

# **The Paper Person: A Comparative Analysis of Rhetoric and Truth in Environmental Economics, Literature, and Policy**

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## Abstract

Environmental issues such as deforestation and climate change are some of the most pressing concerns today and require a concentrated global response. How does the rhetoric surrounding these topics affect how people understand them and form potential solutions? First, I analyze the rhetoric in Garrett Hardin's 1968 "The Tragedy of the Commons," one of the most influential economic articles in environmental studies. Hardin considers potential solutions to the overconsumption of natural goods with his famous example of a herdsman allowing his cattle to overgraze in a pasture. His scientific rhetoric that constructs an objective, factual truth dehumanizes the individual. This is reflected in his proposal to restrict human reproduction to stop overpopulation. Hardin's solution reflects the dangers of removing the individual from the conversation when trying to solve an innately human problem. Next, I analyze three examples of environmental literature, focusing on how historical accounts centered around lived human experiences and imagined spaces provide platforms to explore environmental issues through a subjective, experiential construction of truth. I juxtapose these analyses of environmental economics and literature with a rhetorical analysis of the Paris Agreement, one of the most significant international environmental laws concerning climate change. In my thesis, I explore how the rhetoric around these concerns influences the policies constructed and implemented to combat them. I argue that while the Paris Agreement considers human rights issues and the ways in which countries are capable of combating climate change, there is a lack of enforceability that may lead to countries not reducing their carbon emissions. I conclude that there must be a combination of flexibility and accountability in environmental policies to ensure equitable and effective implementation.

*Keywords:* tragedy of the commons, objectivity, environmental economics, ecocriticism, subjectivity, the Paris Agreement, climate justice

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*“The Earth is what we all have in common.”*

— Wendell Berry, American poet, novelist, and environmentalist

## **Introduction**

As environmental issues such as climate change become increasingly relevant in economic, social, and political discourse, it is important to discuss how we articulate these problems and why we chose certain methods to address them. In my thesis, I explore how approaches in the disciplines of economics and the humanities (specifically literary and rhetorical analysis) articulate the relationship between humans and the environment and how this influences our construction of environmental policies. I also determine how they frame what motivates humans to collaborate, a vital question when collective response is necessary to combat these global crises.

The first field I explore is environmental economics, which encompasses the study of the financial effects of environmental policies and the management of natural resources. This area of economics has been widely researched as mounting concerns of sustainability and climate change demand action. However, the rhetoric in canonical works threatens the successful economic and social implementation of policy to combat these environmental issues. The focus on empirical data and economic models in Garrett Hardin’s 1968 “The Tragedy of the Commons”—one of the most influential articles in environmental studies that is still taught in many introductory-level microeconomics courses today—constructs environmental economics as

an objective science that eliminates the human subject as an individual with freedom of choice. This creates a sterile, narrow perspective that fails to encompass the intricacies of reality. In *The Rhetoric of Economics*, Deirdre McCloskey recognizes the necessity of humanizing the dismal science of economics to bring the interpretation of data in alignment with social forces.

After my rhetorical analysis of Hardin's article, I focus on three genres of literature to determine how the humanities can offer an alternative, more individualized perspective to explore the interactions between people, the environment, and the economy. In contrast to Hardin's objective formation of truth, these works create a subjective truth that varies based on context, perception, and priorities. My study of these contradictory approaches in articulating the human impact on the environment, and vice versa, sets up a framework of evaluating the application of this rhetoric in international environmental law through my analysis of the Paris Agreement. This international agreement provides an example of how the human relationship with the environment is rhetorically constructed in the policies that determine global responses to pressing environmental issues.

## **Dataset and Methods**

I begin my thesis with a literature review and rhetorical analysis of "The Tragedy of the Commons." In my analysis, I specifically focus on how Hardin constructs truth using scientific, mathematical, and biological facts and his intentional definition of the "tragedy" that he addresses. McCloskey cites rhetoric as "the art of probing what men believe they ought to believe, rather than proving what is true according to abstract methods" (McCloskey, 1983, p.482). As Americans tend to be conditioned to believe in science and facts as a reliable source of information, I analyze how Hardin's logos-based rhetoric achieves a sense of objectivity in his conclusions, framing truth in his article as a function of formulas and economic models.

Objectivity, in the context of my thesis, means to take a seemingly impartial stance that focuses on facts and scientific proof over considerations of individual perspectives or opinions. Next in my analysis, I explore the popular references and accommodations Hardin integrates in his article to normalize his arguments and make them more accessible to a wide audience. Finally, I examine what Hardin is leaving out of his arguments. He fails to consider how poorer groups or those with less economic or political protection would be unequally impacted by broad, restrictive policies. The reality of which groups would bear the burden of population control and other concerns of environmental justice are not addressed in Hardin's article.

Literary and rhetorical study provides a platform to explore environmental issues in a more holistic manner than Hardin's article through a subjective construction of truth that acknowledges individual circumstances and experiences. To study such alternative approaches compared to Hardin's staunchly scientific, factual perspective, I have analyzed one work of literary theory and two literary works on environmental topics. I contrast the rhetoric of Hardin's article with Rob Nixon's *Slow Violence and the Environmentalism of the Poor*, a nonfiction book on ecocriticism and postcolonial studies. I also analyze two fictional books in relation to Hardin's article: Ruth Ozeki's *My Year of Meats*, a work of contemporary fiction, and Shaun Tan's *Tales from the Inner City*, an anthology of speculative fiction short stories and art. Through my initial analyses, I determine that the contrasting rhetoric in economics versus literature about environmental issues affects how people understand these problems and form potential solutions.

My thesis concludes with my rhetorical analysis of the 2016 Paris Agreement. The Paris Agreement provides an ideal case study because it is a milestone in international environmental politics with its language debated by nearly 200 countries (Keenlyside et al., 2016). By

combining my findings in my rhetorical analysis of Hardin's article and my analyses of environmental literary works, I created an explanatory schema to connect these ideas in the Paris Agreement. I coded the international policy for evidence of four categories. The first category is subjective truth where the agreement acknowledges the varying circumstance of different countries. This consideration leads into the second category of environmental justice, specifically focusing on how climate change is framed not only through physical properties but as an issue with ethical and political dimensions as well. In this second category, I look at how the agreement protects vulnerable groups in a manner that is overlooked in "The Tragedy of the Commons." The third category I coded for is scientific or technical language, identifying where and how this document relies on science and the similarities and differences in these instances to the use of science in Hardin's article. Does the Paris Agreement also view science as objectively true as it is in the present moment? The fourth category considers how the agreement internally defines terms for clarity and ease of implementation. In addition, I also identified instances in which the rhetoric of the agreement is directly comparable to Hardin's language and areas where I found potential critiques of the Paris Agreement's effective implementation. Finally, I noted a few keywords that frequently arose in important sections of the document, namely: vulnerable; common; adaptation; voluntary; and mutual.

### **Existing Literature on "The Tragedy of the Commons"**

Several scholars have explored the economic properties of Hardin's article. One such study reimagines the tragedy of the commons in which shared resources are exploited and depleted as a prisoner's dilemma game (Kareva et al., 2013). In accordance with economic theory, cooperating to preserve common resources can lead to an efficient outcome. However, individuals who seek to maximize their own benefit will choose to overconsume, deteriorating

the resources. The researchers implement a system of Pavlovian reward and punishment conditioning adjusted to communities with punishment for over-consumption and reward for under-consumption to test the theory of mutual coercion that Hardin promotes. They found that the tragedy of the commons cannot be prevented through rewarding under-consumers alone. There must be some degree of punishment that increases in a non-linear fashion with respect to over-consumption (Kareva et al., 2013). While his conclusion follows this implementation of punishment, Hardin's article ignores the community specificity in Kareva et al.'s study.

Other research has reached diverging conclusions about the solution to this tragedy. In "Indigenous Peoples, Political Economists and the Tragedy of the Commons," Professor of Law Michel Morin addresses the economic, scientific, legal, and anthropological literature that is overlooked in Hardin's argument, such as that of John Locke and Adam Smith. Morin considers elements that Hardin's argument does not address in his analysis of the tragedy of the commons: the attitude of indigenous people toward their commons and the reasoning of political economists. Despite recognizing the possibility of reaching joint decisions in his oxymoronic proposal of "mutual coercion," Hardin never considers how "communal norms could prevent an overexploitation of resources or allow for the adoption of corrective measures" without the threat of punishment (Morin, 2018, p. 559-560). Manfred Stanley similarly aimed to revive the discourse of a common resource managed by communities without regulation by reconceptualizing the commons as a freedom to be abused rather than in classic terms of a commonwealth with a shared goal (Stanley, 1983). These findings clash with those of Kareva et al.'s study as they assert that punishment is not needed if collective norms are adhered to within a community. Typical studies of the commons range from field observations and archival studies to laboratory experiments and have recently broadened to the study of complex social-ecological

systems and global ecosystems (Berge & Laerhoven, 2011, p. 162). There have been many studies conducted on the scientific implications of Hardin's article.

Much of the existing literature surrounding "The Tragedy of the Commons" focuses on studying, adopting, and modifying his metaphor of a cattle herdsman in a pasture to consider the relationship between property rights and environmental conservation. Within the metaphor, pursuit of individual benefit leads to the exploitation and degradation of environmental resources. His metaphor, which acts as a scientific and economic thought experiment in the article, and his conclusion that the freedom of humans to breed is intolerable induces an immediate resistance from the reader but is nonetheless a powerful force behind the endurance of Hardin's work (Ells, 2009). In an article examining this metaphor, American ecologist John Vandermeer argues that Hardin's message is clear; he warns of overpopulation that leads to the deterioration of any resources not specifically in the hands of a private owner. In practice, the expected selfish behavior in this metaphor has repeatedly been disproven. Elinor Ostrom, the 2009 winner of the Nobel Prize in Economics, found that with a public resource such as a fishery, local populations tend to recognize the need to protect the shared resource and develop social rules, or unstated contracts, that protect common property (Berge & Laerhoven, 2011, p. 162; Chibnik, 2011; Vandermeer, 1996). By broadening the definition of these shared resources to include both common property resources that are natural and human social constructs, Vandermeer finds that the metaphor's general implications of the dangers in the free market and competition are even more important than its technical fallacy. The tragedy of the commons has a critical and often unrealized assumption that pasture renovation (how much it costs to put the pasture back to its original state) is costless. The tragedy arises from private benefit being gained from a public space without the consumer taking on the full social cost. Theoretically, this



dilemma can be solved either through privatization or the elimination of private property so that most resources are part of the commons (Vandermeer, 1996). Yet, neither of these solutions seem viable in the current divided political climate.

Hardin's article has been widely criticized for ignoring the historical circumstances and local political economies that determine the potential users of communal resources and informal procedures that communities develop to limit access to common resources (Chibnik, 2011; Morin, 2018; Nixon, 2012). In an article that evaluates Hardin's work and tracks his influence in continued research and policy, anthropologist Michael Chibnik finds that post-Hardin scholarship has largely involved ethnographic studies rather than mathematical models and focuses on how local institutions, rules, and regulations affect resource usage. This, political scientist Arun Agrawal has argued, prevents a better understanding of how international bodies interact with local institutional arrangements and resource systems (Chibnik, 2011). What is local is often created by connections with the external and nonlocal environment, and these connections influence the use of common goods.

