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The limitations of IR theory regarding the environment: lessons from the Anthropocene

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Abstract

Despite its relevance in the global arena, the environment does not receive the attention that it deserves within the discipline of International Relations (IR). An analysis of all of the articles published in 20 journals of relevance in IR between 2004 and 2014 supports that environmental issues have largely been disregarded. This article traces IR's distant attitude towards the environment to its conventional disciplinary structures, arguing that the planet's new conditions challenge the discipline's dominant theory. It is suggested that, by rewriting itself and embracing the Anthropocene concept, IR may enhance its relevance and strengthen its impact. Recognizing uncertainty, abandoning the nature-society dichotomy and adopting a post-anthropocentric perspective are some of the possible pathways presented for the future of IR.

Keywords: Anthropocene, IR theory, environment, discipline, uncertainty, nature-society dichotomy, post-anthropocentrism

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Introduction

For the last few years, it has been my empirical belief that the environment, despite its relevance in the global arena, does not receive the attention that it deserves in the field of International Relations (IR). This perception is shared by some of my colleagues. In 2015, Keohane normatively referenced the scant attention paid by political scientists to climate change. However, during an international conference a few months ago, my empirical belief was called into question by some participants who believed that environmental issues were not undervalued.

Given these opposing perceptions - and even though there are extraordinary environmental groups in the International Studies Association (ISA) and in the British International Studies Association (BISA) - I decided to attempt to test whether

environmental issues are overlooked in IR and to provide some statistical evidence that could help clarify this issue. A careful analysis of all of the articles published in the 20 journals of relevance in IR between 2004 and 2014, and a review of the publications list of the 20 most influential scholars in IR, indeed reveals that environmental issues are largely disregarded. Thus, it is unsurprising that the much more complex phenomenon of the Anthropocene rarely is discussed in IR. This is problematic for numerous reasons that I will discuss in this article, departing from remarkable earlier and recent work in the field (see, for instance, Harold and Margaret Sprout's emblematic work, *Ecological Perspective on Human Affairs with Special Reference to International Politics* (1965); Burke et al. 2016; Nicholson and Jinnah 2016).

I believe that IR's distant attitude towards the environment is related to its conventional disciplinary structures - that is, IR's enduring definition as a sub-discipline of Political Science (PS) - which do not allow this field to address the multidimensionality and complexity of global environmental issues. I advocate and stress the need for IR to reimagine itself outside PS and embrace the concept of the Anthropocene epoch, not only to ensure its relevance and survival but also to (possibly) strengthen its impact.

The article begins with the history of IR as a discipline and the failings of which it has been accused. Then, based on these, it exposes the need and benefits from doing IR outside PS, focusing on the challenges that the Anthropocene poses to conventional pathways of scholarship, as well as on their significance for IR. After that, through the empirical analysis of the journal articles, it demonstrates that, despite all their relevance, IR has been neglecting environmental issues and the Anthropocene concept. The article concludes with a set of suggestions for alternative ways that IR might better approach the current world, highlighting the importance of reversing the field's distant attitude towards global environmental issues.

My argument is that IR may largely benefit from a greater focus on environmental issues and the Anthropocene, not only because of its increasing relevance but also because it might help IR overcome some of the failings of which it has been accused. What can IR learn from embracing the Anthropocene concept?

IR's history and failings

Authors such as Ashworth (2009) and Aalto et al. (2011) acknowledge three distinct phases of IR scholarship: an interdisciplinary era between 1919 and the 1940s, the era between the 1950s and the 1980s, when IR essentially was a sub-discipline of PS dominated by a realist paradigm, and the return to interdisciplinarity that began in the mid-1980s.

During its foundational period, IR adopted its methods and approaches from other disciplines, which can be described as the joint interdisciplinary interests and agreements of various scholars regarding the field's "international" aspect. After the Second World War, as the world moved to a bipolar system dominated by the US and the USSR, IR achieved autonomy and obtained its

disciplinary status. Academics in the US transformed IR into a sub-discipline of PS by linking it to International Politics (IP) in general and power politics among states in particular. IR adopted a state-centric approach, and the idea of the "international" became associated with a world divided by territorial boundaries into sovereign states that existed in an anarchic, competitive, and violent international system (Ferguson and Mansbach 2007). This era was the golden age of realism in IR theory. In terms of methodologies, positivism/rationalism was the dominant approach. The use of historical evidence was the closest IR had to interdisciplinary practices, so IR explained a world based on the assumptions that were unique to it (Ashworth 2009). In the 1980s, however, many scholars started to highlight IR's isolation and its inability to address a world in which states and power politics were no longer the only subjects to define the "international". The end of the Cold War and the acceleration of globalization, with all of its new and complex challenges, revealed that realism and rationalism were insufficient to explain an "international" that was constantly reinventing itself as new actors and new problems emerged (Darby 2010; Shayan 2013). There was a call to integrate the theoretical and methodological insights of other disciplines and fields. Interdisciplinarity has once more been established. Nevertheless, IR remains located within PS. As Rosenberg (2016, 2) stresses, "IR has never been established as a field *in its own right*. (…) It emerged as an extension of Politics or Political Science and has remained trapped within a borrowed ontology." The author calls this confinement "the prison of PS" and underlines the need to re-imagine IR outside this prison. Actually, many scholars have pointed towards the enduring definition of IR as a sub-discipline of PS as the reason behind some of the discipline's failings.

In 2001, Buzan and Little (2001, 21) discussed IR's insularity, claiming that its "theory has not travelled extensively or far across disciplinary boundaries." According to those scholars, the harder IR attempted to be a discipline, that is, to remain within the PS realm, the greater its failure. Brown (2013, 485) also touched upon this issue, claiming that "the exchange between our discipline and the rest of the social/human sciences is pretty much one-way, and not in our favour." In 2014, Baron revisited the problem, adding empirical evidence to Buzan and Little's proposal and confirming that IR had to do more to have an impact on the disciplines from which it drew. Nevertheless, he also stressed that IR had its greatest interdisciplinary influence in the 1990s, when it was embracing new philosophies and methodologies that challenged the realist paradigm.

