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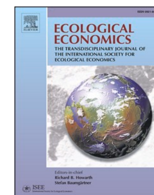

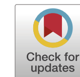

Comparative analysis of Rights of Nature (RoN) case studies worldwide: Features of emergence and design

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ABSTRACT

We provide a descriptive comparative analysis of features related to emergence and design among 14 Rights of Nature (RoN) case studies worldwide. For analysis, we develop a schematic roadmap in which we categorise RoN into case studies with public guardianship and ones with appointed guardians (termed Environmental Legal Personhoods (ELPs) with further sub-categories of indirect, direct and living ELPs). Our findings suggest that RoN case studies emerged under similar circumstances where existing governance structures had been unable to protect natural environments from continued economic (urban, agricultural and industrial) activity by multiple economic actors. The strong role of local community and Indigenous Peoples in advocacy for RoN point to a divide between in situ communities and external economic agents, allowing for eco-centric value systems to emerge in juxtaposition to existing governance structures. We find that the design of RoN, however, varies in geographical entity, legal framework, legal status and guardianship. Poorly defined liability of guardians and economic agents have led to the overturning of two case studies, which stands in contrast to well-defined rights and liabilities in other case studies, suggesting that attention to liability may be an important building block for the effectiveness of RoN to protect biodiversity.

1. Introduction

A report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) shows that ecosystem diversity is declining at rates unprecedented in human history (IPBES, 2019). According to the World Wide Fund for Nature's (WWF) Living Planet Report 2022, species abundance has declined on average by 69% since 1970 (WWF, 2022). Current governance frameworks are failing to protect natural environments, most recently leading to the Kunming-Montreal Global Biodiversity Framework in 2022 pledging to reverse ecosystem degradation. This matters because nature is irreplaceable for human life as we know it today, and new mechanisms to preserve ecosystems are in need.

One emerging concept focuses on giving rights to nature. Many Indigenous Peoples, such as Māori in New Zealand, have long emphasized the intrinsic value of nature and protection of environments through guardianship (e.g. Harmsworth and Awatere, 2013; Kahui and Cullinane, 2019).[1] In 1972, Stone (1972) proposed the idea to vest legal rights in 'natural objects' to facilitate the shift from an anthropocentric ("nature exists for men", p. 489) to an intrinsic (or eco-centric[2]) worldview ("…we may have to consider subordinating some human claims to those of the environment per se", p. 490). In 2008 Ecuador was the first country to enshrine Rights of Nature (RoN) in its Constitution. Other countries have since granted RoN, including Bolivia, U.S., Mexico, New Zealand, Columbia, Australia, Canada, India, Bangladesh and Spain, and advocacy for RoN has been growing since (see Earth Law

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[1] Similarly, deep ecologists have argued for an inherent worth of nature, played out in a long-standing debate on whether nature has instrumental value and should be protected for humans' sake, or whether it has intrinsic value and should be protected for its own sake (see e.g. Chan et al., 2016; Arias-Arévalo et al., 2017).

[2] The eco-centric worldview recognizes the intrinsic value of ecosystems, i.e. the terms 'eco-centric' and 'intrinsic' are used synonymously in this paper (e.g. Grey et al., 2018).

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Center[3] and Anima Mundi Law Initiative[4]). A dataset compiled by Putzer et al. (2022) shows that as of 2021 there were 409 RoN initiatives in 39 countries, with the vast majority of them (80%) initiated in the Americas.

At its core, Rights of Nature (RoN) frameworks represent the ability of persons to take legal action on behalf of natural ecosystems as opposed to on behalf of persons affected by environmental degradation (Stone, 1972).[5] Standard economic principles consider biodiversity loss as a negative externality, i.e. biodiversity loss is the consequence of an economic activity which affects external parties without this being reflected in market prices. Incentive mechanisms to address negative externalities include environmental taxes, tradable permits and/or direct regulations prohibiting or restricting economic activity, such as pollution laws and protected areas (Tietenberg and Lewis, 2018). All of these approaches have the benefit or wellbeing of humans as their main focus, i.e. they are anthropocentric in nature. The IPBES (2019; p.15) highlights that while policy responses to manage nature sustainably have progressed, by themselves they have been insufficient to stem nature deterioration.

The RoN concept represents a fundamentally different approach to the relationship between human activities and the natural environment in that the main focus is the health of ecosystems in its own right (O'Donnell, 2020). By being granted legal status, natural ecosystems emerge as separate entities with their own agency, in the same way that other non-human entities such as charitable trusts and organisations can exist as separate entities in law (see e.g. Micklewaith and Wooldridge, 2003, for the evolution of companies as legal entities). It can also been seen as an effort to give explicit voice to nature as an input to all economic activity alongside labour and capital which also have defined legally secured rights. Depending on the design, the RoN concept may have the potential for natural entities to exercise their agency in the economy and policy making, forcing adjustments to the societal pricing mechanism over time to include the external costs of biodiversity loss. The business ethics literature has long argued for the natural environment to be given stakeholder status to force accountability to companies and the economy for their impact on the environment (Jacobs, 1997, Phillips and Reichart, 2000, Driscoll and Starik, 2004, Laine, 2011, etc.). An example is provided by O'Donnell (2018a) who shows that the Victorian Environmental Water Holder in Australia enters the market for water permits as a competitor to other water rights holders (see more details in the ensuing analysis).

Many of the RoN case studies examined in this paper develop eco-centric in juxtaposition to anthropocentric governance systems. The number of RoN case studies worldwide is still relatively small, and it is yet too early to conclude whether they differ from current governance structures in halting the decline of biodiversity. However, as noted, RoN have the potential to contribute to this aim, and in this paper we use descriptive comparative analysis of emergence and design features across 14 documented RoN case studies worldwide to identify commonalities and differences. The literature on RoNs so far, which is growing rapidly, has mainly focused on the extent of rights in RoN, the role of Indigenous Peoples (see e.g. Talbot-Jones, 2017; O'Donnell and Talbot-Jones, 2018; Macpherson and Ospina, 2018; Talbot-Jones and Bennett, 2019; O'Donnell, 2020; Tanasescu, 2020; O'Donnell et al., 2020, etc.) and legal attributes of RoN (e.g. Maldonado, 2024; Gordon, 2018; Gindis, 2016; Hutchison, 2014; Naffine, 2012). The RoN concept is also part of the burgeoning literature in earth system law[6] (see e.g. Gellers, 2021; Kotze, 2019) and environmental rule of law[7] (see e.g. Wright, 2020).

We provide detailed descriptions of each RoN case study in an Appendix, categorised by variables of interest related to the emergence of RoN and their design. For analysis, we develop a schematic roadmap of RoN categories in which we identify RoN case studies with public guardianship and ones with appointed guardians (termed Environmental Legal Personhoods (ELPs) with further sub-categories of indirect, direct and living ELPs). Our comparative analysis highlights that features of emergence across RoN case studies share the common thread of existing governance structures having been unable to protect natural environments where either governments themselves have pushed for economic development and/or failed to protect the environment from continued economic (urban, agricultural and industrial) activity by multiple economic actors. The strong role of local community and Indigenous Peoples in advocacy for RoN point to the fundamental divide between in situ communities and external economic agents, allowing for eco-centric value systems to emerge as a solution in juxtaposition to existing governance structures.

We find that the design of RoN, however, varies markedly in the variables of geographical entity (ranging from 'nature' to specified ecosystem units), legal framework (Constitutions, Legal Acts, Court Rulings etc.), legal status (legal rights, legal personhood, living personhood) and guardianship (public, board of directors, appointed as legal entities or from existing government roles). Poorly defined liability of guardians and economic agents in particular have led to the overturning of two case studies in India and the U.S. This stands in contrast to well-defined rights and liabilities in Australia, U.S. and New Zealand, the latter of which features appointed guardians as separate legal entities (public/private non-profit legal person), with clearly defined limited liability, the ability to generate income in addition to governmental funding, and support from advisory groups comprising stakeholder representatives and scientific committees. These findings suggest that attention to well-defined liability may be important variables for the effectiveness of RoN frameworks to protect biodiversity.

2. Methods

Descriptive research design methods aim to answer questions of how, when and where but not why, i.e. descriptive studies are hypothesis producing rather than hypothesis testing[8] (see e.g. McCombes, 2023; Siedlecki, 2020 and Dulock, 1993 for a discussion of descriptive research designs commonly used in education, medicine, psychology and social sciences). Descriptive research studies have specific research aims, rather than hypotheses, using observation or survey data to answer descriptive or comparative questions for chosen variables of interest (Siedlecki, 2020). One of the advantages of using data through observations is that there is no manipulation or interference, allowing the researcher to describe one or more variables of interest and/or

[3] https://www.earthlawcenter.org/

[4] https://www.animamundilaw.org/rights-of-nature-case-studies

[5] The RoN concept focuses on recognizing legal rights for natural entities themselves as opposed to citizen suits in the U.S. which allow a private citizen to take legal action against individuals, businesses, or government entities for violating environmental laws (e.g. Stubbs, 2001); or the ability for members of the public and institutions in the EU under the Aarhus Convention to challenge measures by private persons and public authorities that contravene provisions of national law relating to the environment (e.g. Garcon, 2015).

[6] Kotze (2019) argues for an earth system approach in law to overcome the failings of international environmental law. According to Gellers (2021, p. 4), the RoN movement represents the practical instantiation of the ideas of earth system law.

[7] The environmental rule of law concept was first articulated by the United Nations Environmental Program in 2013 to bridge the failings between rule of law and environmental law. In 2016, the IUCN World Environmental Congress listed RoN as one of the desired attributes of environmental rule of law (World Commission of Environmental Law, 2016).

[8] For example, cross-case analysis approaches in qualitative research, such as variable and case-oriented approaches, aim to provide hypothesis testing for particular outcomes or typologies of social phenomena (see e.g. Ridder, 2017; Khan and Vanwynsberghe, 2008; Seawright and Gerring, 2008, etc. for overviews).

determine if there is an association between variables (Dulock, 1993).

Descriptive comparative analysis is the appropriate choice of method for this study because RoN case studies are the result of complex historic and institutional settings, and definitive ecological outcomes are neither defined nor measured, i.e. it is, at this stage, not possible to infer causal relationships in terms of why RoN have emerged and whether they have been successful in halting the loss of biodiversity. Hence, in line with previous RoN literature which applies descriptive comparative discussions of case studies (see e.g. Bookman, 2023; O'Donnell, 2020; O'Donnell and Talbot-Jones, 2018; Talbot-Jones and Bennett, 2019), we have studied one case at a time and, in an iterative process, look for patterns of data going back and forth between case studies.[9]

We choose 14 RoN case studies worldwide that are widely discussed in the literature.[10] Below, we systematically describe and categorise the 14 case studies to answer the question: to what extent do the circumstances under which RoN emerged, and how they are designed, vary across case studies? The answer to this question may help shape future research hypotheses, such as the identification of important variables for the effectiveness of RoN frameworks to protect ecosystems.

3. Data

3.1. Data collection

The Appendix contains the collected data, i.e. the Appendix provides detailed descriptions of RoN case studies worldwide organised into two sets of tables for each of the 14 case studies. The first table gives a timeline that shows the historic and institutional setting leading up to RoN adoption, where sources (literature, media etc.) are referenced in the headline. The second table provides a summary of the variables of interest, where the name of the legislative framework is stated as one of the variables (online links to legislation have been provided in the Reference section where available). The available information was read closely aiming to identify variables of interest relevant to the features of emergence and design of RoN case studies[11] as follow.

Variables of interest related to the *emergence* of RoN case studies:

- Who advocated/advocates on behalf of the environment leading up to RoN adoption;
- What was/is the exploiting activity putting pressure on ecosystems;
- When and what was the time frame (duration) of conflict and RoN adoption;
- What is the purpose and value recognition of the RoN framework;

Variables of interest related to the *design* of RoN case studies:

- What are the boundaries and scale of the geographical entity granted legal rights;
- What is the legislative framework of RoN adoption;
- How is the legal status of the natural entity defined;
- Who are the guardians;
- What is the liability status of the (appointed) guardians;
- How are the (appointed) guardians financed.

For ease of exposition, the information for the design variables is quoted in shortened form in the Appendix.[12]

3.2. Data analysis

To aid analysis, we develop a schematic roadmap of RoN categories in Fig. 1 based on the data in the Appendix, focusing on two worldviews; 1) an anthropocentric and 2) an eco-centric/intrinsic worldview. The anthropocentric worldview portrayed can be seen as current regional, national and international governance structures organised around the objective to maximise some function of social welfare based on legal, structural and practical systems within which governments enact regulations (environmental protection laws; national parks, etc.) and economic incentive mechanisms (environmental taxes, tradable permits, etc.) to mitigate environmental externalities (see e.g. Tietenberg and Lewis, 2018).

The eco-centric/intrinsic worldview in Fig. 1 is represented by the RoN case studies, which are the result of complex historic and institutional settings.[13] While initially the intention was to list all RoN case studies chronologically, separate sub-groups emerged as follows. The RoN case studies of Ecuador, Bolivia, U.S. municipalities and Mexican states provide '*all*' citizens and residents with the right to take legal action on behalf of nature and ecosystems. We capture this characteristic by the term '**public guardianship**' in Fig. 1. For example, in Ecuador "all persons, communities, peoples and nations can call upon public authorities to enforce the rights of nature"[14]; in Bolivia "the duties of natural persons and public or private legal entities" include "reporting any act that violates the rights of Mother Earth"[15] and in Schuykill County, Pennsylvania, U.S. "the Borough of Tamaqua, along with any resident of the Borough, shall have standing to seek declaratory, injunctive, and compensatory relief for damages caused to natural communities and ecosystems within the Borough".[16]

The RoN sub-group of **Environmental Legal Personhoods (ELPs)**, however, features **appointed legal guardians** (as opposed to 'all persons, citizens or residents') for geographically defined ecosystem units (i.e. a named forest, river or lagoon), which are granted legal personhood, and can be further split into indirect and direct ELPs.

