A global environmental justice movement: mapping ecological distribution conflicts

Un moviment de justícia mediambiental global: cartografiant els conflictes de distribució ecològica

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Abstract: The industrial economy is not circular, it is entropic, therefore requiring new supplies of energy and materials extracted from the "commodity frontiers", and producing polluting waste. Therefore, ecological distribution conflicts arise. The Global Atlas of Environmental Justice is an online inventory of such ecological distribution conflicts based on scholarly and activist knowledge. It reached 3200 entries by July 2020 (ejtlas.org) allowing research on such conflicts in the field of comparative, statistical political ecology. The EJAtlas is used for research but also for university teaching in the environmental social sciences and in business economics and management. It 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, sand mining, dams, eucalyptus or oil palm plantations, incinerators and other methods of waste disposal, coal fired power plants, gas fracking, nuclear reactors, CAFOs. Analyses are done also on the cross- cultural expressions (slogans, banners, documentaries, murals) of the conflicts gathered in the EJAtlas. The wealth of research coming from the EJAtlas gives an affirmative answer to the question: Is there a global environmental justice movement? Making old or emergent conflicts more visible contributes to placing political ecology at the centre of politics.

Keywords: statistical political ecology; ecological distribution conflicts; vocabulary of environmental justice; EJAtlas; environmentalism of the poor; valuation contests; corporate social irresponsibility.

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1. Environmental justice and the environmentalism of the poor and the indigenous

The words "environmental justice" are used here in a sociological sense, as they were first used in the movement born in the United States in struggles against waste dumping in North Carolina in 1982 (Martinez-Alier et. al., 2014). Activist-authors such as Robert Bullard (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 colour" in Washington DC proclaimed the 17 principles of Environmental Justice which went beyond a focus only on the United States. The meeting was in Washington DC but the terms "environment" and "justice" were used in ways that challenged US capitalist domination; certainly not a Western celebration of coloniality and racism, on the contrary. 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.[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). This perspective inspired the Brazilian map of environmental and health injustices (Porto, Pacheco and others, 2013) and inspired us at ICTA UAB to start the Atlas of Environmental Justice in 2011, with 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, Das and Padel,

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[1] EJ movements are really "counter-movements", in Karl Polanyi's historical sense, searching for protection against increasing ravages to the environment and human livelihood. In this article I have kept the term "counter-movement" sometimes but now always, to avoid repetitiveness.

2010, Temper and Martinez-Alier, 2013), and indigenous grievances and claims by the Oilwatch nework against the foreign oil industry in the Niger Delta and the Amazon of Ecuador, provided a main impetus for the initial stages of the EJAtlas. I called these movements, in Spanish, *ecologismo popular* (people's environmentalism) or "environmentalism of the poor".

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. Whatever the vicissitudes of the organizations of the EJ movement in the United States in the last forty years (to some extent co-opted by state organs, and regularly too shy to denounce the harms done by US firms outside the country), 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 majorities (Martinez-Alier, 2002). One cannot presume that, as "environmental justice" as a social movement was first identified and named in the United States, it is a "Western" colonialist and racist notion (as wrongly argued by Alvarez and Coolsaet, 2018). As they say in North-East Brazil, one cannot mistake the Cavalcantis for the *cavalcados.*

The Chipko movement in the Himalayas in the 1970s, 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. There were other contemporary examples of this type of environmentalism: the Ogoni, the Ijaw and other indigenous groups protesting the damage from oil extraction by Shell in the Niger Delta; resistance against eucalyptus in Thailand and elsewhere on the grounds that "plantations are not forests"; the movements of displaced 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 biopiracy ("biopiracy" refers to the colonial appropriation of knowledge of agricultural or medicinal plants). There are also historical instances of what could be termed the "environmentalism of the poor", although the words "ecology" and "environment" were not used politically at the time and the actors of such conflicts could not see themselves as "environmentalists. Two examples related to copper mining come from Rio Tinto, Andalusia, in the 1880s against sulphur dioxide; and in the early 1900s against the pollution of the Watarase River by the Ashio copper mine in Japan. Ultimately, the sum of these conflicts in a global environmental justice counter-movement represents today a powerful social force for greater sustainability.

The EJAtlas is thus an outcome of and a tool for research on the environmentalism of the poor and the indigenous, and the global environmental justice movement that we started 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, 1995a; 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 when new social movements moved from economic values towards human rights, feminism and the environment. According to Inglehart and mainstream political theory, the adoption of so-called "postmaterialist values", those emphasizing higher-order human needs in a Maslow scale, are a determining force behind environmentalism. But how was it possible to say that feminism, environmentalism, human rights were "post-materialist" concerns? What is more material than the integrity and defence of human life; the food, the land, the water and the air, the housing we

need for survival; the labours of reproduction and care for humans? Inglehart's identification of "materialist" with "economic" is clear in one of the main survey question eliciting so-called "materialist values": "are you for fighting rising prices"? I ask: what have prices to do with loss of immediate access to material livelihoods threatened by dispossession? One can imagine the perplexity of tribal and peasant respondents.

In my view, "post-materialism" was a "terrible misnomer" (Martinez-Alier, 2002). First, according to Max-Neef, against Maslow, all humans have similar needs of subsistence, affection, protection, knowledge etc (Max-Neef 1991, listed nine needs)[2]. This theory of needs is widely accepted in ecological economics. Second, environmentalism in rich countries, focusing often on the "cult of wilderness", had however an industrial material component as in the alarm against DDT, nuclear power, sulphur dioxide emissions in the 1960s and 1970s. By 1990, the German Green party which put nuclear power at the centre of politics was gallantly fighting the general election on the very material issue of climate change. Third, 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 which was threatened by industrial growth and plantations. The Chipko movement of the 1970s was an example (Guha, 1989). Chico Mendes was killed in 1988 defending the forest in Acre against the cattle ranchers while Ken Saro-Wiwa and companions were killed in 1995 because of their opposition to Shell in Ogoniland in the Niger Delta. The journal *Ecología Política* was launched in Barcelona in 1991 drawing on James O'Connor theory of the "second contradiction of capitalism" supporting the environmentalism of the poor. Its first substantial article was authored by Mexican ethno-ecologist and agroecologist Victor M. Toledo.[3] From the early 1990s we disputed the views that 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). The environment was not a luxury that becomes socially appealing after a country, or a particular human group, has achieved material wealth. Empirical research showed that "subaltern classes", manual workers, indigenous peoples and the poor in general are often the first to defend the environment in which they get their livelihood (Barca, 2012). A unifying definition for these "subaltern environmental struggles" was the "environmentalism of the poor", tied to issues of environmental degradation in terms of human health, livelihoods and well-being. Empirical evidence from around the world led to a theory of Ecological Distribution Conflicts (EDCs), i.e. conflicts on the social distribution of environmental costs and benefits deriving from the material interchange between societies and nature (Barca, 2012). Such costs and benefits are not only expressed in economic terms; the social actors deploy other values.

As noticed in the 1990s, there was a close relation between this environmentalism of the poor 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". After *The Environmentalism of the Poor* was published in 2002, this research programme has been facilitated from 2008 to 2021 at ICTA-UAB by three successive European funded projects (CEECEC, EJOLT, EnvJustice). The EJAtlas (Figure 1) reached 3200 entries of EDCs across the world in July 2020 allowing new work on comparative, statistical political ecology (Temper et. al., 2015, 2018, 2020; Martinez-

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[2] See also http://www.ejolt.org/2012/12/needs/

[3] https://www.ecologiapolitica.info/. Sixty issues have been published until 2020.

Alier et. al., 2016; Scheidel et. al.,2018, 2020, Tran et. al.,2020). The EJAtlas has a solid reputation. 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-founded by Leah Temper and myself, coordinated by Daniela Del Bene) was launched in 2014 with 920 entries focusing on the environmentalism of the poor, often overlapping with agrarian, urban, feminist, indigenous, working class and public health movements but with distinctive contents.[4]

Figure 1: The EJAtlas (ejatlas.org) with a column for recently updated cases (envjustice.org).
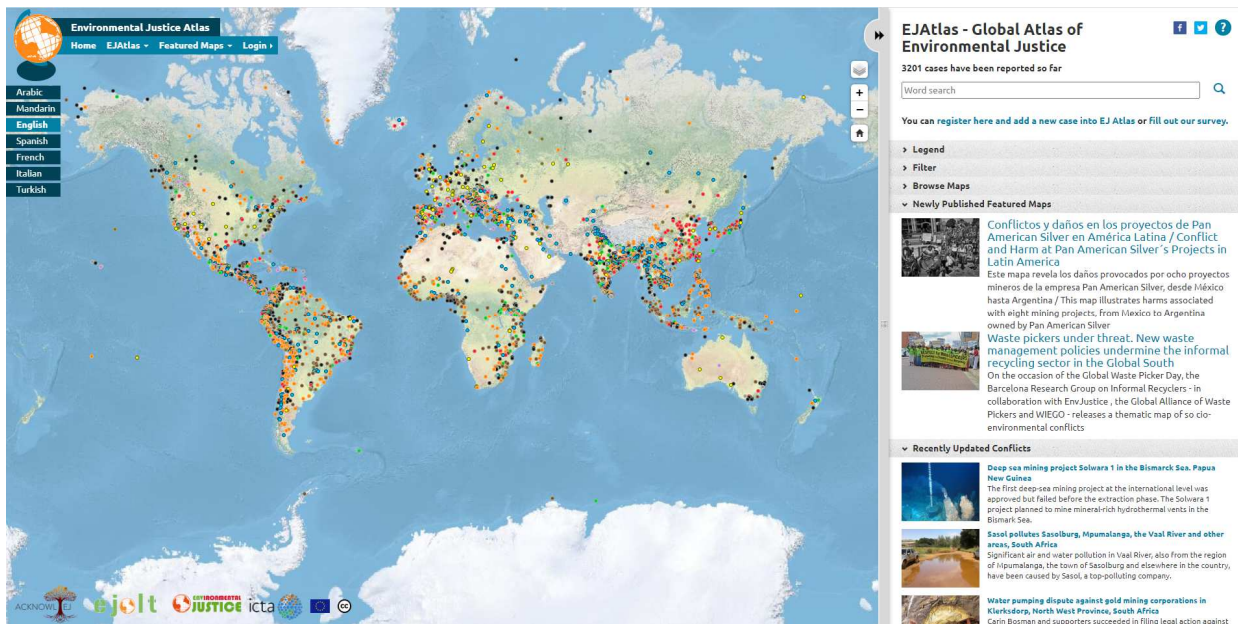
The EJAtlas is now a recognised tool for studies in comparative political ecology (Drozdz 2020, Scheidel et. al., 2020, Charbonnier, 2020, p. 17). It contains a large, expert-elicited sample of mostly recent, previously reported environmental conflicts from an unknown total number of cases worldwide. "Expert" does not mean here academically "certified experts". It means knowledgeable local activists and journalists, young academics and postdocs, junior and senior researchers, some professors. Sometimes academics engage in action-research, and become activists. This on-line archive of environmental conflicts is in open-access. Each entry consists of a data sheet of 5 or 6 pages with a description of the conflict, sources, and many codified variables: visible or potential impacts (environmental, health and social impacts) of the project

