sustainability

MDPI

Commentary

No Net Loss: A Cultural Reading of Environmental Assessment

Jordi Puig [1,2], Ana Villarroya [1,2,*] and María Casas [1,2]

[1] Department of Environmental Biology, School of Sciences, University of Navarra, 31008 Pamplona, Spain; jpbaguer@unav.es
[2] Biodiversity and Environment Institute, 31008 Pamplona, Spain; mcasasj@unav.es
* Correspondence: avillarroya@unav.es; Tel.: +34-948425600 (ext. 806625)

Abstract: Global environmental quality decline builds up through innumerable decisions at many scales that cause damage to ecological and social values. Environmental assessment (EA) is a relevant decision-making framework in this sense. Besides its technical role, EA has a cultural side we should consider in the pursuit of sustainable societies. Despite its limited reach, EA exemplifies and confronts some cultural implicit stances that may unwittingly favor the overall decline of environmental quality, and limit the advancement and efficiency of EA. Many of these cultural traits are well known and easier to point to than to reverse, namely: (1) too tolerant-to-damage standards of environmental protection and equality; (2) inadequate criteria to assess environmental performance; (3) tolerance of the net loss of environmental quality; (4) confrontation between ecological and social values in decision-making; and (5) neglect of full, in-kind compensation of environmental impacts. EA may have not only a technical or procedural, but also a cultural role to play in confronting these sources of unsustainability. A lack of attention to the cultural causes of environmental impacts neglects the deepest roots of environmental damage. This commentary addresses the topics above and brings attention to their disregard for environmental values, which should guide EA towards increased levels of sustainability.

Keywords: environmental impact assessment; net environmental damage; offsets; externalization; restoration; culture of reparation; environmental ethics

Citation: Puig, J.; Villarroya, A.; Casas, M. No Net Loss: A Cultural Reading of Environmental Assessment. *Sustainability* **2022**, *14*, 337. https://doi.org/10.3390/su14010337

Academic Editor: Antonio Miguel Martínez-Graña

Received: 23 November 2021
Accepted: 27 December 2021
Published: 29 December 2021

1. Introduction: The Cultural Roots of Environmental Assessment

Born with the United States National Environmental Policy Act, environmental assessment (EA) is nearing half a century of existence. By the beginning of the 2000s there were already over 100 laws and policies that regulated how EA operates in countries worldwide [1]. Regarding the Sustainable Development Goals (SDGs), EA fosters both ecological aims (such as SDGs 14 and 15) and social aims (such as SDGs 6, 9 and 10). EA aims to ensure that the environmental implications of some policies, programs, plans, or projects be considered before decisions are made. Consequently, EA has a dual nature: both procedural and technical or scientific [2]. Moreover, there is a cultural side to consider in EA: how it is implicitly understood as currently practiced. This aspect is important to understand EA's present role and advance how to adjust and guide it towards the pursuit of sustainable societies (as stated in the Brundtland's Report).

Since its inception, EA has materialized a sustained rise on environmental impact awareness [3]. Environmental and, particularly, EA regulations have evolved with science advancements towards increasing standards of environmental protection [4]. Environmental changes (including both social and ecological impacts (e.g., [5,6]), formerly unnoticed or not perceived as negative, have become environmental impacts no longer acceptable [3,7]. Some of them have been reverted on occasion. This is not just a technical matter, but also a cultural evolution. Moreover, the cultural side of EA is twofold: EA is both a product of present culture and an actor in shaping it.

Any EA system has to ascertain whether a negative environmental effect is tolerable. A key challenge of any socio-ecological transitioning to sustainability [8] is to attain it by progressively raising environmental standards that foster the mitigation of those negative environmental effects. To promote a culture of sustainability, EA performance and environmental practice should decrease progressively the present-day tolerance to socio-ecological damage. This tolerance changes over time as discernment does: it is dynamic and sensitive to education and cultural context [9,10]. Albeit slowly, citizens and societies are becoming increasingly conscious and committed to fight the damage caused by their own way of living. This builds up to a climate of growing environmental concern that implicitly demands EA step up its performance.