In not mentioning IR's lack of influence outside its own academic territory, and in examining the magnitude of contemporary transformations, Dalby (2011) asserts that despite all of IR's efforts to expand in terms of its actors, theories and methodologies, it has been unable to keep pace with the scale and speed of the 21st century. In that author's view, this occurs because the hegemony of PS structures persists, undermining IR's ability to address the conditions of the modern world. In fact, as Kavalski (2015a) emphasizes, "it appears (…) that two-and-a-half decades later, the innovative spark that invigorated (…) [the] proliferation of views [in IR] has petered out (…) [and] IR has not abandoned its "old habits". IR scholars still do not seem conscious of the limitations of IR's mainstream agenda. As Crawford (2016, 264-5) states, "today, disciplinary IR lives out its past" while scholars should be "further open[ing] the discipline to broader conceptions of ontology,

epistemology, and method." This tendency towards adhering to traditional comfort zones in IR, despite efforts to expand and renew its horizons, has been named "returnism" (Heng 2010).

Another failure attributed to IR is that it was unable to predict the end of the Cold War, the emergence of China as the next potential global hegemon, or the attacks of 9/11 (Cudworth and Hobden 2011). This argument is problematic because the dominant rationalist theory in IR asserts that future events can confirm statements made by theories, thus verifying and corroborating them. Essentially, IR claims to be able to do something that it has failed to do regarding the most important trends and events in IP. As Cudworth and Hobden (2011) note, to a certain extent, IR has never recovered from its failure to predict the Cold War. This contributes to the idea of IR as a "backward social science" both inside and outside of its domain. However, as we shall see below, predicting the future should not be IR's aspiration.

IR in an increasingly complex and uncertain world

In the 21st century, almost all of the world's phenomena occur in open systems, which means that they are created by a variety of causal structures, mechanisms, processes, and fields (Bhaskar 2010). This phenomenon contrasts with Newton's assumption of a "closed system." Newton assumed predictability by not considering outside effects (the underpinning of a closed system) on his object of study; he developed numerous equations that could be applied to and explain the real world. His model was successful and dominated the natural sciences, where it is easier to isolate variables to reveal causal consistencies (Wight 2015).The social sciences should not adopt Newton's model, because real-life situations are open systems (Gigch 1974). However, they have done so anyway, and IR is no exception. IR tends to present "explanations premised on assumptions of predictability rooted in the conviction that international life is a closed system, changing in a gradual manner and following linear trajectories, which can be elicited through discrete assessments of dependent and independent variables" (Kavalski 2015b). The attempt to make IR more robust and reliable by adopting models from the natural sciences undermines its ability to address the increasing complexity of world affairs. In other words, IR is not prepared for unpredictability. The complexity of the challenges that humanity currently faces and the awareness that discontinuity is an extremely important feature of international interactions (Bernstein 2000) form a "cognitive punch" (Adler 2005) that leads to the need of reinventing traditional disciplines. Under the disciplinary structures of PS, IR seems to be "chained" to the parochialist and imperialist features of conventional disciplines, which Sayer (2000, p.7) highlights as "a recipe for reductionism, blinkered interpretations, and misattributions of causality." In line with this idea, Næss (2010) uses the expression "disciplinary tunnel vision" to advocate a new attitude towards knowledge. Indeed, as Grenier (2015, 250) asserts, the socio-political function of disciplinary status "reflects understandings of an academic discipline's appropriate approaches to knowledge production, ontologies, and applications" that are uniformizing and intolerant and therefore inappropriate in the current world. According to Whitley (2000),

traditional disciplines are reputational organizations, and they link a scholar's positive reputation to the ability to contribute to the disciplinary structure. If one does not want to be excluded from the discipline, one must fit into its conventional framework. Disciplines thus promote "self-censorship" (Sayer 1999), which might explain why, despite efforts to expose IR to new modes of thinking, IR continues to return to its old frame, that is, monodisciplinary dogmatism.

In an increasingly complex world, the right to think inventively, to refuse fragmented and isolated analyses, and to favor holistic approaches, thus establishing a comprehensive picture of reality that enables uncertainty to be creatively addressed, is mandatory (Cornell 2010; Parker 2010). Nevertheless, as Næss (2010) notes, holistic approaches are rare in both the academic and the political worlds. This is a weakness considering that we now live in a "full world era" (Costaza 2010) in which interconnections are increasingly complex and intense. This phenomenon is perfectly consistent with the "international" aspect of IR studies. As Baron (2015,260) notes - and I completely agree - "attempts at defining (…) [IR's] parameters, set[ting] out its limits, and identify[ing] its normal modes of research, are ultimately futile." The "international" has been constantly expanded, and even if one tries to remain within the statist, political, and rationalist domains imposed by PS, the fact that every phenomenon of the "international" occurs in open systems makes it almost impossible not to transgress those limits. Otherwise, one cannot provide real interpretations and strategies. Consequently, the understanding of the human condition demands new forms of scholarship. IR should abandon the traditional grounds upon which it is based because the current "international" notion demands not only a holistic conception but also new ontologies, epistemologies, and methodologies. Moreover, this attitude is fundamental to surpass mere academic pursuits, to embrace problem solving (Yetiv 2011), and consequently, to focus on real-word problems and change the world (Brown 2013; Cox 2010; Lake 2013) which should be a priority for academia.

Furthermore, it should be noted that IR often is located at the apex of multiple levels of socio-political aggregation depending on what occurs at lower levels (Lebow 2008) and is concerned with the world's most urgent and critical problems (Carr 2001; Keohane 1988; Waltz 2001). In this sense, I would say that IR almost aspires to occupy a sort of god-like position inasmuch as it wishes to see everything, know everything, and have the power to change the course of events (in the sense of insatiable curiosity, not superiority). The truth is that many choose to study IR because it addresses some of humanity's most fascinating dilemmas: deep down, we wish to resolve these dilemmas and make a difference. Kennedy-Pipe (2007) touches upon this idea when she asserts that IR scholars and students want to make sense of the world and understand the greatest challenges of our time because those challenges are real, important, and affect everyone's lives. If this is the case, breaking with conventions becomes even more important. Poverty, terrorism, climate change, and many other issues are impossible to realistically address in the absence of a holistic and non-Newtonian approach (Ruggie 1998). IR needs "to run freely, to be playful, to toy around with what might seem absurd, to posit seemingly unrealistic circumstances and speculate what would follow if they ever were to come to pass" (Rosenau 1980). To embrace this philosophical, theoretical, and methodological freedom, IR should free itself from the restrictive "chains" of PS.