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[4] 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 Walter, 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, DalenaTran, Amaranta Herrero, Sara Latorre, Mario A. Pérez Rincón, Raquel Neyra, Sara Mingorria, Max Stoisser. Patrick Bond, Lucrecia Wagner, Ksenija Hanacek, Anna Lora-Wainright, Keninichi Matsui, Irmak Ertör, Emiliano Teran, Gabriel Weber, Jovanka Spiric, Julie Snorek, Camila Rolando Mazzuca, Nick Meynen. Also interns and master students at ICTA UAB and FLACSO Ecuador. Not least, EJOs such as Oilwatch and Acción Ecológica, Censat, OCMAL and OLCA, CSE and Kalpavriksh in India, ERA in Nigeria, ASUD in Italy, GRAIN, the WRM and others.

or policy causing the conflict, social actors of the conflict, forms of mobilization, outcomes. Names of authors of data sheets are openly displayed unless they want to hide them to the public. The EJAtlas classifies the environmental conflicts arising from this vast movement (or rather counter-movement) for environmental justice 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, Temper et. al., 2018).

2. "Let the subaltern speak"

One can do analyses of the counter-movement for environmental justice based on countries or regions but also cross-cultural analyses on many 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, CAFOs ("concentrated animal farming operations"). Across the whole sample of the 3200 contentious episodes registered in the EJAtlas we see (using the Filter function in the EJAtlas platform) that in about 407 cases deaths of one or more environmental defenders are reported. The social actors (in the EJAtlas data sheets) are women and men taking part in highly intense or subdued conflicts as indigenous peoples, farmers, neighbours and citizens, members of local EJOs, landless peasants, industrial workers, pastoralists, fisherfolk or others. They are militant or "resigned" environmentalists (Lora-Wainright 2017). Some are scientists and professionals, or members of religious groups - as two murdered nuns, Sister Valsa John in Jharkhand in 2011 and Dorothy Stang in Pará, 2005. Their "repertoires of contention" or "forms of mobilization" are displayed and recorded. (Martinez-Alier et. al., 2016a; Temper et. al.,2015, 2018; Scheidel et. al., 2020). Other political ecologists have done research on grassroots environmentalism, and sometimes they have named it with other names, e.g. "environmentalism of the dispossessed", with reference to Ursula LeGuin's great anarchist utopia, "liberation ecologies" (Peet and Watts, 1996), "subaltern environmentalism" (Egan, 2002; Ruiz Cayuela, 2018).

I refer here to Gayatri Spivak's critique (1988) against Ranajit Guha denying the possibility for the subaltern to speak. [5] Compared to the power of corporations, governments and mainstream media confronting these social actors, the EJAtlas allows "the subaltern to be heard" even when they died long ago, were killed recently or are still alive but almost voiceless. Pulido (1996: 128) in her classic book on Hispano pastoralists' claims of 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". Arelí Valencia discussed *ambientalismo subalterno* in Perú (Valencia, 2013) while Italian historian Marco Armiero drew directly from Gramsci and wrote of *subaltern environmentalism* in the waste crisis in Campania bypassing Ranajit Guha and Spivak (Armiero and Sedrez, 2014) as Stefania

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[5] 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 (influencing the much younger Ramachandra Guha's pioneering environmental history the Chipko movement (Guha, 1989)). Ranajit Guha and Ramachandra Guha are not related by family but at the time they had the same editor at Oxford U.P, Rukun Advani. (Ten years earlier, in Catalonia in 1975 still under Franco, Raimon sang: *Jo vinc d'un silenci antic i molt llarg / de gent que anomenen classes subalternes*. This was meant in Gramsci's sense; everybody easily understood).

Barca had done already (Barca, 2012). This "environmentalism from below" is well represented in the EJAtlas; it is different from the "cult of wilderness" and the "gospel of eco-efficiency" (Martinez-Alier 2002).

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, (some) successes and (many) "don't knows". Among the 3200 cases, about 525 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. (Rodriguez-Labajos and Özkaynak, 2017, Aydin et. al.,2017, Scheidel et. al.,2020, Hanacek et. al., 2020). In a few cases (about fifty) the success stories are due to some extent to connections that appearing in the EJAtlas itself has brought to local activist groups. We welcome this but the EJAtlas does not set itself the impossible task of impinging directly and case by case on reality. In my view, we are like contemporary social historians steadily and modestly building up our own open access archive of environmental conflicts, accurate observers arriving after the battles, "rearguard" actors to use Sousa Santos' image (2014) making conflicts visible after they have taken place or are still burning actively or when their embers might revive.

Indigenous and traditional populations" and/or "ethnically discriminated groups" appear as protagonists in about 40 per cent of the conflicts recorded. We will do a systematic analysis of 1200 cases whose protagonists are indigenous groups against "environmental racism". Other cross-cultural analyses are being published or planned in 2020-22 on women environmental defenders assassinated and also on successful women activists (Tran et. al., 2020), on the role of religious groups active in environmental conflicts (mainly in Latin America and South and SE Asia), on working-class environmentalism (Barca 2012, Satheesh, 2020); on the frequent intersection between agrarian conflicts and environmental conflicts (Gerber et. al., 2009); on cases of "militarized" biodiversity conservationism as opposed to "convivial" conservationism particularly in India and Africa (Fanari, 2019); gold mining (corporative or small scale; use of cyanide and mercury, with about 250 cases in the EJAtlas). Many other articles and books will be published based on the EJAtlas, including substantial work on the political ecology of China.

"Featured maps" based on the EJAtlas have focused on companies (Chevron, Vale, Pan American Silver ...) or global counter-movements (such as Blockadia - to leave fossil fuels in the ground), or on Roma populations in Central and SE Europe. There is a forthcoming article on 50 conflicts in the Arctic region (from Alaska and Canada to Scandinavia and Russia), a new frontier for commodity extraction (metals, fossil fuels) and new transport facilities (Hanacek et. al., 2020). There are plans for articles on the struggles of artisanal fishing vs. mechanized fishing around the world; on ten or twelve major oil spills by tankers in the ocean, rising large issues of liability; on conflicts on asbestos mining or manufacturing (as in Cerdanyola del Vallès in Catalonia, Spain, Sao Felix do Amianto in MG, Brazil, and Stephan Schmidheiny's role); on controversial cases of waste burning in cement kilns in different countries; on military and police interventions in environmental conflicts (causing or enabling agents); and on complaints against CAFOs (concentrated animal feeding operations) holding over 700 dairy cows, 2,500 pigs weighing more than 55 pounds, 30,000 laying hens in the USA, China and elsewhere. A comprehensive analysis of changes in social metabolism and 300 environmental conflicts in Andean countries by Pérez-Rincón et. al.,(2019) is available, as also six doctoral

theses based on the EJAtlas finished or almost finished dealing with conflicts on dams (Daniela Del Bene); urban waste and waste-pickers movements (Federico Demaria); Peruvian environmental conflicts and defenders (Raquel Neyra) emphasizing violence, coloniality and racism; wind mills across the world (Sofia Avila); health and environment (claims against the use and damage from DBCP and many other toxic products) (Grettel Navas); coal mining and coal burning conflicts in India (Brototi Roy).

Recent major collective publications based on the EJAtlas are Temper et. al. (2020) on worldwide grassroots movements against fossil fuels and other forms of energy production, and Scheidel et. al. (2020), on environmental defenders. This wealth of research contributes to give an affirmative answer to the question: Is there a global environmental justice movement?

3. The EJAtlas as an accurate advocacy map and an archive for socio-environmental history

The EJAtlas is an archive of environmental conflicts in the form of a "protest map" (Drozdz, 2020). The EJAtlas followed in 2012 on the steps of activist maps compiled by OCMAL (Observatorio de Conflictos Mineros de America Latina) and Fiocruz (*Mapa de Saúde e Justiça Ambiental no Brasil*) (Porto, 2013). It was inspired by them, as also by Ricardo Carrere (World Rainforest Movement), ASUD in Italy, Oilwatch in Ecuador and Nigeria, and Turkish colleagues, when we started the EJAtlas in the EJOLT project. It is a product of a wave of "bottom up" cartography at the service of social counter-movements and also of academic scholarship. In Drozdz'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 the ground on environmental conflicts coming directly from activists and, more often, coming indirectly from journalists and academics.

