

Original article

Mapping ecological distribution conflicts: The EJAtlas

Joan Martinez-Alier

ICTA-UAB, Barcelona, Spain



ARTICLE INFO

Keywords:

Ecological distribution conflicts
Circular economy
Commodity frontiers
EJAtlas
Environmentalism of the poor
Environmental justice
Valuation contests
Political ecology
Iconography

ABSTRACT

This article describes the origins of the terms “environmental justice” and “environmentalism of the poor and the indigenous” since the 1980s. In 2012 the collection of “ecological distribution conflicts” (EDC) in an Atlas of Environmental Justice (the EJAtlas) started. The EJAtlas reached 3350 entries by January 2021. Such conflicts arise because the industrial economy is not circular, it is entropic. Since the industrial economy is entropic, it continuously looks for new energy and material sources at the “commodity extraction frontiers”, and for waste disposal sites. There are counter-movements of resistance, which become also “valuation system contests” since the participants in such movements (environmental organizations, indigenous peoples, peasants, neighbors and citizens) display different values. Examples recorded in the EJAtlas are given from different continents while answering the questions: Why did the world movement for environmental justice come into being, and which type of social movement is it? The relevance of the EJAtlas for research on comparative, statistical political ecology but also on business economics and management, is noticed.

1. Introduction: circularity, entropy and environmental conflicts

Georgescu-Roegen in *The entropy law and the economic process* (1971) and other authors before and after him (cf. [Martinez-Alier 1987](#)) insisted on the fact that the industrial economy is not circular but entropic. This explains the growth of environmental conflicts at the extraction and waste disposal frontiers. This is lesson number one in a course of ecological economics and political ecology. Of all the materials entering the economy (fossil fuels, building materials, metal ores, biomass), by 2005 only about 6% were recycled ([Haas et al., 2015](#)). There is no reason to expect an improvement to have happened since 2005. The low degree of circularity has two main reasons. First, 44% of processed materials were used to provide energy and are thus not available for recycling. Second, socioeconomic stocks were growing at a high rate with net additions to stocks of 17 Gt/yr. In the last 120 years, the human population grew five times (from 1.5 to 7.5 billion) while the inputs processed in the global economy (biomass, fossil fuels, building materials, metals) grew approximately thirteen times, from 7.5 to 95 Gt per year ([Haas et al., 2020](#)). The economy is becoming less and less circular. The expansion of stocks requires, once in place, a persistent input of materials and energy for their maintenance and operation ([Haas et al., 2020](#)).

Therefore the industrial economy marches all the time in search of energy and materials towards the commodity extraction frontiers, and to the waste disposal frontiers, often inhabited by humans and certainly by

other species. Hence the growth in the number of Ecological Distribution Conflicts (EDC), and as a response the strength of the environmental justice movement ([Martinez-Alier, 2020](#)).

The industrial economy is entropic ([Haas et al., 2015, 2020](#); [Giampietro and Funtowicz, 2020](#)), therefore it requires new supplies of energy and materials extracted from the “commodity frontiers” ([Moore, 2000](#); [Joseph, 2019](#)), and it produces polluting waste. Therefore ecological distribution conflicts (EDC) arise. The Global Atlas of Environmental Justice is an online inventory of such conflicts based on scholarly and activist knowledge. It reached 3350 entries by January 2021 (ejtlas.org) allowing research in the field of comparative, statistical political ecology. The EJAtlas is a unique instrument co-produced with and supporting environmental movements. One can do comparative analyses on the social actors involved in the conflicts and their forms of mobilization, and also on the behaviour of private or public companies. Research may focus on countries or regions but also on cross-cultural topics such as gold and copper mining, hydropower and dams, oil palm plantations, incinerators and other methods of waste disposal, coal fired power plants, and nuclear reactors. Analyses are done also on the iconography (banners, slogans, documentaries, murals) of conflicts in the EJAtlas.

I agree with [Hickel and Kallis \(2019\)](#) and other ecological economists in their critique of “ecomodernism”, which I called “the gospel of eco-efficiency” ([Martinez-Alier, 2002](#)) because:

E-mail address: joanmartinezalier@gmail.com.

<https://doi.org/10.1016/j.exis.2021.02.003>

Received 28 June 2020; Received in revised form 1 February 2021; Accepted 5 February 2021

Available online 23 February 2021

2214-790X/© 2021 The Author.

Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

- a) We are not moving to a dematerialized economy based on services. The services use materials and energy; and the money gained in the service sector goes to material consumption (through salaries, dividends for shareholders and their families). The material structures of the economies change, no doubt, but there is no “absolute dematerialization”.
- b) The world industrial economy is less and less “circular”, relying more on cheap commodity extraction and waste disposal. “Green growth” is a mirage.
- c) The sustainable development goals or Agenda 2030 are flawed because SDG n. 8 preaches economic growth (measured by GDP growth) not only in poor countries but also in rich countries. (Martinez et al., 2020).

One favourable trend towards environmental sustainability is that the human population is likely to reach its peak by 2060 at 9.5 billion. It was 1.5 billion in 1900. A slow process, 120 years since the neo-Malthusian Feminists (Emma Goldman, Marie Huot, M. Pelletier, P. Robin) advocated *la grève des ventres* at heavy political cost to themselves (Ronsin, 1980), and since E. V. Ramaswamy Periyar in South India in the 1920s defended women’s freedom, collectively conducive to a lower birth rate. (Martinez-Alier and Masjuan, 2004). We hear that economic growth is good for the people (SDG 8) and shall soon hear that population growth is good for the economy. I have often been blamed for supporting “bottom-up feminist Neo-Malthusianism that raises the spectre of population control” (e.g. Nirmal and Rocheleau, 2019). Never mind. Present trends are welcome. They will indeed open up a new important research field on Depopulation and Environment.

Other social and economic trends are still negative for environmental sustainability. Driven mostly by economic growth, the decrease of biodiversity continues as the HANPP (the human appropriation of net primary production of biomass) increases due to meat consumption and “biofuels” (Temper, 2016), while the world input of materials to the economy (measured in tonnes) still goes up (until 2020) though it might soon reach a peak. Carbon dioxide in the atmosphere measured in the Keeling curve was 320 ppm in 1960, reaching 415 ppm by 2020 in its march to 450 ppm by 2050. True, peak CO2 emissions and also peak extraction of materials (including coal and oil but not natural gas) might be reached soon but descent from the high peaks will be slow. Moreover, even a non-growing industrial economy would require continuous new inputs of energy and materials from the extraction frontiers because energy is not recycled and materials are recycled to a very small extent.

At a time in which despite all the evidence to the contrary there is much enthusiasm about the possibilities of an industrial circular economy, it is necessary to explain the two senses in which authors write about the “circular economy”. They could be teachers of introductory microeconomics, or more recently they could be chemical engineers and industrial ecologists.

Introductory microeconomics is often taught in terms of what Georgescu-Roegen called “the merry-go-round between consumers and producers”, a circular scheme in which producers put goods and services in the market at prices which consumers pay; meanwhile, consumers (as providers of labour, land or other inputs or “factors of production”) get money from producers in the form of salaries, rents etc. and they buy, as consumers, the products or services that have been produced. The “merry-go-round” needs energy for running (energy which gets dissipated), and it produces material waste which is not recycled. This is left aside in introductory mainstream economics, or maybe it is introduced much later, in the analysis of the “intergenerational allocation of exhaustible resources” and in the treatment of externalities which are “internalized into the price system”.

As ecological critics of mainstream economics since the 1970s and 1980s, we thought that we were slowly convincing the public if not the professional economists that the “merry-go-round” representation of the economy was wrong. The economy is embedded in physical realities. However, to our surprise, the recent novelty is that, from industrial

ecology and not only from economics, a circular vision of the economy is also preached. The geologically produced energy and the materials entering the economy are here taken into account, and the waste is very much present, but it is assumed that technical change may close the circle. The waste becomes inputs. The energy (dissipated, or course, because of the Second Law of Thermodynamics) is not a problem because it will come from current sun energy (not fossil fuels, which are exhaustible stocks of photosynthesis from the past). The circular supply chain is supposed to rule physically the economy. We know however that the actual degree of the circularity of the industrial economy is very low, and it is probably decreasing as formerly biomass-based economies complete their transition to an industrial economy based on fossil fuels in India and Africa (Roy and Schaffartzik, 2021).

2. The environmental justice movement and the environmentalism of the poor: a brief history

As the pressure from the extractive industries increases on the natural environment and human livelihoods, there are more and more ecological distribution conflicts (EDCs). They often overlap with gender, ethnic, caste, social class, geopolitical conflicts, and hopefully will soon occupy a central stage in political philosophy and politics (Charbonnier, 2019). Making old or emergent EDCs more visible through the EJAtlas contributes to placing political ecology and socio-environmental justice at the centre of politics, displacing mainstream economics.

The Chipko movement in the Himalayas in the 1970s (Guha, 1989), and the movement of the *seringueiros*, linked to Chico Mendes in Acre, Brazil, in the 1980s, represented two emblematic cases of “environmentalism of the poor” when this notion was developed in the 1980s. Other contemporary examples of this type of environmentalism were the Ogoni, the Ijaw and other indigenous groups protesting the damage from oil extraction by Shell in the Niger Delta; resistance against eucalyptus in Brazil, Thailand and elsewhere on the grounds that “plantations are not forests” (Carrere and Lohmann, 1996); the movements of displaced people due to dam construction as in the Narmada river in India (mostly Adivasi) and the *atingidos por barragens* in Brazil; and new peasant movements such as Via Campesina against agro-industries and bio-piracy. Ultimately, the sum of all these conflicts in a world environmental justice counter-movement represents today a powerful social force for greater sustainability. (Scheidel et al., 2018; Scheidel et al., 2020).

The EJAtlas is an outcome of and also a tool for research on the environmentalism of the poor and the indigenous, and the global environmental justice movement. I started this research around 1990 with Ramachandra Guha and other colleagues (Martinez-Alier, 1992; Guha and Martinez-Alier, 1997, 1999; Martinez-Alier 2016c). We argued (Martinez-Alier, 1991, 1995; Martinez-Alier and Hershberg, 1992) against Inglehart’s “post-materialist” thesis (e.g. Inglehart, 1995) which saw the origins of environmentalism in a cultural shift in rich countries after 1968 expressed in new social movements that discarded economic values in favour of human rights, feminism and the environment. According to Inglehart, citizens prioritized environmental concerns when they became rich enough not to worry about food, housing and shelter. Environmentalism was part of this so-called “post-materialist” mind-set. Instead, I argued that “post-materialism” was a “terrible misnomer” (Martinez-Alier, 2002) because of two reasons. Environmentalism in rich countries, although focusing sometimes on the “cult of wilderness”, had a strong industrial material component as in the alarm against DDT, nuclear power, sulphur dioxide emissions in the 1960s and 1970s. And, second reason, there was a worldwide wave of an environmentalism of the poor and the indigenous born of their own cultural values and from very material concerns for access to land, clean water and air threatened by industrial growth and plantations. From the early 1990s we disputed the views that the environment was a “luxury good” with a high income-elasticity of demand, and that “the poor are too poor to be green” (Martinez-Alier, 1995a). As noticed in the 1990s, there was a

close relation between this environmentalism of the poor and the indigenous in the Global South (Guha and Martinez-Alier, 1997, 1999; Martinez-Alier 1998) and the “environmental justice” movement in the United States coming from the Civil Rights movement and fighting against “environmental racism”.

