

# The Development of Rights of Nature: A Necessary Counterbalance to Technological “Climate Solutions”

By Meseret Carver

## Introduction

Rights of nature is an innovative and growing field of law across the world. Although there is no concrete definition of “rights of nature,” the concept is founded on an ecocentric, rather than anthropocentric, view of the world. An ecocentric perspective values all life on Earth as intertwined and interdependent. In contrast, an anthropocentric perspective centers humans as primary actors on the planet and relegates non-humans to the periphery of legal protection. The anthropocentric legal regime has recognized humans as the primary example of a legal person—an entity with the ability to bring suit, be sued, enter into contracts, etc. Even within anthropocortical systems some humans—such as enslaved peoples—have been defined as property with no legal personhood.<sup>1</sup> Developments in rights of nature draw on the customary laws and traditions of Indigenous Peoples and legal progress in the areas of human rights, infant rights, the rights of differently-abled peoples, and even incorporate personhood, to argue that nature should have legal standing.<sup>2</sup> These legal spaces all aim to decipher who should be a legal person and to what extent. It builds on these fields to argue that living beings—whether that be trees, whales, or mountains—should have legal standing.<sup>3</sup> Since Christopher Stone’s seminal article on the topic in the 1970s, *Should Trees Have Standing?*, rights of nature have emerged on almost every continent in the form of laws, court cases, declarations, and even a constitutional amendment in Ecuador.<sup>4</sup> This development is essential in the face of the climate crisis and accelerated technological development. Human industries such as agriculture, as well as oil and

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<sup>1</sup> *People Not Property: Stories of Slavery in the Colonial North: Defining Slavery*, HUDSON VALLEY NETWORK, <https://peoplenotproperty.hudsonvalley.org/defining-slavery.php> [https://perma.cc/TK5E-KCYP] (last visited May 6, 2025).

<sup>2</sup> Anna Arstein-Kerslake et al. *Relational personhood: a conception of legal personhood with insights from disability rights and environmental law*, 30 GRIFFITH L. REV. 530 (2021); Visa A.J. Kurki, *Can Nature Hold Rights? It’s Not as Easy as You Think*, 11 TRANSNATIONAL ENV’T L. 525 (2022).

<sup>3</sup> See generally RIGHTS OF RIVERS: A GLOBAL SURVEY OF THE RAPIDLY DEVELOPING LANDSCAPE OF LEGAL RIGHTS OF RIVERS, INTERNATIONAL RIVERS 13 (Oct. 2020), <https://www.internationalrivers.org/wp-content/uploads/sites/86/2020/09/Right-of-Rivers-Report-V3-Digital-compressed.pdf>.

<sup>4</sup> *Id.*; see also *Eco Jurisprudence Tracker*, ECO JURISPRUDENCE MONITOR, <https://ecojurisprudence.org> (last visited Mar. 29, 2026).

gas, use incredible amounts of natural resources.<sup>5</sup> However, the climate crisis is forcing us to reassess our extractive patterns.

Rights of nature offers a novel and holistic contribution to the climate crisis, especially in the face of technological developments. Some technological developments like Artificial Intelligence (“AI”) present great water and energy demands; other developments such as gene-editing technology, carbon sink technology, or other geo-engineering techniques are proposed as climate solutions.<sup>6</sup> Whether these solutions are false or true, they do not challenge the extractive practices that brought us to the climate crisis to begin with. If they are not properly regulated, they may even exacerbate the climate crisis.<sup>7</sup> Alternatively, a rights of nature legal system challenges our extractive practices and attempts to develop reciprocity with the natural world.

In this article, I will argue that a global effort to strengthen laws pertaining to the “rights of nature” will provide an effective avenue for regulating the rapid development of high risk technological solutions to climate change. The first part of this discussion will focus on how anthropocentric legal systems empowered humans to form an extractive relationship towards nature, which has played a large role in the creation of the climate crisis. I describe how colonial history, an anthropocentric phenomenon in and of itself, has contributed to the extractive relationship humans currently have with nature. I further analyze how that history translated into our legal system, especially the ideological origins of international law. To conclude this first section, I describe how the anthropocentric legal system has ultimately played a central part in the creation of the climate crisis. For the purposes of this paper, I will characterize colonial influence and its persistence in our legal systems through the violent seizure of Indigenous lands.<sup>8</sup>

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<sup>5</sup> Alan Renwick, Md. Mofakkarul Islam & Steven Thomson, *Power in Global Agriculture: Economics, Politics, and Natural Resources*, 2 INT’L. J. AGRIC. MGMT. 31, 41-45 (2012).

<sup>6</sup> L. Val Giddings et al., *Gene Editing for the Climate: Biological Solutions for Curbing Greenhouse Emissions* 10–17 (2020), <https://www2.itif.org/2020-gene-edited-climate-solutions.pdf>; see also Lin Chen et al., *RETRACTED ARTICLE: Artificial intelligence-based solutions for climate change: a review*, 21 ENV’T CHEMISTRY LETTERS, 2525–57 (2023); see also Mary Church & Rossella Recupero, *Why Geoengineering is a False Solution to the Climate Crisis*, CTR. FOR INT’L ENV’T L. (Oct. 15, 2024), <https://www.ciel.org/why-geoengineering-is-a-false-solution-to-the-climate-crisis/>.