The project supports community-led science as it caters to the needs of scientists, journalists, and teachers for data directly or indirectly provided by activists. For instance, the EJAtlas data are used or could be used to investigate the forms and networks of global opposition to gas fracking or to nuclear energy from uranium mining to breeder reactors. The collaborative maps from the EJAtlas provide an example of what critical mapping can do to reframe the dominant cartographic narrative. 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 policies (Drozdz, 2020), looking at nature from the logic of so-called capital accumulation. The EJAtlas shifts the focus from what economic potential the environment holds to the consequences resulting from its exploitation and the resistance against them (Drozdz, 2020). The EJAtlas registers victims of extractive violence, the dead, the criminalized, jailed or exiled (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 counterinsurgency strategies" and "state terrorism" (Dunlap, 2019). Dunlap 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) 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, not as a General Wyler looking down on Cuban insurgent *mambises* in 1895-98

and placing the civil population in "strategic hamlets" (as replicated later by other colonial generals in Malaysia and Vietnam) but from the viewpoint of today's environmental *mambises* resorting to a wide set of forms of mobilization, mostly non-violent as recorded in the EJAtlas.

Extractive or polluting conflicts might be "solved" by violent methods. Sometimes they reach less dramatic outcomes. In all cases, the EJAtlas puts conflict in front and centre, restoring 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. Therefore, the EJAtlas opens up new avenues for research in comparative, statistical political ecology focusing on the power dynamics and *valuation contests* in ecological distribution conflicts (O'Connor, 1993; Veuthey and Gerber, 2011). We have collected 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. Other valuation languages are also deployed. For most conflicts we can answer the question: which valuation languages have been brought into the dispute, and 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) on plurality and incommensurability of values (Martinez-Alier, 1987; O'Neill & Uebel, 2015; Rodriguez-Labajos & Martinez-Alier, 2013).

4. Risk, uncertainty, activist knowledge, post-normal science in the EJAtlas

As Temper et. al. (2015, 2018) explain, the EJAtlas provides empirical material for a research agenda that contributes to understanding how inequalities (economic, social and epistemic) are shaped through socio-metabolic transformations in the economy, how they are contested and with which outcomes. The EJAtlas holds promise for extending the praxis and the theory of environmental justice: 1. By integrating further activist and academic knowledge into analysis of EJ through new forms of knowledge co-production; 2. By shedding light (through analysis of many cases) on the process called "activists mobilizing scientists" (Conde 2014) where unequal power relations are contested through the co-production of scientific and local knowledge. Lay citizens, communities and EJOs immersed in environmental conflicts sometimes engage with professional scientists to understand the potential or visible impacts that an extractive or polluting project will cause or is causing to their environment and themselves. 3. Through a multi-scale framework that allows a wider geographical analysis of interconnections between actors, struggles, and metabolic flows (domestic extraction and also ecologically unequal trade and waste production). Rich regions have displaced and are increasing the displacement of environmental costs associated with material throughput to poorer regions of the world (Muradian and Martinez-Alier, 2001, Hornborg and Martinez-Alier, 2016). Such a framework of ecologically unequal exchanges or *Raubwirtschaft* helps discern the coalitions of power that produce and benefit from patterns of extraction, trade and consumption, and the social groups (ethnic groups, women, peasants…) that suffer the most, providing a departure point for constructing coalitions to support the protest counter-movements of the most vulnerable groups. In Latin America, the historical and present awareness of ecologically unequal trade has produced an "anti-extractivist" geography with Alberto Acosta, Eduardo Gudynas, Maristella Svampa (Samaniego et. al., 2017); 4. A perspective that through geo-location and cartographic

data allows an interface between the natural and social sciences, revealing features of the territory and social, institutional and cultural processes. There are not only "political opportunity structures" favouring environmental activism but also "biological opportunity structures" (Scheidel et. al., 2020).

The EJAtlas draws on activist knowledge flowing to journalists and academics and vice versa. The vocabulary of the movement for environmental justice and its cultural expressions in mural art, banners, slogans, songs, theatre and films, is mostly born outside universities (Martinez-Alier et. al., 2014; section 13 below). A key question within the process of co-production of knowledge in the EJAtlas is how to combine activist knowledge with scientific rigour. For instance, the Featured Maps on the Chevron, Vale and Pan American Silver companies, and the Blockadia Featured Map are "agit-prop" instruments derived from the EJAtlas for use of concerned activists but they have not yet been developed into peer-reviewed articles or chapters of books in business economics publications. Another instance: with the many cases on the Shell company in the EJAtlas (from Nigeria and elsewhere) we could do a Featured Map and scholarly article contributing to the campaign "Shell must fall". [6] The process of the design and creation of the EJAtlas is a collaborative, iterative process in participatory GIS that is still unfolding. The EJAtlas is a living document, and its contents, form and layers of information are expanded, co-created with its users through a process of co-design. We make visible events that were somewhat hidden although already known, and through this, the project endeavours to bring to the forefront alternative understandings of the real world, making them potential objects of policy and politics (Gibson-Graham, 2008).

Thus, one of the variables in the section of impacts in the EJAtlas data sheets is the existence of "scientific uncertainty" regarding the risks of the project in question, giving as example "radiation" in the use of nuclear energy, or the use of cyanide and/or mercury in a gold mine, glyphosate in a soybean plantation, DBCP or *chlordécone* in a banana plantation, the alleged risk of dioxide from an incinerator, the suspicion of excessive high lead blood levels in children next to an industry. Such cases appear often in the EJAtlas. Another variable in the EJAtlas, in the section on "protagonists" of the conflict, allows for the presence of "scientists and professionals" alongside indigenous peoples, international and local EJOs, farmers, neighbours and citizens, trade unions, women activists etc. We could also select cases in the EJAtlas with a third variable: is the EIA disputed, as a document purporting to turn the conflict into a technical, post-political issue? One could cross these three variables (scientific uncertainty, presence of scientists in the conflict, and disputes on the EIA) and get a substantial sample of cases in the EJAtlas (several hundred) which could be analysed with the hypothesis that "extended peer review" is being applied (as described in "post-normal science" by Funtowicz and Ravetz, 1993) and how it is being applied.

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[6] https://www.youtube.com/watch?v=jbIK8djjRZ8. A campaign song in The Nerthelands, "dedicated to all who resisted colonial fossil fuel violence. In particular this song honours the frontline communities who united against Shell such as the the Ogoni, Mapuche (YPF is backed by Shell investment and business) and Groningen (NAM is a construction of Shell and Exxon)".

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

As ecological distribution conflicts (EDC) intensify along commodity extraction and waste disposal frontiers (including excessive amounts of carbon dioxide emissions) (Moore, 2000), and through the growth of new commodities (e.g. niobium, 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. As mentioned above, several "featured maps" have been published 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. There are publications using the EJAtlas for information relevant to investors such as pension funds keen on applying Corporate Social Responsibility (CSR) criteria to particular firms or business sectors.

As Rajiv Maher writes in the *Business and Human Rights Journal* (2020) the EJAtlas documents and catalogues social conflicts around environmental issues aiming to make these instances of mobilization more visible, highlighting claims and testimonies, making the case for corporate and state accountability for the injustices inflicted sometimes through their activities. The materials collected and the research done with the EJAtlas are relevant, therefore, to the construction and criticism of indices and benchmarks meant to inform and guide shareholders and other stakeholders, such as the Responsible Mining Index, the Business Human Rights Benchmark and others. High-ranking companies in the CHRB and RMI are demonstrably involved in the EJAtlas in multiple socio-environmental community conflicts, perhaps even protagonists of Global Witness' narratives of 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. Harmonious "company towns" end with bleak environmental liabilities when the mineral runs off while "acceptance" may not be always equivalent to willingly granted social permission; it can be obtained by violence and fear.

Therefore, the use of the EJAtlas in professional advisory financial activities and in fields like eco-labelling, product certification and in general CSR (or Environmental Social Governance, ESG as it is nowadays called) opens up opportunities for research in business management on the opposition between the objectives of "shareholder value" and "responsible management" (Laasch et. al., 2020), Corporate Social *Irresponsibility* (CSIR) (Riera and Iborra, 2017, Alcadipani and Medeiros, 2019), corporate accountability, corporate impunity and lack of liability are topics of interest. 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.

6. The EJAtlas as a tool for university teaching

Apart from business schools, there are numerous testimonies of the use of the EJAtlas in university teaching, from the USA and Latin America to China, including also India and several European countries. This was unexpected. The founders of the EJAtlas saw it as a tool for academic research in political ecology and activist support. By 2019, the EJAtlas was used for teaching in the USA by well-known political ecologists (Prof. Paul Mohai at Michigan U. and Prof. David Pellow at California U. Santa Barbara), as well as at Skidmore College and other universities. In Asia, at NWAFU Yangling and China Agricultural University in Beijing in China, at Shiv Nadar University in India. In Europe (UAB in Spain, UEA in UK, ISS in the Netherlands) and Latin America (several universities in Argentina, Chile, Colombia, Mexico, Peru).

Mariana Walter et. al. (2020) identified the ways in which university teachers use the EJAtlas as a teaching tool in the USA, China, Turkey, Latin America, Europe. The experience in Yangling, China was positively assessed by Scheidel et. al. (2018). The online platform is mainly used in English speaking courses; however, there were also examples of Spanish-language courses. The atlas is used to teach socio-environmental sciences, e.g. ecological economics, political ecology, environmental sociology, environment and development, environmental Justice, environmental education, human geography, but also in courses on ethics, Human Rights, political economy, public administration and also, as we have seen, in business management. For some students the EJAtlas is a place where to start finding some evidence of conflicts relevant for their interests, an opportunity to collect new cases and upload them in the EJAtlas, training to be professional political ecologists competent in comparative methods. For instance, adding some data sheets on struggles over asbestos and claims for reparations around the world, on top of those already in the EJAtlas, and write a comparative master or doctoral thesis or book. The same could be done for a particular company, e.g. Anglo Gold Ashanti, by a motivated student from South Africa, Colombia or Ghana. On 30 December 2019, one more unsolicited testimonial written by a student in simple words was placed in the web from Washington University, St. Louis, Missouri (https://sustainability.wustl.edu/resource-digest-the-global-atlas-of-environmental-justice/)

Fiona Eckert presents the Global Atlas of Environmental Justice, or EJAtlas, an online interactive tool that allows users to visualize the scale and nature of environmental injustice instances around the world. The EJAtlas consists of an interactive map that catalogues more than 3,000 crowdsourced cases of conflicts around environmental issues that have or are currently occurring around the world. These conflicts are defined as social movements and mobilizations by local communities, occasionally in conjunction with national or international networks, protesting specific economic activities, infrastructure development, or waste disposal and pollution that have anticipated or proven environmental and social impacts.