The words “environmental justice” are used here in a sociological sense, as they were first used in this movement born in the USA in struggles against waste dumping in North Carolina in 1982 (Martinez-Alier et al., 2014). Activist-authors such as Robert Bullard (1990, 1993), Civil Rights activists with no academic affiliation, and members of Christian churches saw themselves as militants of environmental justice. By October 1991, an assembly of “leaders of peoples of color” in Washington DC proclaimed the 17 principles of Environmental Justice which went beyond a focus only on the United States. The document included affirmation of the sacredness of Mother Earth and the right to be free from ecological destruction; peoples’ right to self-determination; rights of participation and enforcement of principles of informed consent; rejection of military occupation, repression and exploitation of lands, peoples, and cultures, and other life forms (Menton et al., 2020). The Principles explicitly refer in their Preamble to the need to build a “national and international” grassroots movement for EJ, considering environmental injustices facing the current generation but also future generations and other species. It is a strong document coming from the Civil Rights movement and therefore from the experience of slavery, racism and coloniality, a document produced by the descendants of African slaves transported by Europeans to American sugar and cotton plantations to produce on stolen lands the cheap inputs of the industrial revolution. The EJ movement was grounded from its beginning in the 1980s in the lived experiences, places and locations of those communities that suffered still from colonialism and racism. One of the best known locations was “Cancer Alley” in Louisiana, in the deepest South of the United States (Fig. 1). The fight against the disproportionate incidence of pollution in predominantly Black, Hispanic or Indigenous communities was seen by activists in this United States movement as fighting for environmental justice and against “environmental racism”. Often they referred to the need to go beyond US borders (e.g. Bullard and Johnson, 2000).

For instance, Mossville is placed in “Cancer Alley” in the USA. (In China a term that translates as “Cancer Villages” is used (Lora-Wainwright, 2013, 2017), in the context of pollution from heavy metals rather than from oil and gas as in Cancer Alley). Mossville was one settlement of free blacks since 1790. After the 1940s it became surrounded by industrial plants, making it “the most polluted corner of the most polluted region in one of the most polluted states in the USA” (Fig. 1). “Environmental racism” in Mossville is historically analogous to that against Brazil’s *quilombolas*, Colombia’s *palenques* and maroon settlements in Jamaica.

The relations between the original movement for Environmental Justice in the USA and the EJAtlas were beautifully captured in a website in the US illustrating one of our recent articles with an iconic 1982 photo (Fig. 2) from Warren County, NC. <https://portside.org/2020-06-06/new-global-report-environmentalism-poor-and-indigenous>.

They echo our article in these terms. *A new report presents the most complete analysis of environmental conflicts to date, focusing on 3000 cases of grassroots activism worldwide, activism by the poor and indigenous that comes with a heavy cost of criminalization, violence, and murder. Quantitative analyses shed light on the characteristics of environmental conflicts and the environmental defenders involved, as well as on successful mobilization strategies. Environmental defenders are frequently members of vulnerable groups who employ largely non-violent protest forms. In 11 percent of cases globally, they contributed to halt environmentally destructive and socially conflictive projects, defending the environment and livelihoods. Combining*

strategies of preventive mobilization, protest diversification and litigation can increase this success rate significantly to up to 27 percent. However, defenders globally also face high rates of criminalization (20 percent of cases), physical violence (18 percent), and assassinations (13 percent), which significantly increase when Indigenous people are involved... bottom-up mobilizations for more sustainable and socially just uses of the environment occur worldwide across countries in all income groups, testifying to the existence of various forms of grassroots environmentalism as a promising force for sustainability.

This US perspective inspired us at ICTA UAB to start the EJAtlas in 2012 on the steps of activist maps compiled by OCMAL (Observatorio de Conflictos Mineros de America Latina), Fiocruz (Mapa de Saúde e Justiça Ambiental no Brasil) (Porto et al., 2013), also Ricardo Carrere (World Rainforest Movement), ASUD in Italy, Oilwatch in Ecuador and Nigeria, and Turkish colleagues. We drew on the experience of movements of the environmentalism of the poor and the indigenous around the world (as researched and described in Martinez-Alier, 2002). Adivasi struggles in India (particularly in Odisha against bauxite mining, (Padel and Das, 2010; Temper and Martinez-Alier, 2013), and indigenous grievances and claims by the Oilwatch network against the foreign oil industry in the Niger Delta and the Amazon of Ecuador, provided initial impetus for the EJAtlas. The concepts and events inspiring and framing the EJAtlas came in part from “Dixie” in the United States (Bullard, 1990) and mostly from the global South. The framing of EJ as a struggle against the disproportionate negative environmental effects of economic activities on what in the US are “minority” populations or “people of color”, is of permanent value.

What in the US are “minorities”, at world level are often majorities (Martinez-Alier, 2002). One cannot presume that, as “environmental justice” as a social movement was first identified and named in the US, it is a “Western” colonialist and racist notion (as wrongly argued by (Álvarez and Coolsaet, 2018). In fact, the Decolonial Political Ecology of the Americas (Ferdinand, 2019) emphasizes the Maroon cultures of escaped slaves in the wide Caribbean plantation world, including “Dixieland”. Ferdinand himself, from Martinique, has studied this history, and also the racialized injustice of pesticide use in banana plantations. Among other sources, his Decolonial Political Ecology is explicitly inspired (as we also are) by the US environmental justice movement against environmental racism.

3. A brief history of the EJAtlas: “let the subaltern speak”

Empirical research shows that “subaltern classes”, manual workers, indigenous peoples and the poor in general are often the first to defend the environment in which they work and live, or from which they get their livelihood (Barca, 2012; Sathesh, 2020). A unifying definition for these “subaltern environmental struggles” was the “environmentalism of the poor”, tied to material issues of environmental degradation in terms of human health, livelihoods and well-being. Evidence from around the world led to a theory of Ecological Distribution Conflicts (EDCs), i.e. conflicts over the social distribution of environmental costs and benefits deriving from the material interchange between societies and nature (Martinez-Alier and O’Connor, 1996). In general, such costs and benefits are not only expressed in economic terms; the diverse social actors display other values. After publishing *The Environmentalism of the Poor* in 2002, our research programme on world environmental justice was facilitated from 2008 to 2021 at ICTA-UAB by three European funded projects (CEECEC, EJOLT and EnvJustice). The EJAtlas (Fig. 3) reached 3340 entries of EDC across the world in December 2020 allowing new work on comparative, statistical political ecology (Temper et al., 2015, 2018, 2020; (Martinez-Alier et al., 2016a; Scheidel et al., 2018; Liu 2020; Tran et al., 2020; Martinez-Alier 2020). One early article from our group was Gerber’s analysis (2011) of 58 tree plantation conflicts in cooperation with Ricardo Carrere of the WRM. The EJAtlas, co-directed



Fig. 1. An ironic advertisement photographed in Mossville, Louisiana. Here the link to the EJAtlas. <https://ejatlas.org/conflict/mossville-louisiana-environmental-racism-united-states>.

by Leah Temper and myself, coordinated by Daniela Del Bene, was publicly launched in 2014 with 920 entries focusing on the environmentalism of the poor which often overlaps or “intersects” with agrarian, urban, feminist, indigenous, working class and public health movements but has distinctive contents.¹

The EJAtlas entries consist of a data sheet of 5 or 6 pages in open access with a description of the conflict, sources, and many codified variables: visible or potential impacts (environmental, health and social impacts) of the project or policy causing the conflict, social actors of the conflict, forms of mobilization, outcomes. Each case is documented and contains some photographs. The EJAtlas classifies the environmental conflicts in one of ten main categories: nuclear energy, biomass and land grabbing, fossil fuels and climate justice, mining, infrastructures (such as motorways, airports), industry, biodiversity conservation, water, waste management, tourism. There are many secondary categories. (Temper et al., 2015, 2018).

Across the whole sample of the 3340 contentious episodes registered in the EJAtlas we see for instance (using the Filter function in the EJAtlas platform) that in about 414 cases deaths of one or more environmental defenders are reported. The members of the EJAtlas team and myself are (in my view) accurate observers arriving after the battles, “rearguard” actors to use Sousa Santos’ image (2014) recording and making conflicts visible after they have taken place or when they are still burning actively or their embers might revive. The social actors (as classified in the EJAtlas data sheets) are women and men taking part in highly intense or subdued conflicts as indigenous peoples, farmers, neighbors and citizens, members of local EJOs, landless peasants, industrial workers, pastoralists, fisherfolk or others. They might be militant activists or even “resigned” environmentalists (Lora-Wainwright, 2017). Some are

scientists and professionals, or members of religious groups. They display their “repertoires of contention” or “forms of mobilization” (Martinez-Alier et al., 2016a; Temper et al., 2015, 2018; Scheidel et al., 2020).

This “environmentalism from below” is different from the “cult of wilderness” and the “gospel of eco-efficiency” (Martinez-Alier, 2002). Research on this grassroots environmentalism has been practiced by political ecologists with other names: some called it “liberation ecologies” (Peet and Watts, 1996), others call it “subaltern environmentalism”, a term whose use seems to be growing (Egan, 2002; Ruiz Cayuela, 2018).² I refer here to Gayatri Spivak’s critique (1988) against Ranajit Guha denying the possibility for the subaltern to speak.³ Outside India, Laura Pulido (1996, p. 128) in a classic book on Hispanic pastoralists’ claims for environmental justice and land rights in New Mexico quoted Spivak: “being a subaltern includes lack of voice or at best a voice that is barely audible ... moments of mobilization and uprising are then openings that allow us to interrogate those visions ... to explore what they mean to the subaltern”. In Peru *ambientalismo subalterno* was analyzed (Valencia, 2013) while Italian historian Marco Armiero drew directly from Gramsci and wrote of *subaltern environmentalism* in the waste crisis in Campania bypassing altogether Ranajit Guha and Spivak (Armiero and Sedrez, 2014) as Stefania Barca had done already (Barca, 2012). Compared to the powerful corporations, governments and mainstream media confronting the poor and the indigenous, the EJAtlas allows such “subalterns to be heard” even when they died long ago, were killed recently or are still alive but almost voiceless.