<sup>7</sup> *Id.*

<sup>8</sup> CITLALI ROVIROSA-MADRAZO, EUROCENTRISM AND ANTHROPOCENTRISM IN INTERNATIONAL LAW? OBSTACLES FOR THE CRIMINALISATION OF ECOCIDE AT THE ICC 7- 11 (2023), <https://ecocidelaw.com/wp-content/uploads/2023/08/13-Rovirosa-Madrado-Eurocentrism-and-Anthropocentrism-in-International-Law.pdf>.

The second section explores potential technological solutions and threats to the climate crisis. I argue that while technological developments help mitigate the climate crisis, they also perpetuate the extractive relationship that has led us here in the first place. First, I introduce the dangerously anthropocentric ideology of leading tech innovators and argue that such ideology necessitates a counterbalance of ecocentric principles for their innovations to truly be beneficial. Not only are these leaders content with the anthropocentric legal and social order, but they also aim to expand the separation between the human and nonhuman world by dominating nature through technology. Second, I use gene editing as an example of how this anthropocentric ideology can generate technological solutions that pose a great risk to our climate. More specifically, gene editing can mitigate malaria yet poses a potential threat to species and ecosystems. Its use is not separate from its makers' anthropocentric ideology, meaning gene editing has the potential to be wielded in a way that expands the extractive practices that have led to the climate crisis.

Finally, I argue that a parallel development of rights of nature law is necessary to mitigate the risks of technological climate solutions. First, I explain how rights of nature and technology are two extremes on the pendulum of climate change solutions. Rights of nature is based on reconnecting with nature, while technological solutions entail dominating or controlling nature. While critics argue that rights of nature are too vague or overbroad,<sup>9</sup> I argue that this all-encompassing structure of rights of nature is the very benefit necessary to keep up with the rapid developments in technology that slip through the cracks of existing regulations. The same way that unregulated technology has been justified as necessary to combat the urgency of climate change, the sweeping effects of rights of nature are justified to mitigate the tremendous risk that technological solutions pose in perpetuating climate change. Embracing the rights of nature signifies not only a balancing of ideologies but also a balancing of tangible risks. Lastly, I address the challenges of implementing rights of nature and how these challenges can be overcome. In order to truly benefit from these technological 'climate solutions' we must also regulate the development of these technologies to account for side effects or parallel impacts of novel introduced approaches.

## **SECTION I. Colonial Ideology and Anthropocentric Development of Law**

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<sup>9</sup> Noah Sachs, *A Wrong Turn with the Rights of Nature Movement*, 36 GEO. ENV'T L. REV. 39, 41, 50 (2023).

Anthropocentric legal systems empowered humans to form an extractive relationship with nature. Western colonialism's ideology played a crucial part in the development of anthropocentric law on a global scale, starting with the development of property law.<sup>10</sup> The development of property law in the colonial era legitimized exploitative relationships to land. For example, the dispossession of Indigenous peoples and land is a widely accepted practice of colonialism. In the landmark case *Johnson v. M'Intosh*, decided in 1823, the U.S. Supreme Court reasoned that the Kaskaskias, the Pewarias, and the Cahoquias tribes did not have a legal interest in the land they occupied because they were not exploiting its resources to an extent that the colonial powers would have considered efficient, or most profitable.<sup>11</sup> Through this reasoning, the only value that land can have is through the resources it provides. However, relationships to land vary based on the needs of a community. Land may have spiritual, cultural, or even aesthetic value that safeguards it from purely extractive activities. *Johnson v. M'Intosh* delegitimizes relationships to land that are not purely exploitative. Further, the case does not reflect factual reasoning but rather reasoning born out of the racialized hierarchy of the colonial era: the opinion states that Indigenous tribes "remain in a state of nature," implying that the three tribes did not have distinct cultures, laws, and governing systems that were equal to the colonial powers.<sup>12</sup> Therefore, their relationships to land, which may not have been purely exploitative, were invisible to the colonial ideology of the court.

While international human rights law developed to protect humans from the racialized hierarchy of colonial ideology, this body of law is still anthropocentric in nature. In order to argue that human beings do not deserve to be exploited as they are under colonial regimes, the role of the law was to make human beings unique living beings—separate from nature and animals.<sup>13</sup> Equating local and Indigenous peoples with the "state of nature," as *Johnson v. M'Intosh* did, aimed to justify enslavement, colonization, and second-class citizenship all over the world. Human rights law campaigns against the dehumanization of Indigenous peoples,

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<sup>10</sup> Rovirosa-Madrado, *supra* note 8, at 4.

<sup>11</sup> *Johnson v. M'Intosh*, 21 U.S. 543, 590 (1823); *see also* Sheila Simon, *Johnson v. M'Intosh: 200 Years of Racism That Runs with the Land*, 47 S. ILL. U. L.J. 341, 341-344 (2023) (analyzing the court's racism in how it characterizes Indigenous land use).

<sup>12</sup> *See M'Intosh*, 21 U.S. at 567.

<sup>13</sup> Will Kymlicka, *Rethinking Human Rights for a More-Than-Human World*, in MORE THAN HUMAN RIGHTS: AN ECOLOGY OF LAW, THOUGHT, AND NARRATIVE FOR EARTHLY FLOURISHING 55, 57 (César Rodríguez-Garavito ed., 2024).

people of color and women, etc., by emphasizing humans as separate from nature.<sup>14</sup> The implicit reasoning in this separation is that humans have fundamental rights while nature has protections relative to its benefit to humans.