In attending this cultural call to foster environmental respect, the best criterion to assess EA effectiveness should be the level of respect to the multiple values discovered in the environment. Does EA ensure the preservation of values in the real environment, or does it actually tolerate their progressive erosion? Procedures and techniques alone cannot determine how environmental standards should be set and evolve. However, by focusing on respecting values in the real environment, EA may favor best the challenge of sustainability in decision-making and through it [11]. The idea of environmental values as a guide for EA performance calls for revisiting the way we conceive our role in nature. Humans are not just capable of destroying environmental value; we can also create it. Disciplines such as ecological restoration materialize this potential.

At a global scale, present day economies fall short of reaching the desirable, sustainable respect to environmental values (see [12,13]). Economies tend to externalize much of their negative environmental effects [14], making them affect lands and peoples other than the beneficiaries of each particular piece of progress. These beneficiaries are frequently more influential than the negatively affected ones in assigning the location and tolerance to value damage. The unequal distribution of environmental quality and welfare existing across society and lands testifies to this lack of sustainability, at any scale [15–17]. Complementarily, environmental justice initiatives grow (see [18,19]) (pp. 55 and ss.). They remind us that, in a sustainable society, tolerance to environmental damage and its unequal distribution across lands and peoples should decrease and vanish eventually. How do we make progress in this direction from the limited reach of EA?

2. The Assessment of Environmental Performance

The cultural role that EA plays in fighting environmental damage may pass by partly unnoticed and be fading away. The European Directives on EA, as presently expressed by the European Commission, reads as follows:

"The Directives on Environmental Assessment aim to provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation of projects, plans and programmes with a view to reduce their environmental impact" [4].

In tune with this conception, Wood's book on environmental impact assessment (EIA) [1] depicts EIA from this viewpoint:

"It should be emphasized that EIA is not a procedure for preventing actions with significant environmental impacts from being implemented, although in certain circumstances this could be the appropriate outcome of the process. Rather the intention is that actions are authorized in the full knowledge of their environmental consequences." (p. 3)

These lines, in their own context, did not justify environmental damage. A few pages before, Wood had clarified the following:

"Effective EIA alters the nature of decisions or of the actions implemented to reduce their environmental disbenefits and render them more sustainable. If it fails to do this, EIA is a waste of time and money" (p. xvi).

These statements exemplify, a first cultural understanding of EA. They provide some criteria to assess EA performance and effectiveness over time. Measuring against that "high level of protection of the environment", what is the effectiveness of EA to date? The answer

may be ambivalent [20]. When the focus is on the effect attributable to EA implementation, there is no doubt EA has caused many positive environmental outcomes that would not have occurred with no such systems at work [1] (p.8). Environmental impact prevention and mitigation enforced throughout EA procedures are assets to account for in this respect (see [21]). Project, plan, or policy implementation denials on environmental rationale extend this positive count. Nonetheless, when the focus is on the resulting net environmental value change of the land that accommodates the EA authorized projects, plans, programs, and policies, the environmental outcome is frequently negative, which demands that we come to grips with cumulative effects [22,23]. Even when those impacts are not too large, their progressive accumulation in the environment can never be sustainable. However, also cumulative environmental assessment has its shortcomings and, just as any other form of EA, needs some cultural change to develop its full potential effectively [24]. Here looms a problem that requires a constant answer: how to put an end to the loss of environmental quality, from project to global decision-making scales, through the systems at work?

3. The Net Loss of Environmental Quality

The above quotes from the European Commission and Wood exemplify a step forward towards sustainability along the first decades of EA implementation, from a procedural and cultural perspective. However, it may be counterproductive to keep their current formulation for too long, in present-day EA policies and guidelines. Currently, EA does not avoid the progressive erosion of environmental quality [12]. "Even when every effort is made to avoid, minimize and restore, human activities can still have negative impacts on biodiversity" [25], and beyond it. Consequently, it urges to rethink the formulation of the aims of EA, and of environmental practice at large.