Indirect ELPs include the Victorian Environmental Water Holder (VEWH) in Australia and the Oregon Water Trust (OWT) in the U.S., which take on the role of appointed guardians. The former is a 'body corporate' established by the Australian government to manage water entitlements set aside for environmental needs.[17] The latter is a private, non-profit corporation with the stated goal to acquire water rights to conserve fisheries and aquatic habitat.[18] Both these organisations with legal personhood act *indirectly* on behalf of aquatic ecosystems to manage water rights for environmental outcomes, which is not precisely the same as creating legal rights for rivers themselves (O'Donnell 2020), hence we term this category 'indirect' ELPs.[19]

Direct ELPs feature legal personhood *directly* assigned to geographically defined ecosystem units, i.e. a named river, forest or

[9] Comparative law studies often also include the search for functional equivalents where the same purpose is achieved with other rules (see Reitz, 1998). We focus specifically on RoN frameworks which have emerged to address the shortcomings of existing governance structures (see Figure 1).

[10] See relevant references above and in Introduction.

[11] Siedlecki (2020; p. 9) notes that because descriptive analysis is "not a hypothesis testing design, there are no independent or dependent variables, just variables of interest"; i.e. the variables of interest are neither definitive nor exhaustive, but are chosen by the researcher to best address the research question.

[12] Care has been taken to accurately represent the meaning and spirit of the legal framework in shortened form. Numbered paragraphs and sections allow the reader to reference the full legislative wording if needed.

[13] See timeline for each case study in the Appendix.

[14] Constitution of the Republic of Ecuador 2008, Article 71; Appendix Table A2

[15] Law of the rights of Mother Earth 2010, Article 9; Appendix Table A4

[16] Tamaqua Borough Sewage Sludge Ordinance 2006 (source: Boyd, 2018); Appendix Table A5

[17] Amendment 2011 to Water Act, 1989, Appendix Table A8

[18] Appendix Table A10

[19] Other types of environmental water holders and water trusts not listed here, but similar in purpose and nature, exist in south-eastern Australia, the western states of the USA, Chile, Mexico and Canada (O'Donnell, 2018a; O'Donnell and Macpherson, 2019).

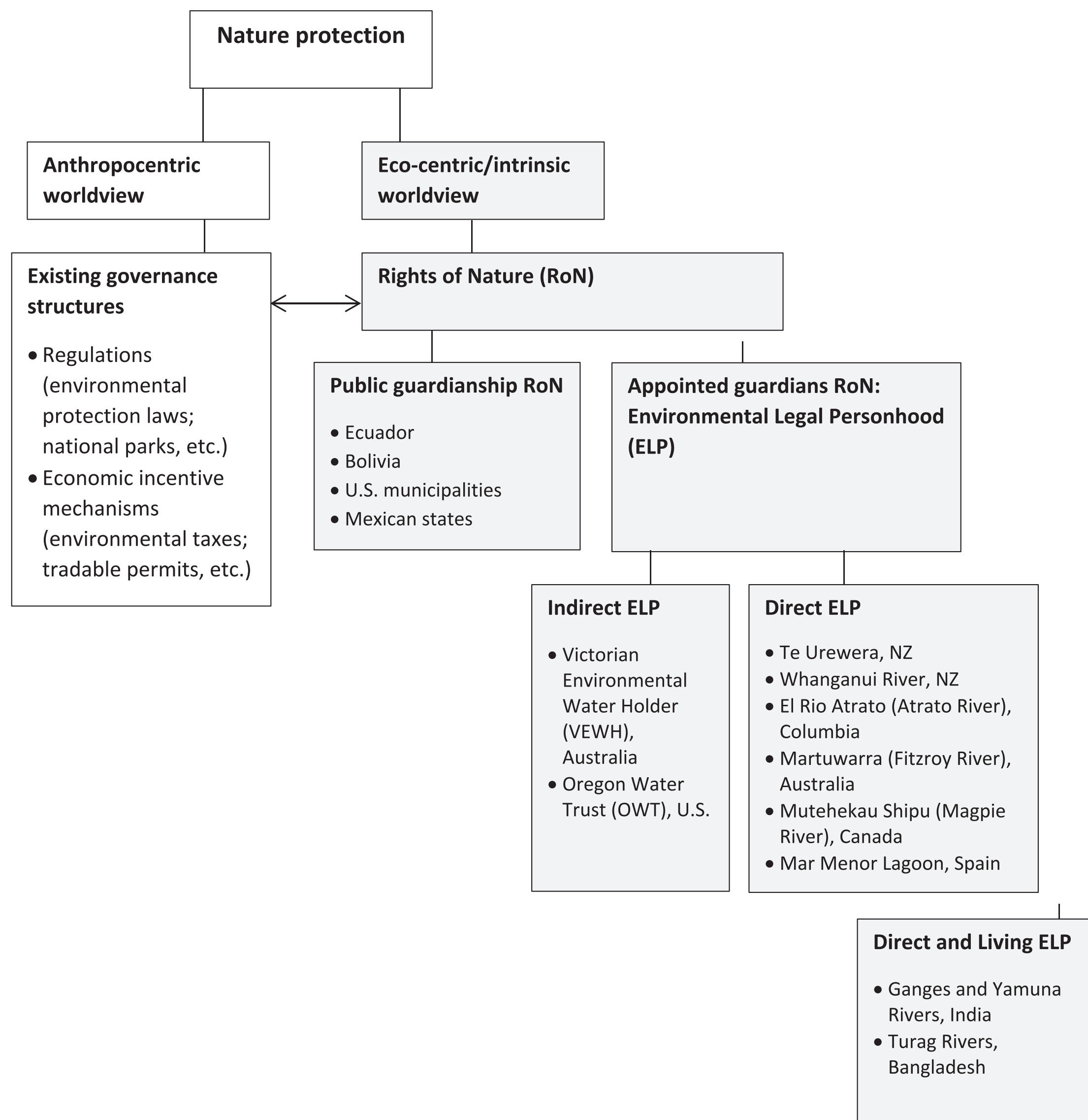

Fig. 1. Schematic roadmap of Rights of Nature (RoN) categories.

lagoon, with legally appointed guardians. Fig. 1 provides an exhaustive list of direct ELPs: 'Te Urewera [forest] is a legal entity and has all the rights, powers, duties, and liabilities of a legal person',[20] 'Te Awa Tupua (Whanganui River) is declared to be a legal person and has all the rights, powers, duties, and liabilities of a legal person',[21] 'The Atrato River, its basin and tributaries, will be recognized as an entity subject to rights of protection',[22] 'The Fitzroy River is a living ancestral being and has a right to life',[23] 'Mutehekau Shipu is a legal person with nine rights'[24] and 'The Mar Menor and its basin shall be recognized as a legal entity with rights'.[25]

Fig. 1 lists the Ganges and Yamuna rivers in India, and the Turag River in Bangladesh, as a further sub-group of direct ELPs because in addition to legal personhood, they also hold the rights of a *living person* under the *parens patriae* doctrine, i.e. injury to rivers will be treated equal to injury to human beings (O'Donnell, 2018b). We term this category **living ELPs**. In India, "the rivers Ganga and Yamuna, all their tributaries, streams, every natural water flowing with flow continuously or intermittently of these rivers, are declared as juristic/legal persons/ living entities having the status of a legal person with all corresponding rights, duties and liabilities of a living person".[26] In Bangladesh, "the Turag River is declared as legal person/legal entity/living entity. All rivers flowing inside and through Bangladesh will also get the same status of legal persons or legal entities or living entities".[27] The implication of the living person status is that rivers can be killed (O'Donnell,

[20] Te Urewera Act, 2014, Appendix Table A12
[21] Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017, Appendix Table A14
[22] Constitutional Court of Columbia (November 10, 2016), The Atrato River Case, Appendix Table A16
[23] Fitzroy River Declaration, Appendix Table A18. Note, the Martuwarra (Fitzroy River) ELP described in Appendix section A10 is the result of an expression of Indigenous Traditional Owners as opposed to constitutional reforms. The Birrarung/Yarra River, not listed here, is the first Indigenous co-titled legislation in Australia (Yarra River Protection (Wilip-gin Birrarung murron) Act 2017) to protect the River as 'one living and integrated natural entity' but contains no reference to legal rights
[24] Appendix Table A20
[25] Appendix Table A22
[26] Mohd. Salim v State of Uttarakhand, 2017, S19; Appendix Table A24
[27] High Court Judgement in Writ Petition No. 13989 of 2016, S2; Appendix Table A26

2020) and anyone accused of harming rivers may be tried and punished as if they 'harmed their own mother'.[28] Note, the legal rulings of the Ganges and Yamuna rivers have since been overturned by the Supreme Court due to issues of transboundary flow and liability, which provide important insights for the ensuing analysis.

Based on the description of the worldviews so far, Fig. 1 also shows a bidirectional arrow between existing governance structures and RoN to highlight their interdependent relationship: regulations and economic incentive mechanisms may support the attainment of eco-centric/intrinsic values and conversely, the enactment of RoN case studies may change or add to existing governance structures. For example, the VEWH and OWT utilise existing water markets for the attainment of conservation goals; while an example of the latter is the enactment of Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017 adding to existing environmental protection laws in New Zealand.

3.3. Descriptive comparative analysis

Table 1 provides a descriptive comparative analysis of the RoN case studies grouped by public guardianship, indirect ELP, direct ELP, and direct and living ELP as laid out in Fig. 1. The information for the variables of interest are extracted from the data in the Appendix. For example, the description of who advocates on behalf of the environment in Table 1 is extracted from the corresponding rows in Appendix Tables A2 (Summary RoN in Ecuador), A4 (Summary RoN in Bolivia), A5 (Examples of RoN ordinances in U.S.), A6 (Examples of RoN constitutional amendments in Mexico), A8 (Summary VEWH in Australia), A10 (Summary OWT in U.S.), A12 (Summary Te Urewera in NZ), A14 (Summary Whanganui River in NZ), A16 (Summary Atrato River in Columbia), A18 (Summary Martuwarra river in Australia), A20 (Summary Mutehekau Shipu river in Canada), A22 (Summary Mar Menor Lagoon in Spain), A24 (Summary Ganges and Yamuna Rivers in India) and A26 (Summary Tuarag Rivers in Bangladesh).

3.4. Features of emergence

The attributes relating to advocates, exploiting activity, timeline and purpose and value recognition in Table 1 highlight the circumstances under which RoN have emerged. For RoN case studies with public guardianship, the Constitutional changes in Ecuador and Bolivia came as a backlash to decades of neoliberal economic policies favouring the mining activities of large corporations. Local, Indigenous and environmental advocates played a crucial role in pushing for Constitutional RoN to limit industrial activities of mining, gas extraction etc. Similarly, the public guardianship RoN case studies in U.S. municipalities and Mexican states came in response to industrial activities by corporations leading to pollution and contamination. The purpose and value recognition of RoN often contain both anthropocentric and eco-centric goals, focusing on environmental protection (e.g. 'The State [Ecuador] shall apply preventative and restrictive measures on activities that might lead to the extinction of species, the destruction of ecosystems and permanent alteration of natural cycles'[29]), the right of people to benefit from a healthy environment (e.g. 'Persons, communities, peoples, and nations shall have the right to benefit from the environment and the natural wealth enabling them to enjoy the good way of living'[30]) and the right to exist/right to life for nature.[31]

The experience with indirect ELPs derives from the fact that both Australia and parts of the U.S. had established water markets to deal with growing pressure from multiple economic actors (urban water use, agriculture, irrigation and industry), where water entitlements can be traded among stakeholders. The VEWH in Australia was established by the government to meet environmental goals following the extreme Millennium Drought 2001–2009, while the OWT in the U.S. was established by local/Indigenous and environmental advocates using a cooperative, free-market approach to conserve streams where small amounts of water provide significant ecological benefits. The primary objective of both the VEWH and OWT is to act as a legal entity *on behalf* of the aquatic resource for environmental protection,[32] i.e. environmental protection is the only stated purpose of the legislative framework.

An overwhelmingly important feature of direct ELPs, and in fact for most RoN case studies, is the role of Indigenous peoples as advocates. Both Te Urewera (forest) and the Whanganui River in New Zealand are the result of hundreds of years of resistance by Indigenous Māori to aggressive colonization by the British Crown that led to the appropriation of land for settlement and riverbed modification for economic gains.[33] The Whanganui River ELP in particular, served as a benchmark for Indigenous communities in Columbia to protect El Rio Atrato from the government's failure to halt mechanized mining companies (as opposed to small scale traditional mining),[34] and for the Martuwarra (Fitzroy River) as a pre-emptive resolution by its Indigenous people to protect the relatively unmodified river system from extensive development plans, including agriculture, tourism and the threat of invasive species.[35] Similarly, the Innu Council of Ekuanitshit in Canada took inspiration from the Whanganui River[36] to protect the Mutehekau Shipu (Magpie River) from development plans by the 4th largest hydro-power producer.[37] Finally, the Mar Menor Lagoon ELP in Spain was the result of strong local advocacy against pollution from decades of agriculture and mining activities, poor sewage systems and lack of environmental protection.[38]

The strong connection between RoN and Indigenous philosophies has also been noted in the literature, e.g. O'Donnell et al. (2020) make the point that while rights of nature are increasingly migrating into mainstream environmental law, the granting of legal rights for rivers has mostly been driven by Indigenous and tribal communities. Macpherson and Ospina (2018) and Macpherson (2018) argue that legal personhood for rivers may be an attempt to amend past wrongs and recognize tribal and Indigenous conceptions of the natural world and human relationships by allowing for the exercise of Indigenous management obligations towards the natural world as guardians. Tanasescu (2020) examines the perceived tension between anthropocentric and eco-centric legal thinking, suggesting that rights for nature allow for the hybridization of Western and Indigenous legal and political conceptions. This hybridization becomes apparent in the purpose and value recognition, which posits eco-centric values (the right of specific ecosystems to exist/life) next to anthropocentric values such as environmental protection and the right of people to benefit from a healthy environment.