With growing exceptions, a majority of legal rulings today only recognize humans as legal persons with standing in court. Even the most progressive U.N. declaration, The Right to a Healthy Environment (“R2HE”), is anthropocentric. The declaration aims to protect those communities most vulnerable to climate change.<sup>15</sup> Unlike previous international laws and declarations, R2HE allows local and Indigenous communities to combat corporate and government actions that degrade their local environments and contribute to climate change—based on the principle that everyone has a right to a healthy environment. However, R2HE is based on the principle of nature for the benefit of humans. In order to truly reach the core of our extractive, anthropogenic relationship with nature, we must shift to a more mutually beneficial relationship with nature, away from the exploitative ideologies that have led to the climate crisis in the first place.

## **SECTION II: The transhumanist influence on technological developments as “climate solutions”**

Technological developments can help mitigate potential harms from climate change, but they can also perpetuate this isolation from nature, as well as our exploitative relationship to nature, if we do not properly regulate their risks. Silicon Valley leaders are increasingly convinced that tech is the answer to all our climate challenges, but this perspective poses many risks, two of which I will discuss in this section. First, viewing technological development as the sole solution to the climate crisis places tremendous power in the hands of a few decision makers within the tech industry, who may not prioritize ancillary damages this technology may have. Second, the development of climate solutions like gene editing can actually exacerbate, rather than help solve, climate threats.

Silicon Valley leaders have been swept up by a “transhumanist” philosophy. Transhumanism asserts that humans can use technology to overcome existential threats such as

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<sup>14</sup> *Id.* at 56.

<sup>15</sup> *What Is the Right to a Healthy Environment?* UNITED NATIONS DEVELOPMENT PROGRAMME 5, at 13-14 (2023), <https://www.undp.org/sites/g/files/zskgke326/files/2023-01/UNDP-UNEP-UNHCHR-What-is-the-Right-to-a-Healthy-Environment.pdf>.

climate change. In his 2022 book *Survival of the Richest: Escape Fantasies of Tech Billionaires*, tech and media critic Douglas Rushkoff comments on the ambitions of tech innovators today:

Taking their cue from Tesla founder Elon Musk colonizing Mars, Palantir’s Peter Thiel reversing the aging process, or artificial intelligence developers Sam Altman and Ray Kurzweil uploading their minds into supercomputers, they were preparing for a digital future that had less to do with making the world a better place than it did with transcending the human condition altogether. Their extreme wealth and privilege served only to make them obsessed with insulating themselves from the very real and present danger of climate change, rising sea levels, mass migration, global pandemics, nativist panic, and resource depletion.<sup>16</sup>

Rushkoff further explains that digital platforms are turning an “already exploitative and extractive marketplace” into a more “dehumanizing successor.”<sup>17</sup> While there may be benefits to looking to technology as a partial solution to some climate risks, these are the ideologies within which the “solution” is embedded. Rights of nature represents one end of the pendulum of potential solutions to climate change because it is rooted in reconnecting with nature and posits that every natural being—from forests to mosquitos—has inherent value and should be protected. Transhumanism sits at the other end of the spectrum. Rather than aiming to protect natural beings by leaving them untouched, it advocates for genetic modification of living beings as a way to transcend our biological limitations and enter a “post-human” world.<sup>18</sup>

Rushkoff also cites Google’s former director of engineering and primary developer of the transhumanist theory of Singularity, Ray Kurzweil. Singularity is the branch of transhumanism that believes humans will become one with technology; Kurzweil’s theory posits that, by 2045, human brains will be uploaded into computers and potentially become immortal.<sup>19</sup> This theory advocates for the further separation of humans from the natural world, building on colonial ideology. Tech venture capitalist Marc Andreessen’s views, on the other hand, are aligned with another branch of transhumanism that asserts that people will maintain their humanity and learn

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<sup>16</sup> DOUGLAS RUSHKOFF, 4-5 (2022).

<sup>17</sup> *Id.* at 8.

<sup>18</sup> Yawen Zou, *Genetic enhancement from the perspective of transhumanism: exploring a new paradigm of transhuman evolution*, 27 *MED., HEALTH CARE AND PHILOS.* 529, 532 (2024).

<sup>19</sup> Lev Grossman, *2045: The Year Man Becomes Immortal* (Feb. 10, 2011), <https://time.com/archive/6595274/2045-the-year-man-becomes-immortal/>.

to love AI as an integral part of society.<sup>20</sup> In a 2023 blog post, Andreessen argued that without “the application of intelligence on all these domains [of ‘science, technology, math, physics, chemistry, medicine, energy, construction, transportation, communication, art, music, culture, philosophy, ethics, morality’], we would all still be living in mud huts, scratching out a meager existence of subsistence farming.”<sup>21</sup> Palpable in his argument is a colonial notion of inherent separations between “uncivilized” and “civilized” worlds with his illusion to mud huts as a prime example of meager living without science, technology, or even culture. It assumes that non-western architecture like mud huts, still employed in the world today, do not offer sufficiently sophisticated and sustainable livelihoods. In practice, mud huts are used all over the world for housing because they are sustainable and comfortable ventilated homes.<sup>22</sup> They have even been proposed as a climate-resilient form of architecture.<sup>23</sup> The now dominant architecture, one that uses concrete and glass, extracts materials from the Earth without a sense of reciprocity and in a way that perpetuates climate change.<sup>24</sup> Yet, Andreessen’s statement implies that one form of building is backwards and without intelligence instead of a natural, innovative form of technology.

