ends

and provide benefits for local communities, there is also mounting evidence of social conflicts over such projects (Esteve-Jordà and Scheidel 2025; Fairhead et al. 2012). In this context, our review of 132 conflicts over green projects has highlighted the importance to implement green agendas that respect and protect local environmental rights, ensure equitable benefit distribution, and minimise environmental trade-offs. Otherwise, social resistance demanding a fair ecological transition is likely to grow, involving land conflicts, and struggles over access to and control of natural resources. The tensions revealed in green grabbing conflicts highlight many instances and the acute risk of disconnection between environmental ambitions and the social realities on the ground. Rather than fostering sustainability, these cases show that “green” projects may be perceived by local communities as new forms of unjust and disruptive dispossession, undermining both their legitimacy and long-term success. This paradox calls into question how the ecological transition is implemented in many places across the globe. The issue lies not in the goals themselves, but in how they are pursued, typically privileging technical and economic efficiency over equity and participation. For the analysed cases, the resulting tensions are not incidental but appear to be structural, embedded in governance systems and policy frameworks that have systematically excluded the voices and interests of those most affected and where environmental solutions are imposed without adequate consultation, consent, or local benefit.

To restore credibility and legitimacy to the transition, there is a pressing need to move beyond narrowly framed environmental interventions. Projects should avoid being confined to approaches that prioritise market-driven logic over the well-being of local communities and the integrity of natural landscapes (Leach et al. 2012). A more holistic and inclusive approach must integrate social justice, democratic governance, and cultural recognition. Central to this shift is the acknowledgement that environmental human rights are not optional add-ons but essential components of sustainability. Securing these rights requires structural change and legal accountability (Esteve-Jordà and Scheidel 2025).

Furthermore, the socio-economic dimensions of the transition must be addressed. While green projects often generate economic value, their benefits tend to be concentrated, while their costs disproportionately impact groups in vulnerable positions. A just transition must therefore be redistributive, centred on community ownership, fair benefit-sharing, and regenerative, inclusive livelihoods. In parallel, the ecological impacts of these projects require more critical evaluation. Many interventions rely on simplified assumptions that neglect local ecosystems or long-term consequences. Transition policies must adopt systemic approaches that assess their effects on both ecological and social resilience.

Importantly, resistance by affected communities offers valuable lessons. These are not merely defensive actions but often articulate alternative, place-based visions of sustainability grounded in situated knowledge, legal mobilisation, and collective action. Engaging with these proposals is crucial for designing transitions that are democratic, legitimate, and durable. Ultimately, land and nature must be understood not just as resources, but as sources of identity, memory, and care. Transitions that acknowledge these dimensions, while fostering inclusion, participation, and justice, are more likely to generate outcomes that are ecologically resilient and socially equitable.

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Data availability All data used in the study are openly accessible, and the systematic review of the used datasets is reproducible and documented in the Supplementary Data provided with this submission. The coded data will be shared upon request.

Declarations

Competing interests The authors declare no competing interests.

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