# Intergenerational Justice and the Ethics of Environmental Stewardship: A Multidisciplinary Analysis of Moral Obligations to Future Generations

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**Abstract- The present article seeks to examine the moral, theoretical, and empirical aspects of intergenerational justice, in the context of global environmental stewardship. As the harmful effects of human activity on the Earth's biosphere increase, the moral responsibility of this generation to preserve the ecological integrity of the planet for future generations, has become a primordial question of political philosophy and environmental governance. The article begins with theoretical considerations of intergenerational justice, in particular through the lens of Rawlsian contractarianism, Parfit's non-identity problem, and utilitarian long-termism. Then it moves on to the ethics of environmental stewardship, deconstructing the philosophical foundations of the stewardship mandate, and the application of the precautionary principle. By bringing empirical data on climate-induced resource scarcity and biodiversity loss into the discussion we show the widening gap between existing consumption rules and the needs of sustainability over the long-term. For example, the economic costs to our planet related to climate change will be approximately USD 54 trillion by about 2100, which requires us to reassess how we manage the global commons (Singh, 2024). Through an interdisciplinary approach, the article argues that anchoring the rights of future generations in institutions is not a mere policy preference but a moral necessity for our flourishing human civilization.**

**Keywords:** ***Intergenerational, Justice, ethics, environmental stewardship, sustainability, environment, governance, moral, Stewardship, Protection.***

## I. INTRODUCTION

The current environmental crisis presents a novel challenge in the history of ethics- it forces us to confront the desires of the living with the basic needs of the unborn. Intergenerational justice, the focus of inquiry on the equity of the distribution of resources and burdens between generations, has shifted from the fringes of academic inquiry to the forefront of global policy discussions. This shift is occurring because of the immense awareness that our current industrial and consumption practices have liquidated natural capital at an alarming rate that threatens basic life-support systems on the planet. The suggested transition of climate settings, driven by a global population that is creating new forms of environmental pressure, begs the question of how to extend our moral community to those who will inherit the results of today's decisions and practices as we approach a near-term 2100 (Schmid, 2022).

At the core of the awakening of intergenerational justice is the tension between short-term economic growth and long-term ecological stability. All economic models routinely ignore the societal "delayed harm" and changing value that occurs as a result of environmental degradation (e.g., loss of biodiversity, and the depletion of their genetic resources). Evidence exists that the market does not express the psychological harm, or intrinsic value, related to the loss of a species (Ferreira, 2024). As climate change has created more frequency and severe weather events, the impact of climate change is becoming more transparent in economic ways; yet political will in the various systems of governance to implement long-term resolutions will continue to lag, due to the "dictatorship of the present."

This paper offers a multidisciplinary examination of these responsibilities. In it, we argue that responsibility to steward the environment is not simply a voluntary act of charity but a serious responsibility of justice. By addressing a philosophical rationale for this responsibility, the paper aims to make a connection between abstract moral philosophy and the

material fact of ecological debt. The sections that follow will further explain the theoretical rationale for our obligations to the future, the ethical frameworks of stewardship, and the material evidence we must act on without delay in order to move toward an equitable existence for future generations.

## II. THEORETICAL JUSTIFICATIONS FOR INTERGENERATIONAL JUSTICE

### 2.1 Rawlsian Contractarianism and the Original Position

John Rawls' theory of justice as fairness is one of the better starting points to assess this question of intergenerational obligations. In *A Theory of Justice*, Rawls introduces the "Original Position" which describes a hypothetical situation in which individuals select the principles of justice for their society from behind a "veil of ignorance." In such a position, participants are presumed to have no knowledge of their social status, wealth, or talents. They also, and importantly, have no knowledge to which generation they belong. Rawls' position is that rational agents in the original position would adopt what he calls a "Just Savings Principle" to ensure that all generations receive their fair share of resources and opportunities.

The Just Savings Principle embodies and extends a Difference Principle through generations. A duty requires that the present generation save an adequate amount of capital (physical capital, intellectual capital, and natural capital) so that future generations can sustain a just social order. In contrast to traditional utilitarianism which may require excessive sacrifice by one generation to benefit a much larger future generation, the Rawlsian position constitutes and insists on a steady-state of justice. The aim being not infinite accumulation but the maintenance of conditions of liberty and fairness.

In a Rawlsian context of environmental stewardship when considering what we can or cannot "spend" of the natural environment, we cannot spend the environment that prevents future generations from living a life within a just society. Under the conditions of the original position, there is a strong possibility that we would choose a policy that would minimize the likelihood of catastrophic climate change and maintain a functioning biodiversity of ecosystem services. The risks associated with being born into a degraded environment must outweigh any perceived current benefits of high levels of consumption. The implications here are that the environment is transformed into a "primary good" that must be preserved into the future to maintain the viability of a social contract.

