

**ECOSYSTEM POLICY & LAW:
A PHILOSOPHICAL ARGUMENT FOR THE
ANTICIPATORY REGULATION OF ENVIRONMENTAL RISK¹**

*“THE SIGNIFICANT PROBLEMS WE HAVE CREATED
CANNOT BE SOLVED
AT THE LEVEL OF THINKING AT WHICH WE CREATED THEM...”
ALBERT EINSTEIN²*

The first part of the twenty-first century has been marked by wildfires, flooding, drought, rising sea levels and melting glaciers, all capped off by the COVID-19 global pandemic.³ If this series of cascading crises tells us anything, it is that an environmental risk policy focused primarily on an efficient economy and only the *ex post* regulation of harm to the environment is catastrophically inadequate. Current environmental policies fail to protect and empower essential human and natural values which should be the foundation of planning and policy implementation. Such an essence-basis for policy would prevent the global crises we are currently experiencing. The ‘economic’ status-quo has failed for decades to properly regulate climate change; much has been written about its limitations but it continues to be used. The immediate threat and the drastic *ex post* measures required by the environmental crises and the pandemic provide vivid evidence that the conventional assumptions of our current public policy model for environmental risk are not just limited, but deadly to our planet and our existence.

A vital reason that these environmental dilemmas have escaped solution is that we continue to examine them within the context of modern theory, specifically positivism, the assumptions and presuppositions of which fail to grasp what is really at stake in these issues. To put it simply, the current methods are inadequate to solve the problem because they do not and cannot address the fundamental issues at the heart of many policy dilemmas and the laws they support. This is especially true when one considered the underlying moral premises of environmental issues in particular. Positivism relies on a limited scope to consider problems and solutions: the present as defined by the empirical. To broaden that scope, we need to understand the essence, or full complexity, of the human being as a basis for deliberation and choice in policy and law.

While the nature of specific problems of law and policy cannot be effectively removed from their time and context sensitive ‘reality’, we can expand the limited options and possibilities of the dominant contemporary theoretical approach, and eliminate its inherent bias, by utilizing whole, systematic philosophical arguments about practical

¹ This chapter is the product of thirty years of thought, the patience of Joel Kassiola, and the expert editorial and publication skills of Margaret Murray, who reconceptualized and invigorated my ideas and the logic of their presentation for this Chapter.

² 1948. ‘*A Message To Intellectuals*’.

³ COVID-19, although superficially a health crisis, is also, fundamentally, an environmental risk dilemma as it involves the interaction of human and ecological systems where the stealth nature of the risk can render catastrophic results without proper, anticipatory, regulation.

reason and human agency deciphered and written before the onset of social-scientific positivism in the mid-nineteenth century. The key to change is to employ policy paradigms deciphered from enlightenment philosophical arguments. By utilizing enlightenment arguments, the contemporary analyst can have access to a range of more universal, comprehensive, and distinctly human-agent based paradigms. These can then be the foundation for a reconsideration of the 'science' of public affairs and the reassessment of the 'truth' of contemporary law and policy.

After decades of positivist-driven policymaking, the idea of considering such an approach as I suggest is challenging, because the status quo is more familiar and firmly enshrined in policymaking for both practitioners and critics of the status-quo. But contemporary theoretical approaches to policy and law, of all types, both in terms of critical arguments against predominant status-quo methods (like efficiency) and constructive arguments for change (like sustainability) inevitably carry an inherent bias toward the categories, assumptions and predispositions of positivism as 'social-scientific' method (this pertains even to arguments alleged to be non- or even anti-positivist). However we have arrived at a point in human history where we need to accept the challenge to 'think anew'.

Specifically, in direct contradiction to enlightenment assumptions, contemporary theory assumes the predominance of the empirical, it dismisses metaphysics as absolutist and all substructural normative justification as 'ideology'. It offers only a narrow scope for theory and emphasizes the micro-differences in classification of the components of culture, law and policy over the universal nature of humanity-in-the-person. It views ideas such as *dialectic* as antediluvian and classifies anything and all things as 'norms', indistinguishable from one-another within fixed, overly defined and artificial disciplinary boundaries. It even dismisses science's original purpose in applying critical reason to both humanity and nature in pursuit of the truth about both (truth being a word that is assumed, by modern theory's practitioners, to be, at best, suspect and at worst totalitarian).

The only way past these prejudices is to seek a philosophical cosmology that expands positivism by predating it. Surprisingly, I am arguing that the way forward is to look back. It is only when we change the essential philosophical-moral premises of environmental risk policy and the codified laws that support it, that we can create *anticipatory ecosystem policy and law* that will prevent further damage and help us rebuild. It is in the arguments of pre-positivist Enlightenment philosophers, like Kant, and their logical maps of human nature, practical reason and moral agency, that a philosophical method can be found to synthesize prerequisite logics of concepts upon which modern theory, and its components, can be reconsidered. In this chapter I will, as an example of how this may be achieved, replace the assumptions of the dominant market paradigm for policy choice with a Kantian paradigm for environmental risk analysis.

INTRODUCTION: SCIENCE, MORALITY & THE UNCERTAINTY OF ENVIRONMENTAL RISK.

Environmental risk is characterized as a *zero-infinity* problem, that is, it threatens an almost *zero* probability of an *infinitely* catastrophic event. Normally, one distinguishes a risk from an uncertainty by the fact that a reliable probability number can be arrived at for the former, but not for the latter. However the “science” of environmental risk estimation (Quantitative Risk Assessment) has ignored this distinction by taking what amounts to a pervasive uncertainty and assigning a probability number to it. Stating that environmental risk is characterized by “ignorance of mechanism” (Page 1978) means that the physical and chemical processes by which risk agents make their way through the environment and integrate into what we might call a ‘risk soup’, with health effects for human beings and nature, is not traceable or predictable through current scientific methodology.

The ‘certainty’ of science does not begin with, or even involve, humanity or its social, political, or moral dimensions, but begins and ends within natural systems function and evolution. Ignorance of biological, chemical, and physical mechanisms, compounded by the use of non-human findings to make human health estimates, results in policy decisions which are “choices under pervasive uncertainty” (Page, 1978). This means that the numbers produced by quantitative risk assessment can be used only as data and not as definitive evidence for setting standards or regulating environmental risk (Graham et.al., 1988). However, additional philosophical considerations can fill the gap between science and public policy choice to properly regulate risk.

To change this predisposition we would need to acknowledge three postulates: first, humanity sets the terms of discourse and value for the assessment of humanity, nature, and their interaction. Second, humanity’s value is moral in nature. Third, the intrinsic value of the environment has its roots in its capacity as an persistent living system which cannot be properly evaluated by the transference of human moral or intellectual attributes (e.g. thought, choice, strategy, rights, interest) to nature.

Like science, philosophical analysis is also a result of human design and execution (Bobrow and Dryzek, 1987; Bohman, 2021). We should be capable of morally evaluating nature on its own terms, without either importing human characteristics onto non-human entities or making humanity the only creature of moral value in the universe. If all human analysis is anthropomorphic in that it begins and ends with human categories, schema, and vocabulary, then the distinction of importance in environmental ethics is not between anthropocentric and eco- or bio-centric theory, but between *anthropocentric* moral theory and merely *anthropomorphic* analysis. This distinction defines *anthropocentric* policy as that which places only human instrumental value on nature while also placing humanity and its concerns as the core matter of importance in policy calculation. *Anthropomorphic* policy then becomes that which admits that all moral valuation is human, but that this, in and of itself, does not promote humanity to be the top policy priority.

By this distinction, all philosophical analysis is anthropomorphic, even that which places natural systems or the biosphere in the central place of value. The important question is not whether humans have decided the terms of analysis, but whether incommensurabilities are acknowledged in how distinct entities are evaluated, and in what terms they are valued.

Within present environmental risk law and policy, the economic models are both anthropomorphic and anthropocentric because nature is analyzed only as it has instrumental-economic use to humanity. Nature is defined in terms of its 'resource' value to individual preference and its characteristics are described to facilitate human consumption (e.g. not a tree, or a component of a natural system, but 1000 board-feet of lumber). Humanity not only sets the terms of discourse for nature but its economic preferences are the sole standard of value in this analysis.

The approach of science, on the other hand, is anthropomorphic, but not anthropocentric, because science attempts to understand the internal structure and function of nature, where humanity is seldom a character, never the central agent, or the singular value (Abrahamson and Neis, 1997; Odum, 1975). The pervasive uncertainty in policy risk estimates appears when science tries to translate environmental, non-human data into commensurable human risks. In effect, risk analysis fails to alleviate uncertainty because it assumes a commensurability between natural and human health effects that may not exist. Policy evaluation and environmental ethics may exacerbate uncertainty by assuming a similar commensurability in the terms of ethical discourse and valuation. Perhaps science should not apply environmental data to judge human capacities, but philosophy ought not attribute human ethical designations to nature, as if it were also a moral agent.

Public policy, like science, may have to plead ignorance of exact mechanism in its evaluation of nature, but it must begin to consider nature within its own context and philosophically integrate it as a distinct but equally valuable component of our moral deliberations about good and bad policy, right and wrong public decisions. As a starting point, we should recognize that all philosophical deliberation, even that which places central and greatest moral value on the natural systems themselves, is anthropomorphic.

However, while we acknowledge our necessary role in the proper valuation of nature, we must also understand that our responsibilities to nature, and the duties that flow from these responsibilities, must be based on nature's functional characteristics and not quasi-human rights, utilities or interests. In addition, we need to realize that debating in human terms does not make humans the only proper subjects of moral duty. When making public choices, we should recognize the *intrinsic functional value* of the environment as a foundation that defines our duties to nature as the *intrinsic moral value* of humanity defines our duties to ourselves and other persons (Gillroy, 2000; Kant, MJ: 434-35).

Philosophically, if natural systems are to have a distinctive value and therefore a pride of place in policy analysis, we must put them there. Our central concern should be to

distinguish between those policy principles and paradigms that can accommodate only nature's instrumental value to man, and those where the functional or intrinsic value of natural systems plays a role. Only within this second group of theories can nature have a place of equality or prominence in our moral consideration of what environmental risks are acceptable and which ones are not.

Environmental risk is not a single issue, law, or policy, but a classification for a cross-section of environment concerns characterized by pervasive uncertainty and zero-infinity management problems (e.g. climate change; COVID 19⁴). Using the characteristics of environmental risk as defined by Toby Page (1978), allows us to assess the failure of market assumptions, and articulate the ethical-moral and administrative requirements of any paradigm seeking to more adequately regulate risk issues.