Maybe because of its considerable newness, it may be easier for IR to embrace experimentation and transform itself in light of the new challenges and conditions of the 21st century. I believe that the greater intellectual freedom earned by abandoning PS may help IR become a "forward social science". Moreover, this path is fundamental for IR to embrace the new geological conditions that confront humanity. Nothing challenges traditional disciplines more than the Anthropocene concept.

Why the Anthropocene is significant for IR

The emergence of a new geological epoch entirely dominated by human activity, i.e., the Anthropocene, makes the destinies of nature and humanity inseparable, thus breaking with not only the Cartesian dualism between the natural and social worlds (Arias-Maldonado 2013; Crutzen and Stoermer 2000) but also with the divided discourses between the natural sciences and the social sciences and humanities. The benign epoch of the Holocene, the relatively stable period of Earth's history when human civilizations prospered[1], gave rise to a much more uncertain, unstable, and dangerous one. Central to the Anthropocene concept is the claim that humans have become a dominant force in global environmental change (Rockström et al. 2009) on "a scale comparable with some of the major events of the ancient past" (Zalasiewicz et al. 2010, 2228). In other words, in this new epoch, humans are incorporating new biophysical factors into the biosphere and by doing so, they are changing the physical framework that regulates the functioning of the global system's[2] major processes (Steffen et al. 2007). The Anthropocene concept transcends the simple idea of human environmental impact and draws attention to the role of humans in the subversion of the global system. Humanity is reshaping the planet (Dalby 2014a), and climate change is perhaps the primary indicator of this post-Holocene world (Crutzen and Stoermer 2000). According to Zalasiewicz and Vidas (cited in Arighostiles 2015), we are on the edge of still-greater changes. Some of these human-produced developments are unprecedented in Earth's history and operate in complex and uncertain ways. In the authors' words (cited in Arighostiles 2015), "as human institutions try to come to terms with a rapidly evolving global system, the Anthropocene will be a defining factor in 21st-century policy." Similarly, Dalby (2011, 143) asserts that "the global political agenda for the twenty-first century will be about how to live in the Anthropocene."

1 It is informally said that the Holocene is the period between the end of the last Ice Age and the mid-20th century. No formal boundary has been set between the Holocene and the Anthropocene because the supposed distinctiveness and endurance of the Anthropocene remain to be measured. However, in August/September 2016, the Working Group on the Anthropocene (AWG)—part of the Subcommission on Quaternary Stratigraphy, a constituent body of the International Commission on Stratigraphy—presented a summary of evidence on the Anthropocene. The AWG is composed by 35 members and 34 say that the Anthropocene is stratigraphically real; 30 agree that the Anthropocene should be formalized (University of Leicester 2016).

2 According to the UNEP's *Global Environmental Outlook* (UNEP 2012, 195), 'the Earth System is a complex social-environmental system, including the vast collection of interacting physical, chemical, biological and social components and processes that determine the state and evolution of the planet and life on it. The biophysical components of the Earth System are often referred to as spheres: atmosphere, biosphere, hydrosphere and geosphere. They provide environmental processes that regulate the functioning of the Earth, such as the climate system, the ecological services generated by the living biosphere, including food production, and natural resources like fossil fuels and mineral. Humans are an integral part of the Earth System'.

Biermann (2014) draws attention to the political essence of this new geological epoch, highlighting that it creates, modifies, and enhances multiple relationships of interdependence among human societies and generations. The Anthropocene generates a) a new dependence among states, inasmuch as even the most powerful states are not free from the negative consequences of poor environmental practices in places outside their national jurisdictions; b) a new dependence among societies as every global policy offers innumerable methods of local implementation with different levels of efficiency; c) new intergenerational dependencies caused by changes in the global system that occur over large time periods, so the measures taken now will have an unprecedented effect on future generations in an entirely new manner; d) an enhanced idea of a "risk society" due to the of the uncertainty that surrounds many of the transformations and outcomes in the global system, which complicate the process of policy-making; and e) a new challenge for poverty eradication in a largely unequal world because environmental protection measures may conflict with efforts to solve poverty issues.

Bousquets (2015) goes further and highlights not only the possibility of the extinction of the human species if environmental problems are not properly addressed but also the need for a radical reinvention of our societies. Actually, ecologists and biologists are discussing whether the Earth is entering a sixth great extinction phase (Kolbert 2014). This is the first great mass extinction danger that confronts humanity since the Cold War era's nuclear threat to extinguish the human species, to which IR paid enormous attention (Keohane 2015).

Therefore, human interactions are transforming the global environment, and by doing so, they are shaping the future conditions for international relations. This means that IR scholars and policymakers will have to discuss political issues in geological language because the traditional premises of a stable environment are no longer valid. This also means that we collectively must consider the type of planet that humanity is creating (Dalby 2015). Moreover, IR scholars must remember that geopolitics is no longer exclusively about how the environment shapes humanity; increasingly, it is also about how humanity is shaping its environment (Dalby 2014b).

Given the complex and multidimensional threats to our common environment, it is possible to say that environmental issues are creating a "new global (dis)order" (Pereira 2015) or to discuss "the meltdown of the global order" (Johnson 2015). This is the Anthropocene in action. This topic undoubtedly concerns IR, even if one considers it a subfield of PS and links it exclusively to IP. Although developing responses to the new conditions of the Anthropocene requires much more than the study of interstate political negotiations, the study of such negotiations is an important part of the question. However, the very nature of global environmental issues and the essence of the Anthropocene both disturb and challenge IR's dominant structure.

The world of the Anthropocene is very different from the one in which IR was constructed as a discipline. First, as we have seen, the Anthropocene world is one of open systems and although order may not be rejected, disorder assumes a very important role. IR is unaccustomed to being open to uncertainty, preparing for failure, and thinking the unthinkable (Rosenau 1980), which assumes an environment of chaos (Mayer 2012). IR traditionally seeks to explain phenomena by assuming

linearity, using a small number of variables, and aspiring to predict international developments. In the Anthropocene, the ability to imagine multiple alternatives and devise unconventional strategies is mandatory (Morin 2006), thus requiring a holistic perspective. The Anthropocene epoch is also a world in which states cannot be the only objects of analysis and in which the environment cannot be perceived as a stable scenario for states to pursue their interests. The "international" of the Anthropocene comprises the interactions between human, sociopolitical, nonhuman, and biophysical elements. As Cudworth and Hobden (2015) note, environmental security can no longer be concerned with providing security for something "out there" but should instead focus on reorienting human activities because humans are now geological agents, and our common existence is dependent on our actions. This requires a new ontology and ethics of the "international" that, without removing humans from the top, entangles humans, nonhumans, and objects (Burke et al. 2016; Cudworth and Hobden 2013; Mitchell 2014; Salter 2015; Youatt 2014;) and their multiple interactions. Nevertheless, as Bousquet (2015) notes, IR remains deeply anthropocentric in its analysis, and this observation generally has not been criticized. These are the reasons that Kavalski (2015b) asserts that IR "needs to rethink many of its core beliefs if it is to maintain its relevance."