4. Comparative, statistical political ecology based on the EJAtlas

In the EJAtlas, the many conflicts showing many aspects of an environmentalism of the poor or, if you wish, “subaltern environmentalism”, are classified according to their outcome into (many) failures,

¹ Here my gratitude to the main co-authors and colleagues in the work on these European funded projects and the EJAtlas in the last 15 years: Leah Temper, Beatriz Rodriguez Labajos, Daniela Del Bene, Yakup Cetinkaya, Hali Healy, Begum Özkaynak, J.F. Gerber, Mariana Weber, Swapan Kumar Patra, Arnim Scheidel, Federico Demaria, Paul Mohai, Marcelo Firpo Porto, Juan Liu, Brototi Roy, Grettel Navas, Sofia Avila, Eleonora Fanari, Arpita Bisht, Irene Iniesta, Dalena Tran, Amaranta Herrero, Sara Latorre, Mario A. Pérez Rincón, Raquel Neyra, Sara Mingorria, Max Stoisser, Patrick Bond, Lucrecia Wagner, Ksenija Hanacek, Anna Lora-Wainwright, Keninichi Matsui, Irmak Ertör, Emiliano Teran, Jovanka Spiric, Julie Snorek, Alfred Burballa, Camila Rolando Mazzuca, Nick Meynen. Also interns and master students at ICTA UAB and FLACSO Ecuador. And not least, EJOs such as OCMAL, Censat, Oilwatch and Acción Ecológica, CSE and Kalpavriksh in India, ERA in Nigeria, ASUD in Italy, GRAIN, the WRM and others.

² Sreejith Varmas. *The Subaltern Environmentalism of Mayilamma. Reading and Translating Mayilamma: The Life of a Tribal Eco-Warrior* (Plachimada struggle in Kerala against Coca-cola, and its leader, Mayilamma 2019). <http://ala.keralascholars.org/issues/13/mayilamma/> Diacronie. “Can the Subaltern Speak” through the Environment? At the crossroads of Environmental History and Subaltern Studies 2020. <https://www.studistorici.com/2020/01/31/cfp-44-en/>

³ The word “subaltern” was Gramsci’s term in the Prison Notebooks, taken up by Ranajit Guha’s remarkable school of historical “subaltern studies” in India in the 1980s with many volumes published by Oxford U.P.



Fig. 2. Their photo caption reads: *In the demonstration that birthed the environmental justice movement, North Carolina State Troopers prepare to oust protestors demonstrating against the dumping of toxic dirt in the Warren County landfill on September 17, 1982.* BFA Environmental Consultants.

(some) successes and (many) “don’t know for sure”. Among the 3340 cases, about 544 are deemed as “successes” in environmental justice - there is no sustained social movement unless it obtains some successes from time to time. We can check whether reported “success” correlates closely with “project cancelled” as an outcome. It does (Rodríguez-Labajos and Özkaynak, 2018; Aydın et al., 2017; Scheidel et al., 2020; Hanaček et al., 2020). One can do analyses of the movement for environmental justice based on countries or regions but also cross-cultural analyses on topics such as copper mining and smelting, sand mining, eucalyptus or oil palm plantations, dams, incinerators and landfills, coal fired power plants, gas fracking, nuclear reactors, windmills, CAFOs (“concentrated animal farming operations”) (Saes and Bisht, 2020) .

As a social movement, environmental justice has distinctive collective actors. In the conflicts registered in the EJAtlas, they display several forms of mobilization or “repertoires of contention” (Table 1). The first studies using the EJAtlas as a novel database were published in 2015 (Latorre et al., 2015; Temper et al., 2015). A 2018 special issue further consolidated its use for comparative political ecology (Temper et al., 2018). These studies analysed up to a few hundred cases and focused mainly on regional trends, such as environmental conflicts in Andean countries (Pérez-Rincón et al., 2019), sectoral dynamics, such as conflicts over wind power (Avila, 2018), hydropower and dams (Del Bene et al., 2018), mining (Aydın et al., 2017), or specific thematic concerns, such as multidimensional violence in central American conflicts (Navas et al., 2018). The only early study employing a global dataset of 1357 EJAtlas cases was published by Martinez-Alier et al. (2016a), providing statistics on actors involved and mobilization forms, while focusing further on qualitative aspects, such as a description of the protest vocabulary used by environmental justice movements. Since then, the number of registered conflicts has nearly tripled. With 2743 conflicts, Scheidel et al. (2020) is by far the largest study using EJAtlas data providing analyses of conflicts in relation to sectors and income groups,

actors and their successful protest forms, and key positive and negative conflict outcomes and their association to Indigenous and non-indigenous mobilizations.

Profiles on the main commodities involved, the most frequent companies (private or public) and social actors, the visible and potential impacts, the “repertoires of contention” for the whole EJAtlas could be compared across countries or regions (India, South America, China, Western and Central Europe). Similarly one could compare the profiles for the outcomes (Martinez-Alier et al., 2016b) (for comparison between India and South America). For instance, hunger strikes are disproportionately present in conflicts in India.

5. The EJAtlas: an advocacy map and an archive for socio-environmental history

Such research results from the EJAtlas are becoming available in top academic journals, testifying to the consistency of the abundant information gathered in it (Scheidel et al., 2020; Temper et al., 2020). The EJAtlas is an archive of environmental conflicts in the form of a “protest map” (Drozd, 2020), a product of a wave of “bottom up” cartography at the service of social counter-movements and also of academic scholarship. In Drozd’s words (2020), the EJAtlas is an “advocacy map” on conflicts around environmental issues. It is an accurate advocacy map useful for activism, research and teaching, a database collaboratively collecting information on environmental conflicts coming directly from activists and, more often, coming indirectly from journalists and academics.

The collaborative maps from the EJAtlas provide an example of what critical mapping can do to reframe the dominant cartographic narrative (Drozd, 2020). Maps sometimes present a view of the environment as a space dotted with strategic resources, which implies that their management and exploitation are the main focus of land use and resource

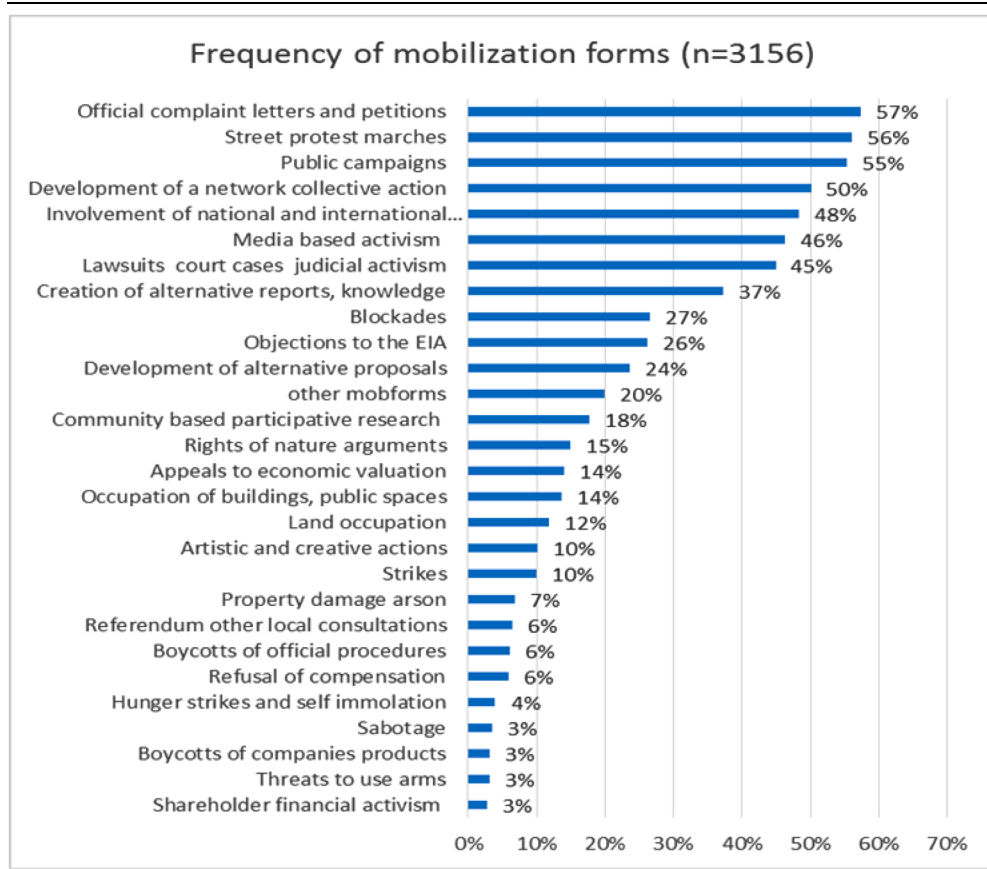


Fig. 3. The EJAtlas with a column for recently updated cases (www.envjustice.org).

policies (Drozd, 2020), looking at nature from the logic of so-called capital accumulation (meaning resource extraction and dissipation). The EJAtlas shifts the focus from what economic potential the environment holds to the consequences resulting from its exploitation and the resistance against the consequences (Drozd, 2020). In all cases, the EJAtlas puts conflict in front and centre, and restores the antagonistic dimension of resource control and management. What the EJAtlas

shows is that land and natural resource use cannot be simply viewed as a matter of post-political technical management but also of politics. The EJAtlas registers victims of extractive violence, the dead, the criminalized (Scheidel et al. 2020), the wounded, the frightened and displaced by “the coercion present in natural resource extraction”, “socio-ecological warfare techniques to control human and natural resources”, “corporate counter-insurgency strategies” and “state terrorism”

Table 1
Repertoires of contentious actions in the EJAtlas.



(Dunlap, 2019). Dunlap rightly emphasizes the use of such techniques by corporations and states against environmental defenders with a mixture of soft approaches (from bribery to Corporate Social Responsibility, CSR) and violent practices (Brock and Dunlap, 2018). But this top-down viewpoint risks to deprive the oppressed from agency. Instead, the EJAtlas looks at reality from below.

The EJAtlas opens up new avenues for research in comparative, statistical political ecology focussing on the power dynamics and *valuation contests* in EDCs (O'Connor, 1993). There are hundreds and hundreds of such valuation contests in the EJAtlas where economic costs and benefits, and demands for monetary compensation for damages, appear in the recorded conflicts. But other valuation languages are also forcefully deployed. For most conflicts we can answer the question: which valuation languages have been brought into the dispute, which have politically prevailed? So the EJAtlas is an instrument for research and teaching not only in political ecology but also in an ecological economics focused from its beginning (Otto Neurath, K. W. Kapp, Georgescu-Roegen) not only on the study of social metabolism but also on the plurality and incommensurability of values (Martinez-Alier, 1987; O'Neill and Uebel, 2015; Rodríguez-Labajos and Martinez-Alier, 2013).

The materials contained in the EJAtlas, including the iconography, often reveal such "valuation contests".

Thus, a slogan heard in many gold mining conflicts in Latin America is *el agua vale más que el oro*. Water is more valuable than gold, not certainly in money per kg but in other standards of value. This slogan is a performative symbol in banners, t-shirts (Fig. 4) and songs since the early boom of open cast gold mining in the 1980s and 1990s. Demonstrators shouting *el agua vale más que el oro* ask for the primacy of socio-environmental values over chrematistic values. Does *el agua vale más que el oro* appear in other continents in conflicts over open cast gold mining, translated into any of the thousands of languages of the "subaltern", many of which are becoming extinct?