### 2.2 The Non-Identity Problem and Parfit's Paradox

While Rawls is concerned with the distribution of goods, Derek Parfit's "Non-Identity Problem" questions the very idea of who is "harmed" by our present choices. Parfit observes that the identity of future people depends on both the timing and conditions of child conception. Large-scale social and environmental policies e.g., a decision to deplete resources quickly or to implement rigorous conservation policies, will change the lives of the present generations, and consequently cause them to choose different partners or at different times. They will consequently give birth to different people.

This creates a philosophical paradox: If we engage in a "depletion" policy that leads to a lower quality of life in the future, the persons who are born into that future cannot claim to have been "harmed" by our choice. If we had chosen "conservation," the same individuals would never have existed, but instead a different cohort of human beings would have been born. Parfit, therefore, argues that if the lives of the persons born into the "depleted" future are still "worth living," it is difficult to argue that they have suffered a wrong in a person-affecting sense.

To resolve those puzzles, most ethicists pivot from "person affecting" principles to "impersonal" principles of justice. This impersonal perspective asserts that we have a moral duty to create the type of world that maximizes well-being—regardless of the specific identity of the persons who inhabit that world. In an environmental context, this means that even if our actions affect *who* exists, the goal should still be that *whoever* exists has access to a stable climate and a biodiverse planet. The focus moves from the rights of particular individuals to leaving behind a world of quality.

### 2.3 Utilitarian Approaches to Long-termism and Future Utility

Utilitarianism presents a different, albeit complicated, account of intergenerational justice. Utilitarianism seeks to maximize the total sum of utility (or well-being) over time. Because the number of future people

could be enormous, some utilitarians, especially those in the long-termist movement, argue that the well-being of future generations should be our primary moral consideration. If there are a thousand generations that will follow us, their collective utility will outweigh the utility of the single generation alive right now.

However, this position leads to some challenges, with the most famous being the "Repugnant Conclusion." This is a logical implication of utilitarianism that a world with mass amounts of people living at a very low (but positive) well-being level is "better" than a small number of people living at a very high well-being level simply because the total amount of utility is higher. In the environmental policy context, this could justify sacrificing the quality of the natural world so that a greater number of people could exist and flourish—so long as their lives are still worth living.

To counter this conclusion, many modern utilitarians endorse a "sufficientarian" or "threshold" level of wellbeing approach, elevated to a sufficient level of flourishing in their lifetime. In addition, applying a "zero discount rate" for human well-being is a key foundational aspect of utilitarian intergenerational justice. Unlike economic discounting which devalues future costs and benefits, ethical utilitarianism argues that a unit of suffering in one hundred years is just as significant as a unit of suffering today. This rationale provides an ethical exigency for climate action because the losses of utility for the long-term from ecological collapse could be in the trillions of dollars in damages and astronomical human suffering over the current costs transitioning to a sustainable economy (Singh, 2024).

## III. THE ETHICS OF ENVIRONMENTAL STEWARDSHIP

### 3.1 Philosophical Roots of the Stewardship Mandate

Stewardship is premised on the notion that no present generation can rightly claim "ownership" of Earth in an absolute sense; instead, it holds "trust" for future beneficiaries. Stewardship as an ethical principle is found in both religious and secular philosophies. Earth is a creation from the divine in many theological traditions, with humans taking up its care and stewardship; "dominion" is to be understood not as license to exploit but as responsibility to "tend and keep" the garden.

In some secular philosophical traditions, the stewardship mandate is linked to the "Lockean Proviso." John Locke advocated for private property, while also indicating that individuals have the right to appropriate natural resources where "there is enough, and as good, left in common for others." As the Lockean Proviso applies to present and future generations, the present generation cannot use up and/or degrade the "commons" of the Earth's atmosphere and ecosystems to the degree that future generations inherit a depleted or unstable environmental state.

Stewardship is also grounded in the idea of "intergenerational heritage." Present generations inherit cultural, scientific, and institutional developments and achievements from past generations, but also inherit the biological and physical systems that make life possible. This idea of intergenerational heritage creates a reciprocal obligation; we are beneficiaries of the past, and must act as custodians in the future. This framing shifts environmental protection away from notions of a "charity" to humans, and more towards being a matter of "repaying a debt" to the chain of human existence.

### 3.2 Sustainability as a Moral Imperative for Resource Conservation

To make the stewardship mandate operational is sustainability. Sustainability is often defined, as noted in the Brundtland Report, that it is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." But the ethical dimension of sustainability runs deeper than managing resources sustainably; there is a type of commitment to "strong sustainability" that argues that natural capital (e.g., biodiversity and climate stability) cannot be substituted fully by human-made capital (e.g., money, and technology).

The moral imperative for resource conservation coupled with sustainability is that the Earth's "carbon budget" is limited, and certain genetic resources are dwindling quickly. Genetic potential in species of livestock and plants is being lost to climate change, and environmental change will limit opportunities for future generations to adapt to new settings (Singh, 2024). Research into managed systems indicates that

the maintenance of genetic resources is essential for responding to changing tree species compositions and other changes in natural systems (Schmid, 2022). In not conserving resources, future generations will inherit less adaptive capacity because we "spent it."