Each dot on the map represents a conflict. By clicking on a dot, users can access a wealth of information including the conflict's background and motivating factors, a description of the project that is being protested against, its visible and potential impacts, a list of all the organizations and groups involved, relevant legislation, academic research, references in the media, and more. The conflicts are structured into ten categories (each is a different dot color), ranging from nuclear to water and waste management, to tourism recreation and fossil fuels. Searches can be refined by a variety of factors, as well, including the specific country,

company, or commodity of interest. The EJAtlas also features a number of maps focusing on specific instances of environmental conflicts within certain regions. By documenting and cataloguing social conflict surrounding environmental issues, the Global Environmental Justice Atlas operates as a network for teaching, networking, and advocacy. Further, it collects stories from communities affected by injustice and seeks to mobilize action. The tool also serves as an information hub for groups working on environmental justice to receive information, connect with other groups, and enhance the visibility surrounding environmental conflicts.

Lecturer Scott Krummenacher utilizes the EJ Atlas in the classroom to facilitate student discovery. He explains, "The EJ Atlas is an invaluable resource for faculty, students and others interested in understanding the range of environmental injustices in the world today. The atlas provides stories from those experiencing the problem on the ground and allows students to make connections across issue areas. I've found that students learn the most from examples and these clear illustrations are helpful in conveying the many dimensions of the issue."

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 forms of action 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.

Collective action giving rise to slogans, banners, marches and other forms of mobilization does not require common organizations. By doing network analysis of the 3150 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 organizations members of the confederation Friends of the Earth International (FoEI) appear (e.g. Censat in Colombia, ERA in Nigeria, Justiça Ambiental in Mozambique, Walhi in Indonesia, Friends of the Earth Norway…). FoE is a network often found supporting the "environmentalism of the poor and indigenous" but not, 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 Caledonie (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 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 actual conflicts recorded in the EJAtlas (as we could prove 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 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 finding that 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 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. 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 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 helping to cause terrible fires.

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. Intesectionality

In many of the ecological distribution conflicts 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 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 (Figure 2). 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.

Figure 2: Zaldibar argitu*! "Workers, Health, Liabilities"*.
https://ejatlas.org/conflict/zaldibar-industrial-waste-dump-basque-country-spain.

Source: EiTB.

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 EJAtas. 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 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 modes of organization of environmental protests.

9. Circularity, entropy and environmental conflicts.

Introductory microeconomics is often taught in terms of what Georgescu-Rogen called "the merry-go-round between consumers and producers", a circular scheme in which producers put goods and services in the marker at prices which consumers pays; meanwhile, consumers (as providers of labour or other inputs or "factors of production") get money from producers in the form of salaries, rents etc. 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 mainstream economics, or introduced much later, in the treatment of externalities which are "internalized into the price system".

The recent novelty is that, from industrial ecology and not from economics, a circular vision of the economy is also introduced. The energy and the materials entering the economy are here taken into account, 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 problem because it comes 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 in the economy. We know however that the degree of the circularity of the industrial economy is very low, and it is probably decreasing as largely biomass-based economies complete their transition to an industrial economy based on fossil fuels in India and Africa.

The fact that the industrial economy is not circular but entropic 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 still growing at a high rate with net additions to stocks of 17 Gt/yr. Such stocks then need new energy and material flows for their maintenance. Therefore, the industrial economy marches all the time towards the commodity extraction frontiers and also to the waste disposal frontiers, which are often already inhabited by humans and certainly by other species. Hence the growth in the number of EDC, and as a response the growing strength of the environmental justice movement.

10. Why has an environmental justice movement been born?

The EJAtlas takes a materialistic approach (Fischer-Kowalski and Haberl, 2015); "materialistic" does not mean economic in the chrematistic sense. We delve beneath the surface of 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. There is continuity between the study of *Warenkunde* or *merceologia* [7] to Wallerstein's distinction between "preciosities" and "bulk commodities" in colonial trade, and today's MEFA (material and energy flow analysis). The world economy's metabolism grows and changes (Krausmann et. al., 2009, 2018). The industrial economy is not circular, it is more and more entropic (Haas et. al., 2015; Giampietro & Funtowicz, 2020) using resources like the fossil fuels. It burns them for energy. The energy dissipates; this also produces residues like carbon dioxide in excessive quantities (hence, the increased greenhouse effect). The "funds" or renewable resources like fisheries and the fertility of the soil, the biodiversity become exhausted, while turnings 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 industrial economy goes to the extraction frontiers to get new resources in greater quantities, 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.

The EJAtlas collects ecological distribution conflicts (EDC), a term coined (Martinez-Alier, 1995a, 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, Rodriguez-Labajos and Martinez-Alier, 2013). The unequal or unfair distribution of environmental good and bad 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, a factory may be polluting the river (which belongs to nobody or belongs to a community that manages the river – as studied by Ostrom (1990) and her school on management of the commons). The same happens with climate change, causing the receding of glaciers in Bolivia and Peru or sea

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[7] *Warenkunde*, in Italian, *merceologia*, is the science of commodities (mainly colonial commodities), similar to today's Industrial Ecology. Wikipedia explains: *"Warenkunde' ist ein Fach, das ursprünglich Grundlagenwissen des Handels beschreibt. Es geht zurück auf den Göttinger Professor Johann Beckmann (1739–1811), der den Begriff 'Waarenkunde' prägte und darunter die neuen und bisher unbekannten Waren (z. B. aus anderen Erdteilen) erklärte und bekannt machen wollte, die später als Kolonialwaren bezeichnet wurden"*.

level rise in some Pacific islands or in the Kuna islands in Panama or in Kivalina in Alaska (as recorded in the EJAtlas). 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 to neglect or violence by companies and state representatives. Capitalism does not and cannot pay compensation to the present and future generations for the sixth great extinction of biodiversity or for the loss of tropical forests or for 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).

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. Instead, ecological economics and political ecology accept that there are value system contests. Institutional structures and power relations determines which values can be expressed, and the strength with which they can be expressed.

The growth and changes in the social metabolism cause many EDCs where different valuation languages are deployed as we see in hundreds and hundreds 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. The relentless increase in the Keeling curve (from 320 ppm in the 1950s to 415 ppm today, inexorably moving towards 450 ppm in three decades more) is caused by the industrial system (which is capitalist, and therefore profit-driven) and also, still, by population growth. 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. They also use terms from Marxian economics such as "simple reproduction" and "expanded reproduction" without reference to the labours of human reproduction and care, and without physical awareness of the entropy law. Certainly, 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 but not introduced in his economic theory (Martinez-Alier, 1987), energy is dissipated, not accumulated. The "productive forces" of the fossil fuels are not developed, they are lost forever. Environmental conflicts are caused by the fact that the industrial economy is not circular but entropic, continuously reaching the new "commodity extraction frontiers" (Moore, 2000) and the waste disposal frontiers. This is helped (but not primarily caused) by

resource commodification that undermines common goods. It is also helped by the unequal distribution of land and the concentration of political power in a few hands. This is represented in Figure 3, which must be read from the top, clock-wise. Growth and changes in the social metabolism cause EDC, which coalesce into a world movement for environmental justice with many local manifestations. If they are strong enough, they have a transformative power. Some of the new energy and materials sources (e.g. windmills, lithium) might cause new conflicts.

Figure 3. *From growth and changes in social metabolism to ecological distribution conflicts and environmental justice movements*
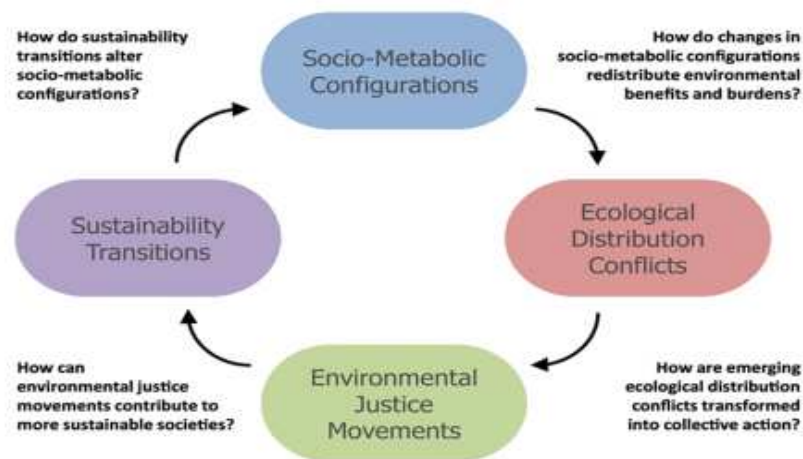
Source: Scheidel et. al. (2018).

11. Comparative, statistical political ecology based on the EJAtlas

As a social movement, environmental justice has distinctive collective actors (briefly discussed above). In the conflicts registered in the EJAtlas, they display several forms of mobilization or "repertoires of contention". 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.., 2018a). These studies employed in their analysis 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), dams (Del Bene et. al., 2018), or mining (Aydin et. al.., 2017), or specific thematic concerns, such as multidimensional violence in central American conflicts (Navas et. al.., 2018). The only study employing a global dataset of 1,357 EJAtlas cases was published by Martinez-Alier et. al. (2016a), and provided 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 counter-movements. Since then, the number of registered conflicts has more than doubled. With an analysis of 2,743

conflicts, Scheidel et. al. (2020) is by far the largest study using EJAtlas data. It provides new analyses of environmental conflicts in relation to sectors and income groups, actors and their successful protests 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. Results are becoming available in top academic journals, testifying to the consistency of the abundant information gathered in the EJAtlas. (Scheidel et. al., 2020, Temper et. al., 2020).