First, we must identify the philosophical *substructure* of the uncertainty characteristic inherent in environmental risk. We do this by using the distinction between anthropocentric market assumptions and anthropomorphic philosophical theory and applying it to the essential dilemmas that involve debates over the distinctions between intrinsic and instrumental values and private and public goods. To do this we will focus on two of Page's (1978) characteristics of environmental risk attributed to its uncertainty: *modest benefits* and their implications given both intrinsic and instrumental values involved in approaching uncertainty, and the *catastrophic* implications of environmental risk given a distinction between the public and private nature of the goods-decisions involved.

Second, we will consider the management *superstructure* of practical administrative dichotomies faced by the nature of environmental risk. Here, again, we will focus on two of Page's (1978) characteristics: the *stealth* quality of environmental risk, with its imperative for rather than responsive institutions, and the distinction of its *internal* market benefits vs. its *external* environmental costs which imply the need for autonomy-based rather than efficiency-based policy.

Lastly, we will integrate philosophical substructure and policy superstructure by expanding our working definition of 'ecosystem' to focus on the interface between human systems and natural systems as these interact and affect one-another. This will provide a new definition of Ecosystem that will redefine the policy space and offer a substitute Ecosystem Law and Policy in place of economically-motivated environmental decision-making. To illustrate the differences in origins and outcomes, I will, first, derive a Kantian alternative policy paradigm to contrast the with market model.

⁴ See footnote 2.

ENVIRONMENTAL RISK: A MORAL SUBSTRUCTURE

Instrumental vs. Intrinsic Value and Modest Economic Benefits

A key characteristic of environmental risk related to its uncertainty is what Page (1978) calls its "relatively modest benefits." A moral dilemma exists in how we judge the "modest" nature of the benefits of a zero-infinity dilemma and justify a decision that denies them to those with a market preference for them. In other words, the policy choice, requires that we justify why we will use the coercive power of the state to make everyone do X regardless of their preferences (Gillroy and Wade, 1992: vii; Gillroy, 2000). In justifying a collective choice, coercion needs to bring cooperation without significant or systematic hardship or widespread rights deprivation. Avoiding tyranny (Fishkin, 1979) is of primary importance for political theory, but the justification of a decision that benefits some at the expense of others is also a necessary result of policy decision-making and the primary reason why economic policy design must move from the Pareto efficiency criterion to Kaldor Efficiency.⁵

But the real inadequacy for the regulation of environmental risk policy is that economic policy design assumes the existence of only one type of value: instrumental. The concentrated focus on the standard of how much instrumental economic 'benefit' (in terms of Kaldor Efficiency, or wealth maximization) is accrued by choosing one alternative rather than another, as the major test of 'good' policy makes market decision-making ignore what is truly at in environmental risk issues (e.g. intrinsic value of both humanity (moral) and nature (functional); need for anticipatory policy, etc.).

Alternatively, I suggest that we might consider that the uncertainty of risk issues is less critical to the decision process if we shift our analytic focus from the benefits themselves to the distinct types of values involved, and, more specifically, to tradeoffs that sort winners and losers. Instead of a world of trade between instrumental human values, where the metric of money and 'willingness to pay' defines the difference between "modest" and "greater" benefits, let us expand the world to include both instrumental and intrinsic value both to humanity and the environment.

Figure 1 About Here

Including the instrumental and intrinsic values for both humanity (moral) and the environment (functional) results in four combinations of risk tradeoffs. They can produce potential winners and losers on two distinct levels of value and for two distinct "subjects" of concern. In cell A, the Intrinsic Value of humanity is weighed against the Intrinsic Value of nature. Here, we could be deciding between an old-growth forest system and our need of

⁵ Efficiency applied to public policy is not the standard Pareto Efficiency of microeconomics as it assumes that everyone is better or as well off in a new more efficient state-of-affairs. Since policy always produces winner and losers, A Kaldor-Hicks definition of efficiency was established for public policy that stipulates only that a new efficient state-of-affairs is a potential Pareto improvement where the winners gain so much that they could "hypothetically" transfer wealth to make everyone as well or better off. (See Gillroy and Wade, 1992: 6-13).

lumber for national security reasons. In cell B, the Intrinsic Value of nature is weighed against what has only Instrumental Value to humanity. Should we trade essential damage to the ozone layer for the convenience of propellants in spray cans? In cell C, what is of Instrumental Value to nature is weighed against what is of Intrinsic Value to humanity. For example, selective cutting of second-growth forests that are inconsequential to the persistence of the natural system, but essential to provide human shelter. Finally, in cell D, what is of Instrumental Value to both humanity and nature is traded. Shall we take an already used piece of urban land, and build a mall?

In this model, the uncertainty of benefits and their implications for policy decision-making becomes more complex. But, simultaneously, uncertainty is also more definitive because we have anthropomorphically segregated what affects essential (intrinsic) value from what affects elective (instrumental) value, and are considering both humanity and nature in terms of their distinct characteristics and essential/elective requirements.

This creates a taxonomy of moral value replacing a single scale of instrumental welfare benefits. The uncertainty of symmetric outcome "benefits" is replaced with the certainty of intrinsic value and the responsibilities that occur with deciphering the essential from the elective, and setting priorities between these. Consequently, the judgment and justification of "benefits" can be transcended to provide more options and arguments to the environmental decision-maker. In addition, the idea of "tyranny" now becomes intertwined with how one's public choices affect what is essential about humanity and/or the environment; concern for trading away intrinsic for instrumental value becomes a foundation of environmental risk decision-making. This segregates the most critical decisions, as in cell A where two intrinsic values, an old growth forest and human security, are the subject of policy from easier decisions, such as in cell B where the intrinsic value of the ozone layer is much more critical than propellants in spray cans.

This taxonomy of moral value also utilizes the attribution and evaluation of human-natural values as a moral means for the limiting of environmental risk uncertainty. In the same way that scientific 'fact' can guide policy during a pandemic making decisions more certain, moral 'value' arguments can create imperatives that promote the persistence and preservation of intrinsic value in the face of pervasive uncertainty. This makes environmental risk policy more flexible while giving it a non-contextual, non-time sensitive certainty that by providing a basis for anticipatory regulation, uses moral value to make decision-making more certain.

Private vs. Collective Goods and Catastrophic Results.

Another key dimension of uncertainty regarding environmental risk is its potential for catastrophic harm. In addition to a concern for the difference between intrinsic and instrumental value in public choice, consciousness of how a policy choice relates to degrees of private vs. public, or collective risk⁶ and voluntary acceptance vs. involuntary imposition

⁶ While the distinction between public and private goods is well established in terms of jointness and nonexcludibility, the idea of a collective good has more utility as it defines a good that is allocated or distributed by government, and justifies central regulation, regardless of its public/private characteristics.

of risk, can further eliminate uncertainty by further defining "catastrophe" in environmental decision-making in terms of the context in which risk is being both generated and received. These should be a factors in delineating different conditions of uncertainty if it is to be properly judged and regulated.

For market analysis, catastrophe has no meaning beyond that attributed to any considerable instrumental cost to humanity. Within a multi-dimensional tradeoff scheme, however, the catastrophe can be redefined by the distinction between private and collective goods. If we assume that a bad result is compounded if its effects are not only to intrinsic value, but also what economists call joint and nonexcludable 'public' goods (Snidal, 1979), then a catastrophe is more than just a greater than normal material cost to the individual. It compounds the potential harm to the essence of one's humanity and nature's fundamental functional integrity by the nature of the goods and choices involved.

In addition, if an environmental risk places everyone in harm's way, where one's subjection to it is joint with all, and where one suffers without consent or voluntary choice (which compromises their intrinsic value as a person), then one is discussing not merely benefit or cost, but harm that is collective, immoral, and insidious, being unjustly and unknowingly inflicted on individuals without their knowledge. If one assumes, further, that harm to the intrinsic or essential value of humanity or nature is possible, and then contends that this harm may be collective and non-voluntarily transferred, this degree of harm can indeed be said to be potentially catastrophic in terms of harm to what is essential to being human. Uncertainty as to result may still prevail, but one can now place uncertainty about what is essential and collective in a separate class of considerations, ex ante, and both anticipate and justify their protection and empowerment in any environmental risk-policy analysis.

By examining risk questions from within the dichotomy of collective and private goods transactions, we replace, first, the market's concern for the free-rider with a new consciousness of the non-voluntary risk imposed on the *imprisoned-rider*⁷ and, second, provide a priority for deciphering the various degrees of essential and collective harm involved in environmental risk. This new taxonomy may not lessen uncertainty but it places it within a completer and more fitting context for the policy and legal matters at hand. For example, if we chart prospective risk policy decisions on a graph where the range from a fully collective choice to a fully private choice is on one axis, and a range from full voluntary acceptance to involuntary transfer of risk is charted on the other axis, one can decide between more or less government regulation of risk by the degree the decision concerns collective involuntary environmental risk (like climate changes or a COVID pandemic.⁸)

Figure 2 About Here

⁷ An imprisoned rider, as opposed to a free-rider is one who has harm (e.g., from environmental risk) imposed upon them without their ability to sense it and therefore to defend against it. (See Gillroy, 1972).

⁸ See Note 2.

The southwest quadrant of this graph illustrates issues that involve voluntary private risks. Smoking cigarettes, for example, is a private choice that requires little government regulation as the risk is private to the individual smoking (in the closed room) and voluntarily accepted (by the adult smoker). The southeast quadrant of the graph shows risks that are still predominantly private, but which may be involuntarily transferred to the individuals involved. In these cases, like dealing with radon in a house, a bit more government involvement may be rational, at least to alert the individuals involved as to the private risks they are accepting by living in their home.

In the northwest quadrant where risk may be accepted voluntarily (sitting in a smoking section of a restaurant but not smoking oneself), risk is collective, affecting anyone in the vicinity who breathes the air. Because of this, we may require more government involvement to mitigate risk to otherwise innocent parties and protect collective interests.

Lastly, in the northeast quadrant of the graph, we find true zero-infinity dilemmas that involve collective involuntary risks, and collective non-voluntary exposure like the emission of radioactive air pollution or a pandemic. In these cases, catastrophe to the imprisoned-rider is likely, and government intervention to anticipate the risk, judge its necessity, and regulate it, is essential.

ENVIRONMENTAL RISK: A POLICY SUPERSTRUCTURE

Responsive vs. Anticipatory Institutions and Stealth

In addition to the pervasive uncertainty that characterizes environmental risk as a zero-infinity dilemma, it also provides management problems to the policy-maker who must justify the regulation of what amounts to an almost 'zero' risk of an 'infinitely' catastrophic exposure to harm. Among the most difficult policy issues regarding the administration of environmental risk, and the law that is codified from it, is the stealth quality of risk. Environmental risk affects individuals in intangible ways that make detection or individual defensive strategies nearly impossible. Dependence on the consciousness or preferences of the individual as a basis for policy, therefore, also becomes exceedingly problematic.