Additionally, the level of resource consumption today has accumulated "ecological debt" at an unprecedented scale. The fact that we are consuming the Earth's biocapacity at a greater rate than is due, amounts to borrowing from the future. Unlike financial debt, ecological debt is also often accompanied by "tipping points" – irreversible changes to the Earth system, like the melting of ice sheets or the collapse of coral reefs cannot be "paid back" with ecological interest. This necessitates a "precautionary" approach to the use of resources, and sustainability, does not allow for crossing planetary boundaries that would lead to what we have referred to as 'ecological bankruptcy' for future generations.

3.3 The precautionary principle and our responsibility for ecological integrity

The precautionary principle is an important ethical tool used to manage the unknown of scientific uncertainty, and state that when an activity raises threats of serious or irreversible harm to the environment or human health, lack of full scientific certainty should not be used as a reason for postponing cost effective measures to prevent environmental degradation. It is a fundamental principle of intergenerational justice that operationalizes a sort of "risk-management" strategy for the future.

Given that we cannot know the precise preferences or technological capabilities of future generations, we should seek to preserve the "ecological integrity" of the planet, which means protecting the functional health of ecosystems, promoting their resiliency to change and continuing to provide essential services such as water purification, soil fertility, and climate regulation. Current market mechanisms often do not capture the loss of biodiversity or the loss of ecosystem services, hence it becomes systematically easy to underestimate the risks we are imposing on the future (Ferreira, 2024).

Responsibility for ecological integrity also raises issues of "asymmetry of power" between us and the future. Future generations do not have social agency to vote, lobby or protest, which is why the present generation acts as their "proxy". The precautionary principle serves as an ethical and legal (or due diligence) basis for proxy action, which prioritizes preventative actions to avert catastrophic, long-term harm to the future than short-term -measurable profits. By upholding the precautionary principle we fulfill our position as stewards of ensuring the biological inheritance that we are handing down is not so

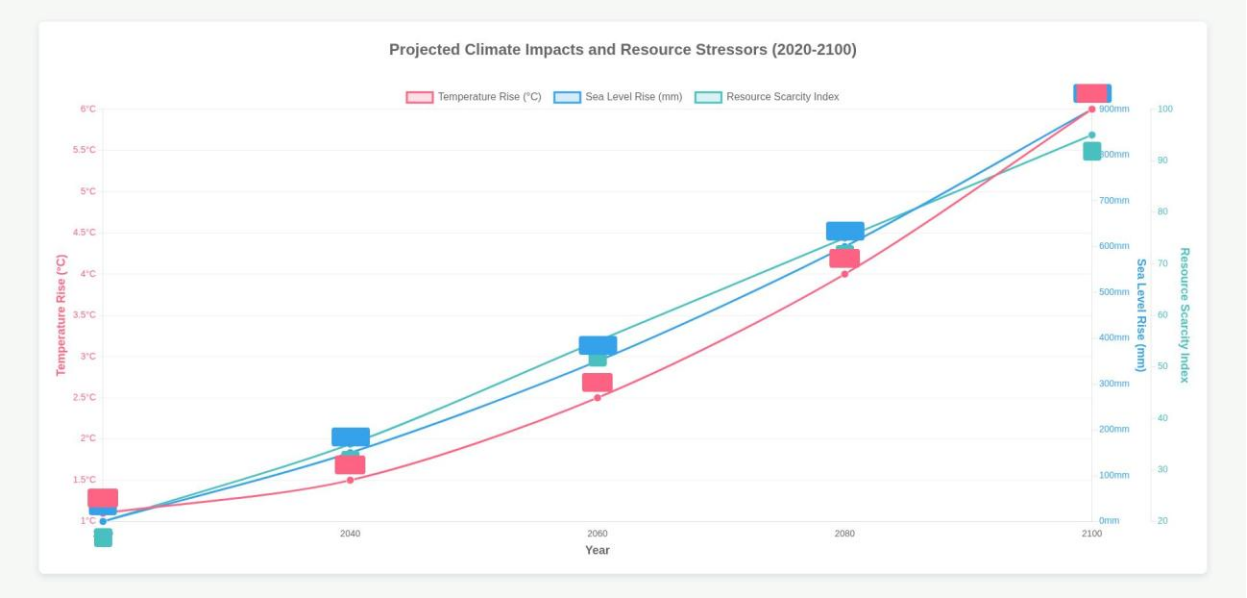
compromised that potential flourishing future life is impossible.

The convergence of these theoretical and ethical frameworks provides a unified message: our current environmental path is an infringement on intergenerational justice. The obligation to care for the environment for future generations holds across the spectrum of the Rawlsian position of fairness, Parfit's impersonal ethics, or the requirement associated with stewardship. These ideas will be developed in the next sections of this essay by also considering and utilizing the empirical evidence of what we, as humans, have done, as well as the case studies of governance frameworks that intend to institutionalize these moral obligations.