This may explain why, as we shall see below, IR scholars have been overlooking global environmental issues and are scarcely discussing the Anthropocene.

Providing statistical evidence and unveiling opportunity

To test whether the environment is overlooked in IR, I believe that it is important to ask two questions: 1) How many articles directly related to the environment have been published in very relevant IR journals? and 2) Are environmental issues studied and discussed by the most influential IR scholars?

Answering question 1 first required a definition of which and how many journals would be analysed, along with the timeframe to be considered. For the difficult task of selecting the most influential IR journals - and seeking the broadest possible analysis - I based my selection on three aspects: 1) several types of impact measures calculated using the two most valued and recognized databases in the academic world, namely, Web of Science (WoS) and Scopus; 2) the 2008 and 2011 TRIP surveys of IR scholars, which focus on the journals that the respondents believed publish articles with the greatest influence on how IR scholars think about international relations; and 3) the Google Scholar database, given its recent emerging relevance (see the detailed selection criteria in table 1). Regarding the timeframe, considering that the world since 2005 has witnessed many relevant natural and international events[3] which increased international awareness of environmental issues, a decade-long analysis between 2004 and 2014 was chosen. Based on the time spent in the first analysis, a review of 20 journals (table 2) was considered as an achievable goal so that this study could be concluded in a timely fashion.

3 This includes large fires in the US and Australia, the first hurricane in the South Atlantic, severe droughts and floods in various regions of India and Africa, the release of the IPCC's AR4, and Al Gore and the IPCC's 2007 Nobel Prize (Viola 2009).

Table 1. Detailed summary of the revised journals selection criteria.

Variable	2009 - 2014		2004 - 2008	
	Selection criteria	**Journals selected**	**Selection criteria**	**Journals selected**
1	A and B and C and D and E and F and G and H and I	2	A and B and C and D and E and F and G and H	3
2	A and B and E and F and G	7	A and B and E and F and G	6
3	A and B and H	2	A and B and H	2
4	(A or B) and H	2	(A or B) and H	1
5	(any E, F or G) and H	2	(any E, F or G) and H	0
6	(any C or D) and H	2	(any C or D) and H	3
7	(any A or B) and I	1	A or B	2
8	(any E or F or G) and I	1	H	3
9	greater predominance in the parameters under evaluation	1		
A	2014 Top 20 JCR for International Relations (5-year Impact Factor)		2009 Top 20 JCR for International Relations (5-year Impact Factor)	
B	2014 Top 20 Eigenfactor for International Relations		2009 Top 20 Eigenfactor for International Relations	
C	2014 Top 20 JCR for Political Science (5-year Impact Factor)		2009 Top 20 JCR for Political Science (5-year Impact Factor)	
D	2014 Top 20 Eigenfactor for Political Science		2009 Top 20 Eigenfactor for Political Science	
E	2014 Top 20 SJR for Political Science and International Relations		2009 Top 20 SJR for Political Science and International Relations	
F	2013 Top 20 SJR for Political Science and International Relations		2008 Top 20 SJR for Political Science and International Relations	
G	2012 Top 20 SJR for Political Science and International Relations		2007 Top 20 SJR for Political Science and International Relations	
H	2011 Top 20 TRIP Worldwide Survey		2008 Top 20 TRIP Worldwide Survey	
I	2015 Top 20 Google Scholar for Diplomacy and International Relations			

Source: Elaborated by the author (2015).

Table 2. Selected journals.

Rank	2009 - 2014		2004 - 2008	
	Journal	ISSN	Journal	ISSN
1	Journal of Peace Research	0022-3433	Journal of Conflict Resolution	0022-0027
2	Journal of Conflict Resolution	0022-0027	Journal of Peace Research	0022-3433
3	International Studies Quarterly	1468-2478	International Studies Quarterly	1468-2478
4	InternationalOrganization	1531-5088	Review of International Political Economy	1466-4526
5	World Politics	1086-3338	International Security	1531-4804
6	European Journal of International Relations	1354-0661	International Organization	1531-5088
7	International Security	1531-4804	Foreign Affairs	0015-7120
8	JCMS - Journal of Common Market Studies	1468-5965	World Politics	1086-3338
9	Conflict Management and Peace Science	0738-8942	European Journal of International Relations	1354-0661
10	Foreign Affairs	0015-7120	Review of International Studies	1469-9044
11	Review of International Political Economy	1466-4526	International Affairs	1468-2346
12	International Affairs	1468-2346	Survival	1468-2699
13	Review of International Studies	1469-9044	American Political Science Review	1537-5943
14	Millennium: Journal of International Studies	1477-9021	American Journal of Political Science	1540-5907
15	Security Studies	1556-1852	The Journal of Politics	1468-2508
16	American Political Science Review	1537-5943	Studies in Comparative International Development	1936-6167
17	American Journal of Political Science	1540-5907	JCMS - Journal of Common Market Studies	1468-5965
18	Security Dialogue	0967-0106	Foreign Policy	0015-7228
19	Washington Quarterly	1530-9177	Millennium: Journal of International Studies	1477-9021
20	Perspectives on Politics	1537-5927	Security Studies	1556-1852