Transhumanism—whether it adheres to Rushkoff’s, Kurzweil’s, Andreessen’s, or another theory—builds on the ideology of colonialism that separates humans from nature, yet obscures this separation at the same time. While mud huts and Silicon Valley appear unconnected at first glance, they in fact concern the same subject. In a recent podcast, Brazilian Indigenous leader Maurício Ye’ Kuana observed that “every city in the world has been taken from the Earth.”<sup>25</sup> We

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<sup>20</sup> Edward Ongweso Jr., *Silicon Valley’s Quest to Build God and Control Humanity*, THE NATION (July 12, 2023), <https://www.thenation.com/article/economy/silicon-valley-artificial-intelligence/>.

<sup>21</sup> Marc Andreessen, *Why AI Will Save the World*, ANDREESSEN HOROWITZ (Jun 6., 2023), <https://a16z.com/ai-will-save-the-world/>.

<sup>22</sup> See Nisrine Kebir et al., *Opportunities stemming from retrofitting low-resource East African dwellings by introducing passive cooling and daylighting measures*, 69 ENERGY FOR SUSTAIN. DEV. 179,185 (2022); see also Roula El-Khoury, David Aouad & Carine Lteif, *Beyond materiality: mud as a living material in heritage preservation*, 7 FRONT. SUSTAIN. CITIES 1, 4, 11 (2025) (illustrating that, in addition to being a sustainable home, mud huts also act as a site of cultural and social cohesion).

<sup>23</sup> Imon Chowdhoree & Kanu Kumar Das, *Indigenous Knowledge of Mud Architecture: Experiences of Surviving against Multiple Natural Hazards*, 13 INT. J. DISASTER RESIL. BUILT ENVIRON. 451, 452.

<sup>24</sup> Jon Goodbun, *Mud and Modernity*, 2016 ARENA J.L ARCHITECTURAL RES. 1, 5 (2016) (“[the use of concrete] is so large scale that it has become a primary constituent of the anthropocene rock which is re-surfacing the planet, while the more than one billion cubic meters of water tied up in the molecularly Scheerbartian crystalline architecture of modern concrete annually drains aquifers and water tables of entire regions, and the carbon dioxide already emitted into the Earth’s atmosphere through cement production will reflect back solar radiation onto the increasingly concrete surface of the planet that would otherwise escape into space, with climatic consequences that will play out over the course of millennia to come”).

<sup>25</sup> Maurício Ye’kuana: Is This The First World?, Crossing the RIVER (Mar. 21, 2024), available on Spotify.

extract oil to run our machines and sand to build the windows for our skyscrapers, but the harm in the process remains largely hidden. We do not have to see the polluted rivers, food systems, and endangered livelihoods when we start our cars in the morning. Technological development, as Silicon Valley sells it, obscures these roots of extraction. And those of us who have the privilege to use these forms of electronic technology have often benefited from colonial development and inhabit environments, professions, and communities that are so far removed from this extraction and dissociated from the scale of its harms.<sup>26</sup> Yet, we are and will continue to suffer the consequences of this extractivism through the climate crisis. Transhumanism aims to dominate nature through technology, rather than shift to a mutually beneficial relationship between technology and nature. For those that do not have the resources to escape a siphoned Earth, these solutions may be more dangerous than beneficial.

Gene editing, a method of altering DNA,<sup>27</sup> is foundational to transhumanism but has also been proposed as a solution to biodiversity loss, disease spread, and human vulnerability to climate change.<sup>28</sup> This is because it can be used to edit the genome of plants, animals, and humans for resistant capabilities through creating gene drives. Transhumanists believe that “modifying material human qualities through technology will release [human] intellect from its limitations.”<sup>29</sup> Gene editing is a method of altering DNA.<sup>30</sup> Many gene editing techniques have been around since the mid-1970s; the latest is the CRISPR (“clustered, regularly interspaced, short palindromic repeats”) technique. The CRISPR technique is a cheaper, more efficient, and more accurate version of past gene editing attempts.<sup>31</sup> Gene drives are especially useful at bypassing the standard 50% chance of genetic inheritance and therefore increasing the presence

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<sup>26</sup> Trish Morgan, *Alienated Nature, Reified Culture: Understanding the Limits to Climate Change Responses under Existing Socio-ecological Formations*, 5 POL. ECON. COMM. 30, 39-40 (2017); see also Deborah Oluwaseun Shomuyiwa & Don-Eliseo Lucero-Prisno III, *Climate Change Trauma and Collective Dissociation: Unraveling the Impact on Mental Health and Advocating for Collective Action*, 12 GLOB. MENTAL HEALTH, 2-3 (Jan. 14, 2025), (Discussing collective dissociation as it relates to populations vulnerable to climate change).

<sup>27</sup> See generally Sikandar Hayat Khan, *Genome-Editing Technologies: Concept, Pros, and Cons of Various Genome-Editing Techniques and Bioethical Concerns for Clinical Application*, 16 MOL. THER. NUCLEIC ACIDS 326 (2019) (describing the mechanics and various kinds of gene editing technologies).

<sup>28</sup> George L. Mendz & Michael Cook, *Transhumanist Genetic Enhancement: Creation of a ‘New Man’ Through Technological Innovation*, 27 NEW BIOETHICS 105, 111 (2021); see also L. VAL GIDDINGS, ROBERT ROZANSKY & DAVID M. HART, *GENE EDITING FOR THE CLIMATE: BIOLOGICAL SOLUTIONS FOR CURBING GREENHOUSE EMISSIONS* 2, 3, 16 (2020), <https://www2.itif.org/2020-gene-edited-climate-solutions.pdf> (discussing gene editing as a climate solution).

<sup>29</sup> Mendz, *supra* note 27, at 109.