Finally, living ELPs in Table 1 are the result of extremely degraded river ecosystems in India and Bangladesh due to decades of raw sewage disposal, industrial waste and unlawful encroachment.[39] The governments' failure to halt pollution from multiple economic actors led to legal challenges by local/Indigenous and environmental advocates,

[28] Should rivers have same legal rights as humans? A growing number of voices say yes; NPR, 3 August 2019

[29] Appendix Table A2

[30] Appendix Table A2

[31] Appendix Tables A2, A4, A5 and A6

[32] Appendix Tables A8 and A10

[33] Appendix Tables A11 and A13

[34] Appendix Table A15

[35] Appendix Table A17

[36] Jean-Charles Pietacho, chief of Innu Council of Ekuanitshit, states he was inspired after visiting the Whanganui River https://www.nationalobserver.com/2021/02/24/news/quebecs-magpie-river-first-in-canada-granted-legal-personhood

[37] Appendix Table A19

[38] Appendix Table A21

[39] Appendix Tables A23-A26

Table 1
Descriptive comparative analysis of RoN case studies.

Rights of Nature (RoN)				
	Public guardianship	Appointed guardians: Environmental Legal Personhood (ELP)		
		Indirect ELP	Direct ELP	Direct and Living ELP
Features of emergence				
Advocates	Local/Indigenous; Environmental advocates;	Local/Indigenous; Environmental advocates; Government;	Local/Indigenous; Environmental advocates	Local/Indigenous; Environmental advocates
Exploiting activity	Mining; water and gas extraction; sewage sludge; fertilizer runoff, etc.	Urban; irrigation, agriculture; industry	Land appropriation and development; steamer service/ gravel abstraction/ river diversion; mining; logging; agriculture; fracking; unregulated tourism; invasive species; hydroelectricity generations; sewage	Raw sewage; industrial activity; construction; encroachment; pollution
Timeline	Earliest timeline since 2000	Earliest timeline since 1909	Earliest timeline since 1840	Earliest timeline since before 2016
Purpose and value recognition	Environmental protection Right of people to benefit from healthy environment Right of nature to exist/life	Environmental protection	Environmental protection Right of people to benefit from healthy environment Right of named ecosystem to exist/life	Environmental protection Right of people to benefit from healthy environment Right of named ecosystem to exist/life
Features of design				
Geographical entity	Nature; regional ecosystems (in general or specified, e.g. lake)	'Water' in rivers	Forest; River/Catchment; Lagoon	River/Catchment
Legal Framework	Constitution; Constitutional amendments; Municipality ordinances	Water Code; Water Act	Act; Court Ruling; First Law Ruling; Alliance Declaration	Court Ruling/Judgement
Legal status	Constitutional/ Municipal rights; Bill of Rights	Public/private non-profit legal person	Legal person	Legal and living person
Guardians	Every citizen can take legal action on behalf of nature	Commissioners/ Board of directors	Appointed guardians; separate legal entity (non-profit/ charitable trust)	Appointed guardians from existing government roles
Liability	N/A	Limited liability	Limited liability	Not specified
Financing	N/A	Government funded; ability to generate income	Government funded; ability to generate income	Not specified

which in India focused on the religious connection between the Hindu population and the Ganges. In Bangladesh, a report published in the national newspaper raised attention to the inability of the government to halt encroachment by 'river grabbers', leading to the filed petition by the Bangladeshi NGO, Human Rights and Peace for Bangladesh, to the High Court challenging the legality of earth filling, encroachment and constructions along the banks of the Turag River.

In summary, Table 1 highlights that features of emergence across RoN case studies share a common thread: local/Indigenous and environmental advocates resisted sustained economic activity and development over many years leading to the emergence of RoN as a legal solution to the failure by the government to protect natural resources, i.e. existing governance structures had continued to fail halting the degradation of the environment. The role of Indigenous philosophies in granting RoN has been instrumental in motivating the shift from a purely anthropocentric worldview, where *all* environmental values are tied to the benefit of humans, to include an eco-centric worldview where natural systems are also worth protecting for their intrinsic value (e.g. 'Preserve in perpetuity a legal identity and protect the status for Te Urewera for its intrinsic worth';[40] 'Tupua the Kawa comprises the intrinsic values that represent the essence of Te Awa Tupua (Whanganui River as legal person)'.[41] The purpose and value recognition varies in wording across case studies, including recognition of multiculturalism, intrinsic values, right to exist/life and the recognition of faith, but in each of the case studies (bar the indirect ELPs) eco-centric value systems through RoN have emerged in juxtaposition to an anthropocentric value system.

3.5. *Features of design*

The variables of geographical entity, legal framework, legal status, guardians, and liability and financing of guardians in Table 1 describe the features of design across RoN case studies.

Public guardianship RoN case studies are applied to natural entities of varying geographical scale and boundaries. Ecuador was the first country to grant rights to 'nature' (Pacha Mama) in its Constitution,[42] followed by Bolivia,[43] while American municipalities' ordinances[44] and Mexican counties[45] granted rights to ecosystems within their boundaries. For public guardianship RoN, every citizen has the right to take legal action on behalf of nature and ecosystems, i.e. effectively all persons are guardians and no separate legal entities representing the environment exist (liability and financing of guardians are therefore not specified/non-applicable). Kauffman and Martin (2017) compared 13 RoN lawsuits in Ecuador with the conclusion that the effectiveness of its RoN application depended critically on the legal training of judges in how to interpret the new legislation.

Boyd (2018) provides details of case rulings involving RoN in the U.S., also pointing to a gradual change in how communities interact with and legally represent their environments. An important example is provided by the 2020 overturning of the Lake Erie Bill of Rights (LEBOR) in the U.S. by a federal court based on farming operations (Drews Farms Partnerships) arguing they would be exposed to liability from fertilizer runoff. Drews argued it could never guarantee that all fertilizer runoff from its fields would be fully prevented from reaching Lake Erie, despite the implementation of methods to reduce the amount of fertilizer, and

[40] Appendix Table A12
[41] Appendix Table A14

[42] Appendix section A1
[43] Appendix section A2
[44] Appendix section A3
[45] Appendix section A4

that this would put them in a position to be sued for violating the rights of Lake Erie. The court agreed[46] in that: 1) The right for Lake Erie to "exist, flourish, and naturally evolve" is vague and does not indicate what type of conduct would infringe on that right; 2) the right of citizens of Toledo to a "clean and healthy environment" is vague and does not specify what "clean" and "healthy" means; and 3) the right of citizens of Toledo to have "a collective and individual right to self-government in their local community" is vague because it does not give guidance as to what that right looks like or what conduct would infringe upon the right. The Court acknowledged the well-intentional goal of LEBOR to protect Lake Erie but concluded that "LEBOR is unconstitutionally vague and exceeds the power of municipal government in Ohio".

Indirect ELPs in Table 1, such as the VEWH (established by a Water Act) and the OWT (established by a Water Code), relate to 'water' entitlements as geographical entity,[47] i.e. ELPs are granted indirectly on behalf of the aquatic ecosystems, which stands in contrast to direct and living ELPs. The VEWH in Australia is established as a legal person and "may do and suffer all acts and things that a body corporate may by law do and suffer". The VEWH is represented by a combination of Governmental Commissioners, is accountable for its performance as set out in its power, functions and duties, and a Trust Fund is established which holds donations and income "for the purpose of meeting the objectives of the Water Holder".[48] The OWT is a private, non-profit corporation, represented by a board of directors, with limited liability and the ability to receive donations/generate income and cover expenditures with the powers and rules set out in their Trust deeds. The literature on indirect ELPs points to the 'paradox of legal personhood': the VEWH increases the legal power of its aquatic environment, but also weakens community support because the legal entity becomes a competitor to the human consumption of water (O'Donnell, 2018a; O'Donnell, 2020). This paradox has not been observed for direct ELPs granted to rivers (Whanganui River, Rio Atrato, etc.) because, as O'Donnell and Macpherson (2019) point out, the recognition of rivers as ELPs to date does not include the right to water.

Direct ELPs apply to named geographical entities of forests, rivers/catchment and lagoons and are instituted through different legal statutes, such as legislative Acts (Te Urewera Act, 2014; Te Awa Tupua (Whanganui River Claims Settlement; Mar Menor Act 19/22) Act 2017), court rulings (Constitutional court ruling of the Atrato River Case), expressions of First Law by Indigenous Nations[49] (Fitzroy River Declaration, 2016) and declarations by alliances (Joint Declaration by Muteshekau-shipu Alliance 2021). Living ELPs also apply to named geographical entities but are instituted by court rulings and judgements.[50]

Te Urewera and the Whanganui River are the most detailed ELPs, with the latter having provided a benchmark for other ELPs. The Whanganui River itself is declared a legal person with all the rights, powers, duties and liabilities of a legal person,[51] as well as the appointed legal guardians (made up from both the Indigenous tribe and the Government) which are treated as a charitable entity under the New Zealand Charities Act 2005.[52] An advisory group comprising representatives of local Indigenous, local authorities, departments of State, commercial and recreational users, and environmental groups support the guardians in their role to "act and speak for and on behalf of" the Whanganui River.[53] An important feature of the appointed guardians is limited liability, i.e. the guardians are not personally liable for actions taken or omissions made as long as these had been enacted in good faith. Finally, guardians receive governmental funding but are also able to derive income and incur expenditure within the guidelines and purpose laid out in the Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017. A similar structure applies to Te Urewera.[54]

Other ELPs, such as El Rio Atrato, Martuwarra and Mutehekau Shipu, provide less detail on guardianship, and no mention of liability and financing of appointed guardians. The exception is the Mar Menor Act 19/2022, which provides a governance structure for the Mar Menor Lagoon (including a Committee of Representatives, a Monitoring Commission and a Scientific Committee) and a restitution of fees for anyone who brings legal action in defence of the Mar Menor ecosystem.[55]

Last but not least, the Ganges and Yamuna Rivers in India were declared as juristic/legal persons/living entities having the status of a legal person with all corresponding rights, duties and liabilities of a living person.[56] The role of guardianships was imposed, with no separate funding, on existing government officials in the State of Uttarakhand, who were declared persons in loco parentis as the human face to protect the rivers, thereby effectively treating the rivers as legal minors. This decision was swiftly overturned by the Indian Supreme Court on the grounds that the Ganges and Yamuna rivers extend beyond the borders of Uttarakhand (the Ganges River flows into Bangladesh) and due to potential implications of liability, i.e. the State argued that their legal status created uncertainty about who the custodians are and *who would be liable to pay damages* to the families of those who drowned in the rivers.[57] The experience in Bangladesh is similar in that the Turag River was also declared a legal person/legal entity/living entity but the 'persons in *loco parentis*' role was assigned to the National River Conservation Commission.[58] So far, the judgement has been upheld. However, no separate financing and details on liability are provided.

In summary, Table 1 highlights that features of design vary markedly across RoN case studies: the geographical scale ranges between the broadest entity of 'nature' within a nation to specific water entitlements and defined ecosystem units such as a named forest, river and lagoon. The legal framework and status include Constitutions, Legal Acts, Court Rulings etc. conferring legal rights, legal personhood and living personhood, with varying detail and provision for guardianship, liability and financing. The overturning of two RoN case studies highlights the issue of uncertainty around liability as an important feature of design.

4. Discussion

The continued loss of biodiversity and ecosystem services in recent decades is an indication that globally, existing governance structures are not sufficient in protecting natural environments, and the descriptive comparison of RoNs worldwide in our study shows that various types of RoNs have developed in order to halt the continued economic pressure. In particular, Table 1 shows that RoN have come as a response to decades of sustained pressure from economic (urban, agricultural and industrial) activity by multiple economic actors (or as a pre-emptive solution to extensive development plans in the case studies of Martuwarra and Mutehekau Shipu).

Local/Indigenous and environmental advocates have played a crucial role in advocating on behalf of the environment, where either governments themselves have sanctioned and pushed for economic

[46] Appendix table A5
[47] Appendix sections A5 and A6
[48] Appendix Table A8
[49] Under First Law, Traditional Owners have rights to use and access water in the River and the responsibility of care (Poelina et al., 2020).
[50] Appendix sections A7-A14
[51] Appendix Table A14
[52] The Act provides for the registration of societies, institutions, and trustees of trusts as charitable entities. It also places certain obligations on charitable entities, such as annual reporting.
[53] S19, Appendix Table A14
[54] Appendix Table A12
[55] Appendix Table A22
[56] Appendix Table A24
[57] Appendix Table A23
[58] Appendix Table A26

development and/or failed to protect the environment from development. The strong role local communities and Indigenous Peoples have played in advocacy for RoN point to the fundamental divide between in situ communities and external economic agents. Eco-centric value systems through RoN emerged as an additional legal solution because anthropocentric structures of governance by themselves had either been forcefully imposed on Indigenous Peoples by colonial governments and/or existing structures of environmental governance had continued to fail from the pressure of multiple economic actors.

The similarities under which RoN have emerged are striking, pointing to the substantial social and economic costs associated with decade-long conflicts between in situ communities and external economic agents. For example, the history of ownership over the Whanganui River in New Zealand between the indigenous Māori tribe, the Whanganui iwi, and the British Crown, documents decades of grievances and economic losses for the Whanganui Iwi prior to the declaration of the Whanganui ELP (see Appendix A8). Similar conditions apply to virtually all of the studied case studies in this paper.