Preference is the currency of economic-market decision-making. Without an argument about the signals sent by preference, the market policy paradigm has no foundation for decision-making. Under the best of circumstances, it is difficult for an economist or policy-maker to distinguish between a true preference and a manifest preference (Sen, 1982: Part II; Gillroy, 1992a). Is the preference expressed by the person and made manifest to the policy maker their real or true preference or does it involve strategic behavior or 'gaming the system' to further self-interested ends? The surreptitious quality of environmental risk makes it even more difficult for a responsive government to decipher the true risk preferences of its' constituents (Page and MacLean, 1983), which is essential to policy formulation and implementation within the Market paradigm.

The market paradigm assumes the sole function of government is to respond to the welfare preferences of consumers when markets cannot. However, even if an administrator

could properly read individual preference, the stealth quality of environmental risk exacerbates the difficulties of using them as a basis for public choice. If one cannot sense environmental risk, then one cannot form a preference order with environmental risk as a factor. Even if informed of the existence of risk, it is difficult for one to measure cardinal or ordinal differences between risk preferences without an independent sense of each in terms of both presence and effect, which in any case is assumed to have a small possibility of producing catastrophic results.

Within the market paradigm, the stealth problem is further compounded by the connection between responsiveness and the burden of proof. In addition to the assumption that the only "ethical" and justifiable public decisions are based on the state's response to aggregate welfare preferences, market axioms also assume that the burden of proof is on the policy-maker to justify action that would intercede in the otherwise 'normal' functioning of said market. The policy-maker should never intercede until specific market failure occurs. Even then, the state can only do what the market would have done; it cannot respond to unfulfilled preferences nor depose preference in favor of more secure non-instrumental values. To do so, within the market paradigm, would be an act of paternalism; it would create state action without authorization from consumers. For the market, responsive government, mimicking the market when it fails, is the only responsible government (Gillroy, 1994).

The dilemma of waiting for preferences to form while environmental risk affects people collectively and irreversibly, creates the collective, non-voluntary imposition of environmental risk characterized as the imprisoned-rider scenario (Gillroy, 1992). In order to overcome the stealth quality of environmental risk, and make policy that anticipates the imposition of environmental risk, we must move beyond the idea of "responsive" government as the only responsible government. The moral complexity of the concept of responsibility needs to be a recognized basis for policy choice so that the legal "burden of proof" in matters of regulation shifts to those who seek to impose environmental risk on society.

Specifically, in order to regulate *responsibly*, risk must be *anticipated* and *action justified ex ante*. The state, as the responsible party, must have a means to decipher what is of necessary value to its citizens and be enabled to protect or preserve these intrinsic environmental/human values from those who would place them at risk. The burden of proof in this approach to regulation changes from those regulating risk to those imposing it. Their responsibility is to justify the imposition of risk, to describe the potential effects on humanity and nature, and to gain political assent for each imposition of environmental risk.

To manage risk, a public decision-maker cannot rely solely on the expressed preferences of consumers, but must define and anticipate the moral values involved and the needs of citizens in terms of possible harm, in order to justify action *ex ante*. The state becomes more than a mere aggregator of market preferences. Anticipatory policy functions to define and provide the fundamental requirements of its citizens, as well as the natural world. Any actions that would infringe on or endanger these essential interests must be

justified, not by cost benefit analysis, but in terms of the intrinsic and instrumental values involved.

Efficiency-Based vs. Autonomy-Based Policy Instruments and Internal Benefits vs. External Costs.

But how do we define the "essential" needs or interests of citizens? Confined to a responsive role, policy makers have few tools at their disposal. In addition, the characteristics of environmental risk compound the question because most benefits are transmitted within the context of the market, while most costs are external and therefore not counted in market price computations (Page, 1978).

Within the market paradigm, risk can only be addressed by internalizing the costs. But if these costs are unknown because of the stealth nature of risk, how can one internalize them? In addition, having the benefits of risk (e.g. spray cans, red apples) as immediate and tangible market factors prejudices the cost-benefit calculations because the superficial nature of economic benefits do not adequately take account of the stealth dimensions that characterize the essential costs or harms involved.

Efficiency-based policy instruments can only respond to expressed preferences and to the signals sent by price through the market. When we consider the factual characteristics of environmental risk policy, we face a serious dysfunction of these signals and a consequent exaggeration of economic benefits as opposed to the more essential harm to human and ecosystem values (e.g. , the superficial need for cheap lumber against the keystone status of an old growth forest). We need a new set of signals that provide for an anticipatory state rather than the responsive market if the "external" costs of risk are to be appreciated in policy choice. These new signals ought to allow both the negative and positive effects of risk on essential citizen interests to be read properly and reported publicly *ex ante*.

Essential citizens interests can be defined in terms of many philosophical concepts. For example, David Hume's philosophical argument defines the social utility of citizens interests in terms of the evolution and persistence of social convention as a basis for a stable social order (Hume, 1740), G.W.F. Hegel defines these interests in terms of individual freedom-through-social recognition and the creation of ethical life for a people within a state (Hegel, 1820). Immanuel Kant creates the duty to the autonomy of the person as the core of their essential interests both in terms of their private ethical choices and the public or juridical choices of the state made on their behalf (Kant, MJ: 218-20). It is this final philosophical argument that I will import here as an example of how new moral-philosophical priorities could lead to an alternative paradigm of choice and anticipatory environmental risk policy.

I recognize that some might disagree with my characterization of philosophical argument and its utility as too broad and not applicable to contemporary policy issues.⁹

⁹ They take a strict, contextual approach to philosophical literature. I quite simply have sought for help where I could find it, including consulting and studying with some current eminent philosophers who have let me try

However, I cannot stop to argue about the merits of finer textual analysis while the world is destroying itself. All I ask of the reader is that we agree on the need for a fundamental change to the moral standards used to define law and policy. We need to start somewhere, and the wealth of preexisting philosophical arguments can provide a basis for experimentation by the decision-maker. In the same way that 'standards' provide a foundation for 'jazz riffing', reconceptualizing the basic rhythm and melodies to see what else can be found or created, preexisting philosophical arguments can provide alternative conceptualizations of practical reason and moral agency as a basis for 'policy riffing' that nonetheless pays respect to the essential 'notes' of a dilemma like environmental risk.

To move from dependence on efficiency-based policy criteria and gain a foothold against the stealth quality of environmental risk and its external cost problems, we need an *autonomy-based* administrative system. Why autonomy-based? Because autonomy defines moral agency as capacity and the practical reason necessary to use it. It involves action, but can be defined to specifically address those actions that confirm and express what is essential to the person in terms of what empowers or protects their essential autonomy. Further, responsibility to autonomy requires the state to set an *ex ante* standard of regulation on the basis of what collectively provided goods are necessary to the material conditions of each citizen's moral autonomy, that is, what is in every human's essential interest as a being of moral-intrinsic value.

When applied to environmental risk policy, the concepts of essential interest and intrinsic value require the policy-maker to also consider the functional capacities of nature. The interfaces between moral agents and function-natural systems must become the focus of concern and the field where values must be assessed and tradeoffs contemplated. Public responsibility is no longer *responsiveness* to, but *ex ante responsible* for, protection and enhancement of human and natural capacities as these interact with one another.

As I have already argued, all human analysis is anthropomorphic. Yet we should construct a theory of human autonomy that includes what is unique and essential about nature without devaluing it. Anthropomorphically, nature can only have value as humans value it, or recognize duties toward it. But, because, as we will shortly see, of both its essential contribution to human freedom and its independent functional integrity, it ought to have equal functional-intrinsic value in policy deliberation and choice, even when no environmental crisis is looming on the horizon.

Autonomy-based criteria can account for environmental risk and all of its effects as part of a management decision. I suggest that to identify what is basic to all individuals, we focus on Kant's concept of moral integrity or "humanity-in-the-person" (Kant, MV: 388; 402-3; 448-50: C2; GW). If one asks what is most basic about one's humanity, it is one's internal capacity to act as a agent, or be autonomous. But not all choices or actions confirm one's humanity. A specific type of agency, that is, moral agency, needs to become the focus

out my ideas against their greater knowledge, pointed out my errors and validated my observations or insights where merited. I believe that philosophy has very concrete information to offer us on how to live and the fact that there is great work to be done to apply it to a contemporary context should not stop us.

of our definition of essential interest and intrinsic human value in environmental risk policy. This necessitates that we take a closer look at Kant's philosophical argument.

KANT'S PARADIGM VS. THE MARKET PARADIGM—IN A NUTSHELL

Here, I combine my knowledge of Kant's exegesis with my experience as a policy analyst. My goal is to integrate what I consider to be the necessary concepts and categories, or perquisites, of proper policy choice with the components of Kant's philosophical argument for practical reason and human moral agency. I will compare and contrast these Kantian concepts with market assumptions about the same categories and concepts of policy-making. My purpose is not only to derive both the status-quo efficiency-based market paradigm for environmental risk policy, but an autonomy-based Kantian alternative. With this alternative set of Kantian philosophical assumptions and values, we can create a philosophical substructure that is capable of transforming the management superstructure for environmental risk decisions toward what I will call "Ecosystem Policy & Law".

In order to decipher an alternative paradigm for policy choice from a pre-existing whole philosophical argument, I've found that it's necessary to begin by identifying the three *fundamental assumptions* of any policy choice. First, the policy-maker needs to be aware of what they are assuming about the *individual* for whom they are making policy, that is, what definition the policy-maker uses to characterize the person's basis for choice and their motivations for agency. Second, how would policy respond to the *collective action* problems created by turning individual choices into public choices? Third, what role do the assumptions about the individual and collective action indicate about the proper *role of the state* in public policy decisionmaking.

From these fundamental assumptions the next task is to derive a *core operating imperative*, or absolute presupposition of the paradigm structure. From the three assumptions, and the operating imperative the policy maker moves on to identify the *material conditions* or empirical matter that will be required to implement the operating imperative. In addition, the core imperative provides a short-hand, policy and legal *priority* that can be employed to implement its recommendations.

Applying this approach to both the market and Kant will insure that the new values we have identified will be competitive with the status-quo in justifying policy choice. This insures that the definitions of practical reason, as rendered through the operating imperative of *Kaldor Efficiency* and its dictate to maximize wealth and *practical reason as Autonomy* with the imperative to protect the intrinsic values of humanity and nature, will be sorted within a common framework that will be adequate to judge which is best applied to questions of environmental risk.

Before we proceed to detail this comparison, a fundamental distinction at the foundation of all policy and law must be posited. Specifically, approaching policy and law in this manner reveals an essential tension that permeates policy choice. Policy and law have

a core dialectic structure¹⁰ characterized by the tension between *process* ↔ *principle*. This dialectic assumes that there are two fundamental categories of normative precepts in policy and law. The first and most basic is that which evolves from repeated human interactions that breed patterns of behavior and set expectations for the terms of cooperation and social stability: social conventions. This basis for moral value, as described by David Hume (1740: 486-8), creates the terms of social cooperation through practice and has three layers of progressive sanctions.