To attain sustainability today, "a high level of protection of the environment" seems too vague an aim. It easily compromises with some degree of damage that even resilient ecosystems cannot assimilate cumulatively and indefinitely. The door remains open to an equivocal or loose EA implementation that results in net damage to the environment. The aim that, during the first stages of EA, manifested political wisdom—yet seeking at its core to promote progressively an ever-higher level of environmental care—may now become a hindrance to preserve environmental quality, if not put to date and reformulated in a more demanding way.

The cultural role of EA, implicitly present at its birth, goes beyond the environmental assessment and decision-making on any specific policy, program, plan, or project. EA should commit itself to approach sustainability [12]. Contrarily, many cultural instances consent net environmental damage or take it for granted, as inevitable, even in the name of welfare [26]. The European Commission itself is aware of this problem, addressed explicitly in its Biodiversity Strategy [27]. Should EA, a tool specifically born to safeguard the protection of the environment, compromise with net loss of environmental value? Arguably, not.

Tolerance with net damage may have been instrumental temporarily in introducing and consolidating EA systems. However, it renders them less efficient than they must be at present to attain sustainability. As the global environmental quality declines, EA practice has a substantive opportunity and responsibility in ruling out of its reach any compromise with net environmental damage tolerance. EA systems face the challenge to lead environmental culture towards replacing in full and in every instance all the environmental quality taken out from any given environment, and thus avoid any kind of damage accumulation and externalization. From a deeper perspective, EA systems may help us materialize the constructive side of human nature.

Present day economies have provided much wealth and welfare to an increasing number of people. For many, there is ample reason for optimism [28]. From a contrasting point of view, the finitude of the planet raises enormous concern over the present and future of the poorest societies, and of the Earth itself [29]. Aware of the planetary boundaries as we are, we cannot keep on accumulating negative impacts in our natural environment.

The economically dominant system knows how to obtain revenue out of the land and the planet at large. However, it causes net damage that denies sustainability. Therefore, EIA and EA sit at the core of a challenged yet mainstream culture of externalization, as the climatic crisis exemplifies. The cultural endeavor for the present time should not be only to ensure richness to a growing number of people or to enrich certain lands. It should consist of accomplishing this without causing any residual or externalized impact. In this global context, EA should pursue the enrichment of each piece of living land involved in every decision-making instance, and of all the people that may depend on it [30].

The aim of sustainability goes beyond the reach of any EA system. However, EA shares in the responsibility to transition culture towards sustainable standards. In the face of global unsustainability and value decline, it is increasingly difficult to justify EA systems—not to mention any environmental culture—that compromises from the start with net value loss. A cultural change towards sustainability requires discussing increasingly—and eventually banning from practice—tolerance of net damage to the environment. This is difficult to attain effectively, especially within a dominant worldview that does not emphasize rationality based on non-economic value [31]. EA, a tool to spearhead the environmental safeguard in decision-making, has a specific responsibility in addressing this aim foremost, and take advantage of its manageable, case-to-case operability.

EA lacks at present all this cultural conviction, as well as the theory and performing tools required to implement fully such a principle [12]. Academic efforts should address not only procedures, but also the deep roots and foundations of EA [32]. A new wisdom and operability are required to speed it up, balancing the pressing need of sustainability with the slower rhythms of cultural, technical and procedural changes and developments towards effective environmental value care. To start in this direction, EA should first not tolerate net value damage in its aims—not even implicitly. Otherwise, the prospect of sustainability will remain remote and difficult to materialize much longer.

4. The Confrontation of Social and Ecological Value

Social impact assessment (SIA) emerged with the passing of the United States National Environmental Policy Act [33]. Ecology and society provide two main poles around which the amplitude of the environment has been commonly organized or understood. Inseparable as they are, weaved together in each specific environment, their respective interests confront each other frequently, even to the point of fracture, when dissected from each other in decision-making. At root, this situation reflects an underlying fragmented cultural view of the world that limits our ability to address properly the relationships among elements of a system [31]. A common example of this situation occurs when social arguments justify damage to ecologic values in the environment, hindering good EA practice as a result. Should a given environmental agency authorize, e.g., a new quarry detrimental to the ecology of a piece of land and its surroundings, in order to secure the job posts in a nearby factory?