12. Some slogans and banners of the global movement for environmental justice

Apart from such statistical analysis, there is another approach to research the global environmental justice counter-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 and in academic writings becomes more visible and audible in the banners and slogans of spontaneous or organized demonstrations within the limits of what state and company violence will tolerate and the participants' fear allows.

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 (Figure 4, one essential element in social protests, together with shouted slogans, leaflets, murals, songs, documentaries) states that the place where the mine is located (the *meseta patagónica*) should not be a "sacrifice zone", a term that is used by the USA environmental justice movement (see Table 1) (Lerner, 2010).

Figure 4. La meseta no es zona de sacrificio. Chubut (No a la mina). *Updated by Lucrecia Wagner 2020.* https://ejatlas.org/conflict/navidad-mine-of-pan-american-silver-chubut-argentina

The source for Figure 4 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 in Argentina, 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 (Figure 5) 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, one of the leaders 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" (coal kills locally and globally).

Figure 5: Coal kills in Bataan, Philippines (Source: https://ejatlas.org/conflict/coal-mining-leading-to-the-killing-of-gloria-capitan)

Figure 6. Against a nuclear waste reprocessing plant in China (Juan Liu, ICTA-UAB). The banner says "For the next generation, refuse construction of the nuclear waste plant". https://ejatlas.org/conflict/thousands-protest-against-proposed-nuclear-reprocessing-plant-in-lianyungang-jiangsu-china)

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 Figure 6 from Jiangsu. The protest took place in 2016 in Jiangsu, China, against a Sino-French project involving the

Areva corporation. The banner says "For the next generation, refuse construction of the nuclear waste plant", the protest took place in 2016 in Jiangsu, China, against a Sino-French project involving the Areva corporation. 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.

Figure 7. Women against "green deserts" in Brazil (Grettel Navas). Source: Via Campesina.

https://ejatlas.org/conflict/women-agaist-the-expansion-of-eucalyptus-monoculture

In common with other local actions around the world giving rise to the slogan "Tree plantations and 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 (Figure 7). This was a symbolic 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.

In Tamil Nadu, India, two current conflicts (sulphur dioxide from copper smelting from a Vedanta factory, and contamination from mercury spilled by a Unilever factory) are classified in the EjAtlas in the category of "industries and utilities". The Unilever's thermometer plant in Kodaikanal exposed many workers to mercury poisoning without giving them any protective equipment or information about the disastrous health effects of mercury. This toxic mercury, dumped around the factory and in forests, continues to pollute soil and groundwater, allegedly affecting thousands. The case involved activists in Tamil Nadu and in The Netherlands. Unilever refused full liability (Figure 8). As in other conflicts, a song was composed. In this case, by Sofia Ashraf and T. M. Krishna (see https://www.youtube.com/watch?v=UhZz5vKi01c&feature=youtu.be, visit 30-6-2020).

Figure 8. Unilever refused responsability for Kodaikanal mercury poisoning, India
https://ejatlas.org/conflict/hindustan-unilever-thermometer-factory-kodaikanal-tamil-nadu-india

Source: India Today.

In Tuticorin after 20 years of complaints, thousands gathered in Thoothukudi district in March, 2018 asking for the smelter to be shut down. In May 22, 2018 as people 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. 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 and Martinez-Alier. 2015). There are many other conflicts in the EJAtlas that have arisen from copper mining and smelting, including (as mentioned above) two of the oldest conflicts registered: the massacre in Rio Tinto (Huelva, Spain) in 1888, and the peasant complaints led 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 170 cases in the EJAtlas).

Africa witnesses many struggles against environmental injustices. The Niger Delta is a hub for protests against devastating oil extraction. A high point was the assassination of Ogoni leaders Ken Saro-Wiva and companions in 1995 from which the slogan "leave oil in the soil" was born. There are new protests against the extraction and export of a much older raw material, palm oil, in new plantations around the world, mainly in Indonesia but also including, for instance, Nigeria's Edo State (Figure 9).

Figure 9. *Representatives of the Owan and Okomu communities and civil society urged in June 2017 the administration in Edo State to revoke an order expropriating 13,750 ha in favour of Belgian company Okomu Oil Palm Company.* https://ejatlas.org/conflict/oil-palm-plantation

Source: Bloom Shire.

All such conflicts are collective actions against socio-environmental injustices but the use of the words "environmental justice" for social movements (opposing "environmental racism") dates back only to the early 1980s in the United States (Bullard 1993) inspiring the rest of the world. Mossville was one early 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". In this sense, an ironic house sale advertisement in Mossville posted: "House for sale. 4 bedrooms, 2 baths. Caution: contaminated Groundwater. 1st air contamination, 2nd soil contamination. Now Groundwater contamination. Vista wants me to be a good Neighbour and Keep quiet and raise my children here while they make millions of dollars".[8] "Environmental racism" in Mossville (as in Brazil's *quilombos*, Colombia's *palenques* and maroon settlements in Jamaica) makes clear the parallel use of the terms "Cancer Alley" in the USA and Cancer Villages in China (more related to pollution from heavy metals than oil and gas).

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[8] Advertisement image available in: https://ejatlas.org/conflict/mossville-louisiana-environmental-racism-united-states.

Finally, one example from my own city of Barcelona (Figure 10). The Ateneu Popular Nou Barris occupies now the space left free by an asphalt plant (owned by the Barcelona City Council) dismantled in 1977 by direct action by neighbours carrying banners: "Save our lungs - Get the asphaltic plant out". The asphalt was being used for paving the streets of the new quarters of the city that received many immigrants before the economic crisis of 1973.

Figure 10. Dismantling the "planta asfáltica" and building the Ateneu Popular, Nou Barris, Barcelona. https://ejatlas.org/conflict/planta-asfaltica-noubarris-barcelona

The rural and urban cases mentioned here and documented in the EJAtlas, are related to metal mining, fossil fuels and climate justice, nuclear energy, industrial pollution, land and biomass grabbing. The banners, murals, slogans, songs, documentaries and theatre performances recorded in the EJAtlas show that many complaints are "glocal" (Swyngedouw, 1997). They have local roots and carry global parallels and implications. There are many links between the conflicts that could be researched in the EJAtlas by network analysis, e.g. the campaign Foil Vedanta is active in Tamil Nadu and London, and has also been active in Zambia and of course in Odisha because of the Niyamgiri Hill case.

Thus, a slogan heard in many gold mining conflicts in Latin America is *el agua vale más que el oro*. This was expressed in banners (and t-shirts) (Figure 11), in the early boom of open cast mining in the 1980s and 1990s. The slogan and t-shirt when displayed by Pope Francis become strong performative symbols. In fact, the encyclical *Laudato si* of 2015 has two full paragraphs (51 and 52) on the Ecological Debt from rich to poor countries because of resource plundering (ecologically unequal trade), environmental liabilities, and excessive use of environmental common space for waste disposal, including the greenhouse gases.

Figure 11. *Pope Francis and Senator (and film-maker) Pino Solanas, 2013 (public domain).*

Demonstrators using this slogan *el agua vale más que el oro* ask for the primacy of socio-environmental valuation over chrematistic valuation. People in Tambogrande and Yanacocha (Peru), Esquel and Famatina (Argentina), La Colosa (Tolima, Colombia, against Anglo Gold Ashanti) might think that they themselves invented the slogan. We don't know who did. No organization leader went around *bajando la consigna*, imposing the *mot d'ordre* or rallying cry of "water is more valuable than gold". This slogan means that, although one kg of water is far less valuable than one kg of gold on a chrematistic scale, this is not so on other scales of valuation. The slogan accepts a basic tenet of ecological economics: incommensurability of values, long words that most participants in such conflicts would not use. The slogan implicitly asks, who has the power to impose a standard of value over others? It also reveals the common emotions of participants in anti-gold mining movements in Latin America who easily remember the encounter between Pizarro and Atahualpa. The slogan is sung in different styles throughout the subcontinent. Can the subaltern sing? Yes, sometimes. [9]

The slogan scales up in countries in the subcontinent. In conflicts in Azuay province in Ecuador involving the companies Iamgold and later IVM over the Kimsacocha gold mine, on 24 March 2019 in the Girón district a popular consultation on mining was held, the first one in the country whose results were deemed to be compulsory. It took thirty years of struggle by the Federación de Organizaciones Indígenas y Campesinas del Azuay and the Unión de Sistemas Comunitarios de Agua de Girón to reach this point. They had support from citizens' movements such as Colectivo Yasunidos de Guapondelig (Cuenca) (itself linked to the countrywide Yasuni ITT campaign "to leave oil in the soil"). The voting was a success. Three months later,

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[9] https://www.youtube.com/watch?v=ymvzKGkJSTc.
 https://www.youtube.com/watch?v=L6bOCRilNEE.

environmental groups gathered outside the Constitutional Court in Quito at whose door they placed a ballot box with the phrase "water is worth more than gold". The prefect (governor) of Azuay, Yaku Pérez, present at the gathering with community leaders from the canton of Girón, said: "in water sources, in moors, wetlands, water recharge areas, we want no type of mining whatsoever, small or medium, mega, neither formal nor informal". The songs and banners stating that "water is more valuable than gold" are thus performative symbols at local level and provincial level in Ecuador. Governor Yaku Pérez uses the slogan[10] (*Yaku* means water in Quechua, this is his adopted first name). He might be a candidate for president in 2021. I would like to know whether *el agua vale más que el oro* appears in confrontations in other continents over open cast gold mining, translated into some of the thousands of languages spoken by the "subaltern", many of which are becoming extinct.

13. The vocabulary of environmental justice

In 2014 we (as members of the EJOLT project) published a long collective article called "Between activism and science. Grassroots concepts for sustainability coined by Environmental Justice Organizations". The abstract to this article reads: "In their own battles and strategy meetings since the early 1980s, EJOs (environmental justice organizations) and their networks have introduced several concepts to political ecology that have also been taken up by academics and policy makers. In this paper, we explain the contexts in which such notions have arisen, providing definitions of a wide array of concepts and slogans related to environmental inequities and sustainability, and explore the connections and relations between them. These concepts include: environmental justice, ecological debt, popular epidemiology, environmental racism, climate justice, environmentalism of the poor, water justice, biopiracy, food sovereignty, "green deserts", "peasant agriculture cools downs the Earth", land grabbing, Ogonization and Yasunization, resource caps, corporate accountability, ecocide, and indigenous territorial rights, among others. We examine how activists have coined these notions and built demands around them, and how academic research has in turn further applied them and supplied other related concepts, working in a mutually reinforcing way with EJOs." (Martinez-Alier et. al.,2014).