The design of RoN, however, varies markedly across case studies in terms of geographical entities, legal frameworks, legal status, guardianship and associated liability and financing. Public guardianship RoN are applied to natural entities of varying geographical scale and boundaries, ranging from 'nature' to regional ecosystems. Indirect ELPs, on the other hand, enact environmental protection through the acquisition of water entitlements, while direct and living ELPs grant legal personhood to specified ecosystem units such as named forests, rivers/catchments and lagoons. The latter may provide administrative efficiencies in managing multiple ecosystem services jointly. For example, a river ELP may be managed for wildlife habitat, carbon storage, water allocations etc., however, as noted the recognition of rivers as ELPs to date does not include the right to water (O'Donnell and Macpherson, 2019).

The legal vehicle for design also varies considerably, i.e. various legal frameworks including Constitutions, Legal Acts, Court Rulings etc. confer legal rights, legal personhood and living personhood to natural entities, with varying detail and provision for guardianship, liability and financing.

The variation in the role of guardianship, and its associated liability and financing, provides a demarcation for case studies. In the RoN case studies of Ecuador, Bolivia, U.S. municipalities and Mexican states 'all' citizens are granted the right to take legal action on behalf of nature and ecosystems, something we term public guardianship, avoiding specification of issues related to liability and financing for guardians. For ELPs, however, appointed guardianship roles in legal frameworks (Constitutions, Legal Acts, Court Rulings etc.) range from being non-defined, to commissioners/board of directors as guardians, appointed guardians in the form of separate legal entities or guardians taken from existing government roles.

The overturning of two RoN case studies puts the spotlight on liability in particular. Both had been overturned for very different reasons under very different circumstances, however, a common factor centres on the *uncertainty of liability*. In India, after the Uttarakhand High Court declared the Ganges and Yamuna rivers as legal/living persons, the Government of Uttarakhand filed a Special Leave Petition appealing the rulings on the basis that they were legally unsustainable.[59] Specifically, the Petition argued that the ruling was not practical and could lead to complicated legal situations. The living person status created uncertainty about *who the custodians are* and who *would be liable to pay damages* in case of flooding or drowning (Lovelle, 2018). In the U.S., farming operations challenged the Lake Erie Bill of Rights (LEBOR) primarily based on the argument that the right for Lake Erie to "exist, flourish, and naturally evolve" was too vague. The Court agreed that the legal definition of the right was vague and did not indicate what type of conduct would infringe on that right, potentially putting farming operations in a position to be sued for violating the rights of Lake Erie. The LEBOR was therefore overturned due to the *uncertainty of liability for economic agents* (rather than guardians as in India) as a result of poorly defined rights of Lake Erie.

In contrast, the indirect ELPs of the VEWH in Australia and the Oregon Trust, and the direct ELPs of Te Urewera and the Whanganui River in New Zealand feature established appointed guardians as separate legal entities (public/private non-profit legal persons), with clearly defined limited liability, the ability to generate income in addition to governmental funding, and support from advisory groups comprising stakeholder representatives and scientific committees. The Mar Menor Lagoon also instructs for the establishment of a guardian governance structure, but stops short of assigning it a separate legal status.

Our findings indicate that if RoN is to allow natural ecosystems to emerge as separate entities with their own agency, then attention to liability may be an important building block in the effectiveness of current and future RoN frameworks to halt biodiversity loss, possibly in the same way that limited liability played a crucial role in the evolution of organisations.

5. Conclusion

Some tentative conclusion can be drawn from our analysis. RoN case studies worldwide emerged where existing governance structures failed to protect natural environments; however, the design of RoN varies markedly across case study. Historical, cultural and institutional circumstances shape the geographical entity, legal framework and legal status of RoN case studies, with the role of guardianship providing a natural demarcation. The amount of legal detail provided for appointed guardians can have important consequences, i.e. two RoN case studies were overturned due to uncertainty around liability. In contrast, the most well-defined ELPs are in Australia, Oregon and New Zealand and include appointed guardians, established as separate legal entities (public/private non-profit legal person), with clearly defined limited liability, and the support from scientific advisory groups and committees of representatives. Further research is required to clearly define and measure necessary attributes for the effectiveness of RoN frameworks.

CRediT authorship contribution statement

Viktoria Kahui: Formal analysis, Writing – original draft, Writing – review & editing. **Claire W. Armstrong:** Methodology, Resources, Visualization. **Margrethe Aanesen:** Formal analysis, Methodology, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data used for the research in this article is contained in the Appendix.

[59] Appendix Table A23

Appendix A. Appendix

Rights of Nature (RoN) case studies worldwide.

A.1. Rights of Nature (RoN), Ecuador 2008

Table A1
Timeline RoN in Ecuador (source: Kauffman and Martin, 2017; Tanasescu, 2020).

2006	Rafael Correa was elected president after a decade of political and economic instability. He promised to rewrite Ecuador's Constitution aiming to replace neoliberal economic policies with alternative development approaches.
2006–8	Ecuadorian RoN advocates (Indigenous, environmental activists and lawyers) collaborated with US environmental lawyers from the Community Environmental Defence Fund to draft RoN articles in the new Constitution. Process of writing Ecuador's new constitution was participatory, with over 3000 proposals submitted by civil society.
2008	Ecuador's new constitution is the world's first to treat Nature as a subject with rights in Chapter 7. However, RoN are one set among an array of rights, sometimes in conflict with anthropocentric rights such as rights to water and development-oriented provisions.
After 2008	President Correa launches public campaign to pass mining law that expands existing mining operations, arguing the State could ensure socially and environmentally responsible mining practices.
	Indigenous and environmental activists criticized the law arguing it violates RoN and constitutional rights of Indigenous communities.
2009	Mining Law leads to tens of thousands of Indigenous, community-rights, and environmental activists to protest nationwide
Sep 2009	Government proposed a Water Law that similarly violated RoN and rights of Indigenous
2011	Nearly 200 Indigenous leaders are arrested, charged with terrorism for protesting mining activities.
	Efforts to apply RoN in Ecuador occurred in highly politicized context, with little institutional structure beyond general constitutional principles.
2008–16	13 cases succeed in applying legal tools to protect RoN.

Table A2
Summary RoN in Ecuador.

Advocates	Local, Indigenous and environmental activists
Exploiting activity	Mining by large companies (neoliberal policies)
Timeline	Since 2006
Purpose and value recognition	Environmental protection; Nature has right to exist (see below)
Geographical entity	'Nature' (Pacha Mama) in Ecuador
Legislative framework	Constitution of the Republic of Ecuador 2008 (Chapter 7).
Legal status	Article 71. Nature, or Pacha Mama, where life is reproduced and occurs, has the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes.
	The State shall give incentives to natural persons and legal entities and to communities to protect nature and to promote respect for all the elements comprising an ecosystem.
	Article 72. Nature has the right to be restored. This restoration shall be apart from the obligation of the State and natural persons or legal entities to compensate individuals and communities that depend on affected natural systems.
	In those cases of several or permanent environmental impact, including those caused by the exploitation of nonrenewable natural resources, the State shall establish the most effective mechanisms to achieve the restoration and shall adopt adequate measures to eliminate or mitigate harmful environmental consequences.
	Article 73. The State shall apply preventive and restrictive measures on activities that might lead to the extinction of species, the destruction of ecosystems and the permanent alteration of natural cycles.
	Article 74. Persons, communities, peoples, and nations shall have the right to benefit from the environment and the natural wealth enabling them to enjoy the good way of living.
Guardians	Article 71. All persons, communities, peoples and nations can call upon public authorities to enforce the rights of nature.
	Article 74. Environmental services shall not be subject to appropriation; their production, delivery, use and development shall be regulated by the State.
Liability	N/A
Financing	N/A

A.2. Rights of Nature (RoN), Bolivia 2010

Table A3
Timeline RoN in Bolivia (source: Calzadilla and Kotzé, 2018).

2000	Cochabamba Water War. Series of protests in response to privatization of municipal water supply company. Demonstrations and police violence erupted in response to rising water prices.
2003	Bolivian gas conflict. Strikes and road blocks due to exploitation of country's natural gas reserves. The conflict had its roots in dissatisfaction about government's policies about gas exploitation and coca eradication.
2005	Conflicts revealed popular dissatisfaction with the neoliberal development model that prevailed in Bolivia. First Indigenous president, Evo Morales, was elected (leader of coca-growing peasants)
	Call for establishment of a Constitutional Assembly arose from a coalition of the largest Indigenous and peasant organisations, the Unity Pact (Pacto de Unidad). The President inaugurated Constitutional Assembly to draft new Constitution.
2009	New Constitution came into force, which abolished existing republic and created a plurinational state, recognizing the 36 Indigenous nations.
	Bolivian Constitution constitutionalized protection of nature, termed Mother Earth or Pachamama. Bolivian Constitution does not formally recognize nature as the bearer of rights as Ecuador does, but rights of nature are set out in Law of rights of Mother Earth (2010)
2010	Law of the rights of Mother Earth is passed

Table A4
Summary RoN in Bolivia.

Advocates	Local, Indigenous and peasant organisations (Pacto de Unidad)
Exploiting activity	Water and Gas extraction by large companies (neoliberal policies)
Timeline	Since 2000
Purpose and value recognition	Article 2. Harmony. Human activities, within the framework of plurality and diversity, should achieve a dynamic balance with the cycles and processes inherent in Mother Earth. 2. Collective good. The interests of society, within the framework of the rights of Mother Earth, prevail in all human activities and any acquired right. 3. Guarantee of the regeneration of Mother Earth. The state, at its various levels, and society, in harmony with the common interest, must ensure the necessary conditions in order that the diverse living systems of Mother Earth may absorb damage, adapt to shocks, and regenerate without significantly altering their structural and functional characteristics, recognizing that living systems are limited in their ability to regenerate, and that humans are limited in their ability to undo their actions. 4. Respect and defend the rights of Mother Earth. The State and any individual or collective person must respect, protect and guarantee the rights of Mother Earth for the well-being of current and future generations. 5. No commercialism. Neither living systems nor processes that sustain them may be commercialized, nor serve anyone's private property. 6. Multiculturalism. The exercise of the rights of Mother Earth requires the recognition, recovery, respect, protection, and dialogue of the diversity of feelings, values, knowledge, skills, practices, skills, transcendence, transformation, science, technology and standards, of all the cultures of the world who seek to live in harmony with nature.
Geographical entity	'Mother Earth' in Bolivia
Legislative framework	Law of the rights of Mother Earth 2010
Legal status	Article 7. Mother Earth has the rights to life; to the diversity of life; to water; to clean air; to equilibrium; to restoration; and to pollution-free living.
Guardians	Article 6. All Bolivians, to join the community of beings comprising Mother Earth, exercise rights under this Act, in a way that is consistent with their individual and collective rights. The exercise of individual rights is limited by the exercise of collective rights in the living systems of Mother Earth. Any conflict of rights must be resolved in ways that do not irreversibly affect the functionality of living systems. Article 8. The Plurinational State has the following duties: 1. Develop public policies and systematic actions of prevention; 2. Develop balanced forms of production and patterns of consumption; 3. Develop policies to protect Mother Earth from the multinational and international scope of the exploitation of its components; 4. Develop policies to ensure long-term energy sovereignty; 5. Demand international recognition of environmental debt through the financing and transfer of clean technologies that are effective and compatible with the rights of Mother Earth; Article 9. The duties of natural persons and public or private legal entities: 1. Uphold and respect the rights of Mother Earth. 2. Promote harmony with Mother Earth in all areas of its relationship with other human communities and the rest of nature in living systems. 3. Participate actively, individually or collectively, in generating proposals designed to respect and defend the rights of Mother Earth. 4. Assume production practices and consumer behavior in harmony with the rights of Mother Earth. 5. Ensure the sustainable use of Mother Earth's components. 6. Report any act that violates the rights of Mother Earth, living systems, and/or their components. 7. Attend the convention of competent authorities or organised civil society to implement measures aimed at preserving and/or protecting Mother Earth. Article 10. Establishing the Office of Mother Earth, whose mission is to ensure the validity, promotion, distribution and compliance of the rights of Mother Earth established in this Act. A special law will establish its structure, function, and attributes.
Liability	N/A
Financing	N/A

A.3. Rights of Nature (RoN) in U.S

Table A5 shows four examples of rights of nature ordinances in the U.S. For descriptions of other RoN ordinances in the U.S. see Boyd (2018).

Table A5
Examples of RoN ordinances in U.S. (source: Boyd, 2018).