Several researchers have analyzed rhetorical strategies other than the central metaphor Hardin employs in "The Tragedy of the Commons." Dr. Kevin Ells examines Hardin's article as a case of ecological rhetoric, which he defines as "rhetoric grounded in an ecological perspective... that everything (rocks, air, water, politics, bodies, thought, argument) consists fundamentally of the same substance" (Ells, 2009, 321). Like other researchers, he looks into the favorable kairos of the late 1960's—in which a sense of environmental crisis was emerging as joint economic and population growth threatened resource stocks—and breaks Hardin's arguments into enthymemes to pinpoint the article's rhetorical appeal (Dryzek, 2005, p. 29; Ells, 2009; Nixon, 2012). Hardin's article gained significant rhetorical velocity and catalyzed much

debate with its “lucid, jargon-free style that reads like a transcript of the public lecture it was at first” (Ells, 2009, 322). Indeed, the article is relatively jargon-free, and yet the economic and science-driven logic seem to be the primary source of truth throughout Hardin’s work. Hardin presents his critique of overpopulation through a pairing of the genres of tragedy and parable with science and uses genre techniques to orient the commons outside of its cultural and historical contexts; with this strategy, the concept is devoid of complexities, setting a blank stage for the science to take over and yield predictable, biologically-driven actions and outcomes (Berge & Laerhoven, 2011; Nixon, 2012).

In the decades following the publication of “The Tragedy of the Commons,” Hardin had defended his own metaphor and rhetoric, and also made a few concessions. In an article summarizing a presentation given by Hardin at a national symposium in 1976 and providing the transcript of a *BioScience* interview held afterwards, Hardin claims the only systems for distributing environmental resources that can work today are those that impose strict controls. In the interview, Hardin identifies that “an essential part of the problem is a recognition that we’ll have to limit personal liberties,” referring to his proposed restriction of the freedom to breed for humans (Leeper, 1976, p. 786). This policy of population control has still not been implemented in many developed countries that enjoy immense personal liberties. Ultimately, Hardin brushes off criticism brought up in the interview. He imposes a binary solution set in which population reduction will only occur due to strict controls or devastation. Yet, thirty years after publishing his article, Hardin himself admitted it detailed the case of “an unmanaged commons” which does not allow for cooperative management nor conditions of locality to be considered, addressing one of the most common critiques against his article (Ells, 2009). In my thesis, I explore how

taking into consideration organization and attitudes that are not entirely science-based, a more holistic view can be taken on the management of environmental resources.

### **The Tragedy of “The Tragedy of the Commons:” A Rhetorical Analysis of Hardin’s Article**

In “The Tragedy of the Commons,” Hardin asserts that due to limited natural resources and space, strict population control must be implemented because the “freedom to breed will bring ruin to all” (Hardin, 1968, p.1248). In six pages, Hardin comes to the abrupt, unpalatable conclusion of restricting humanity’s right to procreate as a means of mediating resource usage. Yet, rather than being outright dismissed, Hardin’s article became widely circulated and is considered an influential benchmark across several fields of study with over 42,000 citations (Berge & Laerhoven, 2011; Ells, 2009). The organization and presentation of his argument has likely been key to its acceptance into academic research. Although Hardin writes for a scientific audience, his article is widely influential and carries implications in other fields. “The Tragedy of the Commons” has been cited in a diverse range of fields including biology, political science, agriculture, and human behavioral science.

Hardin uses objectivity as a source of persuasion in his article by taking on an impartial approach to the topic, seemingly uninfluenced by personal feelings or opinions, and focusing solely on the facts. He also defines “tragedy” in the context of his article to arrive at a sense of inevitability concerning his solution to restrict human breeding. Another strategy I identify in Hardin’s work is his use of comprehensible examples and metaphors to reach a wider audience and gain rhetorical velocity. However, a major drawback to Hardin’s approach is that his rhetoric dehumanizes people, leading to a lack of consideration for environmental justice and basic human rights.

## **Factual Objectivity as Persuasion**

“The Tragedy of the Commons” begins by establishing the population problem (a Malthusian outpacing of exponential population growth versus linear food growth) as part of “the class of ‘No technical solution problems,’” a category Hardin cites from an article on nuclear war by reputable American scientists Jerome Wiesner and Herbert York (Hardin, 1968, p. 1243). His reference to notable figures in the American government and scientific fields lends him a sense of authority to speak on this idea. According to the concept of “no technical solution,” Hardin states that continuous innovations will not suffice to solve this problem of rapid population growth; rather, a “change in human values or ideas of morality” is necessary (Hardin, 1968, p. 1243). He rejects neoclassical economics and the concept of substitutional forms of capital by going against a recurring practice in economic studies: he introduces the human subject in terms of morality rather than exclusively rationality. The neoclassical outlook on capital recognizes that a depletion of natural resources can be made up for by an equivalent increase in human—or labor—and created—or man-made—capital. Sustainability can be realized as long as the total capital stock remains constant. This assumes that technological advancements will increase productivity and efficiency to accommodate population growth even given limited natural resources. Hardin argues the expectation that technology will improve in bursts to counteract the issue of limited resources encourages inaction for the majority and a reliance on the genius of the few. Therefore, he denies this notion and creates a burden of action by asserting that technology will fail to provide a solution to the population problem, eliminating tolerance of this inertia. If there is no technical solution, as Hardin asserts, then there must be a change in human perception and action.

In the first section of his article, Hardin appears to disqualify science as the solution to the problem of population growth and instead looks to the realm of the humanities for a moral paradigm shift. However, the arguments he presents pull reason from “biological facts” and the “mathematically possible” (Hardin, 1968, p. 1243). Scholars in the humanities tend to use subjective language that humans recognize and ascribe to themselves. Economists, on the other hand, tend to take humans as rational economic agents and use terms that are general rather than specific to the human. In his article, Hardin frames truth in scientific terms to establish his articulation of the tragedy of the commons and the population problem as universally factual and his conclusion as, accordingly, logical.

Hardin frames his first argument that change is necessary with a metaphor familiar to the highly educated, scientific audience of his article: the maximization problem. This equation recognizes a single dependent variable with a quantity to be maximized considering some independent variables. By definition, only one variable can be maximized. Hardin considers this problem in context of allocation; energy is required for the maintenance and function of life, and there must be a decision made concerning the acquisition and usage of this energy. The question of what humanity will maximize is posed mathematically with the maximization problem and biologically with the allocation of energy. With these proofs, Hardin identifies the error inherent in attempting to stop the negative externalities of overpopulation such as pollution and overuse of resources while maintaining the current quality of life. Either population or goods can be maximized, not both. As population grows, the marginal share of goods necessarily decreases. Human enjoyment is quantified and conceived in scientific terms to fit into this formula. Hardin states that the human conception of “good” is individual and thus impossible to measure in terms of value, and “theoretically, this may be true; but in real life incommensurables *are*

commensurable” (Hardin, 1968, p. 1244). With a rhetorical maneuver used several times in the article, Hardin constructs a paradox to break down the dichotomy of comparable versus not comparable and establish a common nomenclature. A standard of evaluation can therefore be created to generalize what humans define as “goods”—things or services a person can consume to increase their utility, or happiness—and identify the most beneficial allocation. Gendered terminology and references to the natural process of evolution normalize his argument that “in nature the criterion is survival... [and] man must imitate this process” (Hardin, 1968, p. 1244). To sustain rapid population growth, Hardin concludes that “we must make the work calories per person approach as close to zero as possible,” achieving the basic economic equilibrium of marginal cost equals marginal benefit (1968, p. 1243). To achieve this goal of equalizing population growth and the goods available per person, all excessive goods that are not necessary and only provide pleasure must be eliminated.

By framing the population problem within this economic construct of singular maximization, Hardin simplifies how humans live and consume even after acknowledging the individuality of human experience. The restraints of this model do not allow for variance among the subjects beyond the single dependent variable. If human population increases, then the marginal good required by every human must be consistent, a miscalculation if each individual is not the same. Yet, Hardin ignores these inconsistencies and accepts the homogenous humanity implied by his argument. The reality drawn from the maximization problem in which there is only as much good as to sustain the maximum human population is a minimalistic, dystopia-like alternative that is clearly not a practical solution as most people would be unwilling to sacrifice all enjoyment in life. Hardin answers his own implicit rhetorical question, stating “I think that everyone will grant, without argument or proof, that maximizing population does not maximize

goods” (Hardin, 1968, p. 1243-1244). This hypophora allows Hardin to explore other potential solutions; by presenting one absurdly unacceptable solution offered by an economic model, Hardin’s next proposed solution will comparably seem more reasonable. This tempering move encourages readers to reassess their expectations for what will be necessary to solve the population problem.

Throughout his article, Hardin applies scientific terminology to the population problem to the detriment of humanity. Working towards his eventual proposal of restricted freedom, Hardin rejects the moral being invoked in the introduction and casts humans as selfish individuals with no consciousness of collective survival. Humans deteriorate in the article into mindless, systematic breeders. Hardin quotes English physicist Charles Galton Darwin to literary classify humans with binomial nomenclature; “*Homo contraciens*” create less children and “*Homo progenerivus*” create more children, thus making up more of the future population (Hardin, 1968, p. 1246). This binomial naming system dehumanizes people. Hardin’s strategic use of formal scientific names dichotomously separates humans into different species within the same genus, relating them to beasts and implying there are only two types of humans. There are humans who can recognize the need to limit population growth and those who cannot control their breeding on their own and require intervention. The reckless over-breeders, by definition, make up most of the population and continue to multiply at a more rapid rate than their responsible counterparts. Hardin also argues that members of a culture benefit from overbreeding and spreading their own ideas and religion synonymously to how animals naturally seek to procreate and continue their genetic line. The repeated biological diction of “overbreeding” and “germ line” furthers this animalistic comparison and dehumanization (Hardin, 1968, p. 1246). While Hardin acknowledges “it is painful to have to deny categorically the validity of this right” to

reproduction and family, it is nonetheless framed as a necessary evil as many humans cannot self-moderate their own actions (Hardin, 1968, p. 1246). Hardin outlines the hazards of overpopulation in detail throughout the article. The right to have as large a family as desired is depicted as a “tragic ideal” and the United Nations’ defense of the family unit as autonomous in the 1967 Universal Declaration of Human Rights, a historic document affirming such human rights as reproduction, is called a “tragic course of action” (Hardin, 1968, p. 1246). Hardin’s repetition of “tragic” calls upon the catharsis that accompanies human suffering within the tragedy genre to cleanse the negative associations with his claims (Nixon, 2012). Furthermore, the paradoxical language of “tragic ideal” implies that while it is unfortunate that an ideal state which satisfies the human need to procreate and allows for universal good is not possible, this impossibility is also inevitable, and thus tragic. Again, a compromise of freedom is demanded as “injustice is preferable to total ruin” caused by overpopulation (Hardin, 1968, p. 1247). Limiting certain rights is framed as a necessity in Hardin’s article.

Hardin wields his construction of truth in terms of objectivity and science as a persuasive technique, claiming “if we love the truth we must openly deny the validity of the Universal Declaration of Human Rights” and accept a restriction on reproduction (Hardin, 1968, p. 1246). Unlike the potential solutions he mentions earlier such as maximizing population according to available resources, there is no ambiguity in the language for his own solution. Hardin recognizes the connotation of his chosen means of population control, coercion, as a “dirty word to most liberals” and claims it can be cleansed with repeated exposure (Hardin, 1968, p. 1247). To frame this term more favorably, another oxymoron is established: “mutual coercion” (Hardin, 1968, p. 1247). Hardin rhetorically replaces the oppressive nuance of the word by adding a sentiment of willing compliance. If the coercion is reciprocal, then it could be argued to be



defendable. Yet, despite recognizing the possibility of reaching joint decisions by using the word “mutual,” Hardin never considers how individual communities could establish their own customs and regulations to circumvent this overconsumption. In his analysis, Hardin moves from small examples able to be easily enclosed into private property such as a pasture to limitless natural commons such as the ocean. This rhetorical progress “blurred the difference between communal property regimes, where access to resources is controlled by co-owners or community members, and open-access regimes... such as the atmosphere,” establishing the inability of enclosure to solve the tragedy of the commons (Morin, 2018, p. 560-561). By equating bounded environments with the boundless, Hardin ignores the potential ability to self-regulate resource management within a community and frames his own solution of universal restriction as the inevitable, scientifically correct choice.