Sanctions assure cooperation and become more centralized as the size and complexity of the social group increases. The primary layer focuses on one's sense of honor and the need for social approbation (stage one); sanctions then become focused on a specific norm or convention of justice (stage two) that holds the system together as its moral-focal point and then, finally, sanctions produce formal law and institutionalized governance through contract-by-convention (stage-three). The point of the norms generated by this source of morality is to establish and maintain the stability of collective action based on a sense of the public good/utility. These are *process-norms*, (Gillroy, 2013: 12-13; 25-26) and they form that moral foundation for law that enables social coordination to stabilize cooperation over time. Social conventions informing/creating the positive law are easily entrenched as they become sensed as 'legitimate' authority by those dependent on the legal system, and therefore as necessary to the fundamental stability or order of society. For our purposes, this helps explain why it is so difficult to change a set of essential values and their corresponding policy imperatives, especially when they have become conventional or traditional, as the market paradigm has in its application to environmental risk.

The second essential category of norms forming the moral foundation for the law is *critical principle*. These principles are transcendent of context and find their origins in argument from fixed metaphysical principle, generated and justified by human reason.¹¹ These *aetiological* norms or critical principles do not depend on their social context for legitimacy, but contain their own internal critical standard of validity that is inherently disruptive of social convention; primarily in the name of the status of the individual vis-à-vis the stability of social cooperation. Critical principles, while they inform both the substantive and procedural dimensions of the law, are primarily substantive because, instead of the stability of social process being the end-in-itself for these rules/rights, it is the standing of humanity-in-the-person that provides their imperative.

Fundamental Assumptions: Sub-Dialectics Representing Process ↔ Principle.

The three fundamental assumptions to policy analysis (individual, collective action, state), when examined through the lens of the *process* ↔ *principle* dialectic, further suggest

¹⁰ A philosophical-policy paradigm is assumed to be made up of dialectically interconnected ideas that overlap within a given philosophical system, while existing on a scale of forms, self-refining toward their essence over time through continued application and analysis. See, Collingwood, R.G., (1992/2005), 181-182; (1933/2005), 41-42; Gillroy, 2000; 2008; 2009; 2013: Chapter 1.

¹¹ My project will rely on PPLD paradigms from Hegel and Kant for this normative category.

three sub-dialectics. These represent the specific application of *process* ↔ *principle* to each fundamental assumption, so each can be deciphered more easily.

The first sub-dialectic, applied to defining the fundamental assumption of the individual is between *passion* ↔ *reason*. Human agency, our ability to act, is a balance, and sometimes a struggle, between these two characteristics derived from the *process* ↔ *principle* dialectic. We assume that human agency contains both these components of character, the dialectic balance between them defines the person assumed to be the subject of policy and law.

The second sub-dialectic at play, related to the fundamental assumption defining collective action, is that between *utility* ↔ *right*. Here, to establish and maintain public coordination, one asks how the transition from individual choice to collective outcomes balances the influence of the collective utility of social stability (*process*) against individual right (*critical principle*).

Lastly, the sub-dialectic related to the role of the state is the tension between *active state* ↔ *passive state*. Building on the assumptions about the individual and the collective action problem, an *active state* is charged not only with the protection of a private sphere, but the regulation of process in the name of critical principle; an active state supports not just the negative freedom of the person (i.e. freedom from interference), but the empowerment of their positive freedom (i.e. active moral agency in the world). Meanwhile, the *passive state* exists only to provide the legal background conditions of civil life, where only that negative freedom necessary to social cooperation is protected. Any further policy initiative is limited to mimicking the requirements of said process when they cannot be produced without public law.

Fundamental Assumptions: The Individual.

A closer look at how these fundamental assumptions with their inherent dialectics play out in understanding and shaping policy is available through a comparative analysis of the market and my Kantian alternative. For the market paradigm and its foundations in classical economics, the individual is a 'rational' consumer with welfare preferences where passion drives reason. The passion for wealth provides the core imperative for the individual. Kant's alternative provides the policy analyst with a more complex idea of the individual, one who is more than a collection of desires, or different "levels" of wants (Olson, 1971; Sen, 1974; Gillroy, 2000).

Kant's individual is assumed to be a practical reasoner struggling to form an ethical character as an active moral agent on her own behalf. The internal character struggle is between the *predisposition* toward moral self-awareness in opposition to one's *propensity* to be a self-interested agent, which is the fundamental dialectic tension in Kantian Ethics (Allison, 1990: 146-162; Kant RL: 22-3; 18-19; GW; C2; RL; PP; MJ; MV). This dual character describes a complex moral agent with the capacity and the predisposition to act in accordance with the maxim that she shall respect the moral autonomy or humanity in

herself and others, but who is also a person in a material world of scarcity, uncertainty, and fear which will condition her expression of autonomy.

The "reality" of being neither god nor animal but a combination of both, defines the individual for Kant. The goals of the individual are not wants *per se*, but represent an overall imperative for self-empowerment through the expression of autonomy; Kant's person manifest their predisposition to act morally through the practical application of their moral agency (Kant, RL: BK1, 21-23; MV, 419-20 & Part I, Bk I, passim; C2; Allison, 1990: 148-50). The focus for the policy-maker is now to create policy that supports the moral agency of the individual. By providing for this agency, the decision-maker protects and empowers the autonomy of all citizens.

Within Kant's definition of autonomy, or the moral integrity of the individual citizen, he also suggests that human existence within the 'Realm of Freedom' is interdependent with the persistence of the 'Realm of Nature' (Kant LT, 138-48: C3). Consequently, the policy-maker must also consider the functional integrity of Ecosystems made up of human and natural systems and their interactions (Gillroy, 1996). Just as one's morally intrinsic value as an end-in-itself is based upon practical reason and one's capacity, ability, and purpose in becoming an autonomous person and a moral agent, the functional integrity or capacity, ability, and purpose of nature as an end-in-itself must also be a policy priority. This presents humanity with a primary obligation to use nature carefully and without waste (Kant, MJ: 443), because nature is critical to human autonomy and agency. This gives us what can be called Kantian conservationism (Gillroy, 2000: 180). But Kant also suggests that the fundamental interdependence of humanity and nature requires respect for the intrinsic value or integrity of natural systems, because they are functional ends-in-themselves. This can be called Kantian preservationism (Kant RL: BK2, §1; LT: 143; OP: 21-211; 22-549; MJ: 221-225; Gillroy 2000: 184). Kant's ideal is the "harmony" of the *Realm of Nature* with the human *Realm of Freedom* and because nature predates humanity as a functional and evolving end-in-itself, harmony can only be achieved if the unique intrinsic value of each Realm is recognized in policy and law.

Fundamental Assumptions: Collective Action.

For the second assumption about identifying the nature of collective action, the market paradigm is skewed to the **utility** side of the utility-right sub-dialectic. This concept of utility is no more than the aggregate sum of individual wants and preferences, while collective action is primarily concerned with establishing just enough cooperation to satisfy the material need of the most people possible. A Kantian view of the sub-dialectic examines the political community from the perspective of **right** over utility; that is, as a distinct collective entity where individuals (the moral building blocks of collective action) and the just state (which ratifies and enforces the collective terms of cooperation to insure the moral character of individuals) coordinate and reinforce one another. In Kant's alternative, the challenge with collective action is to encourage each individual's predisposition to act morally. The strategic situation is not a prisoner's dilemma, but an assurance game (Gillroy, 1991; 2000: Chapter 6; Elster, 1979) in which each citizen is assumed willing to cooperate in the production of morally-cooperative outcomes within a

just state, which is more than the aggregation of welfare preferences (Kant, MJ: 255-56). Kant's state also has a duty to protect and treat each person as a moral agent. The political community, within a Kantian paradigm, is a necessary and vital actor.

Policy-makers using a Kantian approach to collective action should assume that when faced with the fear and uncertainty of exploitation in a community where no "public" regulation exists, the individual's underlying propensity toward "evil" or self-interested behavior will dominate one's predisposition to act morally (Allison, 1990: Chapter 5). A policy-maker needs to be aware that the "externalities" of others' behavior and the subsequent fear of exploitation by these 'external' market effects may cause the individual to ignore their predisposition toward cooperative action and move to protect their core of freedom in isolation, acting to exploit others before they are exploited themselves. This "mania for domination" (Kant, AT: 273) illustrates the political community's failure to provide the conditions necessary to coordinate (an assurance game). But the Kantian decision maker, anticipating this crisis with the priority to protect individual autonomy will regulate that economic behavior before it exploits essential moral capacity in some for the instrumental benefit of others. The collective action implications of the assurance game promote a distinct definition of "public interest" and are the reservoir of the moral precepts and principles that define the "right" as prior to the "good" and therefore the core of justice itself.

Fundamental Assumptions: The State.

The place and function of the state, as the third fundamental assumption, is markedly different between a market paradigm and a Kantian paradigm. In a market paradigm, the *passive* state has only two functions: (1) to police and adjudicate property and contract matters, and (2) to provide a surrogate exchange system that can step-in when markets fail and allocations cannot be made without the involvement of a collective third party. For Kant's, the *active* state is a distinct entity, functioning independently and prior to economic markets, and existing to anticipate and regulate markets so they contribute to the "harmony of freedom" for all citizens (Kant, MJ: 230; TP: 297).

Within Kant's paradigm each individual is assumed to have the capacity to recognize herself as a moral being. The resulting just state is, for Kant a 'Kingdom of Ends' (Kant, MJ:231; GW: 433-41) and is defined as that set of institutions and regulations that provide the assurance of those material conditions for the protection and empowerment of the moral capacities of its "active" citizens (Kant, MJ: §46). This responsibility requires the state to solve the assurance game and maintain cooperation over time. The "just" state empowers the individual's predisposition to act morally and defuses, or prevents, the 'mania for domination' (Kant, AT: 273).

From this viewpoint, the state is more than the aggregate of individual preferences and is established to maintain an independent and duty-based 'sense' of justice that insures its long-term existence and justifies its policy choices. The institutions in a just state are responsible to the individual; they support each citizen in seeking autonomy while protecting each against the immoral actions of others. The policy-maker can utilize Kant's

assumptions about the individual, collective action, and the just state to clarify their normative priorities and justify policy and law that anticipates environmental risk and regulates it with the dialectic interaction of the moral integrity of humanity and the functional integrity of nature at stake.

Policy-Law Operating Imperative.

These foundational assumptions, taken together, render operating imperatives or distinctive absolute presuppositions for each paradigm that form the basis of policy choice for the decision-maker.