2006	**Tamaqua Borough Sewage Sludge Ordinance in Schuykill County, Pennsylvania.** Section 7.6: The Borough of Tamaqua, along with any resident of the Borough, shall have standing to seek declaratory, injunctive, and compensatory relief for damages caused to natural communities and ecosystems within the Borough, regardless of the relation of those natural communities and ecosystems to Borough residents or the Borough itself. Borough residents, natural communities, and ecosystems shall be considered to be "persons" for purposes of the enforcement of the civil rights of those residents, natural communities, and ecosystems.
2010	**Pittsburgh Community Protection from Natural Gas Extraction Ordinance.** Section 4.2: Rights of Natural Communities. Natural communities and ecosystems, including, but not limited to, wetlands, streams, rivers, aquifers, and other water systems, possess inalienable and fundamental rights to exist and flourish within the City of Pittsburgh. Residents of the City shall possess legal standing to enforce those rights on behalf of those natural communities and ecosystems.
2013	**Santa Monica Municipal Code** (Chapter 12.02.030 Rights of the Santa Monica residents and the natural environment): (b) Natural communities and ecosystems possess fundamental and inalienable rights to exist and flourish in the City of Santa Monica. To effectuate those rights on behalf of the environment, residents of the City may bring actions to protect these natural communities and ecosystems, defined as: groundwater aquifers, atmospheric systems, marine waters, and native species within the boundaries of the City.
2020	**Lake Erie Bill of Rights ("LEBOR")** (Toledo Mun. Code ch. XVII S254(a): "Lake Erie, and the Lake Erie watershed, possess the right to exist, flourish, and naturally evolve". In February 2020, a federal court overturned the Bill (Drewes Farms P'Ship v. City of Toledo (see https://connect.brickergraydon.com/100/534/uploads/drewes.mjp.-final-order.2.27.20.pdf) because farming operations (Drews Farms Partnerships) argued they would be exposed to **liability** from fertilizer runoff. Drews argued it could never guarantee that all fertilizer runoff from its fields would be fully prevented from reaching Lake Erie, despite the implementation of methods to reduce the amount of fertilizer, and that this would put them in a position to be sued for violating the rights of Lake Erie. Drewes argued that the LEBOR violated the US Constitution by infringing on the plaintiff's First Amendment freedom of speech and to petition the courts, by violating the plaintiff's right to equal protection under the law, by violating the Fifth Amendment protection against **vague laws**, and by depriving the plaintiff of its rights without due

(*continued on next page*)

Table A5 (*continued*)

	process. The court agreed in that: 1) The right for Lake Erie to "exist, flourish, and naturally evolve" is vague and does not indicate what type of conduct would infringe on that right; 2) the right of citizens of Toledo to a "clean and healthy environment" is vague and does not specify what "clean" and "healthy" means; and 3) the right of citizens of Toledo to have "a collective and individual right to self-government in their local community" is vague because it does not give guidance as to what that right looks like or what conduct would infringe upon the right.

A.4. Rights of Nature (RoN) in Mexico

Table A6
Examples of RoN constitutional amendments in Mexico.

2019	Colima, Mexico, passed a state constitutional amendment recognizing the Rights of Nature (RoN). The constitutional amendment establishes that nature, including all ecosystems and species, is a collective entity with fundamental rights. Nature's rights include the right to exist, to restoration, to regeneration of its natural cycles, and to conservation of its ecological structure and functions.
2021	Oaxaca, Mexico, passed a state constitutional amendment recognizing the Rights of Nature (RoN). The Constitutional reform establishes the following rights for Nature: The right to preservation, the right to protection of its elements, the right to exercise its vital and natural cycles and its ecological functions, the right to integral restoration of its ecological balance, and the right to be legally represented.

A.5. Victorian Environmental Water Holder (VEWH), Australia 2011

Table A7
Timeline VEWH in Australia (source: O'Donnell and Talbot-Jones, 2018; O'Donnell and Macpherson, 2019; O'Donnell, 2018a).

1989	Water Act, 1989. The Water Act establishes a water allocation framework in Victoria (Australia), designed around a water market that enables rights to take and use waters to be traded. Water is allocated to cities and towns, irrigation, agriculture and industry. The Act also establishes a legal umbrella under which all water assigned for environmental use is held, the Environmental Water Reserve (EWR). The EWR includes specific entitlements to water for the environment with the purpose to maintain the necessary river flows to support the health of rivers, wetlands and estuaries throughout Victoria.
Until 2007	Minister for Environment had 'owned' the water entitlements for the environment but during extreme Millennium Drought water management was subject to political pressure and the decision was made to transfer ownership.
2011	Amendment to Water Act, 1989: ownership of EWR water entitlements was transferred to the newly established Victoria Environmental Water Holder (VEWH), a body corporate (legal person) with the capacity to hold water rights, to decide how to use the available water each year, and the power to buy and sell water on the water market.
2018	O'Donnell (2018) describes the paradox of legal personhood: VEWH was created to increase the legal power of aquatic environments but it weakened community support because the environment is seen as a competitor to water entitlements.

Table A8
Summary VEWH in Australia.

Advocates	Government
Exploiting activity	Urban, irrigation, agriculture and industry.
Timeline	Since 1989
Purpose and value recognition	33 DC The objectives of the Water Holder are to manage the Water Holdings for the purposes of— (a) maintaining the environmental water reserve in accordance with the environmental water reserve (EWR) objective; and (b) improving the environmental values and health of water ecosystems, including their biodiversity, ecological functioning and water quality, and other uses that depend on environmental condition.
Geographical entity	Water in Victoria Rivers (Australia)
Legislative framework	Amendment 2011 to Water Act, 1989
Legal status	33 dB (1) There is established a body corporate (legal person) called the Victorian Environmental Water Holder. (2) The Water Holder— (a) has perpetual succession; and (b) has an official seal; and (c) may sue or be sued in its corporate name; and (d) may acquire, hold and dispose of real and personal property; and (e) may do and suffer all acts and things that a body corporate may by law do and suffer.
Guardians	33DF (1) The Water Holder consists of— (a) one full-time or part-time Commissioner who is the Chairperson of the Water Holder; and (b) at least two full-time or part-time Commissioners, one of whom is the Deputy Chairperson of the Water Holder; and (c) any further full-time or part-time Commissioners— appointed by the Governor in Council on the recommendation of the environment Minister.
Liability	33DS (1) The environment Minister may give a written direction to the Water Holder in relation to the performance of its functions, powers or duties. (5) The Water Holder is required to include a statement or summary of the contents of any direction received in its annual report. 33DT The Water Holder must include in its annual report information as to the performance of its functions, powers and duties in that year in accordance with any relevant rules made under Division 6.
Financing	33DK A Commissioner is entitled to be paid any remuneration and any travelling and other allowances that are fixed by the Governor in Council from time to time. 33DO (1) There is established in the Trust Fund an account known as the "Water Holder Trust Account". (2) There may be paid into the Water Holder Trust Account the following— (a) money donated to the Water Holder; (b) money paid to the Water Holder by another person, including the Commonwealth Environmental Water Holder, pursuant to an agreement with that

(*continued on next page*)

Table A8 (*continued*)

Advocates	Government
	person; (c) any other money received by, or on behalf of, the Water Holder in the performance of its functions, powers and duties. (3) There must not be paid out of the Water Holder Trust Account any money except for— (a) the purpose of meeting the objectives of the Water Holder; or (b) if the money was received by way of donation, a purpose that is consistent with the purpose for which the money was donated.

A.6. Oregon Water Trust (OWT), U.S. 1993

Water trusts, similar to the OWT, have also been established in Washington, Montana, New Mexico, Colorado, Texas and the Great Basin region (Neuman, 2004). Private, not-for-profit corporations of water shareholders, known as Water Monitoring Boards, also exist in Chile (O'Donnell and Macpherson, 2019).

Table A9
Timeline OWT in Oregon U.S. (source: Neuman, 2004; O'Donnell, 2018a).

1909	Water in Oregon is allocated by the prior appropriation doctrine. This rewards diversion and use of water, penalizing nonuse of water with the loss of water rights. This has led to 'overappropriation' (synonymous with overuse and depletion).
1950s	Decades of irrigation, dam building and population growth threatened health of streams and fisheries.
1955	Water Code introduces minimum stream flow statue.
1987	Creation of tradable instream water rights.
1993	Oregon Water Trust was created, a nonprofit corporation that buys instream water rights for restoration. Similar water trusts spring up in Washington, Montana, New Mexico, Colorado etc.
By 2003	Oregon Water Trust has protected 86 streams. Using a cooperative, free-market approach, the Trust focuses on streams where small amounts of water provide significant ecological benefits.

Table A10
Summary OWT in U.S.

Advocates	Environmental organisation
Exploiting activity	Urban, irrigation, agriculture and industry.
Timeline	Since 1909
Purpose and value recognition	The mission of Oregon Water Trust is to acquire water rights "through gift, lease or puchase and commit these water rights under Oregon law to instream flows in order to conserve fisheries and aquatic habitat and to enhance the recreational values and ecological health of watercourses". Oregon Water Trust uses ecological, hydrologic and water rights data to identify priority streams and evaluate potential water right acquisitions. Analysis of streamflow and habitat conditions includes: • Delineating fish use and distribution for each segment; • Documenting the current and historical ecological value of the waterway for fish; • Evaluating current habitat and water quality conditions; • Describing the current water availability situation; • Summarizing the relationship of the water right to other water rights in the stream segment; and • Evaluating the potential benefits of acquired water on fish habitat and water quality. • Oregon Water Trust compiles data on species present, their habitat needs and endangered species listing status; instream conditions (e.g., flow alteration, temperature, water quality); and relation of instream conditions to riparian, upslope and watershed conditions and activities.
Geographical entity	Water in rivers and streams in Oregon U.S.
Legislative framework	private, non-profit corporation
Legal status	Private, non-profit corporation.
Guardians	Board of Directors
Liability	Limited liability
Financing	Private

A.7. Te Urewera Act, 2014, New Zealand

Table A11
Timeline Te Urewera in New Zealand (source: O'Malley, 2014; Tanasescu, 2020).

1840	Treaty of Waitangi was not signed by Tūhoe leaders (local Indigenous Māori tribe of the Te Urewera region)
1865	Period of aggressive colonization and war begins; British Crown invades Te Urewera using scorched earth tactics (destruction of homes, crops, cattle and livestock), executions and appropriation of lands
1871	British Crown agrees to respect internal autonomy of Tūhoe territory
1890s	Crown confiscates, purchases or leases land on Te Urewera perimeters; disputes threaten to turn into open warfare
1896	Urewera District Native Reserve Act: Agreement that Tūhoe and other Te Urewera Iwi (tribes) autonomy will be protected as long as authority of the Crown is recognized
1910	After series of legislative amendments, Crown starts buying land from individuals
1921	Te Urewera Lands Act repeals the 1896 Act and Crown continues to appropriate land
1954	Te Urewera is declared a National park
2005	Negotiations between Tūhoe representatives and the Crown begin; Tūhoe seeks sovereignty but Crown halts negotiations
2014	Tūhoe Claims Settlement Act acknowledges Tūhoe were left with just 16% of the Urewera reserve and most Tūhoe members now live outside Te Urewera
2014	Te Urewera Act declares Te Urewera as a legal entity

Table A12
Summary Te Urewera in New Zealand.

Advocates	Local Indigenous Māori tribe (Tūhoe)
Exploiting activity	Land appropriation and development (settlement) by Colonial government (British Crown)
Timeline	Since 1840
Purpose and value recognition	S3(9) Tūhoe and the Crown have together taken a unique approach to protecting Te Urewera in a way that reflects New Zealand's culture and values. (10) The Crown and Tūhoe intend this Act to contribute to resolving the grief of Tūhoe and to strengthening and maintaining the connection between Tūhoe and Te Urewera. S4. To establish and preserve in perpetuity a legal identity and protected status for Te Urewera for its intrinsic worth, its distinctive natural and cultural values, the integrity of those values, and for its national importance, and in particular to – (a) Strengthen and maintain the connection between Tūhoe and Te Urewera; and (b) Preserve as far as possible the natural features and beauty of Te Urewera, the integrity of its indigenous ecological systems and biodiversity, and its historical and cultural heritage; and (c) Provide for Te Urewera as a place for public use and enjoyment, for recreationm learning, and spiritual reflection, and as an inspiration for all.
Geographical entity	Primeval forest (Te Urewera) in New Zealand
Legislative framework	Te Urewera Act, 2014
Legal status	S11(1).Te Urewera is a legal entity and has all the rights, powers, duties, and liabilities of a legal person. (2) However, the rights, powers, and duties of Te Urewera must be exercised and performed on behalf of, and in the name of, Te Urewera by Te Urewera Board; and in the manner provided for in this Act; and the liabilities are the responsibility of Te Urewera Board.
Guardians	S16. Te Urewera Board is established S17. The purposes of the Board are – (a) To act on behalf of, and in the name of, Te Urewera; and (b) To provide governance for Te Urewera in accordance with this Act. S18. The functions of the Board are to prepare and approve Te Urewera management plan; advise the persons managing Te Urewera; to make bylaws; prepare or commission reports, advice etc.; to promote or advocate for the interests of Te Urewera; to liaise with, advise, or seek advice from any agency, local authority, or other entity on matters relevant to the purposes of the Board etc. S21. The Board consists of 9 members, 6 members appointed by the trustees of Tūhoe; and 3 members appointed jointly by the Minister and the Minister for Treaty of Waitangi Negotiations.
Liability	S30. A member of the Board who has acted in good faith in the course of the Board performing its functions is not personally liable for any act or omission of the Board or of any member of the Board.
Financing	S38. Before the beginning of each financial year, the Board, the chief executive (of the Tūhoe Trust), and the Director-General (of Conservation) must develop and agree a budget for the performance of powers of the Board; The chief executive and the Director-General must contribute equally to the costs provided for in the budget, unless both agree to a different contribution. S39. All revenue received by the Board must be paid into a bank account of the Board and applied, as directed by the Board, for achieving the purpose of this Act. S40. Tax Treatment (2) For the purposes of the Inland Revenue Acts and the liabilities and obligations placed on a person under those Acts, Te Urewera and the Board are deemed to be the same person; (3) in particular, and to avoid doubt, – income, expenditure, application of funds, goods and services supplied and acquired; and tax obligations by Te Urewera is treated as those of the Board

A.8. Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017, New Zealand

Table A13
Timeline Whanganui River in New Zealand (source: Ruruku Whakatupua, 2014; Hutchison, 2014; Talbot-Jones, 2017; O'Donnell and Talbot-Jones, 2018; Talbot-Jones and Bennett, 2019; Kahui and Cullinane, 2019).