All such terms aim to have some influence through counter-movements and initiatives towards societal transformations. The activists become experts accompanied by new forms of academic research and advocacy such as the EJAtlas. Because of the EJAtlas work, the number of terms has more than doubled because of better geographical coverage (in India, China, Indonesia) compared to those shown in Martinez-Alier et. al., 2014, 2016a, 2016c. This is work in progress. For instance, the term "sacrifice zone" has been adopted in different countries from its probable origin in the USA. Thus, the region of Quintero-Puchuncaví https://www.ejatlas.org/conflict/ventanas-industrial-complex-chile is known by its residents and activists as one of five Chile's "sacrifice zones". The movement in France against the proposed Nantes airport introduced the word *Zadiste*, from the acronym ZAD*, zone à defendre*: a zone to

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[10]   https://ejatlas.org/conflict/iamgold-in-quimsacocha-ecuador.   (Also   El   Comercio. https://www.elcomercio.com/actualidad/prefecto-azuay-corte-constitucional-mineria.html). Yaku Pérez, 20 minutes   speech   in   Guaranda,   Bolivar   province,   Ecuador.   2019. https://www.facebook.com/watch/live/?v=693754644427546&ref=watch_permalink

be defended avoiding its sacrifice. In 2015 Naomi Klein in her book on climate change introduced the word *Blockadia* that she had heard from activists in Canada and the USA opposing pipelines. In Germany, the *Ende Gelände* movement (blockading lignite mines) has achieved world notoriety. The *Stay Grounded* movement is also new: it opposes "greenfield" airports and expansion of old "brownfield" airports. About 60 cases on airport conflicts have been uploaded in EJAtlas with this movement's help. It held a conference on 12-14 July 2019 in Barcelona co-sponsored by the EnvJustice project through Sara Mingorría. https://stay-grounded.org/conference/

Many of these slogans represent calls for "degrowth in practice" even if the word "degrowth" has an origin different from the environmental justice movement. (Martinez-Alier, 2012; Akbulut et. al., 2019).

Table 1. *Vocabulary of the Global Environmental Justice Movement (and everyday slogans and terms of environmental resistance).*

1.- Environmental Justice (EJ). USA Civil Rights Movement, North Carolina (Warren County) 1982 against environmental injustices (Bullard 1993). "People of color" and low-income populations suffer disproportionate harm from waste sites, refineries and incinerators, transport infrastructures. In 1991, the 17 Principles of Environmental Justice were proclaimed.

2.- Environmental racism. USA. Rev Benjamin Chavis, 1982. The fight for EJ, against pollution in Black, Hispanic, Indigenous areas, was seen as a fight against environmental racism.

3.- Ecological debt. Instituto Ecología Política, Chile, 1992, Acción Ecológica 1997. Rich countries' liability for resource plunder and disproportionate use of space for waste dumping (e.g. GHG). (Warlenius et al., 2015.Pope Francis, *Laudato si,* paragraph 51, 2015).

4.- Popular epidemiology. Brown, P. 1987, 1997. "Lay" local knowledge of illnesses from pollution may be more valid than official knowledge (sometimes absent).

5. Environmentalism of the poor. A.Agarwal/ S. Narain (CSE, Delhi) c. 1989. Hugo Blanco (Peru) 1991. Struggles by poor/ indigenous peoples against deforestation, dams, mining; collective projects for water harvesting, forest conservation. "Environmental defenders" is a related term (2017) for ordinary people taking action to protect the environment, including land and water rights, not always defining themselves as environmentalists (Scheidel et. al.,2020).

6.- Food sovereignty. Via Campesina, c. 1993. People's right to healthy, culturally appropriate, sustainably produced food. Right to define own food and agriculture systems.

7.- Energy sovereignty 2014. Catalan Network for Energy Sovereignty, Xarxa per la Sobiranía Energética, inspired by La Via Campesina definition of "food sovereignty" in 1996. The right of conscious individuals, communities and peoples to make their own decisions on energy generation, distribution and consumption in a way that is appropriate to their ecological, social, economic and cultural circumstances, provided that others are not affected negatively. https://tierrayterritorio.wordpress.com/2009/08/15/foro-comunidades-indigenas-autodeterminacion-y-soberania-energetica/

8.- Climate justice. CES (Delhi), 1991, Durban Alliance, CorpWatch 1999-2002. Radically reduce excessive per capita emissions of carbon dioxide and other GHG. "Subsistence emissions vs. luxury emissions".

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9. Water justice, hydric justice. Rutgerd Boelens, EJOs in Latin America (e.g. CENSAT). 2011. Water should not run towards money, or towards power. It should go to those needing it for livelihood. E.g. in Catalonia the slogan *Lo riu és vida* against the transfer of water from the Ebro River (Boquera Margalef, 2007), and in Valencia the movement *Xúquer Viu.*

10. Water as human right. Pablo Solon (Bolivian envoy to UN), Maud Barlow (Council of Canadians), 2001. Human Right to Water recognized by UN as independent human right 2011.

11.- *Hidrocracia*. Movimiento Colombiano en Defensa de los Territorios y Afectados por las Represas: Ríos Vivos (2011). MAPDER (Mexico) MAB (Brazil). *Hidrocracia* is used to characterize the politics in the hydroelectric business in Colombia, opposed by Rios Vivos. https://censat.org/es/noticias/colombia-se-constituye-movimiento-rios-vivos-de-afectados-por-represas

12.- "Damn the dams", slogan, songs, documentary by Jack Palermo, 2018 (Conn., USA) on damn removal; documentary (2012) with tiltle *Iste Böyle*. Damn the Dams, directed by Oslem Sariyildiz (Turkey); documentary, Greenpeace, 2016, Damn the damn, Keep the Tapajós river alive. (Brazil). Also song on the Manapouri damn in New Zelanad (against bauxite smelting). The expression was used also in struggles in Pulangi River, Mindanao, Philippinnes, in Alberta, Canada, etc. http://www.indiawaterportal.org/articles/damn-dams-say-displaced

13.- "Green Deserts". Brazil, network against eucalyptus plantations, *Rede Alerta contra o Deserto Verde*, 1999. Brazilian local term for eucalyptus plantations, used by networked CSO and communities, also by researchers and activists for any tree plantation.

14.- Tree Plantations are not forests. *Pulping the South*, 1996 by R. Carrere, L. Lohmann. The World Rainforest Movement WRM collects and spreads information on tree plantation conflicts, proposing a change in the FAO definition of forest, to exclude tree monocultures. Lohman (1996): ordination of trees, practiced against tree plantations (such as eucalyptus) by Buddhist priests and ecology movement from Thailand.

15.- Land grabbing. GRAIN (small pro-peasant EJO), 2008. The wave of land acquisitions in Southern countries for plantations for exports, leading to first statistics on land-grabbing.

16.- Resource caps. Resource Cap Coalition, RCC Europe, c. 2010. It advocates reduction in global resource use and in poverty. It calls for a European energy quota scheme and the ratification of the Rimini protocol.

17.- To Ogonize / Yasunize. ERA Nigeria, Acción Ecológica, Oilwatch, 1997-2019. "Leave oil in the soil" to prevent damage to human rights and biodiversity, and against climate change. Other slogans: "leave col in the hole", "leave gas under the grass". http://www.ejolt.org/2013/05/towards-a-post-oil-civilization-yasunization-and-other-initiatives-to-leave-fossil-fuels-in-the-soil/

18.- Blockadia. Oil Watch (1997). Naomi Klein's book on climate change (2014). Resistance movements against fossil fuels for "glocal" reasons, north and south. Against oil and gas pipelines (Canada and USA). Documentary by the Seneca Nation of Indians entitled "Denying Access: NoDAPL to NoNAPL".

19.- Rights of Nature. Ecuador: 2008 Constitution, art 71, pushed by Acción Ecológica and Alberto Acosta. Actionable in court cases.

20.- Corporate accountability. Friends of the Earth International, 1992-2002. At UN Johannesburg 2012 summit, FoE proposed the adoption of a Corporate Accountability Convention, against lukewarm CSR principles. Corporate lack of liability or "corporate social irresponsibility" would be accurate terms.

21.- "Critical mass", bicycle rights. San Francisco 1992 (Chris Carlsson). International movement reclaiming the streets, cyclists marching together to impose cyclists rights. "We are not blocking the traffic, we are the traffic".

https://ejatlas.org/conflict/first-critical-mass-san-francisco-history-of-an-organized-coincidence-a-celebration-and-protest

22.- Urban "guerrilla food gardening", c. 2000, started by "food justice" networks (USA; UK). Vacant lot food growing, permaculture, community gardening movements in cities around the world. Related to US so-called "Food Deserts", with only fast food chains and corner-store marts. Unavailability of fruits, vegetables, and meats cooked without frying oil.

23. -Urban waste recycling movements. c. 2005, GAIA against incineration and "energy valorization" of urban waste. Unions or cooperatives of urban waste-pickers, waste gatherers, with their positive environmental impact (movements in Delhi, Pune, Bogota and elsewhere). WIEGO alliance. https://ejatlas.org/featured/wastepickers

24.- "Zero-waste" movement (GAIA). Movement promote the redesign of industrial "life cycles" so that all products are reused, avoiding trash sent to landfills or incinerators. The process recommended is one similar to the way that resources are reused in nature.

25.- Toxic colonialism, toxic imperialism. BAN, Basel Action Network, c. 2000. Fighting the long-distance export of waste from rich to poor countries, forbidden by Basel Treaty, e.g. ship-breaking in South Asia, chemical or nuclear waste, e- waste.