Hardin’s article was originally published in *Science Magazine* and the content reflects this intended audience with the use of facts and models. Scientific communities tend to prioritize a stance of analytical detachment from the subject over less directly rational approaches. Accordingly, “economists pointlessly limit themselves to ‘objective’ facts” that are persuasive only because they have been scientifically tested and proven (McCloskey, 1982, p. 513). Although he avoids introducing too much overt jargon, Hardin’s arguments similarly rely on scientific and economic facts as appeals to logos to give his position a sense of objectivity.

### **Defining “The Tragedy”**

Although the population problem is detailed early on, the commons remains undefined directly in the article. Generally, the concept of the commons is largely considered to be not precisely defined (Berge & Laerhoven, 2011, p. 161). In economics, a common good is a resource that is rivalrous—able to be used up and depleted—but non-excludable—no individual

can be kept from using the commons. Hardin allows for this technical, known definition to be assumed uncontested. The concept of the commons is intrinsically tied to environmental studies because many natural resources—air, oceans, forests, fish, and the atmosphere—are common goods. People can consume them freely and, usually, equally. However, they deplete or deteriorate with more use. Hardin identifies this freedom and lack of controlled allocation as part of the problem leading to the tragedy of the commons. Hardin recognizes Adam Smith as the source of the widespread “tendency to assume that decisions reached individually will, in fact, be the best decision for an entire society” (Hardin, 1968, p. 1244). To prove that this is a fallacy “that has ever since interfered with positive action,” Hardin breaks down the basis of capitalism and the associated autonomy of commerce and argues the need to “reexamine our individual freedoms to see which ones are defensible” (Hardin, 1968, p. 1244). To define the source of the tragedy of the commons, Hardin decomposes human interactions with the commons into three categories: the freedom to consume; the freedom to pollute; and, ultimately, the freedom to breed.

To prove the dangers of the freedom to consume, Hardin dual casts the human subject as a rational economic agent, yet also naive and naturally harmful. As an example, oceans and National Parks are presented as commons. These ecosystems are endangered by open access to humans who have a “natural tendency to do the wrong thing,” to over-consume “without limit” while the “parks themselves are limited in extent” (Hardin, 1968, p. 1245). A human consumer is described as unable to limit their own intake for the betterment of society, the identified “*Homo progenerivus*.” The selfish economic agent that Hardin depicts does not describe all human consumers and does not take into consideration the possibility of personal restraint; however, in this article, the generalization is absolute. Hardin proposes several potential solutions to combat

the damage of free access to environmental resources that he characterizes as “reasonable” yet “objectionable,” such as the privatization of all commons or an allocation of access through an auction system (Hardin, 1968, p. 1245). These solutions are subsequently discarded, leaving room for his own proposal later on. Again, an ultimatum is established: compromise or destroy the commons.

The second part of the tragedy of the commons originates from the resulting waste of consumption: the freedom to pollute. In this section, Hardin quotes his grandfather to show that during frontier times in America, population was low enough that the disposal of waste was not an issue and even though there were many misconceptions about water purification, “the myth was near enough to the truth” to be accepted (Hardin, 1968, p. 1245). However, this is no longer the case. Truth is framed as definitive, but also a function of occasion because morality and facts can develop over time. Humans occupy a “complex, crowded, changeable world,” and the appropriate conceptualization and implementation of morality depends on the surrounding conditions—what is accepted as the truth at that time (Hardin, 1968, p. 1245). Hardin asserts that the present supply of resources and space cannot maintain the growing population at the current standard of living. Earlier in the article, Hardin offered and then rejected the possibility of lowering marginal good. This strategy gives him room to explore the source of the population problem rather than consider ways of mediating the effects of pollution. Hardin returns humanity to the role of “the rational man” when it suits his argument; “so long as we behave only as independent, rational, free enterprisers” operating under standard economic assumptions without individual variance, humans are doomed to over pollute in addition to and as a result of overconsuming (Hardin, 1968, p. 1243). Similar to the overconsumption of the commons, Hardin frames “the pollution problem [as] a consequence of population” (Hardin, 1968, p. 1245). With

these definitions of the problems facing humanity's continued survival, Hardin sets up a reality in which the cause of excessive consumption and pollution is overpopulation. The principle problem is, thus, the source of population: the freedom to procreate. This sequence of logic allows Hardin to define his tragedy of the commons to support his ultimate conclusion of compulsory population control. As Hardin states in the conclusion, "it is the role of education to reveal to all the necessity of abandoning the freedom to breed" (Hardin, 1968, p. 1248). Hardin positions his article as the source of this education that provides the answers to humanity's most pressing problems.

### **Accessing a Wider Audience**

Although "The Tragedy of the Commons" was written by an ecologist for a scientific audience, Hardin uses several accommodations, adjusting aspects of his language and presentation in order to make his article accessible to more people. For example, he comes up with a catchy title analogous to modern click-bait articles, forgoes graphs, charts, and data in building his arguments, and focuses on simple, widely understood examples and metaphors to illustrate his points (Dryzek, 2005, p. 29). Advanced knowledge of economics and ecology are not required to follow the arguments presented. These moves may account for the longevity and reach of Hardin's article in entering other fields of research.

A prominent strategy Hardin employs is using simple examples that are accessible to a wide readership. When defining his classification of "no technical solution problems" in the introduction, Hardin incorporates game theory, which analyzes mathematical models and experiments of strategic interactions between players. However, he presents this theory in a comprehensible format with the example of tick-tack-toe. If both opponents understand the game and play their optimal strategies of stopping the other player from getting three symbols in a row,

then the game will result in a tie for every match. Because there is no way to definitively win each time within the rules of the game, it can be said there is no technical solution to winning the game of tick-tack-toe. Only through “an abandonment of the game” by cheating, lying, or refusing to play can a player be said to win the game (Hardin, 1968, p. 1243). To illustrate his point that sometimes it is necessary to reject the premise of a situation in order to succeed, Hardin references the game of tick-tack-toe because most people will be familiar with its rules—and those who are not can easily learn. Early on, he sets up the idea that known assumptions may need to be subverted in order to solve a problem with seemingly no solution within the current rules of the game. If the rules of tick-tack-toe can be abandoned, then so too can the rule of assumed freedom for humans to procreate—a leap of logic Hardin builds to in his article.

Hardin’s use of accommodations to facilitate reader’s understanding despite their educational background is apparent in his central metaphor of a cattle herdsman in a medieval village that illustrates the tragedy of the commons. Each herdsman faces the choice of how many cattle to raise and sell. This simple hypothetical situation explores the positive and negative externalities resulting from free access to and use of the commons. The herdsman will experience all of the private benefits of selling more cattle and only a fraction of the social costs such as overgrazing shared by the entire community; “therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited” (Hardin, 1968, p. 1244). In terms of human reproduction, the herdsman example illustrates how people will experience the entire personal benefit from having another child, but only share part of the social cost from overpopulation. In this article, Hardin establishes the human agent as one that reproduces and consumes selfishly. This allows him to propose that individuals will consume based on their own personal benefits and costs without considering the costs to society.

In his example, this leads to an excess of cattle in the commons, resulting in overgrazing and degradation of the shared pasture and demonstrating that “freedom in a commons brings ruin to all” (Hardin, 1968, p. 1244). Hardin calls back to a time when this behavior was acceptable because other factors such as war and disease acted as natural population control. However, society developed to protect against these dangers, and without them, “the inherent logic of the commons remorselessly generates tragedy” (Hardin, 1968, p. 1244). Again, Hardin evokes a sense of inevitability with his use of “inherent” and asserts that the basis of his argument is objective “logic” according to the current reality.

In economics, metaphors tend to “convey the authority of Science, and often convey, too, its claims to ethical neutrality,” and Hardin indeed utilizes his cattle herdsman metaphor to prove his claim of human selfishness and justify his ethically-questionable solution (McCloskey, 1983, p. 508). Hardin uses the basic microeconomic principle of overconsumption in respect to common resources to articulate the tragedy of the common as a result of rational agents acting in their self-interest. However, this assumed selfish behavior once more discounts the possibility of cooperation and individual concern for social welfare. Furthermore, Hardin does not present other known policies that can counteract the underpricing and overproduction of a good with a negative externality, such as taxation or the allocation of tradable permits. Instead, Hardin uses this simple, comprehensible metaphor as a premise for his contentious statement that the “freedom to breed will bring ruin to all” (Hardin, 1968, p. 1248).

His conclusion is unsettling, and Hardin reluctantly acknowledges this in a section entitled “Freedom To Breed is Intolerable.” In his argument against the Universal Declaration of Humans Rights, Hardin permits that when “denying [the freedom to have a family], one feels as uncomfortable as a resident of Salem, Massachusetts, who denied the reality of witches in the

17th century. At the present time, in liberal quarters, something like a taboo inhibits criticism of the United Nations” (Hardin, 1968, p. 1246). The Salem witch trials are well-known and thus will be familiar to most American readers. Even those who do not know the specific reference will understand the idea that witches are not real. Hardin compares the rejection of the freedom of humans to procreate to the rejection of the existence of witches during the Salem witch trials as though the two concepts are both fabrications that the current society accepts and foolishly acts on. The simile focuses on the feelings involved in both scenarios to rationalize the discomfort brought about from Hardin’s conclusion with the natural reaction of going against the status quo. This comparison briefly moves away from Hardin’s focus on logic to touch on the probable disagreement from the reader to the restriction of the ability to reproduce.

The well-known, simplified examples and references that Hardin includes makes his arguments more accessible and consequently more marketable to a wide audience. Although his article was published in 1968, it is still read and discussed today over fifty years later. The tragedy of the commons is taught in introductory microeconomics courses, often through Hardin’s popularized example of a cattle herdsman. His frequent use of accommodations and avoidance of overly technical jargon has likely contributed to the longevity and continued relevance of “The Tragedy of the Commons.”

### **But Who Bears the Burden?**

While Hardin intermittently acknowledges the variance and adaptability of humans and criticizes traditional ethics for making “no allowances for particular circumstances,” he proposes a one-size-fits-all solution of restricted breeding that faces this same issue (Hardin, 1968, p. 1245). This is likely a result of Hardin’s framing of truth as objective due to the scientific terminology and compelling examples employed. He specifically defines his terms, questioning

“but what does ‘freedom’ mean?” and forms the concept in terms of necessity (Hardin, 1968, p. 1248). The article functions as a series of proofs, assuming generalizability across the human population and accordingly culminating in the a singularly focused conclusion that the freedom to breed is the source of the tragedy of the commons.

Despite acknowledging truth and morality as adaptable based on the existing circumstances, Hardin does not tailor his solution to any specific group. Rather, he makes a broad claim of restricting population. His arguments are reliant on biological facts and economic models, but he offers no practical implementation. Hardin follows the official rhetoric of economics that is steeped in the “abstract and in methodological ruminations” (McCloskey, 1983, p. 484). While its theoretical nature is part of the article’s claim to acceptance by a wide audience, the lack of specificity and actionable goals leave the conclusion with little real-world application. In Kareva et al.’s study of the tragedy of the commons as a prisoner’s dilemma game, an implementation of the mutual coercion Hardin promotes is demonstrated to be possible by establishing a system of Pavlovian reward and punishment conditioning that is adjusted to the community (Kareva et al., 2013, p. 29). However, Hardin ignores this specificity to the detriment of his own solution’s practicality. The article ends on a call for action, but it is entirely conceptual; his arguments rely on theoretical situations such as the cattle herdsman example rather than laboratory, field, or natural experiments. Ultimately, Hardin advocates to apply a universal shift in morality which, in practice, would play out like one of the technical solutions he rejects at the beginning of his article.