Before 1848	Whanganui Iwi (local Indigenous Māori tribe) exercises rights and lives along the Whanganui River
1848	British Crown purchases block of 86,200 acres at Whanganui and introduces legislation for local authorities to erect structures on the River without Whanganui Iwi involvement
1885	Crown discusses with Whanganui Iwi 'improvements' of river rapids to help establish steamer service
1887	Whanganui Iwi protests against scale and effect of Crown's river works on eel weirs and fisheries
1891	Most weirs are destroyed; Whanganui River Trust Act is passed to conserve natural scenery and protect navigability of River; however, there is no Māori membership on the Trust's board
1893	Parliament expands the Trust's power, including right to extract and sell River gravel
1903	Coal-mines Act Amendment Act asserts Crown's ownership of River bed
1927	Whanganui Iwi petitions for compensation in recognition of their River rights and for the taking of gravel and land for scenery preservation, damage to eel and lamprey weirs and profits made by the steamer company
1937	Whanganui Iwi applies to Native Land Court to investigate their claim of customary ownership; ongoing court proceedings thereafter
1962	Court of Appeal rules that Māori customary ownership of riverbed had been extinguished
1958	Crown Order in Council authorizes diversion of water from Whanganui River into proposed Tongariro Power Scheme; Whanganui Iwi opposes this decision on the grounds that the reduced flow damages the health and wellbeing of the River and adversely affects their cultural and spiritual values
1988	Establishment of the Whanganui River Māori Trust Board to negotiate for settlement of all outstanding Whanganui Iwi claims over the Whanganui River
1990	Trust Board lodges Whanganui River claim with the Waitangi Tribunal
2014	Establishment of Ngā Tāmgata Tiaki o Whanganui Trust
2017	Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017 is passed granting legal personhood to the Whanganui River

Table A14
Summary Whanganui River in New Zealand.

Advocates	Local Indigenous Māori tribe (Whanganui Iwi)
Exploiting activity	Steamer service; gravel abstraction; river diversion for energy by Colonial government (British Crown)
Timeline	Since 1848
Purpose and value cognition	S3. The purpose of the Act is to record the acknowledgements and apology given by the Crown; and to give effect to the provisions of the deed of settlement that settle the historical claims of Whanganui Iwi as those claims relate to the Whanganui River. S13. Tupua te Kawa comprises the intrinsic values that represent the essence of Te Awa Tupua (Whanganui River as legal person), namely – (a) the River is the source of spiritual and physical sustenance. (b) Te Awa Tupua is an indivisible and living whole from the mountains to the sea, incorporating the Whanganui River and all of its physical and metaphysical elements. (c) I am the River and the River is me: The iwi and hapū of the Whanganui River have an inalienable connection with, and responsibility to, Te Awa Tupua and its health and well-being. (d) Te Awa Tupua is a singular entity comprised of many elements and communities, working collaboratively for the common purpose of the health and well-being of Te Awa Tupua.
Geographical entity	River and its catchment (Whanganui River) in New Zealand
Legislative framework	Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017
Legal status	S14. Te Awa Tupua is declared to be legal person and has all the rights, powers, duties, and liabilities of a legal person. Section 16(b). Nothing in this Act creates, limits, transfers, extinguishes, or otherwise affects any right to, or interests in, water.
Guardians	Trustees of Ngā Tāmgata Tiaki o Whanganui; and S19. The functions of Te Pou Tupua (the human face of Te Awa Tupua) are – (c) To act and speak for and on behalf of Te Awa Tupua (c) To promote and protect the health and well-being of Te Awa Tupua; Section 20. Te Pou Tupua comprises 2 persons, one person appointed by Whanganui Iwi; one by the Crown S27(1). An advisory group to be known as Te Karewao is established to provide advice and support to the Te Pou Tupua in the performance of its functions. S29. Nature and purpose of Te Kōpuka (permanent joint committee) (2) Te Kōpuka comprises representatives of persons and organisations with interests in the Whanganui River, including iwi, relevant local authorities, departments of State, commercial and recreational users, and environmental groups. (3) The purpose of Te Kōpuka is to act collaboratively to advance the health and well-being of Te Awa Tupua.
Liability	S21(1). The persons appointed to Te Pou Tupua are not personally liable for any action taken or omission made but only if actions (omission) relates to their powers and functions under this Act and they have acted in good faith.
Financing	S22. Trustees provide administrative support for Te Pou Tupua S23. Te Pou Tupua are to be treated as charitable entity S25. Tax treatment (1) Te Awa Tupua and Te Pou Tupua are deemed to be same person for the purpose of Inland Revenue Acts and the liabilities and obligations placed on a person under those Acts. (2) In particular, and to avoid doubt, – this includes income derived, expenditure incurred, funds attributable, goods and services supplied, goods and services acquired etc. by Te Awa Tupua S57. There is a fund called Te Korotete, which includes Crown contribution. The purpose is to support the health and well-being of Te Awa Tupua. S58. The Korotete must be held by Te Awa Tupua and administered by Te Pou Tupua on behalf of Te Awa Tupua. It may be combined with funds from other sources. The trustees must support Te Pou Tupua in the administration of Te Korotete.

A.9. El Rio Atrato (Atrato River), Choco, Columbia, 2016

Table A15
Timeline Atrato River in Columbia (source: Macpherson and Ospina, 2018; Calzadilla, 2019).

Until 1980s	El Rio Atrato (the Atrato River) lies in Choco, Colombia's poorest region. Traditional activities by Afro-Columbian and indigenous communities along El Rio Atrato basin include agriculture (corn, rice, sugar cane etc.); fishing (with arrows, cast nets, etc.) and artisanal mining (ancestral methods of gold and platinum extraction).
Since end of 1990s	Mechanized mining exploitation developed illegally on a large scale by different actors. Methods include heavy machinery (especially suction dredgers which destroy riverbeds) and toxic substances (such as mercury) in the basin of the River, swamps, wetlands and tributaries; other degrading activities include illegal logging and lack of infrastructure for sanitary landfills;
By 2013	The regional environmental authority estimated there were 200 established miners and approx. 54 dredges in operation to extract gold and platinum.
2013	Death of 3 minors and poisoning of 64 people by ingesting contaminated water was recorded.
2014	Death of 34 children for similar reasons was reported. Ombudsman's office declares environmental and humanitarian emergency in Choco.
2015	*Accion de tutela* was filed by human rights NGO Tierra Digna (*Centro de Estudios para la Justicia Social 'Tierra Digna'*) on behalf of Afro-descendent, indigenous and peasant communities alongside the Atrato River against various agencies of the Colombian government in order to obtain effective environmental protection. They argued pollution and damage to the river, destruction of its natural course, erosion, deforestation, loss of biodiversity etc. had several effects on local ethnic communities affecting their right to life, health, water, food security, clean environment and culture. The plaintiffs argued the Columbian government, at local and national level, failed to adopt effective measures to protect against pollution and illegal mining and the deforestation of the Amazon basin.
2015	Court of First Instance refused to grant the *tutela* action; plaintiffs appealed without success, but ruling was referred to the Columbian Constitutional Court for review.
2016	Sixth Review Chamber of the Constitutional Court (*Sala Sexta de Revisión de la Corte Constitucional*) ruled in favour of the plaintiffs; El Rio Atrato, its basin and tributaries, was recognized as a legal subject with rights.
2018	Following the ruling of Atrato, a similar case was brought forward on behalf of 26 Colombian children (representing future generations) against the Columbian government for deforestation in the Amazon Basin; the Colombian Supreme Court recognized the Amazon basin as an entity subject of rights.

Table A16
Summary Atrato River in Columbia.

Advoates	Local Indigenous (Afro-Colombian and indigenous communities)
Exploiting activity	Mining; logging
Timeline	Since end of 1990s
Purpose and value cognition	S10.12.1 The purpose is to ensure the protection, recovery and due conservation of the River.
Geographical entity	River and its catchment (El Rio Atrato) in Colombia
Legislative framework	Constitutional Court of Colombia (November 10, 2016): The Atrato River Case
Legal status	S10.12.1. The Atrato River, its basin and tributaries will be recognized as an entity subject to rights of protection, conservation, maintenance and restoration by the State and ethnic communities.
Guardians	S10.2.1. Court will order National Government to exercise legal guardianship and representation of the rights of the river (through the institution designated by the President of the Republic, which could be the Ministry of the Environment) together with the ethnic communities that inhabit the basin of the Atrato River in Chocó; in this way, the Atrato River and its basin - henceforth - will be represented by a member of the (plaintiffs) and a delegate of the Colombian Government, who will be the guardians of the river. A commission of guardians of the Atrato River, integrated by the two appointed guardians and an advisory team by invitation of the Humboldt Institute and WWF Colombia. This advisory team can be formed and receive support from all public and private entities, universities (regional and national), research centers on natural resources and environmental organisations (national and international), community and civil society wishing to join the protection project of the Atrato River and its basin. S10.2.2. Colombian Ministries have to develop a plan for conservation with clearly measurable indicators. The plan should also be aimed at restoring the rights of the ethnic communities that inhabit the Atrato River Basin, and must be focused on guaranteeing: (i) the food sovereignty of the communities and (ii) preventing their involuntary displacement of the area due to illegal mining activities and environmental damage.
Liability	Not specified
Financing	Not specified

A.10. Martuwarra (Fitzroy River), Australia 2016

Table A17
Timeline Martuwarra in Australia (source: Martuwarra et al., 2020).

Before 2016	Martuwarra (Fitzroy River) is one of Australia's largest rivers, in the remote Kimberley region in the far north. Martuwarra is still relatively unmodified by human development. 64% of people who live in the catchment are Indigenous. Martuwarra has significant cultural, economic and subsistence importance for Indigenous community. Development pressure on the river mounts from agricultural expansion, mining, fracking, inappropriate fire regimes, unregulated tourism an invasive species.
2016	Kimberley Traditional Owners sign the Fitzroy River Declaration, which is an expression of First Law by the Martuwarra Nations. Under First Law, Traditional Owners have rights to use and access water in the River and the responsibility to care for the River. Declaration argues for the recognition of the traditional laws and customs of Martuwarra Traditional Owners under the native title law, by close analogy with the Whanganui River case.

Table A18
Summary Martuwarra in Australia.

Advocates	Indigenous (Traditional Owners)
Exploiting activity	Agriculture; mining; fracking; unregulated tourism; invasive species
Timeline	Since before 2016
EP purpose and value cognition	Traditional Owners of the Kimberley region of Western Australia are concerned by the extensive development proposals facing the Fitzroy River and its catchment and the potential for cumulative impacts on its unique cultural and environmental values. The unique cultural and environmental values of the Fitzroy River and its catchment are of national and international significance.
Geographical entity	River and its catchment (Martuwarra) in Australia
Legislative framework	Fitzroy River Declaration, 2016
Legal status	The Fitzroy River is a living ancestral being and has a right to life. It must be protected for current and future generations, and managed jointly by the Traditional Owners of the river.
Guardians	Traditional Owners of the Fitzroy catchment agree to work together to: 1. Action a process for joint PBC decision making on activities in the Fitzroy catchment; 2. Reach a joint position on fracking in the Fitzroy catchment; 3. Create a buffer zone for no mining, oil, gas, irrigation and dams in the Fitzroy catchment; 4. Develop and agree a Management Plan for the entire Fitzroy Catchment, based on traditional and environmental values; 5. Develop a Fitzroy River Management Body for the Fitzroy Catchment, founded on cultural governance; 6. Complement these with a joint Indigenous Protected Area over the Fitzroy River; 7. Engage with shire and state government to communicate concerns and ensure they follow the agreed joint process; 8. Investigate legal options to support the above, including: 1) Strengthen protections under the EPBC Act National Heritage Listing; 2) Strengthen protections under the Aboriginal Heritage Act; and 3) Legislation to protect the Fitzroy catchment and its unique cultural and natural values.
Liability	Not specified
Financing	Not specified

A.11. Mutehekau Shipu (Magpie River), Quebec Canada 2021

Table A19
Timeline Magpie River in Canada (source: media releases, e.g. Alliance Mutesheku-shipu, 2021; Stuart-Ulin, 2021; Nerberg, 2022; Remedios and Ardanaz, 2021).

Before 1961	Mutehekau Shipu (Magpie River) is located in the traditional territory of the Innu Council of Ekuanitshit and is an important part of the community's traditional land-based practices and history.
1961	Hydro-electricity generation station is built on Mutehekau Shipu (Magpie River).
2007	Upgrade of generation station to increase energy output; the expansion flooded a section popular with whitewater kayakers.
2009–13	Hydro-Quebec (4th largest hydro-power producer in the world) targets the Mutehekau Ship for a hydroelectric 'complex' (4 dam project) that would generate 850 MWh (enough to power 290,000 homes).
2017	River protectors led by the Indigenous Innu community of Ekuanitshit, the Minganie regional country municipality, SNAP Quebec (the province's chapter of the Canadian Parks and Wilderness Society) and the Association Eaux Vives Minganie (group of nature-lovers and paddlers) protested outside Hydro-Quebec's head office in Montreal demanding an end to all future plans of dams along the river. Hydro-Quebec responded by taking Mutehekau Shipu out of its near-term proposals but made no promises for the future.
2018	River protectors form the Muteshekau-shipu Alliance and call on the International Observatory on the Rights of Nature, a Montreal-based NGO, to draft a 15-page resolution to declare the river a legal person with nine rights, including the right to flow and the right to sue.
February 2021	The Muteshekau-shipu Alliance produce a Joint Declaration granting the river legal personhood and rights. Lawyers from the International Observatory used case law by previous rights-of-nature cases because the Canadian Constitution does not enshrine rights for nature as a legal entity the way it upholds rights for humans and corporations. Legal personhood is passed by Innu and municipal councils but has no constitutional status. It is yet to be seen how Courts will interpret the declaration as Canada's "Protection of Aboriginal Rights" provision in section 35 of the Constitution Act 1982 may confer constitutional status on Mutehekau Shipu's personhood declaration.