Human rights matter in EA [34,35], as ecology does. However, "accepting loss of biodiversity as a tradeoff for socioeconomic gains means that the global ecological deficit continues to grow" [12]. Damage to ecology accumulates when securing social gains at an ecological cost. Ecological costs may only slow down, at best, when EA just secures "a high level of protection of the environment". Unfortunately, at local scales as well as for entire regions in the world, like Latin America and the Caribbean (LAC), "progress is likely taking place at the expense of the natural environment in many cases" [36]. As irretrievable damage to the natural environment eventually depletes the natural basis of emerging economies, ecological damage leads to inequality and human rights erosion.

The implicit cultural challenge is to prevent securing social gain on ecological loss. To neglect this challenge manifests a cultural shortcoming deeply seated at the roots of unsustainability:

> "Our tools are better than we are, and grow better faster than we do. They suffice to crack the atom, to command the tides. But they do not suffice for the oldest task in human history: to live on a piece of land without spoiling it." [37] (p. 410)

To revert the cultural causes of the showdowns between social and ecological quality goes beyond the reach of EA. However, EA should fight them back, denying the authorization to projects that do not seek a complete offset of all quality loss, be it ecological or social. How to reach this scenario of high environmental demand is not clear. In any case, EA regulations should have in mind the need to adopt as soon as possible a zero tolerance policy to net quality loss on the grounds of a particular social gain and accept the challenge of "living on a piece of land without spoiling it". We need to nurture a culture of reparation that assumes environmental restoration as the basis of a new business-as-usual. EA procedures offer a very distinctive opportunity to build such a culture piece by piece, from each project, plan, program, or policy.

5. Environmental Offsets

How can EA systems foster the cultural rise of environmental standards in each decision-making instance? The mitigation hierarchy [38] establishes that the optimal sequence to confront and reverse environmental impacts should be: (1) avoid, (2) minimize, (3) restore and (4) offset, as a last resort, the damage that any project, plan, program, or policy will cause.

In most cases, even when fully applying avoidance, minimization, and restoration measures, a residual impact is unavoidable. Environmental offsets are the only means of fostering no-net-loss at this point [39]. Therefore, net environmental quality loss will remain across EA systems unless they apply fully in each decision-making instance the mitigation hierarchy. Even more, if we want to preserve the net environmental value of an area, EA should prioritize in-kind (like-for-like) compensation over any kind of trade-off, as best practice recommendations and some offset policies already do [40]. "In-kind" means that environmental gains are the same as (or very similar to) the residual losses [41]. For example, payments—which may be indispensable to compensate impacts on income—are not acceptable to offset the parallel loss of any non-monetary environmental quality (see [42]). Along these lines, zu Ermgassen and collaborators [43] warn about the detrimental ecological effects of increasing offset trade flexibility.

There are many instances where compensation operates soundly. Experiences at a variety of scales grow [44–46]. In a few decades, ecological restoration has become an essential part of the response to sustainable development of human societies [47]. However, compensation, as an applied tool, does not guarantee complete sustainability through EA implementation yet [48]. Where explicitly addressed, compensation is not always implemented soundly (see, e.g., [49]), and there is still a need to improve evidence of its effectiveness [50]. There are many cultural and technical difficulties to confront (see, e.g., [51,52]). How do we measure up what is the right amount of compensation to implement on each occasion? What is the meaning of total or complete compensation? At present, EA does not usually incorporate in-kind compensation in full [53]. Moreover, many countries lack legal requirements to offset impacts [54]. At the same time, countries that are raising the standards for approving development projects (such as the UK and their biodiversity net gain requisite) are finding a governance gap when it comes to enforcing such requirements [55]. This results in net environmental damage and externalization of costs from project level to policies on a regular basis, except on occasion [55,56].

The aforementioned shortcomings indicate that environmental compensation is frequently still more a concept, or an ineffective desire, than an applied full-fledged tool able to fight back effectively any residual impact [48]. In other words: residual impact remains, firmly. This is both a symptom and a main operating reason why EA is far from stopping net environmental quality loss in its own ambit. Even so, offsets' low rates of success should not prevent EA from demanding them. Beyond their technically limited tangible

results, offsets can at any rate constitute an effective tool to express and foster a culture of reparation.