<sup>30</sup> See generally Sikandar Hayat Khan, *Genome-Editing Technologies: Concept, Pros, and Cons of Various Genome-Editing Techniques and Bioethical Concerns for Clinical Application*, 16 MOL. THER. NUCLEIC ACIDS 326, (Discussing gene editing technologies) (2019).

<sup>31</sup> *Id.* at 331.

of a modified gene.<sup>32</sup> And while genetic engineering may have the potential to mitigate climate risks, like the spread of malaria, it also has the potential to exacerbate climate change. In one study, CRISPR was used to combat malaria by targeting the fertility genes of female mosquitos to reduce the population.<sup>33</sup> Genome editing affects not only the individual mosquitos but also their reproductive DNA. In particular, CRISPR has shown the potential to entirely sterilize female mosquitoes.<sup>34</sup> Even if technologies similar to CRISPR were successful, they have the potential to wipe out whole species, leading to unknown ecosystem consequences.<sup>35</sup> We know relatively little about the complexity of ecosystems; thus, these types of disturbances risk unknown consequences. This includes risks to humans. Because of its strong potential to improve the accuracy with which genes are edited, experts have warned about the dangerous potential of misapplying these technologies in the future.<sup>36</sup> These risks, associated with radical “solutions” such as gene editing, must be regulated through equally radical methods. This includes a shift to an ecocentric ideology that promotes a need to support, rather than control, our natural environment.

One might argue that the benefits of reducing malaria across the world, in the face of increasing rates due to climate change,<sup>37</sup> outweigh the risks of harming mosquitos and invading their autonomy. However, gene editing technology is being used for more than just mosquitos,

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<sup>32</sup> Andrew Hammond et al., *A CRISPR-Cas9 gene drive system targeting female reproduction in the malaria mosquito vector Anopheles gambiae*, 34 NAT. BIOTECHNOLOGY 78, at 80 (2016); see also KEJE BOERSMA, GENE DRIVE TECHNOLOGY AS HUMAN INTERVENTION INTO NATURE: ON THE FATE OF ENVIRONMENTAL ETHICS IN THE ANTHROPOCENE 11 (2024) (“By biasing inheritance of genetic traits through sexual reproduction, gene drives are hoped to allow the genetic modification of wild populations with relative ease: the release of a select number of modified organisms theoretically suffices to ‘drive’ a modification through a population, as the mechanism is passed on from generation to generation.”).

<sup>33</sup> Hammond, *supra* note 31, at 80.

<sup>34</sup> *Id.* at 81.

<sup>35</sup> Alfred L. Caplan et al., *No Time to Waste—The Ethical Challenges Created by CRISPR*, 16 EMBO REP. 1421, 1424 (2015), <https://pmc.ncbi.nlm.nih.gov/articles/PMC4641494/>

<sup>36</sup> Sikandar Hayat Khan, *Genome-Editing Technologies: Concept, Pros, and Cons of Various Genome-Editing Techniques and Bioethical Concerns for Clinical Application*, 17 MOLECULAR THERAPY: NUCLEIC ACIDS 326, 332 (2019) (“Genome-editing tools are powerful in terms of their potential to not only bring biotechnological revolution in the field of crop development and human pathology but also, in the wrong hands, lead to abuse and misuse in multiple ways, including manipulation of germline genetics. Genuine bioethical concerns have been raised by many experts. While time will be the actual judge of these technologies as boon or bane, still the methods can impact the human race probably in the most nuclear ways, and our incoming human race may be victimized in ways we do not yet understand.”).

<sup>37</sup> Cyril Caminade et al., *Impact of Climate Change on Global Malaria Distribution*, 111 PROC. NAT’L ACAD. SCI. U.S.A. 3286, 3286 (2014), <https://doi.org/10.1073/pnas.1302089111>.

and its development is a “great affirmation” to transhumanist philosophy.<sup>38</sup> In 2018, Chinese scientists combined the CRISPR technique with reproductive technologies to edit the genome of twin girls Lulu and Nanao to be resistant to HIV. The scientists involved went to prison for it, and scientists all over the world reacted by banding together in the call for a moratorium on human gene editing.<sup>39</sup> However, these calls have not shut this Pandora’s box. Even if we assume that the moral price to pay for genetic modification of living beings is small, particularly in the specific case of modification of mosquitoes, the risks remain high—even solely in the case of mosquitoes. CRISPR technologies can have a highly invasive impact on natural ecosystems, altering them in ways that are unknown to us. Academics and environmental activists Dr. Joyce and Michael Huesemann state in their book, *Techno-Fix: Why Technology Won’t Save Us or the Environment*, that “it is surprising that molecular biologists, who more than anyone should have an understanding of the biological complexity of nature and the adaptive role of evolution, can honestly believe the genetic modification of plants and animals will not have major negative consequences.”<sup>40</sup> While it may be unrealistic to entirely ban or halt technologies like gene editing because of low political will,<sup>41</sup> we can regulate their development. Developing the rights of nature on a global scale can protect animals, plants and humans that might be subjected to this type of manipulation, because rights of nature protects the inherent dignity of all living beings, including humans.

### **SECTION III: The development of rights of nature laws as a precautionary approach to risks in technological development**

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<sup>38</sup> ROBERT RANISCH, *When Crispr Meets Fantasy: Transhumanism And The Military In The Age Of Gene Editing*, in *TRANSHUMANISM: THE PROPER GUIDE TO A POSTHUMAN CONDITION OR A DANGEROUS IDEA?* 111, 112 (Wolfgang Hofkirchner & H.J. Kreowski eds., 2021), [https://link.springer.com/chapter/10.1007/978-3-030-56546-6\\_7](https://link.springer.com/chapter/10.1007/978-3-030-56546-6_7).