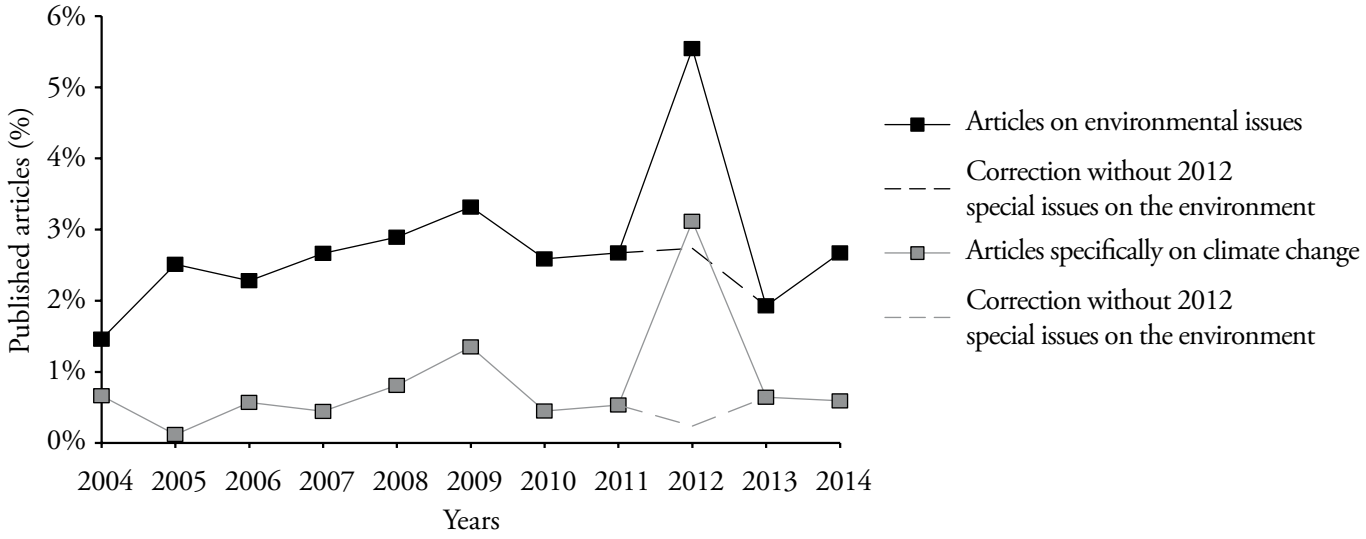
Source: Elaborated by the author (2015).

It should be noted that a) for the journal selection, it was useful to divide the timeframe into two parts as two TRIP surveys were given on different occasions and due to the distinct essence of the impact measures considered, which have different time periods[4]; b) Google Scholar was considered for the second timeframe because of its recently emerging importance; and c) the WoS database has a dedicated category for IR, but as IR also is considered a subfield of PS, the journals in the PS category were also included.

Based on reading the title, abstract and keywords of all of the research articles published in those 20 journals between 2004 and 2014 (9,680 articles), I identified those with content that undoubtedly was focused on environmental issues. A summary of the results of this analysis can be found in Figure 1.

4 For example, the 5-year Impact Factor from the 2014 Journal Citation Reports (JCR) is based on the WoS database and consider articles published from 2009 and 2013; the same applies to the Eigenfactor, which is also based on WoS but integrates a different calculation algorithm following logic similar to that used by Google for ranking websites; the SCImago Journal and Country Rank (SJR) is based on the Scopus database with 3 time windows, so the 2014 ranking considers articles published from 2011 and 2013.

Figure 1. Published articles directly related to environmental issues in the selected journals.



Source: Elaborated by the author (2015).

Looking at Figure 1, one can see an outlier in 2012 related to the existence of two special issues on the environment: "Climate Change and Conflict" in the *Journal of Peace Research* (49, no. 1) (JPR); and "Rio+20 and the Global Environment: Reflections on Theory and Practice" in *International Affairs* (88, no. 3) (IA). If one omits these two special issues, it is clear that the number of articles on environmental issues published in the selected journals was fairly constant throughout the 10 years studied. In general, these articles represent only 2 to 3% (mean: 2.5%) of all published articles. With respect to articles directly related to climate change, which is considered the primary indicator of the Anthropocene and the most multidimensional, global, and pressing issue of all environmental problems, the number of articles drops to less than 1% (mean: 0.6%). These results reveal a low prevalence of environmental articles in major IR journals, a trend that did not change for 10 years. As mentioned above, 2012 was the only exception and even in that year articles on environmental issues represented fewer than 6% of all articles. It should be noted that the word "Anthropocene" did not appear in any of the titles, abstracts, and keywords of the articles analysed.

To answer question 2, I used the results of the TRIP survey of 2011, namely, the list of 20 scholars who were considered by the respondents as having had the greatest influence on IR in the past 20 years (Table 3).

Table 3. The most influential IR scholars in the past 20 years.

Rank	Scholar
1	Alexander Wendt
2	Robert Keohane
3	Kenneth Waltz
4	Joseph Nye
5	John Mearsheimer
6	James Fearon
7	Samuel Huntington
8	Robert Cox
9	Barry Buzan
10	Peter Katzenstein
11	Bruce Bueno de Mesquita
12	Robert Jervis
13	Stephen Walt
14	Stephen Krasner
15	Martha Finnemore
16	John Ikenberry
17	Bruce Russett
18	John Ruggie
19	Susan Strange
20	James Rosenau

Source : Malinak et al. (2012, 49).

Focusing on these scholars' CVs, and specifically on their publication records, it can be concluded that Robert Keohane is the only IR scholar from this list who writes about environmental issues;[5] none of the others' work is devoted to these themes. However, I have not found any reference to the Anthropocene in Keohane's work.

The summary of these results seems to corroborate the empirical perception that the environment is an overlooked subject in IR. This is very odd for at least two reasons: first, environmental issues are increasingly important in international relations (Pereira 2015); second, the apex in which IR is often located links it to the study of the world's most urgent and critical problems - the global management of our common environment is, after all, one of the most global and pressing challenges that confronts humanity. Nevertheless, there is another important aspect that should be assessed: impact.