EA needs to develop tools –following renewed, updated aims and guidelines– than can afford EA professionals with more and more detailed yet adaptive offset protocols. A culture of reparation must rise, overcoming present-day inertias that prevent compensation development. To attain it, a value-rationality is to be introduced [31]. EA regulations should aim effectively at complete compensation of all value damage and enforce it. A first step in this direction could be to enforce the preparation of complete and detailed value loss inventories in each EA case and attach to each of the items lost the offsets intended to revert that transitory value loss. A close public participation inspection would secure the application of demanding standards better in this respect.

6. Conclusions: Environmental Value and the Cultural Role of EA

The global reach of environmental challenges points towards the cultural roots of how we live on the land and spoil it. Deep cultural insights can always inspire the quest for sustainability. From contemporary ethics about technology, it has been advanced that there is a need to overcome those philosophies focused exclusively on the human being—which mostly tend to set aside the biological and environmental phenomena—or on scientific biology alone, which ignore the inner dimension of human life [57] (p.9) and the cultural world. Be that as it may, the cultural origins of environmental impacts stem from this interiority, creative and purposeful, not only of technical or procedural initiatives but of a new culture and standards. We should not focus only on reversing the immediate causes of environmental impact via scientific, technical or procedural approaches.

The cultural causes of environmental impacts permeate their physical or tangible manifestation on ecology and society. Subject to debate, difficult to notice, radical, and difficult to eradicate, these cultural causes lie behind the noticeable social and ecological impacts, somehow inseparably. Any land use is born within a cultural milieu with ingrained environmental standards. They are at work and express themselves in the specific outcomes that we identify partly as environmental care and partly as negative impacts. The coexistence of both contradictions, care and impact, reveal implicit, intangible social tolerance to environmental value damage (Section 1). It reveals as well the degree of respect—or its absence—for ecological and social values (Section 2), the capacity to identify net value loss (Section 3) and revert it efficiently (Section 5), and the need to harmonize social and environmental values (Section 4).

Present-day technological power has become as promising as menacing; it claims for a new culture to guide it that may provide voluntary restraint to human beings, in order to avoid potential disaster. Environmental performance should move beyond mere prudence, and be rooted primarily in respect [58]. To the extent that these statements of Jonas are true for present day culture, the environmental impact has been alerting us of disaster for a long time—be it local or increasingly global—and thus has been playing a key role in shaping the new culture that may eventually lead towards sustainability.

Moreover, through the growing evidence of environmental impact, EA cooperates in showing that the integrity of human essence is at stake [59]. Devaluing the land tangibly not only leads to disaster eventually, but also devalues instantly the person, institution or country, the culture accountable for the value loss. Any cultural trait damaging to the environment—as intangible as human standpoints are, at root, before becoming action or manifesting themselves in impacts—result only consequently in tangible damage on ecology and society. This damage transfers then—and is unequally distributed in—to the future or to other lands, which suffer the consequences, externalized from human inner experience that is unseen such as the wrongs of cultures.

It is debatable to what an extent EA frameworks and practice assume and foster all this cultural significance of environmental impacts on a daily basis, be it out of habit or out of intent. However, this EA cultural call remains. Difficult as it is, EA systems should adopt a more demanding cultural role than the present one: to embrace as a principle

zero tolerance with net environmental damage, nourishing a culture of reparation towards increased sustainability. This is a difficult task, which EA cannot accomplish on its own. Nonetheless, EA should not deflect this cultural role.

Author Contributions: Conceptualization, J.P., M.C. and A.V.; writing—original draft preparation, J.P. and M.C.; writing—review and editing, A.V. and M.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data sharing not applicable.