Table A20
Summary Mutehekau Shipu in Canada.

Advocates	Logal Indigenous Alliance (Muteshekau-Shipu Alliance made up of Innu Council of Ekuanitshit, Minganie regional county municipality, SNAP Quebec, Eaux-Vives Minganie)
Exploiting activity	Hydroelectricity generation (dams) by large corporation (Hydro-Quebec)
Timeline	Since 1961
Purpose and value cognition	See below.
Geographical entity	River (Mutehekau Shipu), Quebec, Canada
Legislative framework	Joint Declaration by Muteshekau-shipu Alliance 2021
Legal status	River is legal person with nine rights: 1) the right to flow; 2) the right to respect for its cycles; 3) the right for its natural evolution to be protected and preserved; 4) the right to maintain its natural biodiversity; 5) the right to fulfil its essential functions within its ecosystem; 6) the right to maintain its integrity; 7) the right to be safe from pollution; 8) the right to regenerate and be restored; and 9) the right to sue.
Guardians	Creation of Indigenous Guardian Program in progress.
Liability	Not specified
Financing	Not specified

A.12. Mar Menor Lagoon, Spain 2022

Table A21
Timeline Mar Menor lagoon in Spain (source: media releases, blogs and other, e.g. Jones, 2022; Mateo and Alvarez, 2022; Anima Mundi Law Initiative, 2021).

Before 2016	Mar Menor is the largest saltwater lagoon in Europe and has been subject to pollution and ecological damage from agriculture and mining activities, poor sewage systems and lack of environmental protection
2016	Extreme eutrophication (overgrowth of algae/anoxia); 85% of seagrass was killed; fish die off; loss of tourism due to smell; fall in house prices; damage to local economy and loss of community cohesion.
30 Oct 2019	Demonstration in the city of Cartagena with more than 55,000 participants calling for measures to save the Mar Menor
2020	University of Murcia, with support of NGOs and others, forming the Pact for the Mar Menor Platform, submit a 'popular legislative initiative' (PLI) and begin gathering supporting signature from the public (640,000 signatures). PLI is a participatory democratic mechanism which allows citizens to propose a new law pursuant to Article 87(3) of the Spanish Constitution. PLI sought recognition of the right of Mar Menor lagoon to exist as an ecosystem and to be protected and preserved.
30 Sep 2022	Spanish Parliament completes the 'Mar Menor Act' (Ley 19/2022), granting legal personhood to the Mar Menor and its basin. It is the first to give rights to nature in Europe.

Table A22
Summary Mar Menor lagoon in Spain.

Advocates	Local initiative (Pact for the Mar Menor Platform, including University of Murcia, NGOs, residents)
Exploiting activity	Agriculture, mining, sewage
Timeline	Since before 2016
Purpose and value cognition	See below
Geographical entity	Lagoon, its basin, drainage networks and aquifers (Mar Menor), Spain
Legislative framework	Mar Menor Act 19/2022 (English translation obtained from University of Murcia, Spain)

(*continued on next page*)

Table A22 (*continued*)

Advocates	Local initiative (Pact for the Mar Menor Platform, including University of Murcia, NGOs, residents)
Legal status	Article 2(1). The Mar Menor and its basin shall be recognized as a legal entity with rights that require the ecosystem be protected, preserved, maintained or, where relevant, restored by regional and central governments and residents of the Mar Menor's surroundings. The Mar Menor shall also have the right to exist as an ecosystem and to evolve naturally, which shall include all the natural characteristics of the water, the communities of organisms, the soil and the terrestrial and aquatic subsystems that form part of the Mar Menor lagoon and its basin.Article 2(2). Mar Menor lagoon is granted the right to exist and evolve naturally; right to protection; right to conservation and right to restoration.
Guardians	Article 3(1). The representation and governance of the Mar Menor lagoon and its basin shall be made up of three bodies: a Committee of Representatives composed of competent representatives of the Public Administrations and the public of the coastal municipalities; a Monitoring Commission (the guardians of the Mar Menor Lagoon) and a Scientific Committee comprising an independent commission of scientists and experts, universities and research centres. These three bodies shall be in charge of the guardianship of the Mar Menor. Article 3(2). The Committee of Representatives shall be constituted by thirteen members, three of whom shall be from the General State Administration, three from the Autonomous Community and seven from the citizens who shall initially be the members of the Promoting Group of the Popular Legislative Initiative. Among the functions of the Committee of Representatives shall be to propose actions for the protection, conservation, maintenance and restoration of the lagoon, as well as to supervise and control compliance with the rights of the lagoon and its basin. Article 3(3). The Monitoring Commission (guardians) shall be formed by a representative and an alternate of each of the coastal municipalities or the municipalities bordering the Mar Menor basin appointed by the respective Town Councils as well as by a representative and an alternate of each of the following economic, social and environmental defence sectors: business associations, trade unions, neighbourhood associations, fishing associations, agricultural associations, livestock associations -with representation of organic and/or traditional agriculture and livestock farming-, environmental defence associations, associations for gender equality and youth associations. Article 3(3). The Scientific Committee shall be constituted by scientists and independent experts specialised in the study of the Mar Menor proposed by the Universities in Murcia and Alicante Regions, by the Spanish Institute of Oceanography (Oceanographic Centre of Murcia), by the Iberian Ecological Society and by the Spanish National Research Council. The functions of the Scientific Committee shall include advising the Representative Committee and the Monitoring Committee, identifying indicators on the ecological status of the ecosystem, etc. Article 4. Any conduct that may violate the rights recognized and guaranteed by this Act, by any public authority, private law entity, natural person or legal entity, shall give rise to criminal, civil, environmental and administrative liability, and shall be prosecuted and sanctioned in accordance with the criminal, civil, environmental and administrative regulations in their respective jurisdictions. Article 5. Any act or action of any of the public administrations that violates the provisions contained herein shall be considered invalid and shall be subject to administrative or judicial review. Article 6. Any natural or legal person shall be entitled to defend the ecosystem of the Mar Menor and may enforce the rights and prohibitions of this Act and the provisions herein by means of an action brought before the corresponding Court or Public Administration Such legal action shall be brought on behalf of the Mar Menor ecosystem as the Party concerned. The person who brings such an action shall be entitled to recover the full cost of the litigation undertaken, including, among others, the fees of lawyers ("abogados" and "procuradores), experts and witnesses, and shall be exempted from the costs of the proceedings.
Liability	Not specified.
Financing	Not specified.

A.13. Ganges and Yamuna Rivers, Uttarakhand, India 2017

Table A23
Timeline Ganges and Yamuna Rivers in India (source: O'Donnell, 2018b; Talbot-Jones and Bennett, 2019; O'Donnell and Talbot-Jones, 2018; Lovelle, 2018).

Up to 2017	The Ganges and Yamuna rivers in India are highly polluted (raw sewage and industrial waste); severe degradation of river ecosystems due to unlawful encroachment. The Glaciers Gangotri and Yamunotri are at the headwaters of the Ganges and Yamuna rivers.
20 March 2017	In Mohd. Salim v State of Uttarakhand, the Uttarakhand High Court declares the Ganges and Yamuna Rivers and their tributaries 'juristic/legal persons/living entities having the status of a legal person'. The Ganges and Yamuna rivers have their headwaters in the Himalayas, and extend south beyond the State of Uttarakhand, eventually flowing into Bangladesh as the Padma river. Courts rely on India's constitution, moral duty to protect nature and sacred status of rivers to the Hindu population under the *parens patriae* doctrine (natural objects are considered minors under the law).
30 March 2017	In Lalit Miglani v State of Uttarakhand, 2017, the Uttarakhand High Court declares, by invoking the *parens patriae* jurisdiction, 'the Glaciers including Gangotri & Yamunotri, rivers, streams, rivulets, lakes, air, meadows, dales, jungles, forests wetlands, grasslands, springs and waterfalls, legal entity/legal person/juristic person/juridical person/moral person/artificial person having the same status of a legal person, with all corresponding rights, duties, and liabilities of a living person, in order to preserve and conserve them.' The ruling explicitly states that the rights of these legal entities are equivalent to rights of human beings and injury should be treated like injury to human beings.
7 July 2017	Indian Supreme Court overturns decision to recognize Ganges and Yamuna rivers as living persons. A Special Leave Petition filed by the Government of Uttarakhand (document not publicly available) appealed the Ganges and Yamuna ruling arguing it is **legally unsustainable** (https://www.bbc.com/news/world-asia-india-40537701) on 2 grounds: 1) The ruling is not practical and could lead to complicated legal situations. The living person status creates uncertainty about who the custodians are and who would be **liable** to pay damages in case of flooding or drowning (Lovelle, 2018). 2) The Ganges and Yamuna rivers extend beyond the borders of Uttarakhand (for the Ganges, into Bangladesh). "If there arises any dispute (due to) illegalities being committed in other states, then the Chief Secretary cannot pass any instruction against any other states or Union of India… therefore, the state of Uttarakhand cannot declare the river Ganga and Yamuna as a legal person, or living entity." (see https://indianexpress.com/article/india/uttarakhand-doesnt-want-living-person-status-for-ganga-yamuna-4723578/)

Table A24
Summary Ganges and Yamuna Rivers in India.

Advocates	Individuals representing others (Mohd Salim; Lalit Miglani)
Exploiting activity	Raw sewage; industrial activity
Timeline	Since before 2017
Purpose and value cognition	S11. Rivers Ganges and Yamuna are worshipped by Hindus. These rivers are very sacred and revered. The Hindus have deep spiritual connection with the rivers. According to Hindu beliefs, a dip in the River Ganga can wash away all the sins. S16. To protect the recognition and the faith of society, Rivers Ganga and Yamuna are required to be declared as the legal persons/living persons. S17. All the Hindus have deep Astha in rivers Ganga and Yamuna and they collectively connect with these rivers. Rivers Gagna and Yamuna are central to the existence of half of the Indian population and their health and well being. The rivers have provided both physical and spiritual sustenance to all of us from time immemorial. They support and assist both in the life and natural resources and health and well-being of the entire communtiy. Rivers Ganga and Yamuna are breathing, living and sustaining the communities from mountains to sea. S19. Rivers Ganga and Yamuna are declared legal person/living entities in order to preserve and conserve the rivers.
Geographical entity	Rivers and their glaciers (Ganges and Yamuna rivers; Gangotri and Yamunotri); Ganges is transboundary (Himalayas/India/Bangladesh)
Legislative framework	Public Interest Litigation Mohd. Salim v State of Uttarakhand, 2017 and Lalit Miglani v State of Uttarakhand, 2017, then overturned by Indian Supreme Court.
Legal status	S19. While exercising the *parens patriae* jurisdication, the Rivers Ganga and Yamuna, all their tributaries, streams, every natural water flowing with flow continuously or intermittently of these rivers, are declared as juristic/legal persons/living entities having the status of a legal person with all corresponding rights, duties and liabilities of a living person in order to perserve and conserve river Ganga and Yamuna.
Guardians	S18. The Ganga Management Board is necessary for the purpose of irrigation, rural and urban water supply, hydro power generation, navigation, industries. S19.The Director NAMANI Gange, the Chief Secretary of the State of Uttarakhand and the Advocate General of the State of Uttarakhand are hereby declared persons in loco parentis as the human face to protect, conserve and preserve Rivers Ganga and Yamuna and their tributaries.
Liability	Not specified
Financing	Not specified

A.14. Turag River, Bangladesh 2019

Table A25
Timeline Turag River in Bangladesh (source: Islam and O'Donnell, 2020; Anima Mundi Law Initiative, 2019).

6 Nov 2016	Report published in "The Daily Star" on the Turag River with the title: "*Time to declare Turag dead: River grabbers appear mightier than Government, Judiciary; all steps go in vain.*" The report also published dozens of satellite images taken between 2013 and 2016 showing the encroachments of Turag River by earth filling, making constructions etc.
7 Nov 2016	Bangladeshi NGO, Human Rights and Peace for Bangladesh, filed Writ Petition No. 13989 at the High Court Division of the Supreme Court of Bangladesh challenging the legality of earth filling, encroachment and construction of structures along the banks of the Turag River. The Writ Petition was against Bangladesh represented by the Secretary, Ministry of Shipping; Chairman, Bangladesh Inland Water Transport Authority; Director General, Department of Environment; etc.
30 Jan and 3 Feb 2019	The Court declared the Turag River to be a legal person, legal entity and living entity. This decision was based on the public trust doctrine. This legal status was extended to all rivers in Bangladesh. The Court appointed the National River Conservation Commission as legal guardian (person in loco parentis), with legal responsibility to protect and conserve the rivers. The Court ordered the state to amend the National River Conservation Commission Act 2013 to strengthen the NRCC's powers of investigation and enforcement. Reportedly, the impact has been significant with authorities demolishing 4000 illegal establishments along the Turag river banks and recovering 190 acres of land since the judgement was issued.
17 Feb 2020	The Appelate Division of the Supreme Court of Bangladesh upheld the judgement, rejecting a civil petition for leave to appeal by one of the respondents.

Table A26
Summary Turag Rivers in Bangladesh.