In the next section I shall discuss the use of the EJAtlas in a related research field: business economics and management.

6. The relevance of the EJAtlas for business management: "corporate social irresponsibility"

As EDC intensify along commodity extraction and waste disposal frontiers (including excessive amounts of carbon dioxide emissions) (Moore, 2000), and through the creation of rather new commodities (e. g. lithium, submarine mining, geoengineering services), the EJAtlas aims to research, exchange and disseminate information. Within and also beyond academic research, the EJAtlas wants to be relevant by 'naming and shaming' (so to speak) the actors behind injustices. This can be done through Network Analysis of corporations (privately or state-owned) involved in EDCs. We have published several "featured maps" collecting the conflicts in which some transnational companies are involved. The EJAtlas therefore is relevant for studies of business economics and management, and not only in the environmental social sciences. As Rajiv Maher writes in the *Business and Human Rights Journal* (2020) the EJAtlas documents and catalogues social conflicts around environmental issues. It aims to make these instances of mobilization more visible, highlighting claims and testimonies, making the case for true corporate and state accountability for the injustices inflicted sometimes through their activities. For instance, in Tuticorin, Tamil Nadu, after 20 years of complaints, thousands gathered in Thoothukudi district in March 2018 asking for the copper smelter to be shut down. In May 22, 2018 as people still protested against the Vedanta-owned Sterlite copper plant, the police opened fire on a rally which marked the 100th day of demonstrations. The following day another person died from being hit by a rubber bullet, taking the death toll up to 13. Dozens of people were wounded. The government of Tamil Nadu then asked for a definitive closure of the plant (Fig. 5). https://www.business-standard.com/article/opinion/sterlite-protest-how-it-began-what-next-118052901513_1.html

The Vedanta corporation (housed in London) is well known because of the conflict on bauxite mining in the Niyamgiri Hill in Odisha where sacredness, indigenous rights, and environmental values were successfully deployed (Temper et al., 2015; Temper and Martinez-Alier, 2013). There are many other conflicts in the EJAtlas that arouse or are arising from copper mining and smelting, including two of the oldest conflicts registered: the massacre in Rio Tinto (Huelva, Spain) in 1888, and the



Fig. 4. Pope Francis and Senator (and film-maker) Pino Solanas, 2013 (public domain).



Fig. 5.

peasant complaints protagonized by Tanaka Shozo around 1900 in Ashio, Japan, against the water and air pollution caused by the Furukawa smelter. (Copper appears as a main commodity in about 175 cases in the EJAtlas).

Therefore, the materials collected in and the research done with the EJAtlas are relevant to the construction and criticism of the indices and benchmarks meant to inform and guide shareholding investors and other stakeholders, such as the Responsible Mining Index, the Business Human Rights Benchmark and others. According to the EJAtlas, high-ranking companies in the CHRB and RMI are demonstrably involved in multiple socio-environmental community conflicts, perhaps even protagonists of Global Witness' narratives on deaths of environmental defenders. Similarly, there is much information in the EJAtlas on "social licence to operate" (SLO), a term much used in the extractive industries (Prno, Slocombe, 2012; Gehman et al., 2017) meaning communities' approval or acceptance of ongoing projects. The use of the EJAtlas in the teaching on CSR, or Environmental Social Governance (ESG) as it is nowadays called, opens up a large opportunity for research and teaching in schools of business economics and management where not only CSR but also Corporate Social Irresponsibility (CSIR) (Saes et al., 2021) is a topic of interest. The use of the EJAtlas in professional advisory financial activities and in fields like eco-labelling, product certification and in general ESG opens up opportunities for research on the opposition between the objectives of "shareholder value" and "responsible management" (Laasch et al., 2020), on Corporate Social Irresponsibility (CSIR) (Armstrong, 1977; Alexander, 2015, (Antonetti and Maklan, 2016), Riera and Iborra, 2017, Alcadiapani and Medeiros, 2019), corporate accountability, corporate impunity and lack of liability. How do corporations (and state organs) react to allegations of using "counter-insurgency methods" against environmental defenders? Corporations are supposed to practice disclosure of environmental, social and governance (ESG) results. There are some publications already using the EJAtlas for information relevant to investors such as pension funds keen on applying ESG criteria to particular firms or business sectors. There are also numerous testimonies of the use of the EJAtlas in university teaching in the environmental social sciences but also in business economics and management. (Walter et al., 2020).

7. What kind of social movement is the global environmental social movement?

I mean here a counter-movement in the same sense in which one could speak of the working class movement in Europe before 1914, or the peace movements across the world at several points in time including the anti-Vietnam War student movement in the USA in the

1960s; or the agrarian or peasant movements in Latin America from the Mexican Revolution of 1910 onwards, or the triumphant anti-colonial world movement after 1945 particularly in Africa, or the Civil Rights movement in the USA; or the growing and increasingly successful feminist movement of the last hundred years or more (Della Porta and Diani, 2020). Such socio-political movements as feminism, the peace movement, peasant movements, industrial working class movements have rarely had a unique organization and leadership even at national level, they are dispersed and to some extent heterogeneous. The usual chronology is from grievances and claims to movements. For instance, peasant grievances and claims came earlier than the recognized historical terms for the movements (such as *jacqueries* in France, Russia, Bengal and elsewhere) or standardized slogans such "land to the tiller", *la tierra al que la trabaja*. The slogan Land and Freedom, *tierra y libertad*, has its origin in the Russian *narodnik* movement after 1870 and travelled to Spain and to Zapata's Mexico in 1910. Peasant movements existed much before the Via Campesina was born in the late 20th century.

Grievances and claims typical of the industrial working class movement (the right to form unions, the 8-hour day against acute exploitation of wage labour, the refusal of piece-work) or the terms for mobilizing actions such as strikes or *grèves* and boycotts, were born before the movements as such and their organizations were recognized. Thus, "boycott" meaning social ostracism or protest against a company or government officer comes from Charles C. Boycott, an Irish land agent who was "boycotted" in 1880 at the instigation of the Irish Land League to get rents reduced. Strike-breaker, scab or blackleg is a person who works despite an ongoing strike. In several Spanish speaking countries the word *esquirol* imported from Catalonia is used. Similarly, in the environmental justice movement we can identify common slogans (in many different languages). There is a feeling of wide collective action when the allegations of NIMBYism (in English) from opponents in local environmental conflicts are answered with replies such as NIABY or even NOPE ("not in anyone's backyard" and "not on planet Earth"). NIMBY has been adopted with enthusiasm by anti-environmentalists even in non-English-speaking countries. *Avons-nous le syndrome nimby?* And in other contexts: *Sind Moscheen in Deutschland NIMBY-Güter?* - asks a newspaper, assuming readers to share the nasty amalgam.

Thus in Italy, somebody could mistake the proliferation of "No" movements for Nimbyism from the many local ephemeral "committees". In Spain they would be called platforms or *coordinadoras*. They are ad hoc, not permanent organizations like Legambiente. The committees and their struggles are listed over the years in the Italian "Atlante" of environmental justice launched in 2015 and linked to the EJAtlas, led by ASud, an archive of local environmental justice struggles. There are also numerous contacts among the committees at regional, national and

sometimes European levels. Italian environmentalists are aware of Italian business corporations' damage abroad (ENEL, AGIP, Impregilo-Salvini). Italian best-known "No" movements are currently *No Tav*, *No Tap*, *No Muos*, *No Ponte*, *No Grandi Navi*, *No Triv*, *Mamme No Inceneritore*, all born at particular locations but with wide reach, respectively on the very material issues of the new rapid railway line between Turin and Lyon, a gas pipeline in Puglia (Fig. 6), the Mobile User Objective System (a military satellite communications system promoted by the US government in Niscemi, Sicily), the bridge over Messina Strait, the nuisance from the enormous cruise ships in Venice waters, the off shore oil drilling, the waste incineration (Bertuzzi, 2019). Fig. 4 gives a translation of NIABY into Italian. In Catalan it would be *Ni aquí ni enlloc*. It is commonly used in the environmental movements.

Collective action giving rise to slogans, banners, marches and other forms of mobilization does not require common single organizations. By doing network analysis of the 3340 data sheets in EJAtlas we could trace organizational cross-country connections (or lack of connections). For instance, we ask, a) in which conflicts recorded in the EJAtlas do organization members of the confederation Friends of the Earth International (FoEI) appear (e.g. Censat in Colombia, ERA in Nigeria, Justiça Ambiental in Mozambique, GroundWork in South Africa, Walhi in Indonesia, Kalikasan in The Philippines, Friends of the Earth Norway ...). FoE is a network often supporting the "environmentalism of the poor and indigenous" but it is not present, by far, in all conflicts. For instance, FoE is not active in India, Pakistan or China, scarcely active in Brazil and Mexico ... b) How relevant are Greenpeace and other international organizations in actual environmental conflicts, and in which world regions and/or which issues are they most active compared to grassroots organizations at national, provincial, local levels? c) How often and in which roles do the "cult of wilderness" organizations such as IUCN, WWF, Nature Conservancy appear in the conflicts recorded in the EJAtlas? d) Is there intersectionality between environmental justice movements and Human Rights organizations which are very active in environmental conflicts? e) Is there intersectionality between geopolitical independence movements and environmental conflicts (e.g. Bougainville island (copper and the Rio Tinto company), Nouvelle Calédonie (nickel), West Papua (copper and Freeport-McMoRan)? Should we look at other conflicts in the EJAtlas through geopolitical lenses – for instance, the Mekong River threatened by dams from China, several of them recorded as conflictive in the EJAtlas; or at smaller scale, the environmental problems at the border between Portugal and Spain

(again river dams, nuclear risks, new metal mining for the electricity transition, and danger of fires from invasive eucalyptus plantations). The EJAtlas is indeed a great source for research on environmental conflicts at borders between countries.

Names of environmental organizations do not always mean much. For instance, FoEI exists in Argentina and Spain but they are rather irrelevant in conflicts recorded in the EJAtlas (as could be shown by network analysis of social actors in conflicts) compared to Asambleas de Vecinos Autoconvocados (AVA) in Argentina and Ecologistas en Acción in Spain. In Colombia, in Nigeria and Indonesia there were first environmental grievances, complaints and movements, then ERA, Censat and Walhi were founded in the 1980s, later joining Friends of the Earth to some extent as a form of international protection. Acción Ecológica of Ecuador, also founded in the mid-1980s, joined at one point FoEI but left it because some of its Northern members were too lukewarm towards the claim for an ecological debt from the South (Warlenius et al., 2015).