Acknowledgments: The authors want to thank the four anonymous reviewers that contributed to the quality of the paper with their insights.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Wood, C. *Environmental Impact Assessment: A Comparative Review*; Pearson-Prentice Hall: Harlow, UK, 2003.
2. Kennedy, W. Environmental impact assessment in North America, Western Europe: What has worked where, how and why? *Int. Environ. Rep.* **1988**, *11*, 257–262.
3. Lowenthal, D. Origins of anthropocene awareness. *Anthr. Rev.* **2016**, *3*, 52–63. [CrossRef]
4. European Commission Environmental Assessment. Available online: https://ec.europa.eu/environment/eia/index_en.htm (accessed on 23 November 2021).
5. Green, C.G.; Cohen, M. Tourism in ilha grande: The promises and the problems of paradise. *J. Int. Acad. Case Stud.* **2018**, *21*, 67–74.
6. Karp, D.S.; Baur, P.; Atwill, E.R.; De Master, K.; Gennet, S.; Iles, A.; Nelson, J.L.; Sciligo, A.R.; Kremen, C. The Unintended Ecological and Social Impacts of Food Safety Regulations in California's Central Coast Region. *Bioscience* **2015**, *65*, 1173–1183. [CrossRef]
7. Puig, J.; Casas, M. El impacto ambiental: Un despertar ético valioso para la educación. *Teoría la Educ.* **2017**, *29*, 101–128. [CrossRef]
8. Aiginger, K.; Schratzenstaller, M. *New Dynamics for Europe: Reaping the Benefits of Socio-ecological Transition. Synthesis Report Part I*; WWW for Europe: Vienna, Austria, 2016.
9. Hards, S. Social practice and the evolution of personal environmental values. *Environ. Values* **2011**, *20*, 23–42. [CrossRef]
10. Bogner, F.X. Environmental values (2-MEV) and appreciation of nature. *Sustainability* **2018**, *10*, 350. [CrossRef]
11. Rode, J.; Le Menestrel, M.; Van Wassenhove, L.; Simon, A. Ethical analysis for evaluating sustainable business decisions: The case of environmental impact evaluation in the inambari hydropower project. *Sustainability* **2015**, *7*, 10343–10364. [CrossRef]
12. Brownlie, S.; King, N.; Treweek, J. Biodiversity tradeoffs and offsets in impact assessment and decision making: Can we stop the loss? *Impact Assess. Proj. Apprais.* **2013**, 31. [CrossRef]
13. United Nations Environment Programme (UNEP). *Global Environment Outlook—GEO-6: Healthy Planet, Healthy People*; UNEP: Nairobi, Kenya, 2019.
14. Khovavko, I.I. Returning Environmental Impact Assessment to Its Former Role. *Probl. Econ. Transit.* **2016**, *58*, 864–875. [CrossRef]
15. Braubach, M. Benefits of environmental inequality assessments for action. *J. Epidemiol. Community Health* **2013**, *67*, 625–628. [CrossRef] [PubMed]
16. Kedron, P. Identifying the geographic extent of environmental inequalities: A comparison of pattern detection methods. *Can. Geogr.* **2016**, *60*, 479–492. [CrossRef]
17. Morello-Frosch, R.; Jr, M.P.; Porras, C.; Sadd, J. Environmental Justice and Regional Inequality in Southern California: Implications for Future Research. *Environ. Health Perspect.* **2002**, *110*, 149–154. [CrossRef] [PubMed]
18. Mies, M.; Shiva, V. *Ecofeminism*; Fernwood Publications: Halifax, UK, 1994.
19. Yakubu, O.H. Delivering Environmental Justice through Environmental Impact Assessment in the United States: The Challenge of Public Participation. *Challenges* **2018**, *9*, 9. [CrossRef]
20. Larsen, S.V.; Kørnøv, L.; Christensen, P. The mitigation hierarchy upside down–a study of nature protection measures in Danish infrastructure projects. *Impact Assess. Proj. Apprais.* **2018**, *36*, 287–293. [CrossRef]
21. Weingarten, E. Merits of a more integrated approach to environmental assessments. *Environ. Policy Gov.* **2010**, *20*, 12–29. [CrossRef]
22. Cooper, T.A.; Canter, L.W. Substantive issues in cumulative impact assessment: A state-of-practice survey. *Impact Assess* **1997**, *15*, 15–31. [CrossRef]