For the market paradigm, the protection and facilitation of each person's voluntary economic trade is of prime concern, and the principle of *Kaldor Efficiency* is used to support the maximization of aggregate social welfare. For Kant's paradigm, the principle of *autonomy* plays a similar role. Further, unlike efficiency, autonomy is divisible into three sub-principles, each corresponding to one of the levels of fundamental assumptions. The assumption about the individual relates to the principle of *freedom*, in both its negative and positive manifestations. Creating an assurance game to support collective action requires an adherence to the principle of *equality* before the moral law, that is equality of all in terms of their being able to express rights or impose duties from the moral law on others. Finally, the attainment of a just and active state mandates recognition of the principle of civic *independence*. Freedom, equality, and independence are what Kant calls the "juridical attributes" of the active citizen (Kant, TP: 290). They are the principles that the operating imperative of autonomy can offer to a policy-maker as standards for decision-making to assure autonomous citizens that they will not be exploited in their expression of moral agency and practical reason.

The three principles, like the categorical imperative (moral law) upon which they are based, all contribute to the same end: autonomy. Duty, individual rights, and community interests are balanced by an active state attempting to protect and empower individuals as ends-in-themselves with intrinsic moral value. It is critical that a "thick" sense of moral autonomy (Gillroy, 1992a) or "a higher order control over the moral quality of one's life" (Kuflik, 1984) be supported by policy and law. It is also important that policy argument recognize both the private and public dimensions of autonomy, in the three juridical attributes, as decision-makers strive to create a cooperative community of moral agents.

Material Instruments of the Policy-Maker.

Operating imperatives require material conditions that can be used by the policy-maker to translate normative values and imperatives into practical goods and opportunities in the lives of citizens. In the market paradigm, the sole material condition that results from using the imperative of Kaldor efficiency is tangible property or wealth. For Kant, however, operating on the imperative of autonomy produces three instruments. Freedom of the individual is promoted by the *protection* of Ecosystem integrity (which is the consideration of both natural and human intrinsic value in policy choice). Equality within the political community is guaranteed through the *distribution and re-distribution* of

the physical property necessary to the widespread expression of autonomy through moral agency. Lastly, civic independence is empowered in the public provision of those *opportunities* necessary for anyone to apply their practical reason to both personal and political choice. The Kantian policy-maker is concerned with human and environmental integrity, collective and private property, and social opportunity, to provide for the "active" citizenship of their constituents.

Short-Hand Policy-Legal Priority.

Operating with the imperative of Kaldor efficiency, the market paradigm requires the methodology of cost-benefit analysis so that the ends and means of public issues are submitted to the Kaldor efficiency test in order to render 'efficient' policy. Using a Kantian approach, the decision-maker must protect integrity, distribute property, and provide opportunity to empower active citizenship. This approach provides a *baseline* function as an alternative policy priority replacing dependence on Kaldor efficiency and cost-benefit.

This baseline function provides three alternative but interdependent variables for consideration in policy decision-making (Gillroy, 2000:276ff): Ecosystem integrity (in terms of collective goods (E^i); property (p_i); and opportunity (o_i). The baseline (E^i, p_i, o_i) represents Kant's argument that justice in collective policy choice requires government to consider, not an equal measure of each, but the basic protection of freedom, distribution of property and provision of opportunity to all. This baseline is necessary to solve the assurance situation and establish collective cooperation for the full expression of each person's practical reason and moral agency as active citizens. The charge of the policy-maker is to create those circumstances in which each citizen's predisposition toward acting morally is empowered, creating autonomy in each and a harmony of moral agency for all.

The baseline, required by a Kantian approach to law and policy, produces distinct policy choices and outcomes. For environmental policy, distributing the means to free expression, protecting equality, and empowering independence moves the burden of proof from the regulators to the creators of environmental risk. It also supports the use of standards to anticipate harm and protect basic agency and autonomous capacity in the face of collective assaults from market extraction, production, and disposal.

In order to assure equal treatment of all citizens, the baseline requires the active state to make policy at the widest level of inclusion that is feasible (national or even international policy rather than local). It also, because of the interdependence of freedom and ecosystem integrity, requires the consideration of Ecosystems as whole, integrated, interdependent, systems with inherent functional integrity. This is an integrity that should be considered subject to harm whenever policy considers only one or some of its components for human use, non-holistically. The imperative of autonomy implies that regulation should be measured by the degree to which it provides for the flourishing of interdependent human↔natural systems, rather than their minimal persistence as proscribed by the market maximizing wealth generation at the threshold of natural systems failure.

The baseline function illuminates the intrinsic functional value of natural systems and the intrinsic moral value of *humanity-in-the-person* and defines justice for the policy maker in the balance of the intrinsic and instrumental values involved. Preference and/or the superficial freedom of consumer choice are consequently not as important as empowering those components of the baseline function that assure each and every person's freedom in terms of their essential capacity to choose. All policy choices now become subject to an ideal-regarding test: will this policy choice protect the intrinsic value of humanity's nature?

For the policy analyst, utilizing a Kantian paradigm, the autonomy of the individual becomes the critical focus of policy. Human moral agency or autonomy is bound with environmental issues because the ability and capacity for human agency can be severely limited or eliminated altogether if nature's integrity is not also considered. The intrinsic value of both humanity and nature are essential in any environmental decision and must be protected and empowered by policy choice. Such an imperative produces duties and rights that take precedence over maximization of wealth and the processes that produce this wealth. In addition, the imperatives promote the citizen as practical reasoner over the consumer as rational maximizer. Considering the intrinsic value of the moral agent in policy choice requires that the community's assurance game be solved so that the cooperation of moral persons can persist across generations. Environmental degradation is a collective threat to the intrinsic value of individual autonomy and ecosystem integrity and should be considered a public phenomenon that can inhibit moral agency and trigger dysfunction in collective action. Under these conditions, the policy priority is to anticipate harm and regulate risk and other market externalities (e.g. harm from risk or contamination, commons problems) *ex ante*.

The passive state promoted by the market paradigm can only approach risk after harm is detected, and only when the preferences for regulation become apparent to the policy maker. This would not be true for policy made on the basis of Kant's imperatives. No longer driven by market assumptions and principles, the active state becomes independent in the provision and maintenance of collective action, and the protection and empowerment of individual moral agency. Risk becomes a "public" concern, not relegated solely to individual calculation. It is incumbent on the state to define what risks are collectively acceptable and which are not, based upon the requirements of the baseline function, to inform each citizen of the risks of any particular choice, and to provide for the regulation of those risks that would inhibit moral agency and therefore the individual struggle for autonomy.

Kant's paradigm helps us elevate the intrinsic value of humanity and nature over the instrumental value (i.e. price) of things and gives paramount importance to the creation of that public reality which empowers the expression of moral agency and the flourishing of natural systems integrity (Kant, MJ: 434-35). The maxims to protect freedom, distribute property, and provide opportunity become our priorities when we consider the agency of the individual to seek their autonomy as central to policy and law. The environment of the political community, its capacity to persist and stop the exploitation of nature or of some of its citizens by others, may require that all risk-producing activity causing collective damage

to environmental security be justified as supporting moral-baseline needs before it can begin or continue. This is a prescription for a *risk-conscious society*, where each collective risk is analyzed for its capacity to empower individual autonomy and support the functioning of natural systems before it is allowed into markets or the environment.

I have outlined the basic contrasting foundations of the status-quo market paradigm as it has been used to generate conventional environmental policy and offered an alternative paradigm, based on Kantian imperatives, as a more adequate response to the challenges of environmental risk. This fundamental change in the assumptions and values constituent of the philosophical substructure for policy design suggests a further change in the design approach to the superstructure of environmental management: *Ecosystem Policy and Law*.

ECOSYSTEM POLICY & LAW

'WE HAVE TRANSCENDED NATURE BUT BEAR DUTIES TO IT'

The Ecosystem¹² design approach that I propose draws on a more inclusive definition of ecosystem than currently used. The sciences provide the predominant definition of ecosystem, attributed to Sir Arthur Tansley (1871-1955), an English botanist who "coined the term ecosystem for biotic and abiotic components considered as a whole" (Odum, 1993: 38). Defined as a hierarchy within nature that includes both the organic (biotic) and inorganic (abiotic) components of the environment, ecosystems are assumed to be systematically interdependent (Odum, 1975; 1993). For conservation biology, ecosystems are normally considered to be natural systems, that is, the environment within which animals, plants, and other populations of organisms live. The distinction between human and natural systems provides the demarcation line for science between what they study and what they traditionally leave to the social sciences and humanities (Primack, 1993).

To examine ecosystems as a tool of Kant's paradigm for autonomy-based policy design, one must transcend science because it does not give us enough information about the critical interface between humanity and nature. There are three ways in which one can understand the relationship between humanity and nature for the purposes of policy design. First, humanity is simply a part of nature, integrated into various ecosystems and considered as a component part. Taking the opposite view, ecosystems are the natural components of the biosphere, while humans and their artifacts are separate and distinct entities, outside the field of ecosystem studies. A third approach is to consider humanity as part of nature (i.e., humanity as interdependent with nature), but also transcendent, because our moral capacity and technological ability impose specific obligations upon us to preserve and protect the natural world from which we arose.

¹² My idea for 'Ecosystem Law' is not that created and applied without success by the U.S. Forest Service in the 1990's under the Clinton administration. My argument is for fundamental change to the inherent principles at the core of environmental policy, not the reorientation of management based upon conventional, mostly market, assumptions. See Gillroy, 2008: 202ff.

Placing humanity as merely another species within the natural world is the approach of many religious and tribal views of nature that assume a cosmology of man's awe and dependence upon nature as a point of departure (Grim 1983: Chapter 4). From this perspective, humanity is one among many species, all subject to extinction if they do not follow the 'natural laws' of the ongoing ecological order, together with which they either survive or die. This picture of a dependent humanity as one within the myriad of species, argues against technological evolution. This perspective rests on the truth that humanity originated in the natural world and remains a species of animal that, in the largest sense, depends upon the functioning of the biosphere for continued existence. However, this perspective fails to acknowledge that humanity, alone among the creatures of the earth, has moral capacity and extensive technological abilities which, together, impose specific moral and political responsibilities upon us as a particular species of animal with a unique capacity and ability to shape our environment.

A second common view of the relationship between humanity and nature is that humans are a "natural alien" (Evernden, 1985). This view argues that, even though humanity has grown out of nature, we have established ourselves apart from the systemic interdependence of natural systems. Our independence is based upon the human ability to utilize technology to create our own environment 'outside' the natural order.

The consequences of technology are subtle but extensive, and one such consequence is that man cannot evolve with an ecosystem anywhere. With every technological change he instantly mutates into a new—and for the ecosystem an exotic—kind of creature. Like other exotics, we are a paradox, a problem for both our environment and ourselves.