The precautionary principle complements the concept of stewardship in regard to carbon farming or using other circular land-based frameworks to increase CO2 sinks. Stewardship, as a proactive form of intergenerational justice, in the present instance, means the current generation invests in the genetic potential of the landscape to address climate change (Singh, 2024). We are engineering a more resilient biosphere for the year 2100 (and beyond) by not only managing our users' reproductive management but also ensuring that we are planting tree species that are genetically better suited to local conditions (Singh, 2024). Such actions are desperately needed because the market does not account for the psychological impairment (e.g., despair) or the biodiversity (i.e., the other members of intricate and well-performing ecosystems) loss associated with extreme weather (Ferreira, 2024).

Additionally, the moral imperative of sustainability forces us to consider the "genetic resources" of our planet as a type of intergenerational capital. The inhabitation of the Earth is projected to increase for the population estimations in 2100, which will only put more pressure on managed ecosystems (Schmid, 2022). If we do not allow the composition of our forests and oceans to change irreversibly, we will take away from the future the very tools they will need to survive in a warming world (Schmid, 2022). Therefore, the ethical duty of stewardship goes beyond "leaving things as they are" to realize we are "actively maintaining the capacity for adaptation."

In conclusion, the theoretical foundation of intergenerational justice gives us the "why" and the ethics of stewardship gives us the "how." Together they form a full moral foundation to question the short-termism of modern political and economic systems through the recognition of the rights of the yet-to-be-born and the value of ecological integrity. We can move toward a just and sustainable relationship with the future by combining the two: a re-tooling, or re-thinking, in policy and an altogether different consideration of our philosophers' views on our place in time. We are fundamentally only a link in a long chain of life, and our first obligation is to keep that chain unbroken and our world a viable home to all who have not yet come.



## IV. EMPIRICAL EVIDENCE OF INTERGENERATIONAL IMPACT

The conversation about intergenerational justice often takes place in an abstract/ethical moral philosophy context, however, the urgency of the stewardship obligation is increasingly supported by scientific empirical evidence. To consider ethical obligations to future generations, one must first quantify the physical and economic changes that are being set in motion at present. The next sections explore quantitative projections of resource scarcity, the increasing loss of biodiversity, and systematic consumption of global carbon budgets, indicating that the generations manifesting these projected ecological harms to future generations are doing so - in a factual sense - with an unprecedented level of ecological debt.

### 4.1 Quantitative Projections of Climate Induced Resource Scarcity

The most visible empirical challenge to intergenerational equity is a projection of the resource scarcity of essential life-sustaining resources resulting from anthropogenic climate change. Scientific modeling indicates that future emissions are placing the planet on a path to a global average temperature increases of significant degree - some extreme to a projected 6 degrees by 2100 (Orr, 2016). A change in global thermal equilibrium of this level represents a "long emergency," that fundamentally alters habitability of vast geographic regions.

The temperature increases will occur, in part, as a result of changes in the hydrological cycles. Projections towards the end of the century raise an alarming concern over sea-level rise that will soon threaten coastal infrastructure and freshwater aquifers, worldwide (Hansen, 2011). This is more than an environmental problem in a specific geographic location, it is an economic security problem, as well. For example, mental-modeling studies in the Great Lakes of Africa from 2010-2020 have revealed how climate variability impacts agricultural productivity, and economic stability, at the national level (Njenga, 2021).

The spring scarcity of resources does not end with water and food, it expands to the inherited stability of the economic systems that future generations will inherit rather than the direct material or physical resources and their scarcity. When a species undergoes planetwide climate shifts, future generations may find themselves in competition for resources leaving them with systemic instability. The data indicates that the "natural endowment" historically passed onto each subsequent generation via that generations historical social contract is being liquidated to support the current consumption path leaving future generations a "depleted estate."

These forecasts have very serious implications. As the resource scarcity index grows, the "opportunity set" that future people will have shrinks. From a Rawlsian perspective, the present generation is not meeting the necessary "just savings" to enable that the least advantaged members of future cohorts might have a baseline of human dignity by the time they reach a given point in their lives. Evidence of Kenya's economic vulnerabilities during periods of climate stress behave as a current proxy for the global challenges that will come to be common, if current trends persist (Njenga, 2021).

### 4.2 The Inheritance of Ecological Debt From Biodiversity Loss

Resource scarcity, as a functioning intergenerational harm relation, leans upon the utilitarian aspects of stewardship, however, the loss of biodiversity is a more permanent and irreversible form of intergenerational harm. This current geological era, often termed the sixth mass extinction, sees extinction of species at far greater rates than historical background extinction levels. Vulnerability assessments indicatively measure the economic loss to biodiversity, and as ecosystems, notably coral reefs, are pushed toward tipping points of rapid ecological change, many species are expected to disappear, relative to the overall biological heritage of the planet (Sekulić, 2012).