To assess impact, one question needs to be answered: how many articles on environmental issues published in all PS/IR journals between 2004 and 2013[6] are among the top 100 most-cited articles of each of those years for these same journals? Because "highly cited articles can be published in lower-ranked journals, whilst many articles published in top-ranked journals fail to gather a substantial number of citations" (Harzing 2010, 2), and to avoid exclusions that may

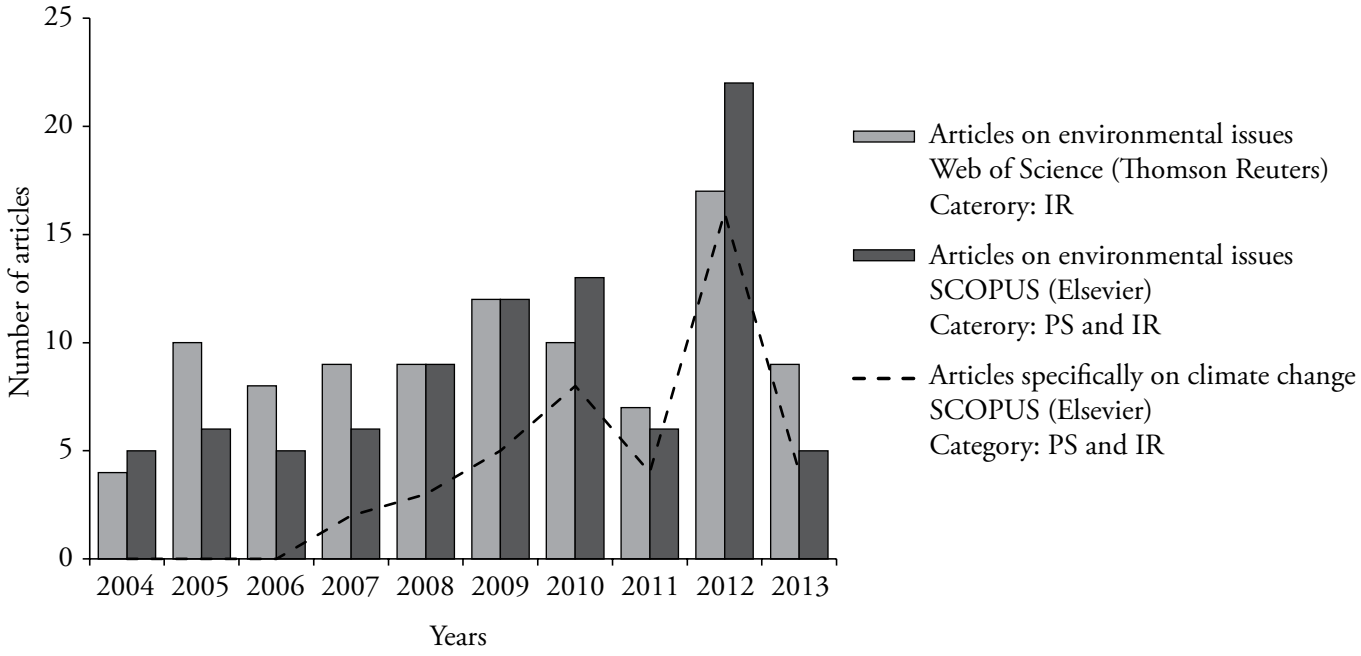
5 See, for instance, Keohane and Raustiala (2009); Keohane and Victor (2011); Ovodenko and Keohane (2012).

6 2014 was excluded because the data are too recent for this type of analysis.

undermine the analysis, all of the articles in all of the journals that fall into the category of IR (in the case of WoS) and PS and IR (in the case of Scopus) were considered.

As shown in Figure 2, articles on environmental issues are fairly well represented among the 100 most-cited articles for each year, taking into account all of the journals in the IR category in WoS and the PS/IR category in Scopus. However, the most important and interesting aspect of this analysis is that although few articles have been written on the environment, those articles were not "forgotten". In fact, as confirmed by their sustainable appearance in the ranking of the 100 most-cited articles each year (in an evident correlation with the data presented in Figure 1), they were widely cited, even though they competed with a much larger number of articles on several other IR-related subjects.

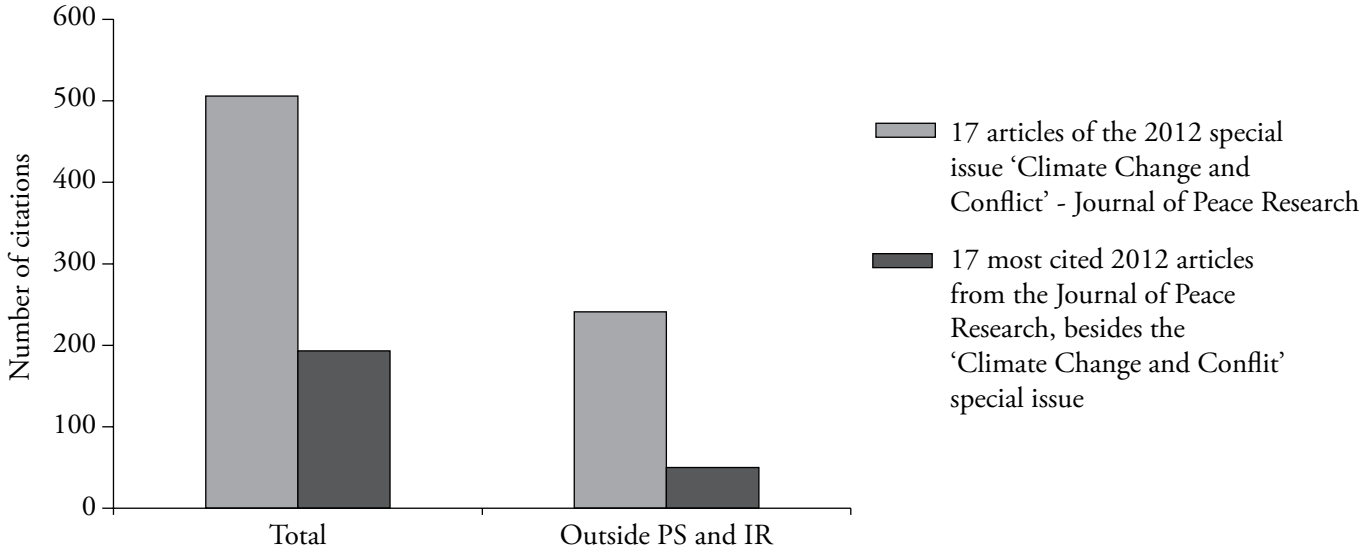
Figure 2. Number of articles on environmental issues in the Top 100 most-cited articles in PS/IR journals — impact. Data: WoS and Scopus as for September 13, 2015.



Source: Elaborated by the author (2015).