(Evernden, 1985: 109)

The alienation of humanity from nature may be evaluated as either a good or a bad outcome. Most economists would view it favorably, since distinguishing humanity from nature and any interdependence, obligations or responsibilities, allows us to use nature, without moral strictures, toward the material enhancement of human life. For the market paradigm, evolving past nature to become "exotic" grants us our place at the top of the food chain, as that 'creature' who has the power, and therefore the obligation, to make the best life possible utilizing current technology to exploit the environment as a resource.

Those who view the alienation of humanity from nature as a bad thing have a variety of reasons for this judgment. Some view this situation as a 'truth' with moral ramifications, while others ignore the ethical dimensions, isolate humanity and focus on the ecosystems left behind by our exotic species as the primary subject of analysis. Among this latter group are most scientists who, when they speak of ecosystems, include humanity only as an afterthought or as a potential perturbation. Studies and experiments in natural science examine biological diversity of non-human plants and animals, and the interference of humanity in the otherwise ongoing evolution of natural systems, but do not fully integrate human and natural systems nor suggest that the former has specific obligations to the latter. The many sub-disciplines of the life and physical sciences studying the patterns

and complexities of natural phenomena do so without specific concern for humanity's place (Abrahamson and Weis 1997), while fields like conservation biology examine humanity only in terms of our separate functioning as whole populations or societies (Primack 1993; Odum 1993; Chapter 6). We are never an integral part of a larger whole or unique individuals with moral capacities and value.

Acknowledging the moral ramifications of human alienation from nature provides a bridge to our third approach to the humanity↔nature question: humanity has obligations to nature specifically based upon our capacity to evolve past its internal mechanisms.

Man remains in nature even if the range of choice he enjoys seems incomparably greater than that of other species. Others are made to their world, while man must construct one with constant risk of error. (Evernden, 1985: 118)

Our third approach provides a new definition of Ecosystem, based on Kant's argument that humanity is unlike any other product of nature on earth (Kant, C3: 429-439) because we are both moral and technological. Unique in the moral discourse of life, we alone hold ourselves to self-generated moral and legal strictures or standards of interrelations. We are also technologically singular, for even if other creatures can be recognized as using tools for construction (e.g. beavers, monkeys, ants), we have evolved the most sophisticated technology on earth, creating our own complex artificial environments.

This view of the humanity↔nature dialectic also acknowledges that a complex two-way moral↔functional interdependence characterizes our new sense of ecosystems. We are subject to natural constraints, but we place more complex and potentially devastating constraints on natural systems than any other species of animals. This dilemma has both empirical and normative implications for policy and law. We have transcended nature but bear duties to it, and our duties speak directly to how we utilize our knowledge, science, and technology to create a life for ourselves on earth while respecting the pattern of natural systems that surrounds us and which produced us.

Understanding our duties can further assist policy makers. But what provides the basis of our duties? Referring to the four-way table of values (Figure 1), our obligations do not just concern the instrumental value of man to nature or nature to man, but must speak to what is essential, or intrinsically valuable, about ourselves and the natural world. Emphasizing the third perspective on the relation between humanity and nature, an Ecosystem from the Kantian approach needs to include the biotic and abiotic elements of both natural and human systems. This includes humanity's moral agency and its artifacts, machines, and social, political, legal, moral, and economic constructions as well as plants, animals, and their environment. The inter-systemic nature of this Ecosystem is located in the dialectic balance between human and natural systems, but the key to this 'balance' lies in the moral responsibility specifically allocated to humanity to define its creativity and expressions of agency conscious of both our own and nature's intrinsic value.

From a policy point of view, an Ecosystem is the dialectic intersection of human and natural systems which must be considered in public choice. Within a Kantian paradigm our alienation forms an imperative to publically define our responsibilities as moral and technological creatures and to politically achieve that particular balance between human creativity and natural evolution that allows the essential intrinsic value of each to persist in harmony with one-another.

Natural Systems: A Starting Point

Using Ecosystem Policy & Law the policy-maker needs to consider the science of biological, chemical, and physical systems and how they persist and evolve. But more importantly, they must be able to value them primarily for what they are, and not for what they can do for humanity.

To acknowledge the foundational imperative of natural systems is to acknowledge that all life begins with the evolution and progress of nature. The earth and its "life-support" systems (Drury, 1998; Odum, 1993) are a primary level of policy concern, not only because of the scientific or empirical functioning of these systems and processes, but for the purposes of making collective choices concerning them. Unlike the market paradigm with its foundation in the positivist distinction and devaluation of moral considerations in policy choice, both the *fact* and *value* of natural systems forms the foundation of Ecosystem Policy.

The market paradigm's fundamental devaluation of normative concerns for empirical analysis has its origin in David Hume's argument that what is (fact) cannot render what 'ought' to be (value). This both distinguishes facts from values and promotes the former into prominence in policy analysis. However, Ecosystem Policy and Law arises from a diametrically distinct assumption. It posits that values can be derived from facts, that what 'is' can directly determine what ought to be, that the normative imperatives and empirical facts of a policy are interrelated or dialectically interdependent. Therefore, in order for the Kantian approach to be operationalized, what has been called the 'is-ought distinction' (Ryan, 2021) must be overcome. This is a prerequisite to making risk regulation more anticipatory and inclusive of intrinsic values.

Hume contends that statements of fact cannot directly render value imperatives because one is distinct from the other (Hume, 1740: 469). Applying Hume's contention to our subject-matter, the fact of an Ecosystem's persistence cannot lead to a moral imperative that it ought to be preserved. However, this perception of difference between is and ought is based on a very restrictive theory of morality which is not founded upon human reason, but on what Hume calls "the passions" (1740: Bk. II). Hume's premise, as I interpret it, assumes that morality is based in sentiment and that sentiment is alien to reason. Since reason is limited to the definition of empirical fact, while only the passions are associated with moral matters and agency, it follows logically that is and ought are constituents of distinct logical lines of thought process and argument and therefore one cannot be deduced from the other. However, because Kant promotes reason over passion and provides a non-sentiment-based foundation for the values involved, our Ecosystem

Design approach allows the policy-maker to move from situations of fact (e.g. a natural system is empirically unique) to moral imperatives (e.g. it ought to be preserved by public policy). In effect, we are bypassing the positivism inherent in Hume's assumptions and moving toward the application of practical reason to public choice, as Kant's paradigm allows us to do.

Hume assumes that reason applied to empirical reality is, by nature of the exclusive connection between moral value and sentiment, value-free. But is it? If practical reason not only delineates facts, but assigns value (based upon those facts), could a policy-maker not use a scientific assessment of a natural system to draw moral imperatives about that system? How might they do so? I suggest that the functioning and persistence of natural systems represents the moral value at issue. Nature is assumed to have no morality, which is an anthropomorphic attribute, but it can have value as a self-generated, self-perpetuating web of natural components. Within this interconnected systemic whole, each sub-system could be assumed to have value as it evolves through various states of homeostasis. Within Kant's paradigm, the fact of functionality then has essential or intrinsic value to the persistence of the whole. But here we are speaking of functional integrity, not moral integrity.

Nature is a functional entity that predates us, produced us, and has the probability of continuing to exist long after us (Kant C3: §82-82). This functional independence is a fact, but a fact that compels a moral duty for humanity. Since we can disrupt this independent functioning, and also because we depend upon it, if we owe any duties to ourselves or others, then we also owe duties to nature, both in terms of the good of ourselves and the 'good' of nature as an 'other'. Contrary to Hume's formulation, humanity's moral duties to nature can be deduced from the fact of natural systems functionality (Gillroy, 1996; 2000; 2013).

Pertinent from a policy point of view, is the fact that natural systems function on their own. Morally, the primary value of these systems, internally or externally, requires that they be protected, empowered, and allowed to persist over time. Since humanity is the only group of moral agents on the planet, it is our responsibility to assume this charge. The 'facts' of nature define an intrinsic value that is not based on human contact or use of the environment, but is founded on the idea of nature as a functional end-in-itself. For the Kantian paradigm, the empirical persistence of natural systems and their internal functions have value to humanity, not because they are necessary to his economic prosperity, but because they are an essential prerequisite to his freedom. Practical reason assigns duty to action in support of the persistence of nature as an empirical world of cause and effect. Amoral within itself, nature is the subject of human moral responsibilities and obligations, due to our ability to cause disruptions in nature's empirical persistence over time.

If reason is a moral attribute of humanity, and it is possible that we can deduce an obligation from a set of facts, then both is and ought are subject to the same logical framework and can be part of the same policy argument. Hume's variant of the "naturalistic fallacy" (Moore, 1903; Frankena, 1967; Searle, 1967) is, in reality, the fallacy that the sentiments are the only human capacity capable of moral motivation, action or evaluation.

Human Systems: Artifice and Obligation

Humanity deduces its obligations to nature from the fact of the empirical existence and functioning of natural systems. This contention assumes that humanity, as another level in the total Ecosystem policy argument, is capable of moral thought that combines reason and duty made imperative by critical moral principle. This suggests another dimension of the is-ought dilemma that is also addressed by Ecosystem Policy & Law.

All human creation is artifice, an addition to nature. For Kant's paradigm, the creation of the artificial, however, carries with it a moral capacity. First, we must set standards for our actions based upon our duties to ourselves and others (including nature) and, second, we must maintain these standards despite the exploitive possibilities suggested to us by our cumulative knowledge and our fabrication of technology. This ability to set standards suggested by duty and maintain them reflects our capacity to decipher the difference between what *is* possible and what *ought* to be done. Specifically, our knowledge and ability to take a certain course of action does not automatically invoke it as a proper course to be chosen. The ability to construct nuclear weapons may be a matter of scientific and technical expertise, but the actual construction of these weapons, and then their employment, in contrast to their scientific creation, are distinct *moral* choices.

To make this distinction between is and ought a person must possess the moral capacity to judge the difference. But what is the nature of this moral capacity? From where does it arise? What obligations does it place on the moral agent? Using Kant's paradigm, I contend that this moral capacity is defined by the concept of autonomy, which is derived from and transcends our understanding of the persistent evolution of nature. Obligations arise from this moral principle which require the person to respect not only their moral autonomy and that of other humans, but the functional integrity of nature.

From nature we learn that we are functional entities with an existence that has purpose as part of the ongoing evolution of the natural world. We begin to reflect about our needs and how we can continue to persist within the environment around us. We can also divide the normative world into its fundamental moral categories: social conventions or process-norms, and the critical principles based on non-contextual reasoning that amend these conventions (this is the aforementioned process-principle dialectic argued to be fundamental to policy and law).