Furthermore, Hardin’s abstraction of people into scientific categories eliminates the reality of who would bear the burden of population control. Environmental justice movements have proven that environmental disaster and degradation inequality target people based on



socioeconomic status, race, national origin, and other factors (Atapattu, 2007). This disparity in the distribution of benefit and burden are not considered in Hardin's arguments, further disqualifying the article from making meaningful, practical changes. When exploring the interactions between humans and nature, reducing both sides to their basic scientific components excludes the complexities and nuances inherent in living things such as people and the environment. Hardin's objective approach results in a conclusion as detached from the current reality as it is from its human subjects.

### **Construction of Subjective Truth in Environmental Literature**

Works of literature provide a platform to explore environmental issues in a more holistic manner than Hardin's article through a subjective construction of truth. In my thesis, subjective is defined as considering individual circumstances and perspectives, an acknowledgment of the personal reality that is experienced differently by different people. To access this broader outlook, I contrast the rhetoric of Hardin's article with one work of literary theory and two literary works on environmental topics. My first analysis is of Rob Nixon's *Slow Violence and the Environmentalism of the Poor*, a nonfiction book which takes a transnational perspective to gradual environmental catastrophes such as climate change, deforestation, acidifying oceans, and more. *Slow Violence* is written objectively in the sense that it is factual and follows historical accounts, but Nixon's human-focused approach contrasts Hardin's more theoretical, equation and model-based arguments. After this analysis, I consider two fictional works, Ruth Ozeki's *My Year of Meats* and Shaun Tan's *Tales from the Inner City*, in comparison to Hardin's article to explore how imagined spaces allow for complex, in-depth storytelling about human interactions with and within nature that is not possible when adhering to a strict conception of objective reality and truth.

## **The Holistic Reality in Nonfiction**

A major weakness I identify in Hardin's article is his abstraction of humanity. A universal solution can only be implemented effectively if it is assumed that all individuals exist under the same circumstances and will experience a restriction on reproduction equally. However, this is not the case in reality. Societies vary across the world in many ways, including culturally, economically, and politically. This variation is even more significant between classes within a society and amongst individuals. The actual effects such a policy would have must be considered. In his nonfiction critical work *Slow Violence*, Nixon provides historical accounts of enforced population control unequally impacting the poor and those with less economic importance. Nixon draws a realistic portrayal of the implementation of these types of policies through the lens of history.

Nixon defines slow violence as "a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (Nixon, 2013, p. 2). Relatively spontaneous environmental disasters such as hurricanes and earthquakes receive world-wide news coverage and evoke an immediate response; they are viewed as emergencies with a "perceived immediate need" (Nixon, 2013, p. 3). However, other environmental issues such as climate change and increasing numbers of endangered species are less conspicuous and accordingly receive less attention and problem-solving actions such as public policy changes. With the current fast-paced news cycle that rarely lingers on an event or controversy for more than 24 hours, it can be difficult to justify timely and substantial mobilization for issues that will not have a notable impact for years, or even decades. Yet, as Nixon explores in his book, this inaction has historically led to devastating consequences that mostly impact vulnerable populations.

In his chapter on unimagined communities—the populations not visible to a global audience—Nixon discusses the removal of non-economic agents, both figuratively from the public eye and literally from their homes. Mostly women and children who are excluded from the workforce, “these ‘surplus people’ were deemed superfluous to the labor market and to the idea of national development and were forcibly removed or barred from cities” to make room for this development in apartheid South Africa (Nixon, 2013, p. 151). Rationalized by narratives of progress, these people have been relocated to crowded rural locations, to the unseen corners. In order to catch up to other developed nations, literal truckloads of people have been forcefully removed from cities. Nixon calls this practice “spatial amnesia, as communities... are physically unsettled and imaginatively removed” from the picture of a developing country (Nixon, 2013, p. 151). The groups most affected by enforced expulsion are “ecosystem people” who live off the land and are largely independent from the capitalist system and therefore exist with a “necessarily adaptable mobility” that offers little legal or financial protection (Nixon, 2013, p. 151). These vulnerable groups would also be the most negatively affected by a generalized solution of population control that does not specify protections or assign responsibility based on some outlined criteria. Without visibility or the means to defend themselves against political and economic systems they do not belong to, these ecosystem people would be left undefended against an ambiguous restriction on their right to procreate.

To illustrate this discriminatory geographical displacement, Nixon provides the example of Guatemala’s Chixoy Dam massacre of 378 native Maya Achi Indians in March 1980. The massacre, though directly carried out by local paramilitary forces, was facilitated by financial and political supporters of the Guatemalan dictatorship in the West. These “invisible, bloodless transnational collaborators” include the World Bank, an international financial institution that

promotes its goal of fighting poverty by providing loans and grants to governments in poorer countries to pursue capital projects (Nixon, 2013, p. 154). In his article on Hardin's work, "Neoliberalism, Genre, and 'The Tragedy of the Commons,'" Nixon identifies the World Bank as one of the groups of policy makers that resonated with Hardin's thinking (Nixon, 2012, p. 593). This intertextual link shows how Hardin's construction of the tragedy of the commons as a thought experiment demonstrating how human selfishness is destroying the economic integrity of environmental resources possibly influenced or referenced the corporate dehumanization of people evident in the massacre, which occurred eleven years after the article's publication. Although these corporations were faceless in the massacre and their involvement was largely overlooked, this silent support had devastating results. The Chixoy Dam massacre is one example of instances in which "people viewed as irrational impediments to 'progress' have been statistically—and sometimes fatally—disappeared" (Nixon, 2013, p. 153). These "irrational impediments" are people who do not contribute to the national economy and therefore fail as rational economic agents and are subject to relegation to the periphery. People without numerical value have been uprooted from their communities for economic convenience, similar to the gluttonous exploitation of the environment that causes a slow but impactful change.

Truth in Nixon's *Slow Violence* is drawn from historical events and real people. While there is a similar focus on factual evidence to Hardin's article, Nixon's analysis offers a human-oriented perspective compared to the scientific rhetoric of "The Tragedy of the Commons." Nixon does not focus on humans as biological subjects, but rather as specific individuals in communities. By acknowledging the individual in tandem with the invisibility of non-economic populations, Nixon is able to establish a "paradoxical notion, that of the 'uninhabitant'" (Nixon, 2013, p. 152). Unlike the paradoxes that Hardin constructs to reach his solution, the concept of

the uninhabitant provides a framework to examine the inequality present in the handling of land and the allocation of resources and waste—a concern Hardin ignores in his article. The phrasing of “surplus people” and “uninhabitant” has economic associations, and this technical terminology paired with the human synonyms “people” and “habitant” highlights the impact of population control on the individual. This factual yet empathetic rhetoric functions to create “a language for contesting the grand narrative of the redemptive megadam as a spectacular symbol of rational deliverance from unreasonable rivers and irrational cultures” (Nixon, 2013, p. 171-172). In the “Unimagined Communities” chapter, Nixon subverts the marketing of megadams as beacons of rational, economic progress against the unpredictable dangers of nature and unknown cultures by showing the actual impact of the megadams and the communities they displaced. These populations are depicted as people rather than merely figures and statistics, eliciting empathy for the individuals displaced that would not come about as easily for theoretical, unspecified groups.

Hardin uses a “pithy essay title and succinct parable” about a herdsman in a pasture to justify his neoliberal rescue narrative of privatization and overlooks the agency of individuals outside of the ability to overconsume when unrestrained (Nixon, 2012, p. 593). While Hardin’s rhetorical framing works to dehumanize and discredit people to push his solution of regulating human reproduction, Nixon brings humans to the forefront of his analysis. Nixon’s focus on the narratives of real people and communities grounds his work in the truth faced by the individuals who experience these forces first-hand. This focus constructs a more subjective truth that provides a holistic picture of reality. Nixon highlights historical examples of the visible impact of the often-unnoticed slow violence caused by climate change and other environmental issues, demonstrating that these problems are pertinent and require action.

The individual-centric approach by Nixon in *Slow Violence* starkly contrasts Hardin's generalized, scientific evidence-based arguments in "The Tragedy of the Commons" and demonstrates how truth can be adapted and drawn from the subjective human experience. To begin devising potential solutions to the population problem, there must be a closer consideration of implementation on a community scale. Nixon's work exemplifies this necessary zoomed-in scope. Nonfiction that is centered on the human experience provides an individualized, yet factual truth backed by real experiences that is more comprehensive compared to the truth created by Hardin's scientific facts and examples.

### **The Value in Fictional Models of Reality**

I analyze two works of fiction that deal with the relationship between humans and the environment to discover how truth can be revealed through creative writing. Ruth Ozeki's *My Year of Meats* is a contemporary fiction novel that tracks a documentary on the beef industry in America. Shaun Tan's *Tales from the Inner City* presents a collection of short stories and artwork portraying human society from various personified animal perspectives, taking an approach of speculative fiction to this topic. Both of these works provide insight into how the prioritization of the economy and nonhuman components has impeded the interactions between humans and the environment and created a toxic, parasitic relationship. Based in settings that transcend reality, these fictional literary works imagine scenarios to access a subjective experience that can inform real-world truths.

### ***Simulated Experiences in Realistic Fiction***

Fiction can provide another perspective on truth despite being a seemingly contradictory genre to reality. Authors of fiction have the freedom to invent experiences that are realistic or

fantastical but nonetheless convey a sense of profound rightness that is perhaps more elusive in nonfictional accounts. The discoveries of documentarian Jane Takagi-Little in Ozeki's *My Year of Meats* exemplify the subjective truth portrayed in fiction novels.

Takagi is tasked with recording the authentic life and cooking of American housewives as a coordinator for the television show *My American Wife* at the beginning of the book. However, the show is sponsored by the fictitious American national lobbying organization for meats, BEEF-EX, and there is a stated agenda to sell meat to Japanese housewives through the broadcast. The "reality" television show aims to "use wives to sell meat in the service of a greater Truth," with that truth being to increase the company's meat sales (Ozeki, 1998, p. 176). Much like in Hardin's article, there is rampant dehumanization due to a focus on economic gains evident in Ozeki's representation of the American meat industry. In each episode of *My American Wife*, a Wife of the Week is chosen to demonstrate how she prepares a type of meat for her family. In the pitch for the show, it is outlined that the wife must be "attractive, appetizing, and all-American. She is the Meat Made Manifest: ample, robust, yet never tough or hard to digest" (Ozeki, 1998, p. 8). The description of the show's ideal wife directly compares her to meat. The adjectives "appetizing" and "hard to digest" that are typically associated with food instead describe the wife. Furthermore, rather than using a metaphor or simile to say she should be like meat, it is stated that the wife *is* a manifestation of the meat, an exhibition to demonstrate why other women should purchase American meat. Ozeki's novel follows Takagi as she films these episodes around the country, directing and staging the lives of families during their week on the show to match with its purpose of selling meat despite what actually happened during that time. The production of the show takes on a meta approach to truth as Takagi recognizes the falsehoods being presented as authentic in the edited final cut, but she is unable to change them.

These lies are clear to the novel's readers, however, showcasing corporate corruption despite the performed attempts to cover it up.