26.- Post-extractivism. Latin America, 2007, E. Gudynas (CLAES), A. Acosta, Maristella Svampa Against the reprimarization of LA economies. Transition to a sustainable economy based on solar energy and renewable materials. Bans, quotas and taxes on raw materials exports.

27.- *Buen Vivir*, *Sumak Kawsay*. Ecuador and Bolivia 2008. Adopted in Constitutions of both countries, inspired by indigenous traditions and by the "post-development" approach.

28.- Indigenous territorial rights, and prior consultations. Convention 169 of ILO, 1989; Adivasi forest rights in India. Used in conflicts on mining, oil exploitation, dams… Communities ask for applying legislation defending indigenous rights.

29.- "Sand mafias". Name given c. 2005 by environmental movement, journalists. The illegal "mining" of sand and gravel in India in many rivers and beaches, driven mainly by the growing building and public works industry, also by sand mining for metals (e.g. ilmenite). A world phenomenon.

30.- Cancer Alley (Louisiana US). Cf the documentary film "Fuel" by Josh Tickell. Also e.g. https://ejatlas.org/conflict/mossville-louisiana-environmental-racism-united-states. In 1987, when residents in primarily African-American and low income, noticed the abundance of cancer cases within their communities, "Cancer Alley" was named. It grew to encompass an 85 mile stretch between Baton Rouge and New Orleans,known as the "petrochemical corridor".

31.- Toxic activists. Ph. Brown, 1993 in the context of popular epidemiology. Refers to laypeople who organize themselves to build knowledge to establish causal relations between a disease and toxic pollutant.

32.- Sacrifice zones. Steve Lerner wrote the book *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States* 2010. The term is used elsewhere, e.g. in Chile #NomaszonasdeSacrificio. https://www.latercera.com/nacional/noticia/quintero-puchuncavi-la-zona-sacrificio/295044/

33.- "Cancer villages" 癌症村，áizhèng cūn. Also "pneumoconiosis villages (尘肺病chénfèi bing). In China, name adopted by academics, officials (Lora-Wainright, 2013, 2017). Rural villages where industry caused pollution (e.g. heavy metals), where lay knowledge of illness is relevant, and subdued protests take place. *Ecologia Política* n. 56 (by Juan Liu, 2018).

34.- P-ainful X-ylene, p-Xylene (para-xylene). Since the first protest happened in Xiamen China 2007, over ten anti-PX protests in the whole country, including Dalian, Maoming, Ningbo, Jiujiang, Zhangzhou, Chengdu, Kunming, Shanghai Jinshan have been recorded (in the EJAtlas).

35.- CO2lonialism. Co-produced by activist and scholars. In 2000, Norwegian environmental organisation Norwatch published a first report (Eraker, 2000). Promotes a progressive decolonising climate agenda.

36.- *Ende Gelände*. (Enough!) Alliance of people from the anti-nuclear and anti-coal movements, the Rhineland and Lausitz climate camps and the Hambacher Forest anti-coal campaign from 2015. Movement against lignite mining in Germany, civil disobedience, direct action against open cast mines, motivated by climate change mainly.

37.- *Grands Projets Inutiles Imposés* (GPII). Name given to a network in Europe since 2012, with meetings in Nantes, Stuttgart, Rosia Montana (Romania) against large "superfluous" public works (e.g. TAV between Turin and Lyon) or open cast mining projects. (Burballa-Noria, 2019).

38.- *Proyectos de muerte*. (Projects of Death). Used in Mexico against open cast mining, hydropower for the mining industry, and fracking projects, particularly in the Sierra Norte de Puebla

39.- Chipko Andolan (Chipko movement). Movement in the 1970s of saving trees in the Himalayas by sticking to them (Chipko), was applied again in Odisha in 2018 (to protect an old sal forest). Also in Appiko mvt (Karnataka). https://ejatlas.org/conflict/brewery-project-destroying-jhinkargadi-forest-in-balarampur-village-odisha-india

40.- *Koyla satyagraha*. In 2016's Gandhi Jayanti, over 1400 people from 25 villages in Raigarh district of Chhattisgarh participated in the fifth Koyla Satyagraha, a movement claiming rights over land, forests and resources in this coal mining region. A new term and form of action, in which the local people extracted coal manually, and submitted the money earned to the national treasury, claiming, 'If the government wants the coal beneath out land, we will give it to them, but we won't part with our fertile land'. (Brototi Roy).

(Satyagraha: is a neologism invented by Mahatma Gandhi in 1906. The term comes from satya, 'truth', and agraha, 'insistence ', it represents the struggle and civil disobedience carried out in a systematic way, with ethical-political objectives and with a spiritual dimension).

41.- *Jal satyagraha*. Medha Patkar and others started Jal Satyagraha in Narmada. As the Narmada continued to rise, the Narmada Bachao Andolan launched a *jal satyagraha* to press for rehabilitation of villagers whose homes and land are submerged. (Hindustan Times 16/9/2017). The Narmada Bachao Andolan was the movement against the dams to save the Narmada River. https://ejatlas.org/conflict/dams-on-the-narmada-river-india

42. *Jaan Denge par Jameen Nai'* (We will give our lives but not our lands)/ *'Na Jaan Denge, Na Jameen'* (We will neither give our life, nor our land). The slogans highlight the attachment that people have to their land, which is often an extension of their cultural and ancestral heritage. Tthe threats of violence and death are very real. In recent years, the new slogans have become more empowering (Brototi Roy 2018. *Ecol. Pol*. 55, also Brototi Roy 2019).

43.- *Poromboke* song for the Commons. T.M. Krishna's song in 2017, complaining about the destruction of Ennore Creek, north of Chennai, by coal-fired power plants and polluting industries. Based on a paper by Nityanand Jayaraman, insisting that the meaning of the word Poromboke in Tamil is "the commons". Mangroves and beaches are commons and are being destroyed: *Poromboke ennaku illai, poromboke unnaku illai* (Poromboke is not for me, it is not for you). *Poromboke ooruike, poromboke bhoomikku* (Poromboke is for the city, it is for the

Earth). https://ejatlas.org/conflict/fishers-protest-destruction-of-mangroves-in-ennore-india

44.- Ocean Grabbing. The international movement in defence of fisherfolk. (TNI). https://www.tni.org/en/collection/ocean-grabbing. In parallel to "land grabbing", to cast new light on processes of enclosures negatively affecting communities whose cultural identity and livelihoods depend on their involvement in small-scale fishing. Ocean grabbing is meant to capture the control of fisheries by powerful economic actors.

45.- "Tragedy of enclosures". Jon Kurien, 1991. Criticism of Garrett Hardin's "tragedy of the commons" in the context of the Kerala movement of defence of local fisherfolks against outside trawlers. https://ejatlas.org/conflict/fisheries-kerala-india. Kerala Swathantra Malsya Thozhilali Federation (KSMTF) - the Kerala Independent Fishworkers Federation in South India.

46.- Fisheries Justice, inspired by the Kerala movment. A national and transversal organization (KIARA, Indonesia (People's Coalition for Fisheries Justice) established in 2003, initiated by WALHI, Bina Desa, JALA (Fishermen's Advocacy Network for North Sumatra), Federation of Fishermen Archipelago (FSNN). Coastal Links South Africa (CLSA) established in 2003 as a vehicle for small-scale fishers to secure their livelihoods and human rights. It applies to both ocean and inland fisheries. In South Africa, fishers' organisations such as Masifundise and Coastal Links, connect fishing communities across the country. They are key members of the Coordinating Committee for the transnational movement, the World Forum of Fisher Peoples (WFFP). (Mills 2018).

47.- *Zadistes.* Activists from the resistance against the airport in Nantes. *Zone à défendre* (ZAD) (Zone to be Defended), a joke on the state-sponsored acronym ZAD meaning "zone to be developed". Word introduced in France by militants calling themselves *zadistes* to refer to their long term occupation and blockade of projects such as the Nantes airport, stopped in 2018. The Nantes ZAD is an area of 1600 ha delimited in 1974 for a new airport.

48.- *Tolak reklamasi* movement, Indonesia. #ForBALI (Forum Rakyat Bali Tolak Reklamasi), a growing number of NGOs, artists and Balinese people concerned with the preservation of their island. The weekly demonstrations organised by Banjars (local communities), multiple banners and billboards show the artistic talent and determination of the people to be heard (Sara Mingorría). https://ejatlas.org/conflict/tolak-reklamasi-bali-indonesia

49.- "Stay grounded" network, stay-grounded.org. Over 30 EJOs by 2018, and growing. Global network to counter aviation launched by local airport opposition groups, climate justice activists, NGOs, trade unionists, academics, groups supporting alternatives like night trains, supporting communities which struggle against offset projects or biofuel plantations.

50.- *Justiça nos trilhos*, "justice in the railways". Marcelo Firpo Porto et. al.. 2013. Against the loss of life in accidents caused by massive iron ore transport by railway to the export harbours in Brazil.

51.- *Paremos de fumigar* ("stop fumigating"). Madres de Ituizango in Cordoba, Argentina. Movement against agricultural GMO, referring to Monsanto Round Up herbicide in soybean production. https://ejatlas.org/conflict/monsanto-and-soy-monocultures-argentina

52-. Biopiracy. RAFI (Pat Mooney) 1993, popularized by Vandana Shiva. Appropriation of genetic resources (in medicinal or agricultural plants) without recognition of knowledge and property rights of indigenous peoples.

53.-Biocide. Rachel Carson (1963) in *Silent Spring*. "These non selective chemicals have the power to kill every insect, the 'good' and the 'bad,' to still the songs of the birds and the leaping fish... they should not be called insecticides but *biocides*." Through Carson's crusade, biocides like DDT were banned but new chemicals like neonicotinoids and similar "systemic" insecticides/ biocides have taken their place.

54.- Ecocide. Zierler, 2011. As the public increasingly questioned the war in Vietnam, a group of US scientists

deeply concerned about the use of Agent Orange started a movement to ban what they called "ecocide".