Biodiversity loss is then in the form of massive "ecological debt." A biologically impoverished world, presents a world for future generations, that lacks the necessary genetic diversity and ecosystem services to sustain human civilization for millennia. The scientific arguments for avoiding "dangerous climate change" communicate the perspective of young people and future generations, whose economic burden is not a choice that they made (Hansen, 2011). One of these burdens is the loss of functional ecosystems, coral reefs, wetlands, and old-growth forests, that provide

essential ecosystem services, i.e. water purification, carbon sequestration, and crop pollination.

The inequities of intergenerational ecological debt are compounded, as it is not about simply being denied the opportunity to enjoy "unnatural wonders," it is about survival. Species are pressed to migrate because of climate change, as climate change forces the "climate zone" for determining where plants or animals can survive towards the equator, but, species often fail to reach and successfully survive in other fragments or human barriers (Hansen, 2011). Their failure to migrate leads to local or global extinction and disrupts the food webs on which humans depend for agriculture. Empirical evidence from Serbia identifies direct risks to public health identified through climate change and risks of losing local flora and fauna due to environmental degradation from climate change (Sekulić, 2012).

The ethics of intergenerational ecological debt, is primarily in the irreversibility of it. Financial debt can be restructured, while the growth of the economic size of the economy can yield calamitous effects and result in destruction to financial debt, "liquidation" of species is final. By allowing biodiversity to collapse, the present generation exercises a form of "intergenerational tyranny." This "intergenerational tyranny" allows for the preference of the current generation to support industrial expansion and consumption relative to future generations, while denying fundamental rights to future generations to inherit a functioning biosphere. The empirical evidence supports the notion that we are living off the "biological principal" of the Earth, not off of the interest from healthy ecosystems.

### 4.3 Empirical Developments in the Global Carbon Budget Distribution

The idea of the "carbon budget" represents perhaps the most precise empirical measure of inter-generational (in)justice. A carbon budget refers to the overall amount of carbon dioxide that can be emitted while maintaining a reasonable chance of limiting global warming to a given amount, such as 1.5℃ or 2℃. Current empirical developments show that a large portion of the carbon budget has already been consumed with all the industrial burning - of all generations - so far.

This use or misuse of the atmospheric commons is one of the major sources of the "huge burden" described in the scientific literature. If the present generation continues to emit at current rates (more years than not), the remaining amount of the carbon budget for achieving a 1.5℃ scenario will be exhausted in less than a decade. This means there will be zero "emissions space" hypothetically available for future generations, unless they are capable of achieving instantaneous carbon neutrality and/or live with devastating environmental consequences. This is a clear example of a "temporal externality." The present generation benefits - from carbon-intensive activity (economic growth, cheap energy, and so forth), and the costs (climate instability and adaptation costs) are borne by future generations.

The empirical distribution of the carbon budget is revealed as extremely inequitable. A small portion of the human population, over a very small time frame, has consumed the vast majority of the Earth's ability to process greenhouse gases. In this context, future generations will not only be born into a warmer world, but will also not have the energy-based opportunities for development that the current generation consumed to achieve its present standard of living. Hence, the "long emergency" is not only a physical happening, but a structural (in)justice that is baked into the global economy.

In addition, the empirical vulnerability of developing countries adds another layer of complexity to the distribution of the global carbon budget. Countries like Kenya, who have quite literally contributed negligibly to the global carbon debt, and yet are among the most vulnerable to its consequences. This fundamentally affects both intergenerational and international justice; the present generation's carbon consumption is taking not only from those in the future, but also disproportionately from the most vulnerable populations of the present. The scientific literature is clear; if our intention is to protect today's youth and nature, then a radical reallocation of the remaining carbon budget is necessary to prevent what is being termed "dangerous climate change."

## V. CONTEXTUAL CASE STUDIES ON ENVIRONMENTAL GOVERNANCE

The theoretical and empirical arguments for intergenerational justice find venue in various governance approaches and legal frameworks. By studying how different societies and legal systems

have tried to institutionalize the interests of future generations, we can begin to determine workable methods for environmental governance. These case studies may include the financial management of sovereign wealth, and the time-honored traditions of Indigenous peoples, but also modern battlegrounds of youth led climate litigation.

5.1 Scandinavian Models of Long-term Sovereign Wealth Management

Among the most robust empirical frameworks for intergenerational stewardship, the Scandinavian model of sovereign wealth management is epitomized by the Norwegian Government Pension Fund Global (GPFG). While the fund is rooted in the extraction of an exhaustible resource—oil—the philosophy of its management embodies the principle of "just savings." Instead of liquefying the nation's oil wealth for present consumption, Norway has transformed this exhaustible natural capital into a sustainable and enduring financial trust.