First, there are grievances and claims, then there are collective mobilizations and actions (and possibly a social movement with identifiable slogans), and even later perhaps an organization appears. The capacity of mobilization depends on resources (time, money, common beliefs), as explained in social movement theory. It also depends on the ability to withstand or overcome fear and repression by corporations and the state. Organizations attract police attention; they are easily disbanded or forbidden. Moreover, organizations are not a requirement for social movements to exist; they might even become noxious because the fights among leaders alienate other potential members. The movements for environmental justice might generate organizations but do not require global or even local permanent organizations. Research on the environmental justice movements must not be primarily guided by the presence of names of organizations but should focus instead on similar grievances, local actions, common or similar slogans and banners. Similar slogans across many cultures and different languages, and similar repertoires of contention, are not necessarily a sign that there is a single organization behind them. For instance, despite obstacles to women's participation in social movements there is a wide eco-feminist movement around the world (Agarwal, 1992, 2001; Salleh, 1997) growing and overlapping with "climate justice" movements without need for a single organization.

Complaints and campaigns against eucalyptus would deserve a "transversal" article or book from Chile and Brazil to Yunnan and Thailand. The fact that they are "exotic" (from Australia) is less relevant



Fig. 6. In Puglia, Southern Italy, "neither here nor anywhere else", struggling to protect land and community from the Trans Adriatic Pipeline (TAP). This gas pipeline and terminal threatens ancient olive farms, water sources, cultural heritage sites and stunning coastline

than their properties. Similar commodity, somewhat similar damages, grievances and social reactions. Adolfo Cordero in *La Voz de Galicia* (15 April 2018) strikingly titled an article *Eucalyptus are like the state: they take everything away giving nothing in return*. The phrase translated and quoted in *The Environmentalism of the Poor* is from a peasant in Thailand. In Portugal and Spain eucalyptus was furthered by the paper industry, now becoming an invasive species, taking water and fertility from the soil and helping to cause terrible fires.

In common with other local actions around the world giving rise to the slogan “Tree plantations are not real forests”, the campaign in Brazil against *Desertos verdes* organized an action in Barra do Ribeiro, Rio Grande do Sul on 8 March 2006, Women’s Day: *Mulheres em Ação, Eucalipto no Chão!* - 3000 women from Via Campesina occupied the Aracruz Cellulose’s eucalyptus nurseries and cut down the trees (Fig. 7). This was a show of “intersectionality”: an agrarian struggle, a women’s struggle, and an environmental struggle against the “green deserts” and in solidarity with indigenous people evicted by Aracruz in Espírito Santo.

The world environmental justice movement does not preach individual changes in behaviour and it is not based on charismatic personalities although respecting and remembering its heroines and heroes (Goldman Prize holders; Global Witness victims). It is formed by mostly ad-hoc local collective groups focusing on collective adversaries. As reflected in the EJAtlas and other such inventories, environmental justice counter-movements are born of concrete struggles and they blame known opponents for damages to the natural environment and to the conditions of human livelihoods. Such adversaries are most often identified as private or public companies (most conflicts registered in the EJAtlas give the names of one or more such companies). They may also be government departments, or the government itself when the conflict is on a policy and not on a particular project. There are some cases in the EJAtlas where a movement opposed and changed a government policy (retreat of Monsanto GMO cotton from Burkina Faso <https://ejatlas.org/conflict/the-retreat-from-monsanto-bt-cotton-burkina-faso>; stopping nuclear energy in Switzerland <https://ejatlas.org/conflict/the-anti-nuclear-movement-in-switzerland>). Most cases in the EJAtlas concern complaints against particular investment projects and companies, and not country-wide policies.

8. Intersectionality

In many of the EDC described in the EJAtlas, there are overlapping social roles and issues arising in the same conflict. To acknowledge the presence of gender, ethnic identity, or working class, peasant, pastoralist, fisherfolk affiliation among the social actors of such conflict does

not imply “essentialism”. This presence is merely empirical reality. For instance, a conflict against open cast gold mining can involve peasant activists who are simultaneously indigenous (and identify as such) and who hold communal water and land rights. The same person is indigenous and peasant, and in Mexico also very possibly an *ejidatario* and in the Andes a *comunero*. The material issues can be simultaneously land grabbing and water pollution, while there might also be impacts on health because of the use of cyanide. The conflicts in the EJAtlas involve overlapping ecological, human health, economic and other social issues and values. Therefore, there is “intersectionality” in any given conflict as regards the social actors and their roles, and also the issues present in it. Fighting for environmental justice is not “single actor” and “single-issued”. For instance, in a recent case uploaded in the EJAtlas (the collapse of the Zaldibar waste dumpsite in the Basque country on 6 February 2020, causing two workers’ deaths plus danger from dioxin emissions and perhaps from asbestos), the demonstrators (working class, and other local Basque citizens) carried banners putting together claims for adequate working conditions, health of the population and liabilities of the responsible private firm (fancifully named Verter Recycling), and the Basque government. A claim for better environmental management is also present (Fig. 8). Although this unfortunate event (betraying a wide industrial waste crisis) took place in the Basque country, no nationalist claims were present here against the Spanish state. There was no reason for this, since waste management is a regional competence.

The overlapping of roles played by the same social actors is often called “intersectionality”, a concept coming from feminist and anti-racist theory in the United States (Crenshaw, 1989) useful for the analysis of the conflicts registered in the EJAtlas. It is applicable in many places around the world. For instance, the social actors in a conflict might be women indigenous peasants supported by local and international EJOs. The roles of local indigenous women and international members of Greenpeace do not overlap. But the same person can of course be (as Berta Cáceres in Honduras was) a woman, indigenous person, leader of a local EJO. Chico Mendes was a *seringueiro*, and leader of a rubber tappers union, and simultaneously fought as an environmentalist against deforestation in the Amazon. However, there might be conflicts where the social actors are merely assorted “neighbours and citizens” (in urban or semi-urban contexts) fighting by themselves against an incinerator because of threats to health (perhaps with help from local scientists, who are different persons?). Or imagine an indigenous tribe of hunter-gatherers confronting an extractive company without any allies at local or global scales except an intrepid journalist or anthropologist of Survival International, who anyway are different persons. Intersectionality is often but not always present. Rural cases (about 1900) in the EJAtlas could be compared to urban and semi-urban

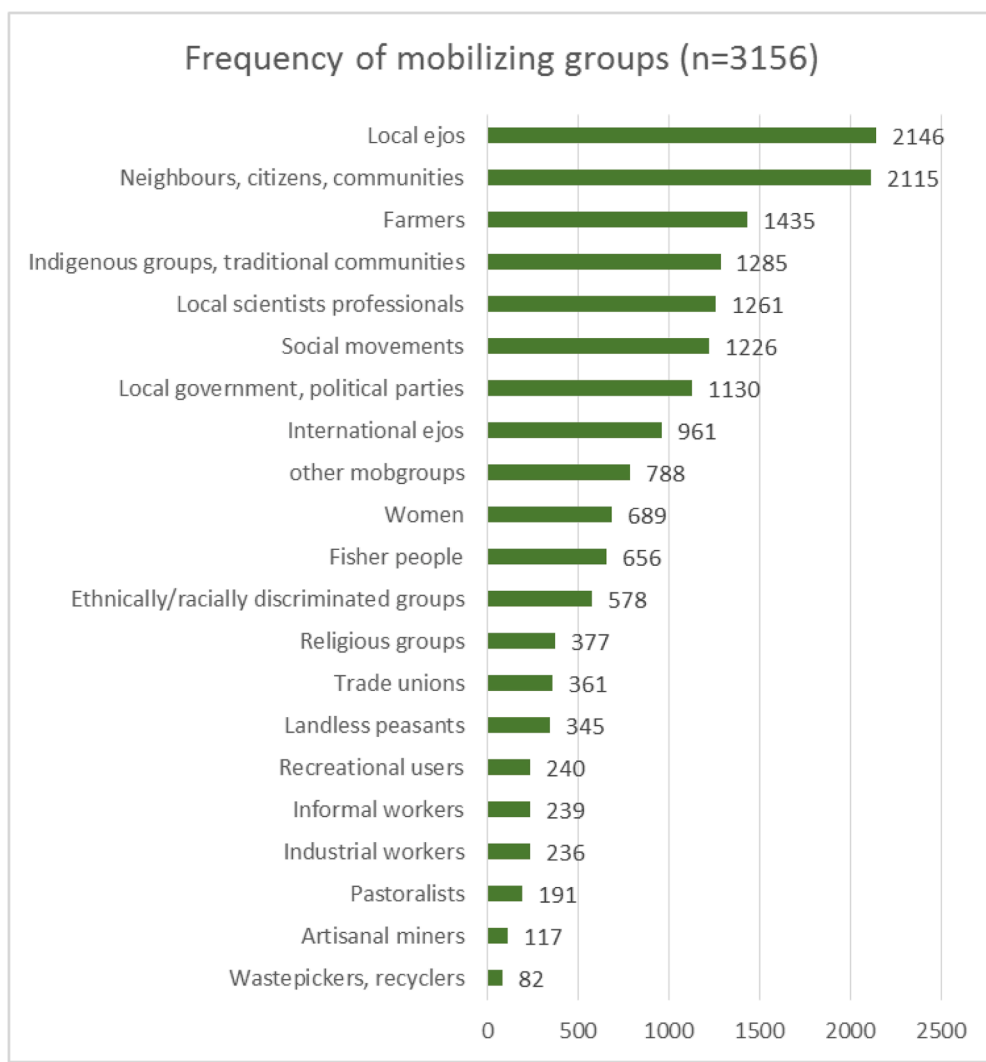


Fig. 7. Women against “green deserts” in Brazil. Source: Via Campesina. <https://ejatlas.org/conflict/women-against-the-expansion-of-eucalyptus-monoculture>.



Fig. 8. Zaldibar argitu! “Workers, Health, Liabilities”. <https://ejatlas.org/conflict/zaldibar-industrial-waste-dump-basque-country-spain>.

Table 2
The main groups mobilized in the conflicts recorded in the EJAtlas (more than one group can be recorded in one conflict).



cases (about 1150) and, first, research the reasons for the difference in numbers (do cities “export” conflicts successfully to rural areas disproportionately providing the materials and absorbing waste?), and then see whether there are significant differences in the participants (Table 2), and the modes of organization of environmental protests.

9. Why has an environmental justice movement been born? A materialistic approach

The EJAtlas rests on the hypothesis that there are structural continuities and transformations in the patterns of socio-environmental conflicts, responding to changes and growth in the social metabolism. Mainstream economics and economic history have been nearly blind to the changes in the social metabolism, too concerned with economic accounting. Such changes in social metabolism explain why there were no movements against fracking twenty years ago and why there are so many today. There were no movements against eucalyptus plantations for paper pulp eighty years ago, or against oil palm plantations forty years ago, or against nuclear power plants sixty years ago. There were no movements then against the threat of dioxins from incinerators (as in China today). But there were social movements against sulphur dioxide from Rio Tinto and Furukawa copper smelters 130 years ago, and against hydropower plants also many decades ago. Social movements related to coal mining are certainly not new; they are more numerous than ever before because coal extraction and burning increased seven times in the 20th century and still increases today (until 2020 at least). To old issues of miners’ safety, health and work conditions there is the added argument of “climate justice”.