<sup>39</sup> S.M. Singh, *Lulu and Nana Open Pandora's Box Far Beyond Louise Brown*, 191 *CANADIAN MEDICAL ASS'N J.* E642 E642 (2019), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6565397/>; see also Khan, *supra* note 35, at 332.

<sup>40</sup> MICHAEL HUESEMANN & JOYCE HUESEMANN, *Technology, Exploitation And Fairness*, in *TECHNO-FIX: WHY TECHNOLOGY WON'T SAVE US OR THE ENVIRONMENT* 26 (2011) <https://www.thetedkarchive.com/library/michael-huesemann-and-joyce-huesemann-techno-fix>.

<sup>41</sup> Britta C. van Beers, *Rewriting the Human Genome, Rewriting Human Rights Law? Human Rights, Human Dignity, and Human Germline Modification in the CRISPR Era*, 7 *J. L. & BIOSCIENCES*, 3 (2020), <https://doi.org/10.1093/jlb/ljaa006>; see also Inmaculada Gabel & Jonathan Moreno, *Genome Editing, Ethics, and Politics*, 21 *AMA J. ETHICS* E3, 3 (2019) (“there seems to be little controversy over genome editing in part because the right—with the significant exception of abortion—has lost interest in the conservative intellectual tradition that informed conservative bioethics. Critically, the elite individuals at conservative policy organizations who identified the most with Jonas’ bioethical concerns—adrift without a party and considering themselves “never-Trumpers”—have largely moved on to economic issues.”).

The global development of rights of nature laws is necessary to mitigate the risks associated with using technology as a climate solution. Rights of nature and invasive technology, such as gene editing, are two extremes on the spectrum of climate change solutions. Technological solutions are based on dominating nature, and developments in rights of nature are based on reconnecting with nature. In this section, I first argue that the rights of nature is an ecocentric perspective that represents a shift from an extractive relationship with nature to a mutually beneficial one. The existing exploitative colonial ideology that has led us to the climate crisis is in part due to the psychological distance that this ideology creates between humans and the natural world to which we belong. Psychological distance allows us to separate our actions from the impacts they have on the natural world.<sup>42</sup> A shift away from this perspective is necessary. Second, I argue that the all-encompassing structure of rights of nature provides the necessary precautions to keep up with the rapid technological developments that are currently slipping through the cracks of existing regulations. Lastly, I address the challenges of implementing a rights of nature perspective and how these challenges might be overcome.

Rights of nature is the natural endpoint of a necessary shift from the exploitative colonial ideology that contributed to our anthropocentric legal system and the climate crisis we find ourselves in today. First, rights of nature are centered in ecocentric, Indigenous ideologies. Indigenous communities in the Americas have generally preserved the right to “communicate with and revere nature in a language unintelligible to the coloniser.”<sup>43</sup> This relationship with nature is not exploitative or extractive, but rather mutually beneficial. For one example, we can look at Ecuador’s Constitution. Ecuador is the only country in the world to implement rights of nature within its constitution. In its preamble, the Ecuadorian constitution states that we should celebrate “nature, the Pacha Mama (Mother Earth), of which we are a part and which is vital to our existence” and “decide to build A [*sic*] new form of public coexistence, in diversity and in harmony with nature, to achieve the good way of living, the *sumak kawsay*.”<sup>44</sup> The phrases “*sumak kawsay*” (roughly translating to “good life”) as well as “Pacha Mama” come from

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<sup>42</sup> *Id.* at 52–53.

<sup>43</sup> CITLALI ROVIROSA-MADRAZO, *Eurocentrism And Anthropocentrism, in INTERNATIONAL LAW? OBSTACLES FOR THE CRIMINALISATION OF ECOCIDE AT THE ICC* 5 (2023), <https://ecocidelaw.com/wp-content/uploads/2023/08/13-Rovirosa-Madrado-Eurocentrism-and-Anthropocentrism-in-International-Law.pdf>

<sup>44</sup> ECUADOR CONST., art. 71, (Oct. 20, 2008), [https://www.constituteproject.org/constitution/Ecuador\\_2021](https://www.constituteproject.org/constitution/Ecuador_2021).

Quechua, an Indigenous language spoken by peoples in Ecuador.<sup>45</sup> These phrases were integrated into the nation's laws precisely because it was these Indigenous groups' efforts that led to the amendment of the constitution.<sup>46</sup>

The laws and values protected by cultural perspectives that see humans as a part of a larger ecosystem, rather than as separate from the natural world, are therefore connected to Indigenous values that have persisted despite centuries of violent oppression.<sup>47</sup> Indigenous management of land “links people to their environment rather than giving them dominion over it.”<sup>48</sup> Additionally, in cases where rights of nature laws have been implemented, granting nature legal standing, local and Indigenous communities have been made legal stewards of the nature meant to be protected.<sup>49</sup> Ecuador's implementation of the rights of nature addresses climate risks by returning to Indigenous ideologies that have always advocated for the inherent value of the natural world, including humanity. This implementation of rights of nature both addresses the ideological faults in extractive practices and mitigates practical climate risks.