At the core of this model is the ethical principle of "fiscal rule," which generally restricts the government's annual drawdown from the fund to the expected real return on the fund (which has historically been around 3–4%). This ensures the principal remains intact for future generations that do not receive oil revenues. The overall model ultimately treats the current generation as a "trustee" who is temporarily responsible for the nation's resources instead of as an "owner." By diversifying the fund's investment into thousands of companies around the world, and applying Environmental, Social, and Governance (ESG) criteria in its investment decisions, the fund tries to also align its financial interests with the sustainable prosperity of the global economy and environment over the long term.

The Scandinavian model, therefore, provides a pragmatic solution to the challenge of "political short-termism." By putting the fund's management under the control of an independent central bank, while committing to transparency and ethical practice, Norway has effectively decoupled wealth from the four-year electoral cycle. This institutional design understands that the interests of future citizens are just as legitimate as those of current voters. In effect it has facilitated a successful application of the "stewardship mandate" to pass on a "portfolio" they received of assets—be that financial, natural, or social—that is at least of the same economic value.

That being said, the model is not without contradictions. The very wealth that supports the intergenerational trust is derived from the fossil fuel industry, which feeds into the global "long emergency" (Orr, 2016). Therefore, on the one hand, the nation may be supporting the financial future of its own citizens while, on the other, contributing to the ecological insecurity of the global future. This contradiction ultimately points to the necessity of moving beyond national stewardship to a global framework of stewardship that incorporates both planetary boundaries and the "common but differentiated responsibilities of all nations."

5.2 Indigenous Perspectives on Seven-Generation Stewardship

In comparison to the financial, market-based custodianship of Scandinavian wealth funds, Indigenous perspectives demonstrate a relational, and temporally-rich view of environmental ethics. A core value of many Indigenous worldviews (for example, that of the Haudenosaunee (Iroquois) Confederacy) is to consider the moral implications of the "Seven Generations." In practice, this means that every major decision a community considers would be made in a way that takes into account what it will mean to the seventh generation after you.

This viewpoint offers a shift from "resource management" to "planetary guardianship." Instead of thinking of the environment as simply a collection of "resources" to be used, it thinks of it as a web of relations to which humans have a moral obligation. This pluralized ontology is starkly different from the "extractive" Western model. For Indigenous stewards, the present generation is simply a link in a chain that stretches back to the ancestors and forward to the unborn. The responsibility of the present is to maintain the "integrity" of the land that it can survive (support life) as it once did for the ancestors.

The "Seven Generations" principle reveals a radical alternative to modern policy making's economic discounting models. While economists have traditionally used discount rates to devalue potential future lives, Indigenous stewardship gives the future equal, if not greater, consideration. This is not just individual philosophy, but rather a practical survival strategy that has allowed many Indigenous cultures to

live sustainably and to be part of their ecosystems for millennia. Research consistently suggests that Indigenous-managed lands demonstrate both higher biodiversity and healthier ecosystems compared to those that have been managed by industrialized states (Sekulić, 2012).

In addition, Indigenous stewardship often involves recognizing the "legal personhood" of the natural world. By recognizing rivers, forests, and mountains as beings with rights and interests of their own, these cultures provide a mechanism for protecting the environment from human short-term exploitation. This also relates to the "precautionary principle." Indigenous cultures prioritize the overall health of the ecosystem, rather than solely maximizing gains for that generation. By incorporating these understandings into a framework of global environmental governance, they would provide the necessary ethical "anchor" to respond to the "long emergency" (Orr, 2016).

### 5.3 Legal Precedents in Youth-led Climate Litigation and Constitutional Rights

The final case study examines the burgeoning field of youth-led climate litigation, the "front line" of intergenerational justice in the 21st century. All over the world young people are accessing the courts to demand action that will secure their future. Examples of these cases, including *Juliana v. United States* and *Neubauer v. Germany*, rely on the premise that a stable climate system is a crucial human right and prerequisite for exercising all other constitutional rights.

The scientific basis commonly used to assert legal claims relies on the "carbon budget" and that, through current emissions bases, youth are under a "huge burden" (Hansen, 2011). Plaintiffs argued that the state, by not regulating greenhouse gas emissions, was failing in its "public trust" responsibility of protecting air, water, climate, and other essential resources for the longevity, survival, and overall welfare of future generations. This legal strategy effectively compels the moral notion of stewardship into a binding constitutional obligation.

In its decision in *Neubauer*, the German Federal Constitutional Court ruled in 2021 that the measures taken by the government to protect climate were inadequate and allocated the burden of emissions reductions to the future. The Court candidly acknowledged that the "intertemporal guarantee of freedom" means that the state has an obligation to safeguard the living conditions of future generations. This marks a significant legal insight, as the Court identifies that the rights of the "unborn" can constrain the present policy choices reliably.