The EJAtlas takes therefore a materialistic approach (Fischer-Kowalski and Haberl, 2015); “materialistic” does not mean economic in the chrematistic sense. We delve beneath the surface of environmental conflicts related to mineral ores, hydroelectric dams, public infrastructures, biomass or fossil fuels extraction to uncover their root causes in the growth and changes in the social metabolism. The world economy’s metabolism (flows of energy and materials) grows and changes (Krausmann et al., 2009, 2018). The industrial economy is not circular, it is more and more entropic. The economy also exhausts the “funds” or renewable resources like fisheries and the fertility of the soil, destroys biodiversity, it turns the natural water cycle in part into a hydro-social cycle. The capitalist industrial economy has a voracious appetite for fresh supplies. If we take 100 million of barrels of oil today, tomorrow again, and again, because the oil (the coal, the gas) is burnt forever.

The EJAtlas collects ecological distribution conflicts (EDC), a term coined (Martinez-Alier, 1995b; Martinez-Alier and O’Connor, 1996) to describe social conflicts born from the unfair access to natural resources and the unjust burdens of pollution. Environmental gains and losses are distributed in a way that causes conflicts. We were inspired by the term “economic distribution conflicts” in political economy that describes conflicts between capital and labour (profits vs. salaries), or conflicts on prices between sellers and buyers of commodities, or conflicts on the interest rate to be paid by debtors to creditors. The terms socio-environmental conflict or EDC can be used interchangeably depending on whether the framing of the same event is socio-political or economic. The term EDC stresses the idea that the economic approach based on economic compensation for negative externalities is inadequate in general (although it might be appropriate in some civil court cases for damages, (Rodríguez-Labajos and Martinez-Alier, 2013). The unequal or unfair distribution of environmental goods and evils is not always coterminous with “economic distribution” such as, for instance, rents paid by tenant farmers to landlords, or the international terms of trade of an exporting economy, or claims for higher wages from mining or plantation labour unions opposing company owners. EDC is then a term for collective claims against perceived environmental injustices. For instance, climate change is perceived as causing the receding of glaciers in Bolivia and Peru or sea level rise in some Pacific islands or in

the Kuna islands in Panama or in Kivalina in Alaska (as recorded in the EJAtlas). This is a growing EDC, very relevant in terms of human rights and in terms of rights of other species. Yet this damage is not valued in the market and those impacted are not compensated for it. Their complaints often do not lead to democratic deliberations and diplomatic dialogs on the appropriate units for valuation of externalities but they lead rather to neglect or even violence by companies and state representatives. The capitalist system does not and cannot pay compensation to the present and future generations for the sixth great extinction of biodiversity, the loss of tropical forests, climate change and ocean acidification. Or for damage to rivers by dams almost everywhere (and hence counter-movements such as the MAB in Brazil, MAPDER in Mexico, Ríos Vivos in Colombia). Or for excessive infrastructure, giving rise to the Stay Grounded movement against airports, and other movements against Imposed Useless Projects in Europe (Burbulla-Noria, 2019).

The growth and changes in the social metabolism cause many EDCs where different valuation languages are displayed as we see in thousands of cases in the EJAtlas. In my view, there is sometimes too much emphasis placed on the triumph of neoliberal capitalism after the 1970s as a cause of environmental injustices. It may be true that “In the last three decades, neoliberal policies and ideologies have brought about fundamental changes to nature-society relationships across the globe, deepening existing environmental conflicts and creating profound new injustices” (Apostolopoulou and Cortes-Vaquez, 2019:1). But the increase in social metabolism arose in industrial capitalism, continued in Keynesian social-democratic capitalism after 1945 and in Soviet-style economies, and is present today in the industrial economy of China and the rest of the world. China’s political-economic system is perhaps better described as state capitalism than neoliberalism.

Writers in the Marxist tradition use words like “capital accumulation” and “development of productive forces” without thinking enough about the metabolism of the economy. Taking coal, oil and gas from the soil gives rents and profits that are accumulated as money which in turn gives the power to get more money through exploitation of labour and use of more fossil fuels. Physically speaking, as was known in Marx’s time (Martinez-Alier, 1987), energy is dissipated, not accumulated. The “productive forces” of the fossil fuels are not developed, they are lost for ever. Environmental conflicts are caused by the fact that the industrial economy is entropic, continuously reaching the new “commodity extraction frontiers” (Moore, 2000) and the waste disposal frontiers. This process is helped (but not primarily caused) by resource commodification that undermines common goods. It is helped also by the unequal distribution of land and the concentration of political power in a few hands. Hence the growth in the number of EDC, and as a response the growing strength of the environmental justice movement which in its cultural expressions displays a plurality of values.

10. Iconography of environmental justice

Apart from what we call “statistical political ecology” based on the EJAtlas (Scheidel et al., 2020; Temper et al., 2020), there is another comparative approach to do research on and with the environmental justice movement, and this is to look at its cultural expressions in the form of banners, murals, slogans, documentaries. While the ultimate causes of collective protests are the growth and changes in the social metabolism (flows of energy and materials), such protests exhibit cultural and symbolic elements that we gather in the EJAtlas. What is invisible and silenced in the official press becomes visible and audible in the iconography of spontaneous or organized demonstrations within the limits of what state and company violence will tolerate and the participants’ fear allows. I give here a few more examples.

Consider for instance the current conflict against the Pan American Silver mine in Chubut, Argentina. The “Navidad” mining project is one of the largest silver deposits in the world. While local inhabitants reject the project, the national government and mining companies are pressing

for changes to the law that prevents its exploitation. The banner (Fig. 9, one essential element in social protests, together with shouted slogans, leaflets, murals, documentaries, songs) states that the place where the mine is located (the *meseta patagónica*) should not be a “sacrifice zone”, a term used by the USA environmental justice movement (Lerner, 2010). The source for Fig. 9 is “No a la mina”, initially a local movement and now a well-known webpage in South America born in the Esquel conflict in 2000, where a new institution was born, the public anti-mining consultation (imitating Tambo Grande in Peru). (Walter and Urkidi, 2017). Notice also the small banners announcing the two “Lof” taking part in the complaint. Lof is the basic social organization of the Mapuche peoples (in Chile and Argentina), a familial clan or lineage recognizing the authority of a Lonko. Consider now (Fig. 10) the banners at the commemoration of Gloria Capitan, shot dead in July 2016 opposing the construction of a coal stockpile as leader of a local anti-coal movement and member of the Philippine Movement for Climate Justice. Katarungan means “justice”. She was 57 years old, a leader of the Coal-Free Bataan Movement and the President of United Citizens of Lucanin Association (Samahan ng Nagkakaisang Mamamayan ng Lucanin), opposing the operation and expansion of coal plants and storage facilities in the Mariveles neighbourhood. Here local collective grievances and complaints were linked to a global call for climate justice.

Many anti-nuclear movements starting in the 1970s appear in the EJAtlas. Organizations giving information over the years (such as WISE) are quoted. The symbol of a smiling sun and the slogan “No Nukes” became known worldwide. Consider for instance Fig. 11 from Jiangsu. The protest took place in 2016 in Jiangsu against a Sino-French project involving the Areva corporation. This particular banner has no smiling sun, it says “For the next generation, refuse construction of the nuclear waste plant”. The accident of Fukushima was invoked, and possibly some of the activists were also well informed about the stopping of the Creys-Malville fast breeder reactor in France in 1980 and other nuclear conflicts in France and elsewhere.

11. Conclusion

The conflicts mentioned in this article are related to metal mining, fossil fuels and climate justice, nuclear energy, industrial pollution, land and biomass grabbing, hydropower. The available descriptions in the EJAtlas, the banners, also the murals, slogans, songs, and documentaries recorded or mentioned in the EJAtlas show that many complaints are “glocal” (Swyngedouw and Cox, 1997). They have local roots and carry global parallels and implications.

The industrial economy goes to the extraction frontiers to get new resources and it deposits the waste anywhere (the atmosphere, oceans, rivers and soils). Even a non-growing industrial economy would need “fresh” materials and energy because energy is dissipated and materials are recycled only to a small extent. Hence so many conflicts. The EJAtlas is basically an archive of EDCs that took place in the last decades or are taking place right now at commodity extraction frontiers or at waste disposal frontiers. The EJAtlas is a product of the global grassroots counter-movement for environmental justice, and at the same time a tool for researching its contemporary history across world regions and cultures. After eight years of academic and activist work the EJAtlas is now recognised as a tool useful in the field of comparative, statistical political ecology (Scheidel et al., 2020; Temper et al., 2020) and for university teaching in several countries (Walter et al., 2020).

Political ecology studies EDC, and it puts biophysical reality (increased material and energy flows, climate change, increased HANPP and loss of biodiversity) and the environmentalism of the poor and the indigenous at the centre of politics. Instead, mainstream environmental sociology, political science and neoclassical environmental economics still hold fast to Inglehart’s notion that “the poor are too poor to be green”. Environmentalism is supposed to grow in the so-called “post-materialist” affluent societies, and ecological modernization and technological improvements will hopefully come to the rescue, with increasing incomes making pollution follow a “Kuznets curve” and also achieving at least relative dematerialization of the economy. Moreover, the environment will improve by public policies. Bottom up protests are deemed irrelevant by analysts and marginalized and repressed by the state and corporations.

On the other hand, the traditional Left shared the view that appreciation for the environment is a luxury of the rich; economic growth is supposed to be more important for the masses than biodiversity loss and climate change. As a consequence, the voices of the poor and the indigenous asking for socio-environmental justice are not heard. Gayatri Spivak’s “Can the Subaltern Speak?” questioned the ability of the silenced, colonised, invisible groups to make their voices heard without distortion. The marginalised groups referred to as “subaltern” by Spivak cannot be heard because they cannot speak across the enormous gulfs of coloniality, patriarchy and racism which certainly exist in the world. “When the subaltern speaks there is not enough infrastructure for people to recognise it as resistant speech” (Lahiri, 2011). The EJAtlas is such an infrastructure, a living open-access archive and a modest loudspeaker for what is called “subaltern environmentalism”.

When an indigenous group manages to stop a conflictive mining



Fig. 9. *La meseta no es zona de sacrificio*. Chubut (No a la mina). Lucrecia Wagner 2020. <https://ejatlas.org/conflict/navidad-mine-of-pan-american-silver-chubut-argentina>.



Fig. 10. Coal kills in Bataan, Philippines (Source: <https://ejatlas.org/conflict/coal-mining-leading-to-the-killing-of-gloria-capitan>). Coal kills locally and globally.



Fig. 11. <https://ejatlas.org/conflict/thousands-protest-against-proposed-nuclear-reprocessing-plant-in-lianyungang-jiangsu-china>. “For the next generation, refuse construction of the nuclear waste plant”. Against a nuclear waste reprocessing plant. (Juan Liu, ICTA-UAB).

project, one could say that their actions speak louder than words. It is not so difficult to hear subdued or strong movements for environmental justice across the world, offering similar types of complaints against dispossession and contamination caused by the growth and changes in social metabolism (concomitant with the operations of the industrial economy), similar commodities, similar pollutants and health impacts, similar social actors and allies, similar forms of mobilization and also of repression when confronting similar public or private companies. All of these movements, no doubt, with local characteristics. For instance, the meanings of women’s environmental activism (Agarwal, 1992) are similar but somewhat different across the world, as reflected in the EJAtlas (Tran et al., 2020).