55.- Environmental disruption. International Symposium on Environmental Disruption in the moderm world, held under auspices of the International Social Science Council (Paris) in Tokyo, March 8-14, 1970. A term was first used interchangeably with the Japanese term Kogai (book by Shigeto Tsuru). "Environmental disruption" was used in the 1970s by economist K.W. Kapp (who asserted that externalities were not market failures but cost-shifting successes).

56.- *Kogai.* After many instances of industrial pollution in Japan (Ashio copper mine around 1900), in 1955 the word *kogai* meaning pollution was introduced (S. Tsuru, 1999) gaining wide currency, covering pollutions of all kinds and undesirable side effects of economic activities.

57.- "No Nukes" / No Nukes but Children (要孩子不要核子yào háizi bùyào hézǐ). Anti-nuclear movement of the 1960sand 1970s, strong in the US, France, Germany. Also in Japan, Korea, China, Taiwan and elsewhere. In Chinese slogan is related to two conflicts in Guangdong and Jiangsu, China. (Juan Liu).

58.- *Clear water and blue mountains are mountains of gold and silver// Lucid waters and lush mountains are invaluable assets* "绿水青山就是金山银山"(lǜ shuǐ qīngshān jiùshì jīnshān yín shān). In many environmental protests in China, people will hold banners with this sentence to legitimize their demonstrations or street marches in front of the local government. (Juan Liu).

59.- "Collective stroll" or "go for a walk"(散步，sànbù or集体散步，jítǐ sànbù). A euphemism for "demonstration" or "protest". Like "sipping tea" –a meme in social media or chat room of discretely taking part in verbal disclosure of some valuable, interesting or useful information. The listeners quietly sips tea as they drink in the information also. There are similar forms of protests in other countries. "We Walk" activists carried anti-junta protest from Bangkok to Khon Kaen. https://isaanrecord.com/2018/02/14/we-walk-activists-protest-bangkok-khon-kaen

60.- *Nemagon nos mata* (Nemagon Kill us) (DBCP). Central American movement, asking for reparations for damage to the health from use of DBCP in banana plantations. Strong in Nicaragua. (Grettel Navas)

61.- *Nos semences, nos savoirs, Monsanto ne passera pas par nous.* (Our seeds, our knowledge, Monsanto will not pass over us). Slogan against GMOs (Monsanto Bt cotton) in Burkina Faso https://ejatlas.org/conflict/the-retreat-from-monsanto-bt-cotton-burkina-faso

62.- *Faucheurs volontaires*. (Volunteer mowers), against GMO, a French movement (similar actions took place in Germany, Portugal and UK). 6,700 militants committed to destroy the test plots of GMO crops in the open field. On 5 June 1999, a group led by José Bové entered the Center for International Cooperation in Agronomic Research for Development (CIRAD) in Valletta, near Montpellier, and destroyed a greenhouse in which a European research project was conducted. ttps://fr.wikipedia.org/wiki/Faucheurs_volontaires

63.- *Sin maíz, no hay país*. In Mexico, 300 EJOs, peasant movements, workers unions, human rights, women's and food organizations, joined on June 25, 2007 to launch the National Campaign "Without Maize, there is No Country" defending food sovereignty, the reactivation of the countryside, and criticizing the use of GMOs. https://www.jornada.com.mx/2017/07/15/opinion/015a1pol

64.- SLAPP, a strategic lawsuit against public participation (SLAPP). A lawsuit is started by a company against environmentalists, to censor and intimidate them by burdening them with the cost of a legal defence until they abandon their criticism or opposition.

14. Conclusions

The EJAtlas is basically an archive of ecological distribution conflicts that took place in the last decades or are taking place now at the commodity extraction frontiers or at the waste disposal frontiers. The EJAtlas is a product of the grassroots counter-movement for environmental justice, and at the same time a tool for researching its contemporary history and support its presence across world regions and cultures. The EJAtlas contains valuable information on the cultural expressions of such conflicts. It also provides coded materials for research on comparative, statistical political ecology. One of its main purposes is to lift the curtain of invisibility over worldwide movements for environmental justice or "liberation ecology" (these are names that look at the aims of the movements) or the environmentalism of the poor and the indigenous, ecofeminism, subaltern environmentalism, the environmentalism of the dispossessed, peasant or agrarian environmentalism, working-class environmentalism, the environmentalism of "peoples of color" (names that look at the actors).

It is not obvious that such an archive as the EJAtlas should exist. It came from our own initiative. The records of environmental conflicts are not stored in official files open to research. Police records will be useful in future, at state level, if they are well preserved. Also judicial archives, in some cases. Corporations' archives may provide evidence in due course of their own awareness of unacknowledged environmental liabilities and even of their practices of "counter-insurgency" to eliminate environmental defenders (Dunlap, 2019). But no official body shows so far any sign of interest in building up such an archive. The ILO publishes statistics on strikes but nobody in the UN (or UNEP) was willing up to now to sponsor a worldwide archive of environmental conflicts. Global Witness (an NGO) started to publish statistics on killed environmental defenders, not the UN and not even the UN Rapporteurs. Global Witness had not the means to record also the wounded, the jailed, the displaced and the frightened, so it specialized on deaths of environmental defenders. Its valuable work has had a social impact and been used by academics. Other activists with close links to the environmental movements of the poor and the indigenous such as OCMAL with its map of mining conflicts in Latin America, Fiocruz with the Marcelo Firpo Porto's and Tania Pacheco's map of environmental and health injustices in Brazil, and other NGOs with other inventories (the CSE in India), promoted such maps and archives. We imitated them. After eight years of academic and activist work at ICTA UAB the EJAtlas is now recognised as a tool useful in the field of comparative, statistical political ecology (Scheidel et. al., 2020) and for teaching in undergraduate and graduate courses in the environmental social sciences in a wide range of countries (Walter et. al., 2020). It can also be used for courses in business administration and management and as a guide to investors focusing on Corporate Social Irresponsibility and non-compliance with ESG standards (Maher, 2020; Riera and Iborra, 2017). In particular, corporate managers are supposed to give primacy to the financial interests of shareholders. Hence the systematic lack of acknowledgement of environmental liabilities (Kapp, 1950). They also know that in the extractive industries they need in practice a SLO, "social licence to operate". The CSR is geared to building good relationships with affected stakeholders to increase material and energy extraction, or to dispose of waste without opposition. There are many recent calls for "responsible management" attending to the demands of diverse stakeholders (shareholders, managers, employees, communities, and different varieties of environmentalists), all with different values. The EJAtlas provides thousands of examples of value system contests in ecological distribution conflicts involving private or public businesses.

Political ecology studies ecological distribution conflicts, and it puts biophysical reality (increased material and energy flows, climate change, increased HANPP and loss of biodiversity) at the centre of politics (Temper, 2016, on the HANPP). 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 or marginalized and repressed.

On the other hand, from the traditional Left, we got 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. Moreover, the marginalised groups referred to as "subaltern" by Gayatri Spivak cannot be heard because, to start with, they cannot speak across the enormous gulfs of coloniality and racism which certainly exist in the world. Spivak's "Can the Subaltern Speak?" questioned the ability of the silenced, colonised, invisible groups to make their voices heard without distortion. "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 for what sometimes is called "subaltern environmentalism".[11] This variety of environmentalism is really the same as environmental justice and the environmentalism of the poor and the indigenous, the "people's environmentalism" or *ecologismo popular* made so visible in the EJAtlas. When an indigenous group manages to stop a conflictive mining 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, composed of 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 social actors, similar forms of mobilization and also of repression when confronting similar public or private companies, similar allies. All of these movements, no doubt, with local characteristics (Aguelovski and Martinez-Alier, 2014). 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).

Thus, the Pastoral da Terra in Pará, Brasil, is a movement born from "liberation theology", and it is similar in its support for environmental struggles to the role of some Catholic bishops in the Philippines, and similar also although different in some respects from Buddhist support for environmental activists in some Asian countries, and also similar but different to the defence of "sacred groves" in some conflicts on biomass extraction in India.

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[11] For instance, R. Sreejith Varmas, 2019, *The Subaltern Environmentalism of Mayilamma. Reading and Translating Mayilamma: The Life of a Tribal Eco-Warrior* (on the Plachimada struggle in Kerala against Coca-cola, and its leader, Mayilamma). http://ala.keralascholars.org/issues/13/mayilamma/. Or Diacronie. Studi di storia contemporanea in April 2020 call for papers on *"Can the Subaltern Speak" through the Environment? At the confluence of Environmental History and Subaltern Studies.* https://www.studistorici.com/2020/01/31/cfp-44_en/

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. Many local protests create ad-hoc local support groups that sometimes form networks; normally they are not supported by strong formal environmental organizations (Kousis et. al., 2008). 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 of failure in stopping projects and in changing policies, and not so much the names of ephemeral or lasting organizations.

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, oblivious of the entropy law and 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 todays. 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 increase today (until 2020 at least). To old issues of miners safety and health and conditions of work there is now the added argument of "climate justice".

There is a world counter-movement against the exploitation of raw materials and the disposal of waste based on local instances of resistance. It should find allies in the smaller movements in the global North preaching "prosperity without economic growth" or Degrowth (Martinez-Alier, 2012). The social actors in this world movement for environmental justice deploy many different valuation languages, their values are often incommensurable (at least to start with) with money valuation of damages. Political ecology and ecological economics advocate the acceptance of different valuation languages to understand such conflicts. Who has the power to reject valuation languages such as sacredness, livelihood, 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? (Martinez-Alier, 2002).

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). Their names are important, because indigenous identity is one of their main instruments of self-defence (Hanacek et. al., 2020, for the Arctic). As the pressure on the natural environment and human livelihoods increase, there are more and more ecological distribution conflicts. They occupy central stage in today's society and economy often overlapping with gender, ethnic, social class, geopolitical conflicts, and hopefully will occupy soon central stage in political philosophy and politics (Charbonnier, 2020). Making old or emergent EDCs more visible through the EJAtlas contributes to placing political ecology and socio-environmental justice at the centre of politics.

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