The importance of this legal context is acute because it creates an opportunity for the "representation of the un-represented." Because future generations cannot vote, the judiciary offers a critical space for their interest to be represented in the face of the short-termism represented by the executive and legislative bodies. These cases require 'empirical' evidence, such as future sea-level rise projections and "long emergency" scenarios for a 6° world, to demonstrate the "imminent" harm to youth posed by climate (Orr, 2016). Institutionalizing the rights of the future in constitutional law provides a path to more just and sustainable stewardship of the planet.

On the one hand, different financial models, Indigenous knowledge, and legal innovations, suggest that the tools for intergenerational justice are already here, and we simply need the political will to implement them. As lived experience confirms—along with empirical evidence—of climate-induced resource scarcity and biodiversity loss the need for moral obligation for stewardship becomes an existential issue (Hansen, 2011). This "long emergency" prompts a deep rethinking of how we value time, resources, and for that matter, lives of those who will follow us. Only by interweaving these multidisciplinary perspectives will we have a chance to meet the obligations to the future and steward the "ecological integrity" of our shared planetary home (Sekulić, 2012).

## VI. DISCUSSION: BALANCING PRESENT NEEDS AND FUTURE RIGHTS

The merging of ethics and empirical science projects a fundamental tension in contemporary governance. This tension is between the needs of the current human population at present and the rights of the unborn human population in the future. This discussion engages the moral and practical aspects of this tension and considers the ways in which economic mechanisms, political institutions, and empirical research informs our obligations across generations.

### 6.1 Economic Discounting and Future Lives

One of the most significant barriers to achieving intergenerational justice is the economic practice of discounting. The standard methodology for cost-benefit analysis is the "discounting" of future benefits and costs to their present value based on the assumption that all goods and services available today are valued more than the same goods and services available in the future. While it makes sense to accept this logic for private investment decisions--because private investors can reinvest their capital to generate growth over time--it is ethically problematic to apply this framework when analyzing longer-term environmental outcomes.

The "Social Cost of Carbon" (SCC) illustrates much of this tension. The SCC is an estimate of the economic damages from the emission of an additional ton of carbon dioxide in the atmosphere. The choice of the discount rate used in this analysis vastly alters the SCC. A high discount rate (i.e., 7%) suggests that future damages occurring in 100 years have essentially no present value today--thus justifying a "business as usual" approach to emissions. In contrast, a low discount rate (e.g., 1% or 0%) implies that the investments should invest heavily today to avoid future catastrophes.

From an ethical standpoint, the "pure rate of time preference"--the part of the discount rate concerned with an individual's ability to have a higher regard for the mere passage of time--is difficult to justify. Assuming moral parity, the well-being of a newborn in 2100 should receive the same moral consideration as the well-being of a newborn in 2026. To discount the value of their lives because they occur later in time represents a form of discrimination based on time. It has been suggested that most human societies have never organized themselves around growth as the principal driver of interaction; however, it is now the political reality of economic growth is the political reality we have accepted, at the cost of long-term stability (Heinberg, 2011).

Furthermore, discounting does not recognize the "non-substitutability" of natural capital. Financial capital can grow, but the loss of a stable climate or a functioning ecosystem can never be compensated for with an increase in bank account for future generations. If the increase in the global mean temperature pushes toward 2100, the damage to coral reefs and other critical ecosystems may be irreversible, at least for current generations, it will not matter how much wealth has been made available (Hoegh-Guldberg, 2010). The unique value of "critical natural capital" that cannot simply be substituted by human-made means suggests that economic models may have to reflect these values.

6.2 Political Short-termism and Future Generational Representation

The second main challenge is the "dictatorship of the present," which refers to the chronic structural bias of democracies that targets the needs and vote of current generations over the needs of future generations. Since future generations do not possess the right to vote, run for public office, or participate in public deliberation, they interests are dissociated from the political process. In the context of climate change, this is especially troubling; the costs of an ecological mitigation are, indeed, to be paid today, while benefits will only be realized for decades or centuries.

As noted in section five, the cycle of elections, which usually last between two and six years, promotes a mindset of economic growth and social welfare, rather than an orientation towards the long-term health of the ecology. This temporal short-term critical bias, at its broadest scale, is exacerbated by the "tragedy of the commons" or "temporal tragedy of the commons." Each generation of the present has an economic disincentive to treat resources sustainably, because it is their successors who will pay the "ecological debt" created with over-consumption of shared resources. The political reality of addressing climate change is relevant because it is a specific representation of this struggle to create political institutions that concentrate on the long-term beyond the next election (Heinberg, 2011).

A number of scholars have noted various ways to establish "representation for the future" through institutional reforms that eliminate or decrease short-termism. Examples of institutional reforms include, but are not limited to:

1. Ombudspersons for Future Generations: Offices that operate independently of government, but review legislation and the long-term implications of governments, and promote intergenerational equity.
2. Legislative Quotas or "Future Houses": Parliamentary bodies that are specifically mandated to advocate for the interests of the unborn.
3. Legal Personhood for Nature: Provides certain rights to ecologies, i.e., a river or forest, whereby legal

guardians can sue as advocates to protect long-term interests.