Advocates	NGO (Human Rights and Peace for Bangladesh) on behalf of human rights, protection of the environment as well as health and hygiene of citizens
Exploiting activity	Construction; encroachment; pollution
Timeline	Since before 2016
Purpose and value cognition	See below S3.
Geographical entity	All rivers and tributaries (Turag Rivers and all rivers flowing inside and through Bangladesh)
Legislative framework	High Court Judgement in Writ Petition No. 13989 of 2016: Turag River Case
Legal status	S2. Turag River is declared as legal person/legal entity/living entity. All rivers flowing inside and through Bangladesh will also get the same status of legal persons or legal entitites or living entities.
Guardians	S3. The National River Conservation Commission (NRCC) is declared as the 'Persons in Loco Parentis' of all rivers of Bangladesh including River Turag for protection, conservation, development by saving them from pollution and encroachment. From now on, the NRCC is under obligation for protection, conservation, development and beautification of all rivers after saving them from pollution and encroachment as well as making them suitable for navigation with the cooperation and assistance of all river-related Authorities, Departments and Ministries. S7. The Respondent No. 1 is hereby directed to take steps for necessary amendment of the National River Conservation Commission Act 2013 by inserting provisions of criminal offences for river encroachment and its pollution with stricter punishment and fines, and also procedure of institution of case, its investigation and trail.
Liability	Not specified
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References

Alliance Mutesheku-shipu, 2021. Announcement of Legal Personhood of Magpie River in Quebec Canada. Available at. http://files.harmonywithnatureun.org/uploads/upload1070.pdf.

Anima Mundi Law Initiative, 2019. Rights of Nature Case Study Turag River. Available at. http://files.harmonywithnatureun.org/uploads/upload1130.pdf.

Anima Mundi Law Initiative, 2021. Rights of Nature Case Study Mar Menor Lagoon. Available at. http://files.harmonywithnatureun.org/uploads/upload1139.pdf.

Arias-Arévalo, P., Martín-López, B., Gómez-Baggethun, E., 2017. Exploring intrinsic, instrumental, and relational values for sustainable management of social-ecological systems. Ecol. Soc. 22 (4).

Bookman, S., 2023. Rights of nature in comparative perspective. Nat. Resour. Environ. 37 (4).

Boyd, D.R., 2018. Recognizing the rights of nature: lofty rhetoric or legal revolution. Nat. Resour. Environ. 32 (4), 13–17.

Calzadilla, P.V., 2019. A paradigm shift in Courts' view on nature: the Atrato River and Amazon Basin cases in Colombia. Law Environ. Dev. J. 15 (1), 49.

Calzadilla, P.V., Kotzé, L.J., 2018. Living in harmony with nature? A critical appraisal of the rights of mother earth in Bolivia. Trans. Environ. Law 7 (3), 397–424.

Chan, K.M.A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R., Hannahs, N., Jax, K., Klain, S., Luck, G.W., Martín-López, B., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., Turner, N., 2016. Relational values and the environment. Proc. Natl. Acad. Sci. 113 (6), 1462–1465. https://doi.org/10.1073/pnas.1525002113.

Constitution of Ecuador, 2008. Translated into English. available at. https://pdba.georgetown.edu/Constitutions/Ecuador/english08.html.

Constitutional Court of Colombia, November 10, 2016. The Atrato River Case; Judgment T-622/16. available at. http://files.harmonywithnatureun.org/uploads/upload838.pdf.

Driscoll, C., Starik, M., 2004. The primordial stakeholder: advancing the conceptual consideration of stakeholder status for the natural environment. J. Bus. Ethics 49, 55–73.

Dulock, H., 1993. Research design: descriptive research. J. Pediatr. Oncol. Nurs. 10 (2), 154–157.

Fitzroy River Declaration, 2016. Available at. http://nationalunitygovernment.org/content/kimberley-traditional-owners-unite-fitzroy-river-declaration.

Garcon, G., 2015. Limits of NGO rights to invoke access to justice under the Aarhus convention. Eur. J. Risk Regul. 6 (3), 458–469.

Gellers, J.C., 2021. Earth system law and the legal status of non-humans in the Anthropocene. Earth Syst. Govern. 7, 100083.

Gindis, D., 2016. Legal personhood and the firm: avoiding anthropomorphism and equivocation. J. Inst. Econ. 12 (3), 499–513.

Gordon, G.J., 2018. Environmental personhood. Columbia J. Environ. Law 43, 1.

Grey, J., Whyte, I., Curry, P., 2018. Ecocentrism: what it means and what it implies. Ecol. Citizen 1 (2), 130–131.

Harmsworth, G.R., Awatere, S., 2013. Indigenous Maori knowledge and perspectives of ecosystems. In: Dymond, J.R. (Ed.), Ecosystem Services in New Zealand - Conditions and Trends. Lincoln, Manaaki Whenua Press, pp. 274–286.

Hutchison, A., 2014. The Whanganui River as a legal person. AltLJ 39, 3.

IPBES, 2019. In: Díaz, S., Settele, J., Brondízio, E.S., Ngo, H.T., Guèze, M., Agard, J., Arneth, A., Balvanera, P., Brauman, K.A., Butchart, S.H.M., Chan, K.M.A., Garibaldi, L.A., Ichii, K., Liu, J., Subramanian, S.M., Midgley, G.F., Miloslavich, P., Molnár, Z., Obura, D., Pfaff, A., Polasky, S., Purvis, A., Razzaque, J., Reyers, B., Chowdhury, R. Roy, Shin, Y.J., Visseren-Hamakers, I.J., Willis, K.J., Zayas, C.N. (Eds.), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany, 56 pages. Available at. https://zenodo.org/records/3553579.

Islam, M.S., O'Donnell, E., 2020. Legal rights for the Turag: Rivers as living entities in Bangladesh. Asia Pacific J. Environ. Law 23, 160–177.

Jacobs, M., 1997. The environment as stakeholder. Bus. Strateg. Rev. 8 (2), 25–28.

Jones, S., 2022. Endangered Mar Menor lagoon in Spain granted legal status as a person. The Guardian, 21 Sep 2022. Available at. https://www.theguardian.com/world/2022/sep/21/endangered-mar-menor-lagoon-in-spain-granted-legal-status-as-a-person.

Kahui, V., Cullinane, A., 2019. The ecosystem commons. N. Z. J. Ecol. 43 (3), 3380.

Kauffman, C.M., Martin, P., 2017. Can rights of nature make development more sustainable? Why some Ecuadorian lawsuits succeed and others fail. World Dev. 92, 130–142.

Khan, S., Vanwynsberghe, R., 2008. Cultivating the under-mined: cross-case analysis as knowledge mobilization. Forum Qual. Soc. Res. 9 (1). Art.34.

Kotze, L.J., 2019. Earth system law for the anthropocene. Sustainability 11, 6796.

Laine, M., 2011. The nature of nature as a stakeholder. J. Bus. Ethics 96, 73–78.

Lalit Miglani v State of Uttarakhand, 2017. Available at. https://indiankanoon.org/doc/92201770/.

Law of rights of Mother Earth, Bolivia, 2010. Translated into English. available at. http://www.worldfuturefund.org/Projects/Indicators/motherearthbolivia.html.

Lovelle, M., 2018. Entering unchartered waters: Awarding legal rights to rivers. In: Strategic Analysis Paper. Global food and Water Crises Research Programme.

Macpherson, E.J., 2018. Indigenous Water Rights in Law and Regulation. Lessons from Comparative Experience. Cambridge.

Macpherson, E., Ospina, F.C., 2018. The pluralism of river rights in Aotearoa New Zealand and Colombia. J. Water Law 25, 283–293.

Maldonado D. B. (2024). Global legal pluralism and the rights of nature. In "The Rights of Nature and Global Legal Pluralism" Maldonado D.B, Michaels R, Forthcoming, Max Planck Private Law Research Paper No. 23/15.

Mateo, B.S., Alvarez, S., 2022. The Mar Menor lagoon enjoys legal standing: and now, what? Verfassungsblog on matters constitutional, 14 Oct 2022. Available at. https://verfassungsblog.de/the-mar-menor-lagoon-in-spain-enjoys-legal-standing-and-now-what/.

McCombes, S., 2023. Descriptive Research. Definition, Types, Methods & Examples. Scribbr. https://www.scribbr.com/methodology/descriptive-research/.

Micklewaith, J., Wooldridge, A., 2003. The Company: A Short History of a Revolutionary Idea. The Modern Library, New York, USA.

Mohd. Salim v State of Uttarakhand, 2017. Available at. https://www.ielrc.org/content/e1704.pdf.

Naffine, N., 2012. Legal personality and the natural world: on the persistence of the human measure of value. J. Human Right Environ. 3, 68–83.

Nerberg, S., 2022. I am Mutehekau Shipu: a river's journey to personhood in eastern Quebec. Can. Geogr. Available at https://canadiangeographic.ca/articles/i-am-mutehekau-shipu-a-rivers-journey-to-personhood-in-eastern-quebec/.

Neuman, J.C., 2004. The good, the bad and the ugly: the first ten years of the Oregon water trust. Nebraska Law Rev. 83 (432).

O'Donnell, E.L., 2018a. Legal Rights for Rivers. Competition, Collaboration and Water Governance. Routledge.

O'Donnell, E.L., 2018b. At the intersection of the sacred and the legal: rights for nature in Uttarakhand, India. J. Environ. Law 30, 135–144.

O'Donnell, 2020. Rivers as living beings: rights in law, but no rights to water? Griffith Law Rev. 29 (4), 643–668.

O'Donnell, E., Macpherson, E., 2019. Voice, power and legitimacy: the role of the legal person in river management in New Zealand, Chile and Australia. Australas. J. Water Res. 23 (1), 35–44.

O'Donnell, E.L., Talbot-Jones, J., 2018. Creating legal rights for rivers: lessons from Australia, New Zealand and India. Ecol. Soc. 23 (1), 7.

O'Donnell, E., Poelina, A., Pelizzon, A., Clark, C., 2020. Stop burying the Lede: the essential role of indigenous law(s) in creating rights of nature. Trans. Environ. Law 9 (3), 403–427.

O'Malley, V., 2014. Tūhoe-Crown Settlement: Historical Background. Māori Law Review online articles; available at. https://maorilawreview.co.nz/2014/10/tuhoe-crown-settlement-historical-background/.

Phillips, R.A., Reichart, J., 2000. The environment as a stakeholder? A fairness-based approach. J. Bus. Ethics 23, 185–197.

Putzer, A., Lambooy, T., Jeurissen, R., Kim, E., 2022. Putting the rights of nature on the map. A quantitative analysis of right so nature initiatives across the world. J. Maps 18, 2–5.

Reitz, J.C., 1998. How to do comparative law. Am. J. Comp. Law 46 (617).

Remedios, S., Ardanaz, J., 2021. Quebec River Granted Rights and Legal Personhood by Indigenous Community and Local Municipality. The Canadian Bar Association, British Columbia Branch, Q1. Available at. https://www.cbabc.org/Sections-and-Community/Business-Law/Business-Law-Quarterly/Q1-2021-Changing-Winds/Rights-for-Rivers#ft10.

Ridder, H., 2017. The theory contribution of case study research designs. Bus. Res. 10, 281–305.

RiverOfLife, Martuwarra, Poelina, A., Bagnall, D., Lim, M., 2020. Recognizing the Martuwarra's first law right to life as a living ancestral being. Trans. Environ. Law 9 (3), 541–568.

Ruruka Whakatupua, 2014. Whanganui River Deed of Settlement between the Crown and Whanganui Iwi. https://www.govt.nz/browse/history-culture-and-heritage/treaty-settlements/find-a-treaty-settlement/whanganui-iwi/whanganui-iwi-whanganui-river-deed-of-settlement-summary/.

Seawright, J., Gerring, J., 2008. Case selection techniques in case study research. Polit. Res. Q. 61 (2), 294–308.

Siedlecki, S.L., 2020. Understanding descriptive research designs and methods. Clin. Nurse Spec. 34 (1), 8–12.

Stone, C.D., 1972. Should trees have standing–toward legal rights for natural objects. South. Calif. Law Rev. 45 (2), 450–501.

Stuart-Ulin, C.R., 2021. Quebec's Magpie River becomes first in Canada to be granted legal personhood. National Observer 24 Feb 2021. Available at. https://www.nationalobserver.com/2021/02/24/news/quebecs-magpie-river-first-in-canada-granted-legal-personhood.

Stubbs, C., 2001. Is the environmental citizen suit dead–an examination of the erosion of standards of justiciability for environmental citizen suits. N.Y.U. Rev. Law Soc. Chang. 77.

Talbot-Jones, J., 2017. The Institutional Economics of Granting a River Legal Standing. Dissertation. Crawford School of Public Policy, Australian National University, Canberra, Australia.

Talbot-Jones, J., Bennett, J., 2019. Toward a property rights theory of legal rights for rivers. Ecol. Econ. 164, 106352.

Tanasescu, M., 2020. Rights of nature, legal personality, and indigenous philosophies. Trans. Environ. Law 9 (3), 429–453.

Te Awa Tupua (Whanganui River Claims Settlement) Act, 2017. Available at. https://www.legislation.govt.nz/act/public/2017/0007/latest/whole.html.

Te Urewera Act, 2014. Available at. https://www.legislation.govt.nz/act/public/2014/0051/latest/whole.html.

Tietenberg, T., Lewis, L., 2018. Environmental and Natural Resource Economics, 11th edition. Routledge.

Water Act, 1989. Available at. https://www.water.vic.gov.au/planning/victorias-entitlement-framework/the-water-act.

World Commission of Environmental Law, 2016. World Declaration on the Environmental Rule of Law, Outcome Document of the 1st IUCN. World Environmental Law Congress.

Wright, D.V., 2020. Environmental rule of law: in need of coherence in contested terrain. McGill Int. J. Sustain. Dev. Law Policy 15 (1), 1–15.

WWF, 2022. In: Almond, R.E.A., Grooten, M., Juffe Bignoli, D., Petersen, T. (Eds.), Living Planet Report 2022 – Building a Nature-Positive Society. WWF, Gland, Switzerland.