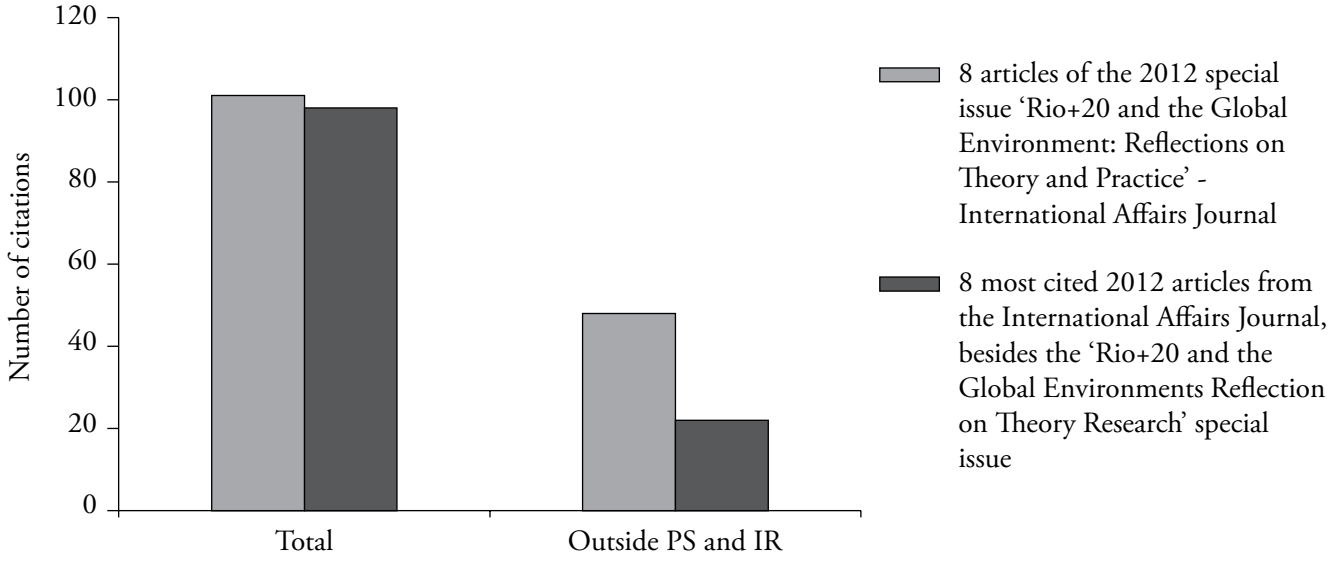
Led by these interesting results and considering that IR has little or no impact in other disciplines, I decided to search for the level of impact of some of the analysed articles on environmental issues outside of the PS/IR categories. To this end, I focused on the year 2012 (when the two special issues on environmental issues were published) and compared the performance of a) the 25 articles of the two special issues on the environment - 17 in JPR and 8 in IA; and b) the other articles published in the same journals that same year. This analysis was conducted exclusively with the data from the WoS. These results were perhaps the most impressive of all (Figures 3 and 4).

Figure 3. Citations analysis from the 2012 *Journal of Peace Research*. Data: WoS as for November 25, 2015.



Source: Elaborated by the author (2015).

Figure 4. Citations analysis from the 2012 *International Affairs* journal. Data: WoS as for November 25, 2015.



Source: Elaborated by the author (2015).

Comparing the 17 articles in the special issue of JPR with the 17 most-cited articles in 2012 published in that same journal, only 3 of the 17 most-cited articles are not from the special issue on the environment. If one examines the 24 most-cited articles of that year, one finds all 17 articles from the special issue. The 17 most-cited articles of JPR in 2012, excluding the 17 from the special issue, accounted for 193 citations; the 17 articles of the special issue accounted for 506 citations (approximately 2.5 times as many citations).

When attempting to assess these articles' impact outside PS/IR based on an analysis of the number of citations in journals outside the PS/IR category of WoS, the results are even more striking. The 17 most-cited articles of JPR in 2012, when the 17 from the special issue are excluded, accounted for 50 citations, whereas the 17 articles of the special issue accounted for 241 citations (approximately 5 times as many).

Of the other journal's (IA) 8 most-cited articles in 2012, 4 are from the special issue, and 2 of these are the most cited of all. An examination of the 19 most-cited articles of that year reveals that all 8 articles of the special issue are included in that group. In terms of the total number of citations within the PS/IR journals, the difference is virtually nonexistent. The IA's 8 most-cited articles in 2012, excluding the 8 from the special issue, accounted for 98 citations; the 8 articles of the special issue accounted for 101 citations. However, when one seeks to assess those articles' impact outside PS/IR, one finds that the 8 most-cited articles, excluding the 8 from the special issue, accounted for 22 citations; the 8 articles from the special issue accounted for 48 citations (approximately 2 times as many).

Even if it is fair to say that some issues are disseminated more rapidly than others, it should be noted that with respect to the impact on journals outside PS/IR, the difference already appears to be too overwhelming to be reversed. Is IR less insulated when it devotes itself to environmental matters? Is this because IR deviates from archaic disciplinary structures when it analyses global environmental issues? I cannot say for sure, but this would be an interesting analysis to conduct.

What can IR learn from embracing the Anthropocene concept?

Returning to the question I asked at the end of the introduction to this article, namely, "What can IR learn from embracing the Anthropocene concept?", there are numerous points that I would like to stress. First, the awareness of the Anthropocene's uncertainty, instability, and unpredictability may help IR realize that the development of predictive capabilities should not be the goal of any of the current social sciences. Past actions, experiences, and institutional designs are not a valid guide for a no-analogue future. Nonlinearities, unexpected change, and feedback effects are key features of the Anthropocene (Crawford 2016; O'Neill 2016; Young 2016). The recognition that failure is natural may, on the one hand, free IR from the burden of its failure to anticipate because this realization will lead to the abandoning of the naïve assumption that there is a static world outside which is ready to be completely discovered and perfectly anticipated. Conversely, IR will be encouraged to identify and prepare for various alternative futures. Instead of searching for the "one truth", IR should be open to the existence of many truths. As Godet (cited in Godet and Durance 2011, 170-1) assertively observes,

"the future is open, thus any form of prediction is tantamount to fraud(…)[so] good anticipation is not predicting what will happen but rather that which leads to action. (…) [Science should] enlighten our actions in the context of possible futures."