Ozeki's novel follows several of the assumptions in Hardin's article, such as the inefficiency in substitutions of capital and the linear growth of food versus an exponential growth of population. Takagi witnesses the dangers present in substituting natural capital for created capital and the reality of what it takes to feed the current population during the filming of an episode at a Texan feedlot called Dunn & Son, Custom Cattle Feeders. Despite having been banned due to serious associated health risks, Diethylstilbestrol (DES), a synthetic form of the female hormone estrogen, is suspected to be used to stimulate growth in the cattle at this feedlot. The use of chemicals in rearing livestock is an example of substituting natural capital such as land and grain with created capital such as DES to decrease the amount of time and resources until the cows can be slaughtered for beef. In the novel, the dangers of hormone poisoning from DES are graphically detailed; a mother shows Takagi and the camera her young daughter's fully developed body, a grotesque figure for a five-year-old. Furthermore, techniques to maintain the high bovine population in order to supply beef to the high meat-eating human population are shown as morally dubious. During a tour, the owner's son brags "we even got by-products from the slaughterhouse—recycling cattle right back into cattle... Pretty good, huh?" (Ozeki, 1998, p. 258). Economic efficiency is prioritized as more important than moral concerns of feeding cows cannibalized remains. These scenes create simulated experiences; Ozeki introduces her main character, gives Takagi a detailed background to generate empathy and a connection, and then has the reader follow her on this journey as she experiences these situations first-hand. This fictional but realistic portrayal of what it takes to provide so much meat to a large population is more likely to elicit emotional responses of horror and disgust from the reader and creates more



investment in the narrative compared to Hardin's generic example of the cattle herdsman to explain the overuse of common goods.

The main problem in "The Tragedy of the Commons" is also addressed in Takagi's filming for the TV show: overpopulation. In an interview, Grace, the mother of several children—most adopted—states "it's the single most underdiscussed issue in the world... no one ever talks about population" (Ozeki, 1998, p. 69). Although the fact that population is growing at a rapid rate is widely understood in America, it is stated that there are human instincts influencing people to become parents that cannot solely be attributed to biology. Even Grace and her husband chose to birth two biological children to carry on their genes and "replace" them in the world before adopting to satisfy their human need to care for children. Beyond an individual longing, the ability to give birth has also entered cultural consciousness as a defining feature of women. Takagi and the other female protagonist, Japanese housewife Akiko Ueno, suffer from this sexist expectation of procreation. In her abusive marriage, Akiko is forced to avidly watch *My American Wife* by her husband, an employee of BEEF-EX, and eat meat so she is healthy enough to birth a baby. However, she eventually chooses instead to purge physically the meat and symbolically the ability to conceive from her body because the decision is being forced on her by a man she does not love, thus rejecting this reproductive ideal. In response, Akiko is repeatedly beaten and raped by her husband for her bulimic tendencies. Akiko is disdained as a "barren old witch... [a] poisoner" for her actions against the perceived "natural" act of procreating that aligns with the push for excess supported by her husband's job advertising for the beef industry (Ozeki, 1998, p. 238). Takagi suffers from the opposite problem; the genetic inability to procreate. This "involuntary infertility... kills [her] sense of a future" and shapes Takagi's casual approach to romantic and sexual relationships (Ozeki, 1998, p. 159). The

protagonists are influenced by the gender norms that define women in terms of their reproductive capabilities, a dangerous practice both for the mental and physical health of women as well as for the global ecology that is suffering from overpopulation.

Takagi and Akiko's contrasting storylines illustrate how there is more to the decision to have a child than clinical purposes of "breeding" and continuing genetic lines as Hardin portrays human reproduction. Culture has influenced the perception of procreation as a women's value, her ability to become pregnant a sign of her worth. The choice to have children is further complicated by consent and ability, as well as other factors. These emotional and moral concerns about population control ignored in Hardin's article are able to be explored in Ozeki's novel through the medium of fiction. Due to its dynamic form and content, the novel can attend to psychic, personal spaces that a scientific representation of the human individual cannot access.

Much like truth in fiction, truth within *My Year of Meats* is malleable. While editing the film of the vegetarian wives Dyann and Lara, Takagi describes "creating a seamless flow in a reality that was no longer theirs and not quite so real anymore" as she manipulates the video to support the consumption of meat (Ozeki, 1998, p. 179). The framing of a situation can drastically distort the perception of reality without changing the facts. Hardin's framing of the tragedy of the commons and the population problem creates a distortion in which the ethics of population control are not accounted for despite the acknowledgement of human morality in the beginning of the article. In the novel, Takagi admits "I wanted to tell the truth, to effect change, to make a difference... but the truth is so much more complex" than a single interpretation (Ozeki, 1998, p. 360). Fiction allows an in-depth exploration of this complexity. In *My Year of Meats*, there are at least three truths—the truth of the beef industry's economic gain, the misogynistic truth of a woman's value in her reproductive capabilities, and the truth of the cruel operation of

slaughterhouses to feed a massive population—all existing and clashing in the same space. As stated at the end of the novel, “in the Year of Meats, truth wasn’t stranger than fiction; it *was* fiction” (Ozeki, 1998, p. 360). Although fiction cannot fully contain objective truth due to its imagined origin, it can provide subjective, experiential truths that are not as easily accessed in nonfiction works centered solely on facts.

### ***Imagined Perspectives in Speculative Fiction***

Beyond the novel, other genres of literature and fiction can offer a framework for exploring alternative forms of truth. Shaun Tan’s *Tales from the Inner City* is a collection of short stories interwoven with “luminous paintings, windows upon a hidden world of truth and feeling” (Tan, 2018). Tan’s collection, which intersperses art with text, provides a textual and visual experience of a world of humans and animals different from reality yet convergent in truth. The stories themselves are untitled, although each starts with a silhouette of the animal it is following on an otherwise blank page. With the common thread of navigating relationships between humans and beasts, the narratives present a type of animal in an urban setting, a startling and incongruous premise. Some of these relationships are mutually beneficial and respectful, such as the peaceful coexistence of humans with crocodiles and butterflies in the first two stories. Other stories, however, present opportunistic or parasitic relationships, such as the case of a pig who lives in an apartment and slowly disappears “bit by bit, piece by piece—or rather, slice by slice” to feed the family living there (Tan, 2018, p. 85). This anthology explores the complex dependency and exploitation in humanity’s interactions with nature through both textual and artistic depictions.

Realism is suspended for fantastical elements of transformation and translation in *Tales from the Inner City*, providing an unusual but no less impactful perspective on human

consumption and waste. In one story, bears sue the human race for “*Theft. Pillage. Unlawful Occupation. Deportation. Slavery. Murder. Torture. Genocide*” (Tan, 2018, p. 177). While there is humor in the idea of bears teaming up with human lawyers to bring a class action against humanity, the charges brought up reveal an alternate perspective; the consequences of industry on the environment from the viewpoint of other animal inhabitants. The bears concisely state that, “for the hungriest of all animals, [humans], the only thing left to eat is the truth,” facing the



Source: Tan, Shaun. *Tales from the Inner City*. Arthur A. Levine Books, September 25, 2018, pages 180-181.

effects of their “progress” (Tan, 2018, p. 177). The associated work of art depicts a human lawyer holding hands with a bear as she helps him up the courthouse stairs. While this image could indicate the possibility of humanity and animals working together to rectify the damage inflicted by human development, the dominant color scheme of gray and the empty left side of the image lends the piece a morose, foreboding tone. Indeed, the story concludes with the humans slaughtering the bears and the seemingly traitorous lawyers who helped them, bringing about peace until a group of cattle arrive with lawyers. This ending demonstrates the cyclical

nature of a rejection of reality for a selfish “truth mired in self-contradictions” that even the humans have to convince themselves to believe (Tan, 2018, p. 177). Tan engages with characters of a non-anthropocentric construction to convey truths about human nature, an engaging and confusing reversal that invites active thought and discussion as opposed to Hardin’s hard facts and statistics that exert authority and demand unquestioning acceptance.

The theme of animals understanding more about economics than humans, the inventors of these financial systems, reoccurs several times throughout the anthology. Another short story explores the exploitation of horses from the second-person perspective of a two-year-old who imagines “some long-ago dreamtime when blood came before diesel” (Tan, 2018, p. 80). The large-scale reliance on fossil fuel in society is highlighted in this fictional recreation, bringing out an uncomfortable truth. Horses are anthropomorphized to understand the interactions of economics and morality better than humans; “*Sentiment pays no dividend*. Horses know this more than most: The greatest curse of any animal is to be worth money to men” (Tan, 2018, p.



Source: Tan, Shaun. *Tales from the Inner City*. Arthur A. Levine Books, September 25, 2018, pages 82-83.

80). Tan's artwork at the end of the story reflects this feeling of entrapment as a herd of horses are stopped at the end of an unfinished highway overpass, overlooking the city. The only source of light in this piece is from the streetlights littering the bottom of the frame, keeping the dominance of humans central even though no human figure is present. There is clearly no freedom for horses in the city of man. Reframing animals as capable of cognition allows Tan to emphasize how many human behaviors are obviously faulty, and yet so many people are oblivious to the tyranny of humanity over nature that it must be articulated by an animal. Accordingly, the critique "you [humans], who always complain about taxes and debts and rates of exchange, what do you really know of such folklore?" comes from the first-person perspective of a mischievous fox (Tan, 2018, p. 190). Many of society's functions serve economic purposes, yet so few people understand or think of the reasons for the existence of such functions. Without humans to give them meaning, debts have no true value and taxes do not exist. Yet, humanity has created these binding facts of money and exchange to govern how society operates. Hardin proposes even more restraints to govern population control by allocating the right to breed in his article.

Continuing with this theme, another story tracks the movement of pigeons through the financial districts in cities, claiming these birds are "the world's greatest investment bankers" (Tan, 2018, p. 197). Humans have built everything around the artificial concept of money; dollars pay for buildings and belongings and keep society functioning in a circular flow of income and expenditure. However, if people stop believing in the value of paper money then, according to the story, human society will collapse. Once this "urban pretension" ceases to exist, a "radiant green world" will be rebuilt by nature, and it is in this future that pigeons invest (Tan, 2018, p. 197). The predicted dystopian end to the human race is framed from the pigeon's

perspective as an inevitable resurgence of nature. Even humans will have a place in this post-Anthropocene land as long as they abandon their outdated economic lessons. In this story, the scientific and economic facts that Hardin uses to back his arguments and build truth is completely rejected by the pigeons as contrived methods for humans to hold onto power. While the validity of this pigeon-perspective can be questioned, the story is nonetheless an interesting catalyst for conversation and reflection about the human reliance on currency to drive commerce and the dangers in putting value in paper money that holds no innate worth.

The final short story I consider in my analysis blurs the lines between humans and animals and what is real. The board members of a prestigious company become frogs during a meeting, leaving the secretary with a table of amphibious bosses. Although she initially reacts with incredulity, the secretary quickly accepts the situation—as is necessary in a short story—and reasons “*but there’s no natural order, it’s all luck and absurdity*” (Tan, 2018, p. 130). By embracing the absurd, this story discards the conventional structuring of truth and creates its own reality in a move afforded to fiction. In the secretary’s rambling stream-of-consciousness, she considers that “maybe she too was guilty of making the same dumb assumptions that had led to every other collapse, of not seeing people as people, with all their fragility, fear, and complicated weakness, amphibious or otherwise” (Tan, 2018, p. 130). In this thought wedged in the middle of a paragraph in the middle of the short story, there is an articulation of the human complexities missing in Hardin’s article. Eliminating the human subject as an individual with freedom of choice creates a sterile, narrow truth that fails to encompass the intricacies of a reality with many types of animals operating within it, including humans.