23. Noble, B. *OCCASIONAL PAPER SERIES NO 8—December 2010 Cumulative Environmental Effects and the Tyranny of Small Decisions: Towards Meaningful Cumulative Effects Assessment and Management*; University of Northern British Columbia: Prince George, BC, Canada, 2010.
24. Jones, F.C. Cumulative effects assessment: Theoretical underpinnings and big problems. *Environ. Rev.* **2016**, *24*, 187–204. [CrossRef]
25. European Commission No Net Loss. Available online: https://ec.europa.eu/environment/nature/biodiversity/nnl/index_en.htm (accessed on 22 November 2021).
26. Bond, A.; Pope, J.; Fundingsland, M.; Morrison-Saunders, A.; Retief, F.; Hauptfleisch, M. Explaining the political nature of environmental impact assessment (EIA): A neo-Gramscian perspective. *J. Clean. Prod.* **2020**, *244*, 118694. [CrossRef]
27. European Commission. *EU Biodiversity Strategy for 2030*; European Union: Luxembourg, 2021.
28. Pinker, S. *Enlightenment Now. The Case for Reason, Science, Humanism and Progress*; Penguin Random House UK: London, UK, 2018.
29. Jackson, T. *Prosperity without Growth. Economics for a Finite Planet*; Earthscan: London, UK, 2009.
30. Puig, J. Sensibilidad por el medio ambiente y cristianismo. *Sci. Fides* **2019**, *7*, 73–96. [CrossRef]
31. Audouin, M.; de Wet, B. Sustainability thinking in environmental assessment. *Impact Assess. Proj. Apprais.* **2012**, *30*, 264–274. [CrossRef]
32. Cashmore, M. The role of science in environmental impact assessment: Process and procedure versus purpose in the development of theory. *Environ. Impact Assess. Rev.* **2004**, *24*, 403–426. [CrossRef]
33. Vanclay, F. International principles for social impact assessment. *Impact Assess. Proj. Apprais.* **2003**, *21*, 5–12. [CrossRef]
34. van der Ploeg, L.; Vanclay, F. A human rights based approach to project induced displacement and resettlement. *Impact Assess. Proj. Apprais.* **2017**, *35*, 34–52. [CrossRef]
35. Gulakov, I.; Vanclay, F. Social impact assessment in the Russian Federation: Does it meet the key values of democracy and civil society? *Impact Assess. Proj. Apprais.* **2018**, *36*, 494–505. [CrossRef]
36. United Nations Environment Programme (UNEP). *GEO-6 Regional Assessment for Latin America and the Caribbean*; UNEP: Nairobi, Kenya, 2016.
37. Leopold, A. Engineering and Conservation. In *A Sand County Almanac and Other Writings on Ecology and Conservation*; Meine, C., Ed.; Library of America: New York, NY, USA, 1938; pp. 405–410.
38. De Jesus, J. *Fast Tip: Mitigation in Impact Assessment*; IAIA: Fargo, ND, USA, 2013.
39. Business and Biodiversity Offsets Programme (BBOP). *Standard on Biodiversity Offsets*; BBOP: Washington, DC, USA, 2012.
40. Bull, J.W.; Hardy, M.J.; Moilanen, A.; Gordon, A. Categories of flexibility in biodiversity offsetting, and their implications for conservation. *Biol. Conserv.* **2015**, *192*, 522–532. [CrossRef]
41. Villarroya, A.; Persson, J.; Puig, J. Ecological compensation: From general guidance and expertise to specific proposals for road developments. *Environ. Impact Assess. Rev.* **2014**, *45*, 54–62. [CrossRef]
42. Rowan, M. Aligning resettlement planning and livelihood restoration with social impact assessment: A practitioner perspective. *Impact Assess. Proj. Apprais.* **2017**, *35*, 81–93. [CrossRef]