Youth-led climate litigation is a recent grassroots attempt at disrupting political elbowing. By framing climate stability as a "right" recognized inside the constitution, these cases place the judiciary as a check to the political short-termism of the executive and legislative arms of government. This represents a legal shift from discretionary policy to one of protection held for the future, known as "fundamental obligation."

6.3 Empirical Assessments and Moral Decision-Making Frameworks

The bridge between philosophical theory and policy practice is empirical assessment, yet absent the ability to quantify the carbon budget, the loss of biodiversity, or the scarcity of resources, all ethical discussion remains an abstraction. But equally, absent a framework to assess morality, empirical assessments are merely empirical and become a collection of numerals that represent a "should."

The "Global Carbon Budget" concept can quantify intergenerational justice. It sets an upper bound for CO2 emissions if we are to have a good chance to limit global warming to 1.5 °C or 2 °C. Therefore, supporting the carbon budget through legally binding statutory frameworks (in line with existing climate acts/spatial planning acts) is an essential step to preventing today's development from infringing on tomorrow's survival entitlements (Wilson, 2010).

Moreover, our empirical forecasts of population growth (with some prognostications estimating a much larger global population, say by 2100) makes the situation even more daunting (Wilson, 2010). If there are more people in the future, they will need more resources which calls for a more constraining stewardship mandate. If we are to provide "sufficient" life for 2 billion more, we need to reduce our current "ecological footprint".

The empirical facts surrounding biodiversity loss can also contribute to the "Precautionary Principle." We are not just losing "resources," but the very biological substructure that sustains life as species are lost, organisms go extinct, and coral dies (Hoegh-Guldberg, 2010). The empirical facts suggest we are currently liquidating the "natural capital" of the future to perpetuate the "consumption" of the moment. Integrating values into decisions implies a shift from "weak sustainability" (where human-made capital can replace natural capital) to "strong sustainability" (where some natural capital can never be replaced, and thus must be protected).

By combining the "Non-Identity Problem" (the philosophical challenge of harming nonexistent people) with the empirical "Thresholds of Decency" (the physical necessities to enable a life worth living), we can create a powerful planning framework. In this framework, any act that pushes future generations under the threshold of "physical necessity" of keeping someone alive—that is in any way harms a person in the future to whom we have no obligation to—can be classified as a moral wrong.

## VII. CONCLUSION

By undertaking this multidisciplinary analysis, we have explored the profound moral obligations to future generations we owe in the present. From the theoretical orientations of Rawlsian contractarianism and the non-identity problem of Parfit, to the empirical realities of carbon budgets and biodiversity loss, the evidence points to one conclusion: we must exercise stewardship of the environment.

When we invoke the stewardship ethos, we move from the current role of "owners" of the Earth to "trustees" of the Earth. This position calls upon us preserve the "natural endowment" we were given access to, as far more than the physical functioning of our biosphere, we need our biosphere to thrive. The Scandinavian models of sovereign wealth management and the Indigenous "Seven Generations" approaches provide tangible possibilities of how stewardship can be instilled so that the present economic needs mesh with the rights of future generations.

There are certainly barriers to this consideration. Economic discounting continues to deprioritize future lives for present-day efficiency, as political short-termism limits the prospect of implementing the long-term strategies to address climate change. Pushing past these barriers requires redesign on our social political and legal institutions. We must bring empirical assumptions into ethical frameworks and treat the carbon budget, not as a resource for exploitation, but as a shared inheritance.

The data is clear: the decisions we make in the years ahead are likely to matter for centuries to come. Projections for the Earth’s population by 2100 suggest

as many as 2 billion more people; the continuous dangerous and dreadful decline of coral reefs; and global temperatures threatening high levels of catastrophic damage[id:17708211338006085/17708211338008122]. We have little margin for error toward inter-generational justice is not an ideological consideration but a realistic obligation to continue the prosperity and survival of the human species.

In the end, our responsibility for the environment means we are the bridge between the now and the future. By unequivocally understanding the rights of the unborn and the limits of our planet's boundaries, we can meet our moral responsibility to leave the world capable of sustaining life in all its diversity and potential. The "stewardship mandate" is our generation's ultimate challenge and opportunity to declare its legacy.This legacy necessitates a robust framework for assessing risk management interventions, particularly those focused on preserving resource options and avoiding irreversible planetary degradation. Such environmental moral obligations are deeply rooted in an interconnected web of life that demands the integration of intergenerational equity into the broader mandate of sustainable protection (Kelbessa, 2024)(Doorn, 2025). Furthermore, fostering these beneficent motives requires an understanding of the specific mechanisms, such as fairness and legacy considerations, that influence current attitudes toward long-term ecological preservation (Syropoulos, 2021).

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