## **Conclusion of Literature Section**

Due to his logic-based rhetoric, Hardin's construction of truth is rooted in science and perceivable facts while subjective experiences are discarded. This perspective provides compelling backing for Hardin's solution of "abandoning the freedom to breed" that disregards considerations of human rights (Hardin, 1968, p. 1248). Literature expands the conversation about how to overcome the population problem by considering more than just theory and data. A nonfictional inclusion of human accounts and experiences as the primary form of evidence brings the human element back into the discussion. In Nixon's book, slow violence is framed as a violence humanity inflicts on itself in addition to the environment, forming a persuasive argument that is perhaps even more based in reality than Hardin's economic models. The exploration of a wide range of possibilities in fictional works, both realistic and imaginative, introduces creative interpretations of the problem that encourage a reframing of the human role in nature. Although Ozeki and Tan never directly offer alternative solutions to the issue of limited natural resources, their rhetoric argues against the problematic idea that the problem *is* humanity. Hardin's assertion of a needed shift in morality may be correct, but humanity must be perceived as the source of this correction, not only the problem, to enact meaningful change.

## **Environmental Rhetoric in Action: A Rhetorical Analysis of the Paris Agreement**

The rhetoric in the three ecocritical works I have analyzed illustrates the importance of considering the subjective experiences and truths in life when dealing with humans and the environment. This awareness is crucial when attempting to implement large-scale change in how humans perceive and interact with the environment. To examine how my findings thus far relate to real-world examples, I analyze the rhetoric of the Paris Agreement, one of the most significant



international environmental laws currently in place dealing with climate change, one of the most imminent environmental threats to human life.

Similar to Hardin's "The Tragedy of the Commons," the Paris Agreement is concerned with the global consumption of common natural resources and pollution, specifically as it pertains to the impact on climate change. The United Nations Framework Convention on Climate Change (UNFCCC), an international environmental treaty that set a framework for negotiating agreements to specify further action on addressing climate change, adopted the Paris Agreement by consensus on December 12<sup>th</sup>, 2015 (Blau, 2017, p. ix). The umbrella agreement establishes long-term goals and actions for lowering the increase in the global average temperature by allowing parties to make concrete bottom-up commitments called intended nationally determined contributions (INDC) for reducing carbon emissions (Popovski, 2018, p. 23). The rhetoric of the Paris Agreement was consciously and intentionally designed by representatives of the over 190 state parties present at the conference so that the language best reflects all of their needs while uniting them towards one goal. Currently, every country in the UNFCCC has signed the agreement with 189 having become party to it, meaning they have ratified and entered the agreement. Out of an estimated 1,100 environmental agreements, only ten qualify as global based on their membership and the scope of their goals, emphasizing the importance of the Paris Agreement as a declaration of how the world will approach and act on the urgent environmental issue of climate change (Popovski, 2018, p. 57). Like Hardin's article, this agreement will have far-reaching, long-lasting implications in environmental studies, international law, and other academic disciplines.

Unlike "The Tragedy of the Commons," the Paris Agreement accounts for individual countries' developmental statuses when assigning responsibility to ensure goals are feasible. The

over 25,000 attendees of the 2016 meetings in Marrakesh, Morocco to launch the Paris Agreement included a diverse array of “scientists, heads of state and ministers, farmers, representatives of faith groups, indigenous peoples, fisher men and women, CEOs of multinationals, people from nongovernmental organizations, and journalists,” bringing together many different people with varying perspectives and experiences with the goal of establishing an agreement that will implement widespread change (Blau, 2017, p. vii). Furthermore, the Paris Agreement details practical approaches in dealing with greenhouse gas emissions mitigation, adaptation, and finance with well-defined procedures and committees to oversee progress. These considerations and specificity make the agreement more practical in terms of implementation and actionability than Hardin’s conclusion drawn from theoretical principles and devoid of pragmatic steps to take.

### **Acknowledgment of Differentiated Circumstances**

A major barrier to action I identified in Hardin’s article is the uniformity of his solution to restrict human reproduction. This conclusion lacks not only specificity, but also any acknowledgement of how a universal restriction would actually be realized. In practice, certain disadvantaged populations would likely be most impacted. As Nixon discusses in his work on ecocriticism and postcolonial studies, there is a difference in treatment between groups when policies are implemented; “surplus people” who do not hold economic worth are valued less than people who fill traditionally productive roles in society and they would likely suffer more under such reproductive restrictions (Nixon, 2013, p. 151). In his article, Hardin does not consider who would bear this responsibility nor differing capabilities between populations and countries. What is considered reasonable is subject to the context of a situation and the people involved. Hardin’s universal, singular solution lacks the versatility necessary to respond to the variety of situations

present in the world and thus cannot be executed on a global scale. In contrast, the Paris Agreement repeatedly recognizes the differences between the capabilities of developed countries, also known as the global North, and developing countries, also known as the global South. These differences are accounted for in the allotment of expectations and responsibilities in the agreement. These considerations are derived from the “common but differentiated responsibility” principle in international law.

In a chapter titled “Common but Differentiated Responsibility Principle,” Dr. Sumudu Atapattu explores how the sovereign equality of states can be upheld in international environmental law through this principle. Countries in different stages of social and economic development face differing areas of concern; that is, “developing countries have paid more attention to immediate pressing problems such as poverty, the provision of basic needs and economic development while developed countries, with the resources they command, are more concerned with environmental issues” (Atapattu, 2007, p. 380). Climate change affects the entire world, but some countries are in a privileged position to address these long-term dangers while other countries need to commit their resources internally to combat other imminent socioeconomic issues. Global policies that aim to enact large-scale change require the participation of both developing and developed countries. Therefore, “it becomes necessary to take into account differentiations that are inherent in contemporary international society” by assigning common but differentiated responsibilities (Atapattu, 2007, p. 381). In practice, this principle means that while all countries are responsible for addressing global environmental issues and share a common goal, not all are equally capable in means and focus so differentiation arises, perhaps in the scale or the tasks of a country’s commitment (Epstein). Another rationale for assigning these differentiated responsibilities is the differing levels of countries’

contributions towards greenhouse gas emissions. It is clear that developed countries have contributed more to the pollution problem than developing countries with emissions from the Industrial Revolution still in the atmosphere today, and this culpability is reflected in the assigned responsibilities to cut back on carbon emissions (Atapattu, 2007; Blau, 2017).

The principle of common but differentiated responsibilities is central in the Paris Agreement. The phrase is repeated verbatim in four instances throughout the document. The first mention occurs in the preamble, stating that the parties will be guided by “the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances” (Paris Agreement, 2015, p. 1). Goals and expectations are set for each country given their individual circumstances. Only two lines later, this language is reiterated to address how developing countries will be treated differently in that the “specific needs and special circumstances of developing country Parties” will be recognized and taken fully into account in the agreement (Paris Agreement, 2015, p. 1). Although the phrase of “common but differentiated responsibilities” is only repeated again once in article 2 when outlining the agreement’s objectives and twice in article 4, the concept of dividing expectations based on individual capability and culpability permeates the agreement. While assigning different responsibilities may not apparently follow the key principle of upholding sovereign equality of states, it does follow the principle of equity, or fairness, given the irregular distribution of wealth, power, and technological development between countries (Atapattu, 2007, p. 387). The reality of a world with countries that differ so significantly in many ways demands variation to achieve a practical, equitable division of responsibility rather than uniformity. Contributions that are realistic and fair in practice are prioritized in the agreement over a numerically equal distribution.

A primary objective of this consideration of differing circumstances seems to be to ensure the agreement is as effective as possible and enacts real change. Article 3 recognizes “the need to support developing country Parties for the effective implementation of this Agreement” (Paris Agreement, 2015, p. 2). Developing countries tend to be in the least able position to enforce environmental regulations due to other pressing concerns, but their active participation is required for a global, concentrated effort. Therefore, developed countries are required to support developing countries financially, technologically, and through capacity-building (the improvement of resources such as knowledge and tools to increase competency in completing a job) with specific requirements and examples of this support in articles 9, 10, and 11. Beyond merely including developing countries, article 4 further acknowledges “that enhanced support for developing country Parties will allow for higher ambition in their actions” (Paris Agreement, 2015, p. 3). Although commitments of greenhouse gas reductions are binding for the countries, they are also nationally determined. This means that contributions are decided, communicated, and maintained by the countries themselves. While this allows for individual countries to take their own needs and priorities into account, it can also potentially lead to underestimated goal setting. The Paris Agreement encourages support of developing countries not only to combat the differences in development, but also to open the possibility of “higher ambition” in carbon emission reduction levels and dissuade countries from minimizing their contributions. Each country’s INDC is to demonstrate a progression from their last one with a more ambitious contribution, gradually increasing the marginal effort from participating countries to achieve the overall goal of combating climate change. The basis of achieving higher ambition is through “voluntary cooperation” of countries to go beyond their commitments (Paris Agreement, 2015, p. 4). The language of “voluntary cooperation” is internally parallel with both words converging in

meaning towards collaboration that is achieved without compulsion. This analogous phrasing contrasts Hardin's enforcement tactic of mutual coercion, an intrinsically contradictory concept. These strategies both seem to originate in the spirit of partnership but diverge in their application of encouraging versus enforcing. The cooperative elements that likely arose from the negotiation of the Paris Agreement's language involving so many contributors "makes states more comfortable; they can make commitments voluntarily and revise these later," allowing for binding but amenable resolutions (Popovski, 2018, p. 20).

The term "common" is itself a keyword that appears seven times in the agreement. In addition to the principle of common but differentiated responsibilities, the word is also used in the context of unifying the purpose, actions, and expectations of the 189 countries party to the agreement. This commonality is reflected in the primary purpose of the Paris Agreement to acknowledge "that climate change is a common concern of humankind" and requires a united, organized effort to combat it (Paris Agreement, 2015, p. 1). In the economic terminology, Hardin's "commons" refers to goods that are accessible to all and in danger of degradation due to human greed. This meaning of the word is indirectly present in the agreement as action to conserve and enhance the sinks and reservoirs of greenhouse gases—which primarily include oceans and forests, common goods referenced by Hardin—is demanded in article 5. Indeed, this abuse of common resources is identified as a major contributor of greenhouse gas emissions and the "sustainable management of forests and enhancement of forest carbon stocks in developing countries" is listed as an endorsed action to combat climate change (Paris Agreement, 2015, p. 4). While the concept of common environmental resources and their protection is key in the purpose and implementation of the Paris Agreement, the term "common" itself carries connotations of unity within the document as the countries party to it commit to a common goal.

Another component of the Paris Agreement is that it allows adjustments to be made after countries have signed the document. Article 13 establishes “an enhanced transparency framework for action and support, with built-in flexibility which takes into account Parties’ different capacities and builds upon collective experience” (Paris Agreement, 2015, p. 10). The consistent language of accounting for differing capabilities among countries is coupled with principles of transparency and flexibility to enable action. Although the Paris Agreement is essentially a reactive policy because climate change is already occurring to a dangerous degree, it includes additional proactive measures to prevent climate change from unmitigatedly worsening. This is reflected in the adaptive language that anticipates the unexpected changes and uncertainty inherent in dealing with environmental issues and many countries. The agreement also sets deadlines for assessment to evaluate the collective progress made towards the long-term goals. This first global stocktake will take place in 2023 and follow-ups will occur every subsequent 5 years in a “comprehensive and facilitative manner” (Paris Agreement, 2015, p. 12). Scheduling these iterative evaluations is essential to the agreement’s longevity and robustness as it allows consistent assessment and adjustment (Popovski, 2018, p. 127). According to article 14, “the outcome of the global stocktake shall inform Parties in updating and enhancing, in a nationally determined manner, their actions and support in accordance with the relevant provisions of this Agreement” (Paris Agreement, 2015, p. 12). The reporting system and the frequent assessments allow for policies and expectations to be updated based on the current scientific reality of climate change and the individual countries’ results. If certain actions are not effective and goals are revealed to be under or overestimated, they can be adapted according to the most recent information available. These built-in acknowledgements of current and changing circumstances demonstrate the agreement’s focus on the realistic implementation of countries’

policies to meet the identified goals. The Paris Agreement articulates a subjective truth within these acknowledgements by allowing for the division of responsibilities among countries to be relative based on individual capabilities and needs.