In the context of technological development, implementation can take many forms, including the regulation of genetic modifications. For example, Project CETI (“Cetacean Translation Initiative”) is an interdisciplinary nonprofit company that is using AI to translate the language of whales.<sup>50</sup> Recognizing that the law does not properly protect animals from abuse—especially whales who have a history of human exploitation for their oil<sup>51</sup>—Project CETI supported the More-Than-Human Rights program at the NYU School of Law to develop a framework for legal and ethical precautions in the use of these technologies.<sup>52</sup> Among other things, these precautions advocate for the least intrusive form of engagement. For example,

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<sup>45</sup> INT'L RIVERS, RIGHTS OF RIVERS: A GLOBAL SURVEY OF THE RAPIDLY DEVELOPING LANDSCAPE OF LEGAL RIGHTS OF RIVERS, 11 (2020), <https://www.internationalrivers.org/wp-content/uploads/sites/86/2020/09/Right-of-Rivers-Report-V3-Digital-compressed.pdf>.

<sup>46</sup> *Id.* at 33.

<sup>47</sup> Kyle Pietari, *Ecuador's Constitutional Rights of Nature: Implementation, Impacts, and Lessons Learned*, 6 *WILLAMETTE ENV'T L.J.* 37, at 89-90 (2016).

<sup>48</sup> MARCIA LANGTON, *The “Wild,” the Market and the Native: Indigenous People Face New Forms of Global Colonization*, in *DECOLORIZING NATURE* 141, 157 (William M. Adams & Sally Jeanrenaud eds., 2006).

<sup>49</sup> Dignity Rights Project, *Center for Social Justice Studies et al. v. Presidency of the Republic et al.*, *CLIMATE CASE CHART* 114 (Aug. 10, 2023), [https://admin.climatecasechart.com/wp-content/uploads/non-us-case-documents/2016/20161125\\_T-62216\\_judgment.pdf](https://admin.climatecasechart.com/wp-content/uploads/non-us-case-documents/2016/20161125_T-62216_judgment.pdf) (recognizing local populations as guardians of the Atrato river after it receives legal personhood).

<sup>50</sup> *About*, PROJECT CETI, <https://projectceti.org/about> (last visited Mar. 29, 2026).

<sup>51</sup> *Big Fish: A Brief History of Whaling*, NAT'L GEOGRAPHIC (Oct. 19, 2023), <https://education.nationalgeographic.org/resource/big-fish-history-whaling/>.

<sup>52</sup> *MOTH PROGRAM, Listening To Our Animal Kin: The Promise And Peril Of Animal Communication Technologies.* 8 (2025), [https://mothlife.org/wp-content/uploads/2025/11/Listening-to-Our-Animal-Kin\\_MOTH-Report.pdf](https://mothlife.org/wp-content/uploads/2025/11/Listening-to-Our-Animal-Kin_MOTH-Report.pdf)

scientists take into account that whales are sensitive to noise so they ensure that drones do not fly too close to the whales.<sup>53</sup> This type of caution and respect for whales considers their intricate dignity and autonomy while also allowing for progress in technological development.

A rights of nature approach also helps mitigate climate risks by filling the gaps of existing regulations for genetically modified plants and animals. In one study, researchers have surveyed laws that regulate clinical research on gene editing technologies: out of 106 surveyed countries, 29 countries have banned the study of genome editing, 75 countries have banned heritable genome editing with expectations for other types of studies, and most countries have limited regulations for studies on gene drives.<sup>54</sup> In the U.S., there is a trend toward deregulation of gene editing technologies. In recent years, both researchers and biotech companies have successfully lobbied the Animal and Plant Health Inspection Service (“APHIS”), the body that regulates Genetically Modified Organisms (“GMOs”), to exclude their use of CRISPR technologies from regulation because the technology involves deleting rather than modifying the genes.<sup>55</sup> Because the agency exists to regulate pests, the use of CRISPR technology falls outside of regulation parameters. However, in 2024 a federal court vacated APHIS’s rule that allowed for this gap in regulation, and the agency has not developed a new rule, still leaving the space unregulated.<sup>56</sup> Even the “[European Union’s] stricter regulatory regime is not suitable to address all possible risks—in particular with gene drive—as it is designed to regulate transgenic organisms.”<sup>57</sup> Given CRISPR’s sophistication and accessibility, it will become increasingly popular. What we need now is a shift to a more ecocentric perspective—similar to Project CETI’s approach to technological development in the context of animal studies—that operates on caution and respect for the natural world rather than quick-fixes with no safety net.

A large critique of the rights of nature is that it is not well defined. However, the role of law is not only to create clear guidelines but also to set value systems within a society. The power of law to define social values is most evident in the actions we choose to criminalize and

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<sup>53</sup> Alexa Robles-Gil, *How Scientists Are Using Drones to Study Sperm Whales*, [N.Y. TIMES](https://www.nytimes.com/2025/08/13/science/whales-drones-acoustics-tagging.html) (Aug. 13, 2025), <https://www.nytimes.com/2025/08/13/science/whales-drones-acoustics-tagging.html>.

<sup>54</sup> Tahir ul Gani Mir et al., *CRISPR/Cas9: Regulations and Challenges for Law Enforcement to Combat Its Dual-Use*, 334 *FORENSIC SCI. INT’L* 111544, at 5 (2022), <https://www.sciencedirect.com/science/article/pii/S0379073822001049>.

<sup>55</sup> Alison Peck, *Re-Framing Biotechnology Regulation*, 72 *FOOD & DRUG L.J.* 314, at 317- 322 (2017), <https://www.jstor.org/stable/26661138>.

<sup>56</sup> *Id.* at 321; *see also* Eleni G. Bickell, Cong. Rsch. Serv., IF11573, *USDA’s Regulation of Agricultural Biotechnology* (updated Mar. 3, 2026).