We are first, part and product of the causality of nature and this determinism dominates our thoughts, actions, and beliefs. From this, we derive social conventions, as Hume pointed out. Our artifacts include justice as defined in terms of those conventions which allow us to anticipate the actions of others and cooperate toward shared goals (Hume 1740, 489-90). However, as Kant argues, in addition to the determinism of nature that is our ancestry, we also inherit the possibility of critical reflection that empowers us as agent-causes in the world. This is based upon the idea of freedom and the capacity to make decisions derived from one's own standards, not arising solely from convention, but from

freedom which, for Kant, is a universal and necessary assumption for human reason (Kant, C1: B446-7; C2: 31-3). The human realization of the critical principle of freedom can be described as the true point at which the individual becomes the "natural alien" transcending the natural world. This is an ethical epiphany that results from the reflective process identified by Annas as originally Greek or Stoic.

To live naturally, in fact, involves an inner change, without which outer changes are useless; we must start to reflect on what kind of being we are, what our needs are and so on. Clearly we cannot do this in a way which keeps ethics right out of it. The appeal to nature gives shape to a demand to come to terms with ourselves from an ethical point of view. . . ethical improvement is seen in terms of my increased rational ability to come to terms with and modify the given aspects of my life.
(Annas, 1993: 219-220)

In the inventory of needs and interests, we come to understand that, in addition to existing in the causal reality of the natural world, the person can also be a first cause himself in the satisfaction of needs and the creation of the world around him.

Kant's paradigm contends that, in order to be a human being, one must acknowledge freedom as the capacity to be an agent-cause in an otherwise deterministic world. This acknowledgment of one's "moral" capacity to have an effect on one's own and other lives evolves into one's capacity for autonomy. Autonomy then becomes the capacity to reason practically about one's existence and to act by intellectually approved principle in order to further one's ability to have a higher order moral control over one's life (Kuflik, 1984). Acknowledging freedom propels the person from the functional world of natural causality into the political and moral world of humanity and human communities. Because of the concept of freedom, one can assume obligations and duties, including those that utilize this freedom in ways that are not contrary to autonomy in the person or functionality in nature.

But how is nature part of human autonomy? As previously explained, all moral evaluation is human or anthropomorphic. I suggest that one can acknowledge the anthropomorphic fact of moral value without devaluing the non-human world. The idea of the evolution of morality and freedom evolving from pre-existing nature gives us a conduit to establish a concept of autonomy that does just that: a theory that respects nature as part of human autonomy without devaluing it.

If nature is the point of origin for human ethical thought, it is because the existence of nature as an independent and self-generating entity gives it cause to continue, while it simultaneously give us reason to protect and facilitate this evolution. If our realization of freedom comes from our reflection on this need, and this reflection itself begins with existence, then the first moral thought could be: because I exist, I ought to persist in that existence. This realization could not come without the experience of nature and our understanding of its systemic processes (e.g. life, death) from which we arose. Functional ecosystems are both necessary and sufficient for the continuation of natural wholeness or

integrity. But while the same can be said of humanity physically, our ethical dimension makes functional existence necessary, but *not* sufficient, to the full moral agency or integrity of the person.

In Kant's paradigm, the advent of morality is the genesis of duty. Duty defines our obligations, but to what? If nature generates humanity, and we then transcend nature with our capacity to be a free agent-cause, then the subjects of duty fall nicely into two primary categories: our obligations to humanity and our responsibilities to nature. If, as Kant suggests, we are defined by our capacity to have and express freedom, and freedom is described in terms of autonomy as a higher order control of one's life, then our duties to humanity would be to support autonomy in ourselves and in others. Our duty to nature could then be defined within either of these categories.

As a duty to ourselves, we might define nature as a necessary prerequisite to our freedom, as the context of our morality and the point of departure for both our physical and spiritual being. In these terms, nature is critical to who we are and therefore of vital importance to our essential freedom, or our capacity to be human. Our duty to nature is necessary to our autonomy; this instrumental value is not optional but essential. Nature is valued as much as autonomy; both are equal and interdependent in defining one's humanity.

However, our duties to nature are also independent of the instrumental value of nature to our autonomy, if we define obligation to nature as an external entity falling under our duties to others. The duty to other humans appears straight-forward as a duty to their autonomy. After all, if the standard of human morality in oneself is autonomy, it is reasonable that this same standard also marks others as moral ends in themselves and worthy of respect. Respect for nature however, since it lacks moral capacity or autonomy, must be defined by a distinct sense of intrinsic value, one that marks what is necessary and sufficient to the organic integrity, or whole intrinsic value, of nature. The functional integrity of nature offers such a definition.

I have argued that nature is a whole entity in terms of systemic function; it is a self-generating, persistent, and evolving whole with many parts and sub-systems. The wholeness of nature defines its intrinsic value and our moral obligation to respect the natural world independent of its instrumental use to us. To adequately evaluate and respect nature, the persistence and evolution of individual natural systems, apart from their human use, should become the gauge of our success.

IMPLEMENTING ECOSYSTEM POLICY & LAW

“THE DOGMAS OF THE QUIET PAST ARE INADEQUATE TO THE STORMY PRESENT.
THE OCCASION IS PILED HIGH WITH DIFFICULTY AND WE MUST RISE WITH THE OCCASION.
AS OUR CASE IS NEW, WE MUST THINK ANEW AND ACT ANEW.
WE MUST DISENTHRALL OURSELVES, AND THEN WE SHALL SAVE OUR COUNTRY.”

ABRAHAM LINCOLN¹³

A Kantian alternative to the market approach to environmental risk is, alone, insufficient to establish an anticipatory, autonomy-based regulation of environmental risk. We have, perhaps, already imposed irreversible risks on ourselves and the biosphere. To reverse course on the way we approach the relationship between humanity and nature, we need to do two things: first, we need to formalize the thought process by which to derive, like the Kantian alternative, additional foundational paradigms for environmental regulation based on whole, systemic philosophical arguments. Second, with this method in hand, we need to drastically change our approach to environmental risk and environmental regulation in general; that is, we need to apply the appropriate paradigms to the appropriate dilemmas and ‘act anew’ to ‘save’ not just ‘our country’ but the human race.

For 150 years the social sciences have struggled to understand humanity from the vantage point of observing and experimenting with our superficial behaviour and preferences. This phase of social science strove to understand the human status-quo and worked from the obvious human character traits, basing its studies on such assumptions as self-interest, power and conflict. This mapping of the superficial human landscape was a critical prerequisite to an understanding of humanity, but, while necessary, it is not sufficient. It facilitates a basic knowledge of what one can observe about how we think and act, and the probable motivations and consequences of our actions. But it cannot adequately address more essential concerns about what constitutes human nature, how individual agency creates the social context we experience and what real constraints or incentives shape human life. Anyone who wishes to understand the human condition well enough to design policy and law that speaks to the intrinsic values involved and how our ideas become law through policy argument must not rely solely on science and positivism to limit uncertainty and justify legitimate policy. They must also understand the various pre-positivist philosophical arguments for definitions of practical reason and the concurrent imperative for agency that these philosophical systems demand, designing policy and law accordingly as the case requires.

Unlike the positivist bias, that has made cost-benefit the primary point of departure for both critical and constructive environmental policy argument, this new approach to utilizing Enlightenment paradigms for policy choice creates a level of complexity necessary to understand both the status-quo of what ‘is’, and to make effective arguments about what ‘ought’ to be. To facilitate change we need this further depth of knowledge, that allows us not only to decipher, but to effectively redesign the human condition, given the

¹³ Address to Congress, December 1, 1862.

requirements of human agency that seem not just ‘real’ but required’ to achieve a public end. This necessitates an understanding of the essence, or full complexity, of the human being and our natural context, as a basis for deliberation and choice in policy and law.

Specifically, social science, public policy and law have reached a level of maturity where they need to replace positivist methods and epistemology with a consideration of a completely distinct, prior, Philosophical Method.¹⁴ This will more accurately illuminate not only what happens within the policy process, but what essential traits, principles and dialectics are involved in making policy and law and how these might be adjusted to initiate change and a more just or beneficial outcome. A new level of investigation is required, a philosophical investigation. A new philosophical method of analysis, complementary but prior to scientific method will enable us to focus on the substructure of those physical circumstance and consequence that have been the preoccupation of social science to date. We need to lay out a fuller conceptual framework for empirical investigations. But uncovering the complexity of this philosophical substructure is a daunting task. Or is it?

Pre-positivist Enlightenment philosophers, like Kant, can provide ready-made logical maps of human nature, practical reason and moral agency.¹⁵ To empower effective change in human law and policy, we can, first, begin with these alternative arguments, or sets of premises, for human complexity. Second, we can harness them as alternative paradigms that allow us to translate essential understandings of the human experience into transformative policy and legal designs for the future. This is a call for a new era of *Philosophical-Policy & Legal Design* (PPLD).

With PPLD, we can implement Ecosystem Policy & Law through the use of many different paradigms with distinct definitions of practical reason generating different imperatives for agency, both in the service of evaluating and ‘designing’ policy and legal change. Within this chapter, the characteristics of environmental risk have been examined and distinct Kantian goals have been set for an alternative design approach. Kant’s PPLD suggests that a new design approach must be based upon the central role of anticipatory environmental regulation, autonomy-based administration, and an expanded definition of ‘Ecosystem’ in the policy decision-making process. Ecosystem has been redefined, not in terms of isolated natural systems and their interaction, but as the dialectic tension between natural and human systems. Having traced the origins of moral capacity in humans arising out of, and then transcending, nature, we subsequently suggested that there are two intrinsic values with which an Ecosystem approach must concern itself: human moral autonomy and the functional integrity of nature.

Environmental risk policy is riddled with uncertainty. That uncertainty is as much an ethical-moral, as a scientific, dilemma and understanding the full range of moral categories of value and the tradeoffs between those values is critical to making sound

¹⁴ See, Collingwood note 10.

¹⁵ This also suggests that the use of primary sources (e.g., Hume, Kant) should precede and inform any consideration of secondary literature in terms of framing the contemporary within the whole, systematic and comprehensive context of the original philosopher’s argument.

public choices. The administration of risk questions becomes a matter of sorting instrumental from intrinsic value and setting standards that protect the essential ethical and functional qualities of living things (e.g., keystone species, old growth forests, non-toxic air and water), while placing the burden of proof on those who would put them in jeopardy, especially for the promotion of elective market preferences.

The moral demands of uncertainty in risk decision-making require a theoretical paradigm that considers ethics as an anthropomorphic activity that regards nature in non-human terms without devaluing it. Further, uncertainty requires that policy design encompass intrinsic as well as instrumental value and the tradeoffs between these. The policy choice should be characterized by its concern with collective goods and what action, at the baseline, will solve the coordination problems involved. Decision-makers should elevate both the facts of environmental dilemmas and the values involved, promoting the inherent values of acts over the consequences they produce (e.g., protecting bio-diversity through wise-use over classification of habitat by considerations of its economic benefit and cost).