### **The Paris Agreement and Climate Justice**

Within the Paris Agreement's construction of subjective truth and consideration of countries' differing circumstances is a cognizance of environmental justice. In addition to equity, the protection of the disadvantaged has been a rationale for differential treatment between countries in international environmental law (Atapattu, 2007, p. 387). Given the scope of the agreement, there is specifically an acknowledgement of climate justice, which "refers to broad issues and debates about equity and fairness in UN climate policy" (Widick, 2019). Recently, there has been a convergence between human rights law and international environmental law, establishing a direct relationship between environmental protection and economic, social, civil, political, and cultural rights (Atapattu, 2007, p. 9). The Paris Agreement is the latest culmination of these cross-sectional human rights concerns. Dr. Vesselin Popovski has commended the Paris Agreement for containing "examples of the best-ever human rights language in international environmental law" (Popovski, 2018, p. 23). The term "climate justice" is present in the preamble, affirming the agreement's dedication to accounting for the ethical and political issues raised in dealing with climate change as well as those of the environmental and scientific nature.

The Paris Agreement takes a holistic view of climate action and considers the many factors that contribute to the varying vulnerability to climate change. Addressing sustainability and poverty, for example, are identified as long-term contributions to mitigating the effects of climate change in the agreement. In the preamble, "the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and



eradication of poverty” is acknowledged (Paris Agreement, 2015, p. 1). The concern of eradicating poverty is raised in four instances throughout the agreement, emphasizing its dedication to addressing the connection between systemic poverty and climate change. It is clear that to achieve sustainable development, both poverty and overconsumption of resources must be addressed (Atapattu, 2007, p. 56). An extensive list is provided in the agreement to convey the range of climate justice concerns that must be considered in decisions about climate action, including “the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations... as well as gender equality, empowerment of women and intergenerational equity” (Paris Agreement, 2015, p. 1). A central concept in all of these examples is identifying factors that increase vulnerability to climate change. “Vulnerable” is a key word that appears frequently throughout the agreement in the context of acknowledging the countries and communities that are most at risk to the adverse effects of climate change and outlining procedures to preferentially assist them in their climate change mitigation efforts. This repetition highlights how poorer developing countries and communities within them tend to face the most risk. Although climate change is framed as a global problem that affects all countries, the agreement also acknowledges that this impact is not equally distributed and there is no one correct approach to solving it. Adaptation, or the process of adjusting to actual or expected effects of climate change, contains “local, subnational, national, regional and international dimensions” (Paris Agreement, 2015, p. 6). The inclusion of a human rights lens in the agreement clarifies that “the poor and vulnerable are the first to suffer and the worst hit,” and the policies being implemented must account for this unequal distribution of suffering and vulnerability (*Climate Justice*, 2019). Climate change is a global issue on a macro-scale, but it

also affects communities and individuals in facets of their everyday lives with certain vulnerable groups more concentratedly impacted than others.

Conditions of locality and the potential contributions of individual communities are also accounted for in the Paris Agreement. The agreement acknowledges that a country's response to climate change will be directly influenced by its immediate surroundings and local cultures. In article 7, the agreement states that adaptive action should be guided by "traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate" (Paris Agreement, 2015, p. 6). This consideration is also apparent in the Paris Agreement's intentional use of language from multiple cultures participating in the agreement, such as including the terminology of "Mother Earth" as the personification of nature that some cultures recognize (Paris Agreement, 2015, p. 1). A notable critique of "The Tragedy of the Commons" is Hardin's exclusion of a community's potential ability to internally regulate their resource usage to prevent overuse and excessive pollution (Chibnik, 2011; Morin, 2018; Nixon, 2012). History has provided examples of communities successfully developing methods of managing and safeguarding shared common resources as a way to prevent poverty and misery in the future (Nixon, 2012, p. 594). The Paris Agreement allows for this possibility of synthesis between individual countries' local conditions and knowledge and their commitments to combating climate change as outlined in the agreement in order to facilitate implementation and achieve the desired goals.

A consequence of chronic poverty in many developing countries, particularly those in Africa and Asia, is famine and undernourishment ("Climate Justice," 2019). The production of food is fundamentally tied to environmental issues with global warming presenting a danger to

these systems, such as by damaging crops. The Paris Agreement recognizes this vulnerability of food production systems to the effects of climate change and prioritizes safeguarding food security by calling for adaptive efforts that do not threaten food production (Paris Agreement, 2015, p. 1). Hardin also acknowledges this issue of food production becoming inefficient to feed the human population in his article and argues that technology will be insufficient to solve this problem. In reality, this shortage has not yet occurred. Food production seems to have kept pace to sufficiently feed the growing population, and yet people still go hungry today; the issue is not in quantity, but in distribution (Atapattu, 2007, p. 56). Although the Malthusian prophecy of human population growth outpacing food production that Hardin invokes has not been realized, food scarcity is still a major problem worldwide due to unequal distribution of resources. The Paris Agreement addresses the importance of protecting food production from deteriorating due to climate change as this would place even more burden on poorer communities. In addition, the agreement also acknowledges the unequal access to these necessary resources through its repetition of a major source of this issue, poverty. Hardin overlooks this consideration of who suffers most from environmental issues and resource depletion in his article. At the heart of the Paris Agreement is the equal right of all humans to dignity and fundamental human rights, the premise of the Universal Declaration of Human Rights that Hardin rejects in his article (Blau, 2017, p. x). By considering the subjective realities and circumstances that people around the world face, the Paris Agreement accounts for human rights in its construction of a global plan to combat climate change.

## **Specificity and Actionability**

### *Forward-Looking Science*

Much like in Hardin's article, the use of scientific and technical language is integral in the Paris Agreement. However, rather than maintaining a source of authority, science in the agreement is essential in providing specificity when establishing goals and outlining expectations and responsibilities to strengthen the global response to climate change. There is a clear and unambiguous scientific consensus of climate change as an immediate threat to human health (Blau, 2017, p. 35). The science on climate change is incorporated to set goals that are specific and realistic. Article 2 lists these goals, the first of which is "holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels" to minimize the impact of climate change (Paris Agreement, 2015, p. 2). This quantitative goal is measurable, allowing countries to gauge their own progress in terms of a common numerical benchmark. In addition to clearly and precisely identifying this temperature goal as part of a comprehensive solution to minimizing climate change, specific actions are outlined to achieve the goal. These include countries aiming to "reach global peaking of greenhouse gas emissions," meaning emissions reach their highest point and then proceed to decline, and to "pursue domestic mitigation measures" (Paris Agreement, 2015, p. 2, 3). These guiding targets set up a framework for achieving goals, but the measures taken to reach these requirements are largely left to the discretion of the country to account for comparative differences.

While scientific rhetoric is used to establish goals and actions, the Paris Agreement also acknowledges potential gaps in current knowledge. The language of acting according to and guided by the "best available scientific knowledge" is repeated four times throughout the

agreement (Paris Agreement, 2015, p. 1). This phrasing acknowledges a change in scientific “truth” over time and takes a progressive, forward-looking stance on the development of procedures and technologies for combating climate change. In “The Tragedy of the Commons,” Hardin also acknowledges science as a function of time based on current knowledge. However, Hardin takes a reflective stance on science, arguing that the faulty knowledge of the past led to incorrect behaviors that need to change to reflect present information. This backwards-looking view of science is clear in Hardin’s example of unregulated pollution in frontier America being acceptable due to the myth of water quality self-purification being close enough to the truth due to the limited population at the time. The present reality of higher population, he argues, necessitates an updated response. Hardin accepts the scientific knowledge at the current time as objectively correct without acknowledging that human understanding of science will continue to develop in the future. The Paris Agreement, on the other hand, establishes goals that will take decades to complete and accordingly reflects this longevity by accounting for the possibility of scientific advancements.

The Paris Agreement’s forward-looking perspective of science is explicitly stated in article 7 with one of the goals being to strengthen “scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems, in a manner that informs climate services and supports decision-making” (Paris Agreement, 2015, p. 6). Although the progress of scientific discovery is uncertain and is therefore not relied on to reach goals, the agreement emphasizes the importance of increasing global knowledge about climate change to make better-informed decisions about counteracting its effects. In article 18, a committee is formed to give guidance on and promote the development and distribution of environmental scientific knowledge and technology: the Subsidiary Body for Scientific and

Technological Advice. The function of this subsidiary body is to apply to the agreement “mutatis mutandis,” a Medieval Latin phrase referencing the ability to make necessary alterations while not affecting the main point at issue (Paris Agreement, 2015, p. 13). The Paris Agreement does not consider science as an objective and definitive bastion of truth, but as a constantly evolving source of the most updated information. The agreement holds a more sustainable attitude towards the use of science in policymaking than Hardin’s citation of outdated practices to support his argument necessitating enforced population control.

Just as scientific knowledge is taken as provisional, the Paris Agreement does not present itself as the only possible solution to climate change. The agreement encourages engagement among countries to cooperate and find “alternative policy approaches, such as joint mitigation and adaptation approaches for the integral and sustainable management of forests” (Paris Agreement, 2015, p. 4). While Hardin frames his conclusion as the exclusively logical next step, the agreement mentions several opportunities for external collaboration and action. In addition to the binding commitments made in the agreement, article 5 encourages countries to implement and support the existing framework through additional actions such as “results-based payments... policy approaches and positive incentives” (Paris Agreement, 2015, p. 4). This suggestion of implementing a reward-based incentivization system presents alternative means of reducing greenhouse gas emissions. The Paris Agreement also presents non-economic solutions; specifically, it emphasizes the “importance of integrated, holistic and balanced non-market approaches being available to Parties to assist in the implementation of their nationally determined contributions” (Paris Agreement, 2015, p. 5). Hardin omits this possibility of non-economic solutions in his single-minded approach towards his own conclusion. The Paris Agreement does not seem motivated to reach a solution in a certain manner, but rather to achieve

a set of goals with the objective of minimizing the impact of climate change by using methods that are most practical and equitable given the best available science.

### *In-Text Definitions*

The Paris Agreement's adaptable stance on scientific knowledge leads to realistic and amendable expectations, encouraging action. This specificity also arises from internally defining terms. For example, Article 1 is entirely concerned with defining terms and pulling in common references. The language is standardized with an identification of what or who the labels "Convention," "Conference of the Parties," and "Party" refer to and previously agreed-upon meanings are brought in as, "for the purpose of this Agreement, the definitions contained in Article 1 of the Convention shall apply" (Paris Agreement, 2015, p. 2). In addition to these designations, the goals and actions outlined in the agreement are also specifically defined. Article 3 states that "all Parties are to undertake and communicate ambitious efforts as defined in Articles 4, 7, 9, 10, 11 and 13 with the view to achieving the purpose of this Agreement as set out in Article 2" (Paris Agreement, 2015, p. 2). This strategy defines specific goals to encourage action. In this example, what constitutes an "ambitious effort" and how to communicate it is not left ambiguous and up to individual countries' interpretations but rather is standardized according to the specifications of the agreement. The repetition of these references to specific articles stems from the agreement's overall emphasis on implementation in a "serious effort to ensure that the Agreement remains not simply a wish-list" but a series of actionable steps that will help mitigate the impact of climate change (Popovski, 2018, p. 24).