<sup>57</sup> Caplan et al., *supra* note 34, at 1424.

those we have accepted as moral.<sup>58</sup> One of rights of nature's greatest strengths is its promotion of a mutually beneficial relationship, rather than an extractive relationship, with nature. On the question of vagueness, mutuality is also a strength of the rights of nature approach to regulating technology. It may be unrealistic to halt the development of technologies such as CRISPR, and governments' deregulatory bias means these technologies will likely be used with increasing frequency.<sup>59</sup> Rights of nature's all-encompassing approach is flexible to technological "solutions" because it is not exclusively prescriptive.

In the case of Ecuador, the first and only country in the world to weave the rights of nature into its constitution, rights of nature offer an effective tool to fight the Lockean ideologies that promote exploitation of nature.<sup>60</sup> Article 10, Chapter 7 of the Ecuadorian Constitution grants to nature the right to integral respect of its existence, a right to regenerative life cycles, and a right to be restored.<sup>61</sup> These rights are vague and require case law and precedent to elucidate their meaning. Doctrines, principles, and policy are in place to ensure that lawmakers' intent is being furthered by the courts. However, institutional capacity will always be a concern for legislative bodies. Even if the tools listed above are available, legislatures want to ensure that judicial systems are not being overburdened by unnecessarily vague laws. In addition, vague laws do not always have to be hard to implement.<sup>62</sup> And, considering the equally undefined nature of technologies such as CRISPR, overly broad laws might be necessary to mitigate the severe risks associated with these technologies. Additionally, no legislation can address all potential questions or scenarios. That is why courts hear cases and interpret implications of laws in specific contexts. Rights of nature can be formally established through these same practices.

A second critique is that the implementation of the rights of nature is not realistic, especially in the United States. Interestingly, the rights of nature provisions in Ecuador's constitution were written with the help of a U.S.-based environmental organization, Community Environmental Legal Defense Fund (CELDF).<sup>63</sup> The organization was also responsible for the

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<sup>58</sup> Alexey Podoprigrora, *Implementation of "Cultural Values" Concept in Criminal Law System*, 403 E3S WEB CONF. 06013\_3 (2023), [https://www.e3s-conferences.org/articles/e3sconf/pdf/2023/57/e3sconf\\_ebwff2023\\_06013.pdf](https://www.e3s-conferences.org/articles/e3sconf/pdf/2023/57/e3sconf_ebwff2023_06013.pdf)

<sup>59</sup> Aftab Ahmad, Amer Jamil & Nayla Munawar, *GMOs or Non-GMOs? The CRISPR Conundrum*, *FRONT PLANT SCI* 05 (2023) ("most countries like the US, Japan, India, Australia, and Ecuador consider SDN1 and SDN2 modified [CRISPR modified] plants safe and do not regulate them under conventional GM regulations.").

<sup>60</sup> Pietari, *supra* note 46, at 38.

<sup>61</sup> *Id.* at 43.

<sup>62</sup> *Id.*, at 43–47.

<sup>63</sup> Cristina Espinosa, *Interpretive Affinities: The Constitutionalization of Rights of Nature, Pacha Mama, in Ecuador*, 21 J. ENV'T POL'Y & PLAN. 608, 608 (2019), <https://doi.org/10.1080/1523908X.2015.1116379>

first rights of nature legal provisions in Pennsylvania, introduced three years before Ecuador's constitution was amended to include the rights of nature. In addition to Pennsylvania, a total of 51 rights of nature provisions have been passed across nine U.S. states, including politically unlikely states such as Florida.<sup>64</sup> While the rights of nature are not new to the U.S.'s legal landscape, a federal constitutional amendment would be near impossible politically. However, the rights of nature's rapid development on an international scale can force the hand of even the most powerful country in the world. For example, the United Nations General Assembly's declaration that the Right to a Healthy Environment is a fundamental human right has been adopted all over the world, but not by the U.S., which has persistently objected to this right.<sup>65</sup> As a result, advocacy groups are pressuring state governments to recognize this right through "green amendments."<sup>66</sup> Increased awareness of these types of rights via public movements, like the "green amendment" movement, can help shift public values. This may not happen overnight in the U.S., but compared with the incremental nature of other laws and our inability to predict future risks of technological development, implementation of the rights of nature laws is the most precautionary approach.

## **Conclusion**

The development of the rights of nature is necessary to mitigate the risks of technological solutions to climate change. Left unregulated, tech "solutions" to this planetary emergency can prove more dangerous than they are beneficial. This is because innovators in the tech industry are driven by the same anthropocentric ideologies that developed through colonialism. This ideology has created an extractive relationship between nature and humans, and thus has led us to the very climate crisis we find ourselves in today. What is needed now is both a shift in ideology and mitigation of increasing climate risks. Rights of nature offers both. Rights of nature's ecocentric ideology, informed by Indigenous knowledge systems, calls for a mutually beneficial relationship with nature. In addition, rights of nature's broad scope allows courts to define specific rights through individual cases. Implementing rights of nature on a global scale

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<sup>64</sup> *Eco Jurisprudence Tracker*, ECO JURISPRUDENCE MONITOR, <https://ecojurisprudence.org> (last visited Mar. 29, 2026).

<sup>65</sup> Earth Law Center, "Green Amendments" and the Right to a Healthy Environment (Apr. 29, 2024), <https://www.earthlawcenter.org/blog-entries/2024/2/green-amendments-and-the-right-to-a-healthy-environment>.

<sup>66</sup>*Id.*

would allow technological development to continue while offering blanket precautions for risks that are not regulated by existing law.