This is exactly what IR should be doing: honing its ability to imagine multiple scenarios and develop different skills for distinct situations, providing iterative responses and leading informed actions would certainly strengthen IR's scientific relevance.[7] This will only be possible if IR pursues the most complete picture of reality, which requires the abandonment of archaic assumptions of disciplinary unity and segregation.

This leads us to IR's second teaching. In the Anthropocene, no science will survive in isolation or through a selfish search for elements that suit its own disciplinary interests. Just as humanity will need to engage in unprecedented cooperation if it is to preserve the planet and its own survival as a species, the various sciences will likewise have to join to counter challenges with unforeseen force. The Anthropocene reveals how the humanities, social sciences, and natural sciences are all linked. Indeed, "the collapse of the distinctions between humanity and nature and the growing recognition of the importance of processes, systems, information, and codes in contemporary explanations suggest a world in which the traditional disciplines do not fit" (Dalby 2011, 143). This teaches IR that there is an unbreakable link between the social and natural spheres, an understanding that is fundamental if IR is to guide informed action in an epoch in which human actions are the dominant force driving global environmental change. Hence, IR will have to abandon one of the central organizing logics upon which much of its security discourse is built, i.e., the nature-society dichotomy (Fagan 2017; Inoue and Moreira 2016). Humanity is now a geological agent, so our security and survival depend on our own actions. Threats to security are no longer limited to outside agents, because the human development paradigm, that is, the dominant capitalist modes of production and consumption, are transforming nature into the greatest enemy humanity has ever faced.[8] Moreover, it should be noted that the security concept was defined under the stable environmental conditions of the Holocene. Consequently, the environment was merely considered the scenario in which human events and conflicts took place. Nevertheless, the environmental instability associated with the new conditions of the Anthropocene transforms the environment into humanity's greatest enemy. Besides, it is very likely that extreme environmental events that have the capacity to destabilize the entire international system take place. Threats such as climate change, water scarcity, ocean acidification, and biodiversity loss and extinctions put the security and survival of the human species at risk (Viola and Basso 2016).

zFinally, all of these lessons from the Anthropocene may make the IR community realize that it must reinvent itself to survive. A turn that breaks with disciplinary self-censorship and encourages creativity will be essential. However, for IR to take advantage of the Anthropocene, it will have to abandon its distant attitude towards the environment. Moreover, and given the urgency of the planetary reality, IR scholars will also have to create "problem-solving" theory (Brown 2013). The discipline seems to be deeply abstract, having little relevance and failing to respond to real-world threats (Erskine and Booth 2016; Sylvester 2016). The articles published

7 For an example of "scenario-building" in IR, see Pereira (2013).

8 For this reason, the term "Capitalocene" has emerged as an alternative conceptual framework.

in *Global Environmental Politics* also corroborate this fact: "GEP scholars are clustering around ever-smaller academic debates, potentially alienating them from policy and activist communities (and at times, even from other academics)" (Dauvergne and Clapp 2016). For a discipline that is explicitly devoted to security and survival on a global scale, this is a huge limitation. To be relevant under the new planetary conditions, IR will have to abandon many of its key beliefs.

Conclusion

In writing this article my aim was to provide numbers that would raise awareness among IR scholars, highlighting that they should be paying more attention to global environmental issues and the Anthropocene because of its potentially positive impact on IR development. I have traced IR's distant attitude towards the environment to its definition as a sub-discipline of PS, arguing that the world of the Anthropocene challenges IR's dominant structure. I have also pointed out a number of IR's core assumptions that need to be abandoned if the discipline wants to maintain its relevance and contribute to the issues of security and survival on a global scale.

I believe that the discussion and results presented in this article possibly may introduce an agenda for future research. As we have seen, and although the analysis presented in this article is based on a sample of segments within databases that have their own limitations, I think that this is a solid and reliable groundwork that allows us to see that IR has been overlooking the study of environmental matters. Examining the issue from different angles allowed me to find evidence and trends that support this perception. However, my results concerning the impact of IR's articles on environmental issues outside the PS/IR categories should be explored. It would be interesting to make a qualitative analysis of those articles and assess whether they deviate from PS structures and follow a more creative line. Why are they being so cited? Why are they travelling so much to other disciplines? Does IR produce something more valuable when it devotes itself to the environment? It seems a valid hypothesis that should be tested. Furthermore, I hope to begin a discussion about how IR might respond to the Anthropocene challenge and what alternative pathways of scholarship should look like in a complex and anthropocentric world. I think that this article may serve as a basis for the beginning of a dialogue about the future of IR in theoretical, methodological, and organisational terms.

In this uncertain epoch, one thing is certain: to keep pace with the environmental, social, economic, and political challenges presented by the Anthropocene, IR will have to rewrite itself.

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The limitations of IR theory regarding the environment: lessons from the Anthropocene (Erratum)

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Third, IR scholars will certainly understand that the "international" is composed of much more than the interactions among states or human beings. Exclusively state-centric and anthropocentric analyses will become increasingly obsolete in the Anthropocene because they will lack a whole range of actors, i.e., natural and material actors, which play a significant role in the complex web of global interactions. However, the "state-centric blindness" of IR still persists, making it difficult to notice other types of actors and developments in the international system. The articles published in the prestigious journal *Global Environmental Politics* corroborate this fact. As Dauvergne and Clapp (2016, p.3) note, those who publish in that journal "focus on formal state-based environmental governance (…) [dealing with] regimes or international agreements as a primary thematic focus, with topics ranging from how to measure the effectiveness of regimes to why

states chose to ratify or oppose specific treaties." This is problematic because, since humans and nature are inseparable, humans, non-humans and biophysical elements interact with each other. This means that events are not only the result of human agency and humans cannot fully control the world (Connolly 2011). Furthermore, as Mitchell (2014, 5) highlights, "harm does not happen to humans in isolation, but rather to worlds composed of diverse beings." In IR, humans and their well-being are the ultimate subjects of security. Therefore, non-humans are instrumentalized to the point that even the superfluous needs of human beings are placed above the survival of non-humans. Hence, post-anthropocentrism is essential. Since humans and nature are one, a new ethical approach is needed, one that values non-humans not only because they are valuable to humans, but also because their existence should be respected and preserved. Only by recognizing the intrinsic value of living beings, and through a fair share of the planet between humans and non-humans, humanity will be able to create a "safe operating space" for itself.