The use of definitions is self-referential within the Paris Agreement. Meanings contain an internal logic in relation to this specific document. These definitions are created and then cited in other sections of the agreement, formalizing how the language should be interpreted. Articles

frequently cite one another as sources of specialized information. This close precision in defining terms is even self-contained within individual articles, as demonstrated in article 21 in which, “solely for the limited purpose of paragraph 1 of this Article, ‘total global greenhouse gas emissions’ means the most up-to-date amount communicated on or before the date of adoption of this Agreement by the Parties to the Convention” (Paris Agreement, 2015, p. 14). The preceding paragraph in the agreement details its enforcement date as thirty days after a certain number of countries have ratified their commitment, and the terminology is specifically defined in context of the condition to ensure clarity on this important timing of the agreement’s implementation. It is vital that environmental laws clearly define expectations and adherence to the obligations outlined because “no specific standard to determine what constitutes ‘good’ compliance exists. Compliance is perceived as the result of a subjective evaluation in which measurement will depend on expectations and is rarely understood as a single variable” (Popovski, 2018, p. 61). Establishing both goals and standardized means of evaluation and assessment are necessary to define acceptable behavior and analyze the degree of successful implementation for policies. The regularly scheduled global stocktakes are only functional given clear guidelines and a consistent understanding of what good compliance means in context of the Paris Agreement.

### **Potential Drawbacks of the Paris Agreement**

Although the allowances built into the agreement permit countries to accommodate for their specific circumstances and changes in knowledge, there is a concern that the Paris Agreement is too lenient in its language. There are several areas that allow for alterations or exceptions. Modal verbs such as “should,” “may,” and “can” appear frequently in the text to add the possibility of change and failure, and these semantic inclusions threaten the binding nature of the commitments. For example, article 4 states that “developed country Parties should continue



taking the lead by undertaking economy-wide absolute emission reduction targets” (Paris Agreement, 2015, p. 3). The use of the word “should” makes it so developed countries are only *requested* to undertake the most ambitious carbon reduction commitments rather than *requiring* this factor that is key in the “common but differentiated responsibilities” principle. Those who are most capable of making change must be the ones who take on most of the responsibility; yet, this is not binding in the Paris Agreement.

Furthermore, the agreement includes exceptions to some of the requirements for countries. Examples of exceptions in article 16, which deals with the meetings and functions of the Conference of the Parties, include “except as may be otherwise decided by consensus... [and] unless otherwise decided by the Conference of the Parties” (Paris Agreement, 2015, p. 13). While these concessions can account for altering conditions, they may also provide loopholes and result in shirking, or negligence of responsibility, as some countries fail to meet carbon emission reduction deadlines. This creates a situation of transient responsibility; while countries make a binding commitment in the agreement, this sense of duty is short-lived because there is little consequence for deviation. A major contributing factor to this potential for shirking is the agreement’s “non-existent enforceability mechanisms” (Widick, 2019). Incentive-based reward systems are endorsed, but as found in Kareva et al.’s study, the success of rewarding underconsumption to manage resources also depends on, to a degree, punishing overconsumption (Kareva et al., 2013). Without the threat of punishment, it becomes difficult to enforce the countries’ commitments, threatening the success of the agreement in mitigating the impact of climate change.

Comparable to Kareva et al.’s study that mathematically remodels Hardin’s tragedy of the commons situation, the lack of enforceability in the Paris Agreement may result in a

prisoner's dilemma situation. This problem arises in game theory when players always receive the highest personal payoff by choosing a strategy that leads to a less-than-optimal outcome for all players as a group. An optimal outcome could be reached if players cooperate, but there is a selfish tendency to deviate to increase personal benefit. The prisoner's dilemma issue is another motivation behind the overconsumption of common environmental resources that Hardin narrates in "The Tragedy of the Commons." While meeting the INDCs set in the agreement will benefit all countries in the long run by mitigating the impact of climate change, countries may benefit more in the short run by reallocating time and resources to other domestic ambitions and failing to meet these carbon emission reduction goals. If there is not sufficient trust that other countries will cooperate and meet their goals, then there is less incentive for a country to meet their own goals. By bringing together hundreds of countries over an extended timeline, the Paris Agreement is essentially establishing a repeated game with fixed partners in an attempt to circumvent this non-cooperative behavior. Over rounds in a repeated game, trust can be established as countries who deviate are punished in the following round, or after the next global stocktake. However, the lack of substantial accountability for failing to meet carbon emission reduction goals is an issue in sustaining cooperation. By publicly entering an agreement on a national stage with other countries and scheduling global stocktakes to assess progress, there is the threat of social punishment in lieu of political or economic penalties. The degree of success of these enforceability tactics will not be evaluated until the first global stocktake in 2023. As we observe if carbon emission goals are being met, we will see if this consequence of the non-binding rhetoric is realized.

In addition to the enforceability of the agreement, there is also a concern about the effectiveness given the countries that are participating. The membership of China and the United

States in particular is vital to its success as these two countries are the world's biggest contributors to climate change, jointly accounting for roughly 40 percent of the world's emissions (Blau, 2017; Deverian, 2016). While the U.S. accepted the agreement under the Obama administration and submitted an INDC of "medium" ambition, President Trump officially declared the United States' withdrawal from the Paris Agreement in 2017, which will go into effect in November 2020 as stated in article 28 (Keenlyside et al., 2016, p. 12). The importance of cooperation and participation is repeated through the agreement as it organizes a global effort to combat a global problem. The withdrawal of the U.S. will greatly hamper the effectiveness of the agreement with one of the largest sources of greenhouse gas emissions no longer agreeing to abide by its terms. This aligns with some scholars' concerns that the Paris Agreement is "a shell without sufficient action and support" (Keenlyside et al., 2016, p. 29). While the adaptable language in the Paris Agreement is one of its greatest strengths, it is also a potential weakness that could nullify its effective implementation. Whereas Hardin may go too far towards oppressive control with his concept of mutual coercion, perhaps the Paris Agreement does not go far enough in its enforcement.

The rhetoric of the Paris Agreement surpasses the rhetoric of Hardin's article in that it is more actionable and tailored for realistic implementation. The Paris Agreement provides a well-defined, actionable series of steps towards a solution compared to Hardin's board command of limiting human reproduction. The agreement also allows for flexibility through individual opportunities for amendment, accounting for changing knowledge or circumstances in the coming years as well as differences between countries. However, this rhetorical flexibility runs the risk of impeding the effective implementation of the agreement by limiting accountability and enabling countries to shirk their responsibilities. Overall, I find that the Paris Agreement

adapts the subjective truth of the environmental literature I reviewed to achieve a holistic perspective on the consumption of common natural resources and pollution as they relate to climate change.

## **Conclusion**

The concept of the tragedy of the commons can be applied to several of today's most pressing global environmental issues, including overconsumption, overpopulation, deforestation, and climate change. My thesis has explored the importance of considering how the rhetoric centered around these issues across disciplines influences the way people understand them and come to potential solutions. In his article, Hardin uses scientific rhetoric that dehumanizes the individual. His proposed solution presents humans as paper people ruled by economic principles, mindless cattle that must be controlled before they overpopulate and ruin the shared environment through overconsumption and pollution. Humans are made out to be the problem with no potential to cooperate, an approach that could do more harm to humanity than the problems attempting to be solved. The works of environmental literature I analyzed, on the other hand, bring humans to the forefront of the conversation. Although not all of these works claim to have an answer, their rhetoric considers humans as part of the solution rather than solely the problem. The different constructions of the human-environment relationship has an impact on the perception of these issues and on the policies that are constructed to combat them.

I agree with Hardin's premise that there must be a shift in human morality to solve environmental degradation. However, the moral shift he proposes is to bend the cravings of selfish humans to overpopulate by enforcing control of human reproduction. Hardin's conclusion ignores concerns about human rights and overlooks the potential of a solution to curb human population growth through cooperative, humane interventions and policies. In *The Penguin and*

*the Leviathan: How Cooperation Triumphs Over Self-Interest*, Yochai Benkler explores the history of human cooperation and the recent trend away from this idea of assumed universal selfishness in the past few decades. Instead, there is a movement towards a “more optimistic, human, and humane view—that we as individuals can be motivated to productive ends by engaging one another socially and creating collaborative relationships” (Benkler, 2011, p.12). An assumption of the human ability to cooperate is vital to construct environmental policies that solve global problems. Through my comparative analysis of environmental economic, literature, and policy, I conclude that comprehensive solutions to environmental issues must involve human cooperation, or they risk causing even more damage to humanity. To share my findings, I presented my research at Miami University's 26th Annual Undergraduate Research Forum. The poster I presented is attached at the end of my thesis.

In an increasingly globalized world, it is important that our international environmental laws account for the various capabilities and needs of every country to enact practices and expectations that achieve sustainable development. Global commitments such as those in the Paris Agreement must address urgent environmental issues while also considering the realistic implementation of policies and which groups will be most affected. As the impact of climate change on vulnerable populations progressively increases, it becomes vital to combine current scientific knowledge with best practices in environmental justice that encourage fair distributions of responsibility. There needs to be a melding of these strategies in disciplines—of cooperation and enforcement, of adaptability so that every country can make meaningful contributions without certain groups unequally suffering and accountability to ensure goals are being met—as we move further into a century that will be defined by humanity’s response to changing environmental conditions.

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# The Paper Person:

## A Comparative Analysis of Rhetoric and Truth in Environmental Economics, Literature, and Policy

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Dean's Scholar Project and English Honors Thesis

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### Research Question

Does the contrasting rhetoric in economics versus the humanities about environmental problems such as climate change and overpopulation affect how people understand these issues and form potential solutions? Is there a corresponding impact on how environmental policies are constructed as a collective response to these global crises?

### Environmental Economics

First, I rhetorically analyzed Garrett Hardin's 1968 "The Tragedy of the Commons," one of the most influential economic articles in environmental studies. Hardin uses a metaphor of a cattle herdsman in a shared pasture to illustrate the dangers of overpopulation, which he believes is at the root of most environmental issues. In his article, Hardin explores potential solutions to overpopulation.

My main findings are that Hardin:

- Presents mathematical models and scientific facts to form his arguments as objective truth.
- Defines the "tragedy" in economics terms; humans will pollute, consume, and reproduce according to their own benefit without considering the social cost.
- Includes simplified examples for a wider audience.

Hardin's scientific rhetoric constructs an objective, factual truth that dehumanizes the individual. This is reflected in his proposal to restrict the human right to reproduce to stop overpopulation. Hardin's inhumane solution reflects the dangers of removing the individual from the conversation when trying to solve an innately human problem.

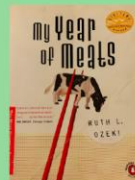
### Environmental Literature

The humanities provide a platform to explore environmental issues in a more holistic manner than Hardin's article through a subjective construction of truth that acknowledges individual circumstances and perspectives.

To access this broader outlook, I contrast the rhetoric of Hardin's article with one work of literary theory and two literary works on environmental topics.

#### Nonfiction/Critical Theory

- Brings humans to the forefront of the conversation with historical accounts of environmental injustice contextualized with lived experiences.
- Provides an individualized but still factual truth, a holistic picture of reality.



#### Realistic Fiction

- Includes several forms of truth (economic gains, gender expectations, etc.) showing the malleability of truth as a human construct.
- Fiction allows an in-depth exploration of the complexity of truth in reality.



#### Speculative Fiction

- Presents hypothetical scenarios that inform real-world truths.
- Imagined spaces catalyze conversation and reflection about the human/environment relationship.

### Environmental Policy

To explore the real-world impact of rhetoric on environmental issues, I analyze the Paris Agreement, one of the most significant international environmental agreements currently in place dealing with climate change. The agreement considers countries' individual capabilities and human rights concerns. However, there is a lack of enforceability that threatens its effective implementation.

### Conclusion

I agree with Hardin's premise that there must be a shift in human morality to solve these issues. However, the moral shift he proposes assumes universal human selfishness, treating humanity as the problem rather than part of the solution. Comprehensive approaches to environmental issues must involve human cooperation, or they risk causing even more damage to humanity.



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