Protest actions give birth to social movements (local, “glocal”, and sometimes international), rarely aligned with political parties, and resting sometimes in already existing organizations or creating new short-lived ones. What matters (in the analyses that draw on the EJAtlas) is the types of social actors, their grievances and claims, their forms of

mobilization, and whether the outcome is of success or failure in stopping projects and in changing policies, and not so much the names of ephemeral or lasting organizations. Through the EJAtlas we discover indigenous populations (sometimes “refugees” at the frontiers of commodity extraction) who are often protagonists of such struggles (Scheidel et al., 2020; Temper et al., 2020). In their case, their proud names are important because indigenous identity is one of their main instruments of self-defence after centuries of colonization exacerbated by the growth of the global social metabolism (Hanáček et al., 2020, for the Arctic).

Unfair ecological distribution is inherent to capitalism, defined by Kapp (1950) as a system of cost-shifting. In environmental neoclassical economics, the preferred terms are “market failure” and “externalities”, a terminology implying that through forced commensuration such externalities would be valued in monetary terms and internalized into the price system. If we would wrongly accept economic commensuration and reject incommensurability of values, then “equivalent”

eco-compensation mechanisms could be introduced. However, in ecological economics and political ecology we accept that there are value system contests. Institutional structures and power relations determine which values can be expressed, and the strength with which they can be expressed. The social actors in the world movement for environmental justice display many different valuation languages, their values are often incommensurable (at least to start with) with money valuation of damages. Who has the power to reject valuation languages such as livelihood, sacredness, rights of nature, indigenous territorial rights, archaeological values, and ecological or aesthetic values in their own units of account? Who gives mainstream economists the power they have? Will the visibility of EDCs help to subvert the power of economists and the capitalist industrial system, changing the political agenda? (Martinez-Alier, 2002; Charbonnier, 2019).

Acknowledgement

ERC Adv.Grant 695446.

References

- Agarwal, B., 2001. Participatory exclusions, community forestry, and gender: an analysis for South Asia and a conceptual framework. *World Dev.* 29 (10), 1623–1648.
- Agarwal, B., 1992. The gender and environment debate: lessons from India. *Femin. Stud.* 18 (1), 119–158.
- Alcadipani, R., Medeiros, C.R.de O., 2019. When corporations cause harm: a critical view of corporate social irresponsibility and corporate crimes. *J. Bus. Eth.* <https://doi.org/10.1007/s10551-019-04157-0>.
- Alexander, P.B., 2015. *Corporate Social Irresponsibility*. Routledge, New York, NY.
- Álvarez, L., Coolsaet, B., 2018. Decolonizing environmental justice studies: a Latin American perspective. *Capital. Nat. Soc.* 31 (2), 50–69.
- Antonetti, P., Maklan, S., 2016. An extended model of moral outrage at corporate social irresponsibility. *J. Bus. Eth.* 135 (3), 429–444.
- Apostolopoulou, E., Cortes-Vazquez, J.A., 2019. *The Right to Nature. Social Movements, Environmental Justice and Neoliberal Natures*. Routledge, London.
- Armiero, M., Sedrez, L., 2014. *A History of Environmentalism: Local Struggles, Global Histories*. Bloomsbury, London.
- Armstrong, J.S., 1977. Social irresponsibility in management. *J. Bus. Res.* 5 (3), 185–213.
- Avila, S., 2018. Environmental justice and the expanding geography of wind power conflicts. *Sustainability Science* 13 (3), 599–616. <https://doi.org/10.1007/s11625-018-0547-4>.
- Aydin, Cem I., Ozkaynak, B., Rodriguez-Labajos, B., Yenilmez, T., 2017. Network effects in environmental justice struggles: an investigation of conflicts between mining companies and civil society organizations from a network perspective. *PLoS ONE* 12 (7). <https://doi.org/10.1371/journal.pone.0180494>.
- Barca, S., 2012. On working-class environmentalism: a historical and transnational overview. *Interface J. Soc. Mov.* 4 (2), 61–80.
- Bertuzzi, N., 2019. Political generations and the Italian environmental movement(s): innovative youth activism and the permanence of collective actors. *Am. Behav. Sci.* 63 (11), 1556–1577.
- Brock, A., Dunlap, A., 2018. Normalising corporate counterinsurgency: engineering consent, managing resistance and greening destruction around the Hambach coal mine and beyond. *Polit. Geogr.* 62, 33–47.
- Bullard, R., 1990. *Dumping in Dixie: Race, Class, and Environmental Quality*. Boulder, Westview Press, Colorado, 1990.
- Bullard, R., 1993. *Confronting Environmental Racism. Voices From the Grassroots*. South End Press, Boston.
- Bullard, R., Johnson, G., 2000. Environmental Justice: grassroots activism and its impact on public policy decision making. *J. Soc. Issues* 6 (3), 555–578.
- Burballa-Noria, A., 2019. Environmental justice claims and dimensions in anti-mega projects campaigns in Europe: the case of the forum against unnecessary and imposed megaprojects, p. 155–167 in Apostolopoulou and Cortes-Vaquez, op. Cit.
- Carrere, R., Lohmann, L., 1996. *Pulping the South. Industrial tree Plantations and the World Paper Economy*. Zed Books, London.
- Charbonnier, P., 2019. *Abondance et Liberté. Une histoire Environnementale Des Idées Politiques*. La Découverte, Paris.
- Crenshaw, K., 1989. Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum*, 1, Article 8. <http://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8>.
- Del Bene, D., Scheidel, A., Temper, L., 2018. More dams, more violence? A global analysis on resistances and repression around conflictive dams through co-produced knowledge. *Sustain. Sci.* 13 (3).
- Della Porta, D., Diani, M., 2020. *Social Movements: An Introduction*, 3rd ed. Wiley, Blackwell.
- Drozdz, M., 2020. Maps and Protest. *International Encyclopedia of Human Geography*. Elsevier, pp. 367–378.
- Dunlap, A., 2019. Agro sí, mina NO! The Tía María copper mine, state terrorism and social war by every means in the Tambo Valley, Peru. *Polit. Geogr.* 71, 10–25.
- Egan, M., 2002. Subaltern environmentalism in the United States: a historiographic review. *Environ. Hist. Camb.* 8 (1), 21–41.
- Ferdinand, M., 2019. *Une écologie décoloniale. Penser l'écologie depuis Le Monde Caribéen*. Seuil, Paris.
- Fischer-Kowalski, M., Haberl, H., 2015. Social metabolism: a metric for biophysical growth and degrowth. In: Martinez-Alier, J., Muradian, R. (Eds.), *Handbook of Ecological Economics*. Edward Elgar, Cheltenham, 10.4337/9781783471416.
- Gehman, J., Lefsrud, L.M., Stewart, F., 2017. Social license to operate: legitimacy by another name? *Can. Public Adm.* 60 (2), 293–317. <https://doi.org/10.1111/capa.12218>.
- Gerber, J.-F., 2011. Conflicts over industrial tree plantations in the South: who, how and why? *Global Environ. Change* 21, 165–176.
- Giampietro, M., Funtowicz, S.O., 2020. From elite folk science to the policy legend of the circular economy. *Environ. Sci. Policy* 109, 64–72.
- Guha, R., 1989. *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya*. Oxford University Press, Delhi.
- Guha, R., Martinez-Alier, J., 1997. *Varieties of Environmentalism. Essays North and South*. Earthscan and Oxford, U.P., London and Delhi.
- Guha, R., Martínez-Alier, J., 1999. Political ecology, the environmentalism of the poor, and the global movement for environmental justice. *Kurswechsel* 3, 27–40.
- Haas, W., Krausmann, F., Wiedenhofer, D., Heinz, M., 2015. How circular is the global economy? An assessment of material flows, waste production, and recycling in the European Union and the world in 2005. *J. Ind. Ecol.* 19 (5), 765–777.
- Haas, W., Krausmann, F., Wiedenhofer, D., Lauk, C., Mayer, A., 2020. *Spaceship earth's odyssey to a circular economy - a century long perspective*. *Resour. Conserv. Recycl.* 163, 105076.
- Hanaček, K., Kröger, M., Martinez-Alier, J., 2020. The arctic commodity extraction frontier and environmental justice conflicts - a network analysis, under revision.
- Hickel, J., Kallis, G., 2019. Is green growth possible? *New Polit. Econ.* <https://doi.org/10.1080/13563467.2019.1598964>.
- Inglehart, R., 1995. Public support for environmental protection: objective problems and subjective values in 43 societies. *PS Polit. Sci. Polit.* 28 (1), 57–72.
- Joseph, S. (Ed.), 2019. *Commodity Frontiers and Global Capitalist Expansion. Social, Ecological and Political Implications from the Nineteenth Century to the Present Day*. Palgrave Macmillan.
- Kapp, K.W., 1950. (1963/1978) *The Social Costs of Business Enterprise (Revised and Enlarged Edition of The Social Costs of Private Enterprise)*. Spokesman, Nottingham.
- Krausmann, F., Gingrich, S., Eisenmenger, N., Erb, K.-H., Haberl, H., Fischer-Kowalski, M., 2009. Growth in global materials use, GDP and population during the 20th century. *Ecol. Econ.* 68 (10), 2696–2705.
- Krausmann, F., Lauk, C., Haas, W., Wiedenhofer, D., 2018. From resource extraction to outflows of wastes and emissions: the socio-economic metabolism of the global economy, 1900–2015. *Global Environ. Change* 52, 131–140. <https://doi.org/10.1016/j.gloenvcha.2018.07.003>.
- Laasch, O., Suddaby, R., Freeman, R.E., Jamali, D., 2020. Mapping the emerging field of responsible management: domains, spheres, themes, and future research. *Research Handbook of Responsible Management*. E. Elgar, Cheltenham.
- Lahiri, B., 2011. In Conversation: Speaking to Spivak. *The Hindu*. <https://www.thehindu.com/books/in-conversation-speaking-to-spivak/article15130635.ece>.
- Latorre, S., Farrell, K.N., Martinez-Alier, J., 2015. The commodification of nature and socio-environmental resistance in Ecuador: An inventory of accumulation by dispossession cases, 1980–2013. *Ecological Economics* 116, 58–69. <https://doi.org/10.1016/j.ecolecon.2015.04.016>.
- Lerner, Steve, 2010. *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States*. MIT Press, Cambridge, MA.
- Lora-Wainwright, A., 2013. *Fighting for Breath: Cancer, Healing and Social Change in a Sichuan village*. University of Hawaii Press, p. 320.
- Lora-Wainwright, A., 2017. *Resigned Activism: Living With Pollution in Rural China*. The MIT Press, Cambridge, MA, p. 272.
- Maher, R., 2020. De-contextualized corporate human rights benchmarks: whose perspective counts? *Bus. Human Rights J.* 5 (1) <https://doi.org/10.1017/bhj.2019.19>.
- Martinez-Alier, J.K.S., 1987. *Ecological Economics: Energy, Environment and Society*. Blackwell, Oxford.
- Martinez-Alier, J., 1991. Ecology and the Poor: A neglected dimension of Latin American history. *J. Latin Am. Stud.* 23 (1), 621–639.
- Martinez-Alier, J., Hershberg, E., 1992. Environmentalism and the poor: the ecology of survival. *Items Soc. Sci. Res. Council* 46 (1), 1–5.
- Martinez-Alier, J., 1992. *De La Economía Ecológica Al Ecologismo Popular*. Icaria, Barcelona.
- Martinez-Alier, J., 1995a. The environment as a luxury good or "too poor to be green"? *Ecol. Econ.* 13 (1), 1–10.
- Martinez-Alier, J., 1995b. Distributional issues in ecological economics. *Rev. Soc. Econ.* 53 (4), 511–528.
- Martinez-Alier, J., 1998. Environmental justice" (local and global. In: Jameson, F., Miyoshi, M. (Eds.), *The Cultures of Globalization*. Duke U.P., pp. 312–326.
- Martinez-Alier, J., 2002. *The Environmentalism of the Poor. A Study of Ecological Conflicts and Valuation*. Edward Elgar, Cheltenham.
- Martinez-Alier, J., 2020. A global environmental justice movement: mapping ecological distribution conflicts. *Disjunctiva. Crítica de las Ciencias Soc.* 1 (2), 81–126.
- Martinez-Alier, J. and E. Masjuan 2004. *Neo-malthusianism in the Early 20th Century*. <http://www.isecoco.org/pdf/Neo-malthusianism.pdf>.
- Martinez-Alier, J., Angelovski, L., Bond, P., Del Bene, D., Demaria, F., Gerber, J.-F., Greyl, L., Haas, W., Healy, H., Marín-Burgos, V., Ojo, G., Porto, M., Rijnhout, L., Rodríguez-Labajos, B., Spangenberg, J., Temper, L., Warlenius, R., Yáñez, I., 2014.