43. Zu Ermgassen, S.O.S.E.; Maron, M.; Corlet Walker, C.M.; Gordon, A.; Simmonds, J.S.; Strange, N.; Robertson, M.; Bull, J.W. The hidden biodiversity risks of increasing flexibility in biodiversity offset trades. *Biol. Conserv.* **2020**, *252*, 108861. [CrossRef]
44. Bull, J.W.; Strange, N. The global extent of biodiversity offset implementation under no net loss policies. *Nat. Sustain.* **2018**, *1*, 790–798. [CrossRef]
45. Grimm, M.; Köppel, J.; Geißler, G. A Shift Towards Landscape-Scale Approaches in Compensation—Suitable Mechanisms and Open Questions. *Impact Assess. Proj. Apprais.* **2019**, *37*, 491–502. [CrossRef]
46. Rega, C. Ecological compensation in spatial planning in Italy. *Impact Assess. Proj. Apprais.* **2013**, *31*, 45–51. [CrossRef]
47. Buisson, E.; Jaunatre, R.; Regnery, B.; Lucas, M.; Alignan, J.-F.; Heckenroth, A.; Muller, I.; Bernez, I.; Combroux, I.; Moussard, S.; et al. Promoting ecological restoration in France: Issues and solutions. *Restor. Ecol.* **2018**, *26*, 36–44. [CrossRef]
48. Maron, M.; Hobbs, R.J.; Moilanen, A.; Matthews, J.W.; Christie, K.; Gardner, T.A.; Keith, D.A.; Lindenmayer, D.B.; McAlpine, C.A. Faustian bargains? *Restoration realities in the context of biodiversity offset policies. Biol. Conserv.* **2012**, *155*, 141–148. [CrossRef]
49. Brown, M.A.; Clarkson, B.D.; Barton, B.J.; Joshi, C. Ecological compensation: An evaluation of regulatory compliance in New Zealand. *Impact Assess. Proj. Apprais.* **2013**, *31*, 34–44. [CrossRef]
50. Zu Ermgassen, S.O.S.E.; Baker, J.; Griffiths, R.A.; Strange, N.; Struebig, M.J.; Bull, J.W. The ecological outcomes of biodiversity offsets under "no net loss" policies: A global review. *Conserv. Lett.* **2019**, *12*, 1–17. [CrossRef]
51. Bull, J.W.; Suttle, K.B.; Gordon, A.; Singh, N.J.; Milner-Gulland, E.J. Biodiversity offsets in theory and practice. *Oryx* **2013**, *47*, 369–380. [CrossRef]
52. Hanna, P.; Vanclay, F.; Langdon, E.J.; Arts, J. The importance of cultural aspects in impact assessment and project development: Reflections from a case study of a hydroelectric dam in Brazil. *Impact Assess. Proj. Apprais.* **2016**, *34*, 306–318. [CrossRef]
53. Global Inventory of Biodiversity Offset Policies (GIBOP). Available online: https://portals.iucn.org/offsetpolicy/ (accessed on 23 November 2021).
54. Tallis, H.; Kennedy, C.M.; Ruckelshaus, M.; Goldstein, J.; Kiesecker, J.M. Mitigation for one & all: An integrated framework for mitigation of development impacts on biodiversity and ecosystem services. *Environ. Impact Assess. Rev.* **2015**, *55*, 21–34. [CrossRef]

55. Zu Ermgassen, S.O.S.E.; Marsh, S.; Ryland, K.; Church, E.; Marsh, R.; Bull, J.W. Exploring the ecological outcomes of mandatory biodiversity net gain using evidence from early-adopter jurisdictions in England. *Conserv. Lett.* **2021**, 1–10. [CrossRef]
56. Brownlie, S.; Von Hase, A.; Botha, M.; Manuel, J.; Balmforth, Z.; Jenner, N. Biodiversity offsets in South Africa—challenges and potential solutions. *Impact Assess. Proj. Apprais.* **2017**, *35*, 248–256. [CrossRef]
57. Middle, G.; Middle, I. A review of the use of environmental offset as a policy mechanism in the environmental impact assessment process (EIA) in Western Australia. *Impact Assess. Proj. Apprais.* **2010**, *28*, 313–322. [CrossRef]
58. Jonas, H. *El principio vida: Hacia una biología filosófica*; Editorial Trotta: Madrid, Spain, 2000.
59. Jonas, H. *El principio de Responsabilidad: Ensayo de Una Ética Para la Civilización Tecnológica*; Herder Editorial: Barcelona, Spain, 1995.