- Between activism and science: grassroots concepts for sustainability coined by environmental justice organizations. *J. Polit. Ecol.* 21, 19–60.
- Martinez-Alier, J., Temper, L., Del Bene, D., Scheidel, A., 2016a. Is there a global environmental justice movement? *J. Peasant Stud.* 43 (3), 731–755.
- Martinez-Alier, J., Demaria, F., Temper, L., Walter, W., 2016b. Changing social metabolism and environmental conflicts in India and South America. *J. Polit. Ecol.* 23, 467–491.
- Martinez-Alier, J., 2016c. Global environmental justice and the environmentalism of the poor. In: Gabrielson, T., Hall, C., Meyer, J.M., Schlosberg, D. (Eds.), *The Oxford Handbook of Environmental Political Theory*. Oxford University Press, Oxford, pp. 547–562.
- Martinez-Alier, J., O'Connor, M., 1996. Ecological and economic distribution conflicts. In: Costanza, R., Martinez-Alier, J., Segura, O. (Eds.), *Getting Down to Earth: Practical Applications of Ecological Economics*. Island Press/ISEE, Washington, DC.
- Menton, M., Larrea, C., Latorre, S., Martinez-Alier, J., Peck, M., Temper, L., Walter, M., 2020. Environmental justice and the SDGs: from synergies to gaps and contradictions. *Sustain. Sci.* <https://doi.org/10.1007/s11625-020-00789-8>.
- Moore, J.W., 2000. Sugar and the expansion of the early modern world-economy: commodity frontiers, ecological transformation, and industrialization. *Rev. Fernand Braudel Center* 23 (3), 409–433.
- Navas, G., Mingorría, S., Aguilar-Gonzalez, B., 2018. Violence in environmental conflicts: the need for a multidimensional approach. *Sustain. Sci.* 13 (3), 649–660.
- Nirmal, P., Rocheleau, D., 2019. Decolonizing degrowth in the post-development convergence: questions, experiences, and proposals from two Indigenous territories. *Environ. Plann. E.* <https://journals.sagepub.com/doi/full/10.1177/2514848618819478>.
- O'Connor, M., 1993. Value system contests and the appropriation of ecological capital. *Manch. Sch.* 61, 398–424.
- O'Neill, J., Uebel, T.E., 2015. Analytical philosophy and ecological economics. In: Martinez-Alier, J., Muradian, R. (Eds.), *Handbook of Ecological Economics*. Edward Elgar, Cheltenham, pp. 48–73 by.
- Padel, F., Das, S., 2010. *Out of This Earth: East India Adivasis and the Aluminium Cartel*, 2nd ed. Orient Blackswan, New Delhi. 2020.
- Pérez-Rincón, M., Vargas-Morales, J., Martinez-Alier, J., 2019. Mapping and analysing ecological distribution conflicts in Andean countries. *Ecol. Econ.* 157, 80–91.
- Peet, R., Watts, M., 1996. *Liberation Ecologies: Environment, Development, Social Movements*. Routledge, New York.
- Porto, M.Firpo, Pacheco, T., Leroy, J., 2013. *Injusticia Ambiental e Saúde No Brasil: O Mapa De Conflitos*. Fiocruz, Rio de Janeiro.
- Prno, J., Slocombe, D.S., 2012. Exploring the origins of 'social license to operate' in the mining sector: perspectives from governance and sustainability theories. *Resour. Policy* 37, 346–357.
- Pulido, L., 1996. *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest*. University of Tucson Press, Tucson.
- Riera, M., Iborra, M., 2017. Corporate social irresponsibility: review and conceptual boundaries. *Eur. J. Manag. Bus. Econ.* 26 (2), 146–162.
- Rodríguez-Labajos, B., Martinez-Alier, J., 2013. The economics of ecosystems and biodiversity: recent instances for debate. *Conserv. Soc.* 11 (4), 326–342.
- Rodríguez-Labajos, B., Özkaynak, B., 2018. Environmental justice through the lens of mining conflicts. *Geoforum* 84, 245–250.
- Ronsin, F., 1980. *La Grève des ventres. Propagande néo-malthusienne et Baisse De La Natalité En France (XIXe-XXe Siècles)*. Aubier, Paris.
- Roy, B., Schaffartzik, A., 2021. Talk renewables, walk coal: the paradox of India's energy transition. *Ecol. Econ.* 180, 106871.
- Ruiz Cayuela, S., 2018. Subaltern environmentalism in Can Sant Joan, Catalonia. In: Cristiano, S. (Ed.), *Through the Working Class: Ecology and Society Investigated Through the Lens of Labour, Through the Working Class: Ecology and Society Investigated Through the Lens of Labour*, 8. Edizioni Ca' Foscari. <https://doi.org/10.30687/978-88-6969-296-3>. Culture del lavoro.
- Saes B.M., Del Bene D., R. Neyra, L. Wagner, J. Martinez-Alier, 2021. Environmental justice and corporate social irresponsibility: the case of the mining company Vale S. A. Forthcoming in *Ambiente e Sociedade*.
- Saes, B.M., Bisht, A., 2020. Iron ore peripheries in the extractive boom: A comparison between mining conflicts in India and Brazil. *Extractive Industries and Society* 7 (4), 1576–1578. <https://doi.org/10.1016/j.exis.2020.09.010>.
- Salleh, A., 1997. *Ecofeminism as Politics: Nature, Marx and the Postmodern*. Zed Books, London.
- Satheesh, S., 2020. Moving Beyond Class: A Critical Review of Labor-Environmental Conflicts From the Global South. *Social Compass.* <https://doi.org/10.1111/soc4.12797>.
- Scheidel, A., Demaria, F., Temper, L., Martinez-Alier, J., 2018. Ecological distribution conflicts as forces for sustainability: an overview and conceptual framework. *Sustain. Sci.* 13 (3), 585–598.
- Scheidel, A., Liu, J., Del Bene, D., Navas, G., Mingorría, S., Demaria, F., Avila, S., Roy, B., Ertor, I., Temper, L., Martinez-Alier, J., 2020. Environmental conflicts and defenders: A global overview. *Global Environ. Change* 63. <https://doi.org/10.1016/j.gloenvcha.2020.102104>.
- Sousa Santos, B.de, 2014. *Epistemologies of the South. Justice against Epistemicide*. Routledge, London.
- Spivak, G.C., 1988. Can the subaltern speak? In: Nelson, C., Grossberg, L. (Eds.), *Marxism and the Interpretation of Culture*. University of Illinois Press, Chicago, pp. 271–313.
- Swyngedouw, E., Cox, K.R., 1997. *Spaces of Globalization: Reasserting the Power of the Local*. The Guilford Press, New York, pp. 137–166.
- Temper, L., Martinez-Alier, J., 2013. The god of the mountain and Godavarman: net present value, indigenous territorial rights and sacredness in a bauxite mining conflict in India. *Ecol. Econ.* 96, 79–87.
- Temper, L., Del Bene, D., Martinez-Alier, J., 2015. Mapping the frontiers and front lines of global environmental justice: the EJAtlas. *J. Polit. Ecol.* 22, 255–278.
- Temper, L., 2016. Who gets the HANPP (Human Appropriation of Net Primary Production)? Biomass distribution and the bio-economy in the Tana Delta, Kenya. *J. Polit. Ecol.* 23 (1), 410–433.
- Temper, L., Demaria, F., Scheidel, A., Del Bene Daniela, M.-A.J., 2018. The Global Environmental Justice Atlas (EJAtlas): ecological distribution conflicts as forces for sustainability. *Sustain. Sci.* 13 (3), 573–584.
- Temper, L., Avila, S., Del Bene, D., Gobby, J., Kosoy, N., LeBillon, P., Martinez-Alier, J., Perkins, P., Roy, B., Scheidel, A., Walter, M., 2020. Movements shaping climate futures: a systematic mapping of protests against fossil fuel and low-carbon energy projects. *Environ. Res. Lett.* 15 (2), 123004.
- Tran, D., Martinez-Alier, J., Navas, G., Mingorría, S., 2020. Gendered geographies of violence: a multiple case-study analysis of murdered women environmental defenders. Forthcoming *J. Polit. Ecol.*
- Valencia, A., 2013. *Justicia ambiental y subalternidad en el Perú*. *Just. Democr.* (11) <http://repositorio.amag.edu.pe/handle/123456789/190>.
- Walter, M., Urkidi, L., 2017. Community mining consultations in Latin America (2002–2012): the contested emergence of a hybrid institution for participation. *Geoforum* 84, 265–279.
- Walter, M., Weber, L., Temper, L., 2020. *Learning and Teaching Through the Online Environmental Justice Atlas: From Empowering Activists to Motivating Students*. Wiley Periodicals. *New Directions for Teaching and Learning*, n. 161.
- Warlenius, R., Pierce, G., Ramasar, V., 2015. Reversing the arrow of arrears: the concept of "ecological debt" and its value for environmental justice. *Global Environ. Change.* <https://doi.org/10.1016/j.gloenvcha.2014.10.014>.