Within the context of Kant's PPLD, we can define duties both to humanity and our intrinsic value, but also to the environment both as a necessary instrumental ingredient in human autonomy and as an independent functional end-in-itself. No longer do we separate the environment into resources and sectors from the point of view of the economy. Instead, we design law and policy that divides the economy into extraction, manufacturing, and disposal interfaces and examines all law that is relevant to a particular socio-economic function simultaneously (e.g., not distinct clean air and water acts, but a comprehensive pollution from manufacturing and use act).

The demands of Kantian environmental risk management are facilitated by this new design model. The requirements of risk anticipation and planning, within a context of autonomy-based policy standards, requires the economy to serve the environment and not the reverse. Policy is refocused onto the dialectic of the intrinsic values involved. The risk-conscious society requires that each potential risk be analyzed both scientifically and morally in order to replace pervasive risk with a degree of protection and certainty. This consciousness further requires that assessments be made to determine how human activity affects the interface between humanity and nature, *ex ante*, before a product or technology is allowed into the environment.

Considering the stealth, latency, and irreversibility problems of environmental risk, our alternative paradigm offers a design model that defines the law in terms of a core focus on intrinsic value and the hierarchy of nature, state, and then market. Kant's PPLD paradigm will provide an administrative model comprehensive enough to examine environmental characteristics and their economic requirements given the specific function at hand (e.g. extraction, manufacture, or disposal). In this design model, the active state coordinates human collective action in terms of our individual and social duties to the balance of essential capacities between humanity and nature.

Only with a change in the foundational assumptions of our policy paradigm can legal design transcend the conventional design model where economic principle and assumptions determine the boundaries of politics and the uses of the environment on a media-by-media or resource-by-resource basis. In designing policy and law, Kant's PPLD provides a moral theory that can accommodate intrinsic as well as instrumental value, where the latter is not limited to economic definition. In order to answer the questions generated for the public manager (e.g. What can be designated a resource? What can be extracted? How will this be done?), Kant's PPLD sets distinct moral and non-economic standards for choice, making its philosophical capabilities more adequate than those of the market paradigm, for making policy in the complex world of environmental risk.

These questions make no sense in a simpler policy space where all natural material is subject to extraction by any efficient means given 'willingness to pay'. To the principle of Kaldor efficiency as the operating imperative of the market paradigm, everyone and everything is a resource and subject to extraction and use, limited only by the preferences and technology available. Such a paradigm cannot accommodate the preservation of a natural system from resource exploitation. It has no way of justifying a non-resource decision and it cannot argue that our use is trumped by our duty to the intrinsic value of a natural system. Comparing the market and Kantian alternatives through the lens of PPLD, one can see the differences based on sorting each model's essential values and assumptions into a common matrix.

Figure 3 About Here

Kant's PPLD, provides for a risk-conscious society rather than a no-risk or profitable-risk evaluation standard. This new strategic model can be employed to provide a standard for identifying and defining acceptable resource use and how and if nature ought to be extracted, polluted, or put at risk, given our dual responsibility to ourselves and to nature. The new design model provides a workable framework with which we can 'think anew' on a foundation of autonomy-based ethics and Ecosystem Policy & Law and 'act anew' in terms of the anticipatory-managerial demands of environmental risk. It only remains to ask: can we 'disenthrall ourselves' from established practices and theoretical conventions before it is too late?

SELECTED REFERENCES

- Abrahamson, Warren G. and Arthur E. Weis. 1997. *Evolutionary Ecology Across Three Trophic Levels*. Princeton: Princeton University Press.
- Aharoni, Yair. 1981. *The No Risk Society*. Chatham: Chatham House Publishers.
- Allison, Henry E. 1990. *Kant's Theory of Freedom*. New York: Cambridge University Press.
- Anderson, Charles W. 1979. "The Place of Principles in Policy Analysis." *American Political Science Review* 73: 711-723. Reprinted in Gillroy and Wade 1992, Pp. 387-410
- Annas, Julia. 1993. *The Morality of Happiness*. New York: Oxford University Press.
- Aristotle. (PL) 1905. *Politics*. (Trans. by Benjamin Jowett) Oxford: Clarendon Press.
- Andrews, Richard N.L. 1999. *Managing The Environment, Managing Ourselves: A History of American Environmental Policy*. New Haven: Yale University Press.
- Aune, Bruce. 1979. *Kant's Theory of Morals*. Princeton: Princeton University Press.
- Axelrod, Robert. 1984. *The Evolution of Cooperation*. New York: Basic Books.
- Bohman, Brita. 2021. *Legal Design for Social-Ecological Resilience*. Cambridge University Press.
- Bobrow, Davis B. and John S. Dryzek. 1987. *Policy Analysis By Design*. Pittsburgh: University of Pittsburgh Press.
- Buchanan, Allan and Gordon Tullock. 1963. *The Calculus of Consent*. Ann Arbor: University of Michigan Press.
- Buck, Susan J. 1991. 1998. *The Global Commons: An Introduction*. Washington D.C.: Island Press.
- Campbell-Mohn, Celia, Barry Breen and J. William Futrell. 1993. *Environmental Law from Resources to Recovery*. St. Paul, MN: West Publishing.
- Collingwood, R. G. 1933/2005. *An Essay on Philosophical Method*. Oxford Clarendon Press, 1933.
_____. 1992/2005. *The New Leviathan or Man, Society, Civilization & Barbarism*. Revised ed. Oxford: Oxford University Press, 2005.
- Conservation Foundation. 1985. *Risk Assessment and Risk Control*. Washington, D.C.: Conservation Foundation Press.

DiIulio, John H. Jr. 1994.(ed.) *Deregulating the Public Service*. Washington, D.C.: Brookings Press.

Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.

Drury, William Holland Jr. 1998. *Chance and Change: Ecology For Conservationists*. Berkeley, CA: University of California Press.

Elster, Jon. 1979. *Ulysses and The Sirens: Studies in Rationality and Irrationality*. Cambridge: Cambridge University Press.

Evernden, Neil. 1985. *The Natural Alien: Humankind and Environment*. Toronto: University of Toronto Press.

Fishkin, James S. 1979. *Tyranny and Legitimacy: A Critique of Political Theories*. Baltimore: Johns Hopkins.

Frankena, William K. 1967. "The Naturalistic Fallacy" in Foot. *Theories of Ethics*. Pp. 50-63.

Gillroy, John Martin. 1991. "Moral Considerations and Public Choices: Individual Autonomy and the NIMBY Problem" *Public Affairs Quarterly* 5: 319-332.

_____. 1992a. "The Ethical Poverty of Cost-Benefit Methods: Autonomy, Efficiency and Public Policy Choice" *Policy Sciences* 25: 83-102. Reprinted in Gillroy and Wade 1992. Pp. 195-216.

_____. 1992b. "Public Policy and Environmental Risk: Political Theory, Human Agency, and the Imprisoned Rider" *Environmental Ethics* 14: 217-37.

_____. 1992c. "A Kantian Argument Supporting Public Policy Choice" in John Martin Gillroy and Maurice Wade, eds. *The Moral Dimensions of Public Policy Choice: Beyond the Market Paradigm*. Pp. 491-515.

_____. 1993. (ed.) *Environmental Risk, Environmental Values and Political Choices: Beyond Efficiency Tradeoffs in Policy Analysis*. Boulder, CO: Westview Press. [Reissued by Routledge Publishing 2018]

_____. 1994. "When Responsive Public Policy Does not Equal Responsible Government" in Robert Paul Churchill, ed. *The Ethics of Liberal Democracy: Morality and Democracy in Theory and Practice*. Oxford: Berg Publishing.

_____. 1996. "Kantian Ethics & Environmental Policy Argument: Autonomy, Ecosystem Integrity and Our Duties To Nature" *Ethics & The Environment* 3: 131-58 (1998).

- _____. 2000. *Justice & Nature: Kantian Philosophy, Environmental Policy, and the Law*. Washington D.C.: Georgetown University Press.
- _____. 2009. "A Proposal for 'Philosophical Method' in Comparative and International Law" *Pace International Law Review*.
- _____. 2013. *An Evolutionary Paradigm For International Law: Philosophical Method, David Hume & The Essence Of Sovereignty*. New York, Palgrave-Macmillan.
- Gillroy, John Martin and Maurice Wade, 1992. (eds.) *The Moral Dimensions of Public Policy Choice: Beyond the Market Paradigm*. Pittsburgh: University of Pittsburgh Press.
- Gillroy, John Martin & Breena Holland with Celia Campbell-Mohn. 2008. *A Primer For Law & Policy Design: Understanding The Use Of Principle & Argument In Environmental & Natural Resource Law*. West: American Casebook Series.
- Gordon, George J. 1992. [4th ed.] *Public Administration in America*. New York: St. Martin's.
- Graham, John , Laura Green, and Marc Roberts. 1988. *In Search of Safety: Chemicals and Cancer Risk*. Cambridge, MA: Harvard University Press.
- Green, Donald P. and Ian Shapiro. 1994. *Pathologies of Rational Choice Theory*. New Haven: Yale University Press.
- Grim, John. 1983. *The Shaman*. Norman: University of Oklahoma Press.
- Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science* 162: 1243-45.
- _____. 1993. *Living Within Limits*. New York: Oxford University Press.
- Hardin, Russell. 1971. 1982a. *Collective Action*. Baltimore: Johns Hopkins University Press.
- _____. 1982b. "Difficulties in the Notion of Economic Rationality." *Social Science Information* 23: 436-67. Reprinted in Gillroy and Wade 1992. Pp. 313-24.
- Hargrove, Eugene. 1992. "Environmental Ethics and Non-Human Rights" in Eugene Hargrove, ed. *The Animal Rights--Environmental Ethics Debate*. SUNY Press.
- Hegel, G.W.F. *Outline of the Philosophy of Right*. [1820] 2008. (ed. T.M. Knox; Trans. S. Houlgate). Oxford: World Classics.
- Henderson, David E. 1993. "Science, Environmental Values, and Policy Prescriptions" in John Martin Gillroy, ed. *Environmental Risk, Environmental Values, and Political Choices*. Pp. 94-112.

Hume, David. [1740] 1975. *A Treatise of Human Nature*. (ed. by L.A. Selby Bigge) Oxford: The Clarendon Press.

Kant, Immanuel. *Gesammelte Schriften*. Berlin: Prussian Academy of Sciences. {All references are by Academy Page, Book [BK] Section [§] and/or Volume [V]}. The following initials, dates and volume numbers indicate particular texts.

(GW) 1786. *Groundwork For A Metaphysics of Morals*. [V4]
(C1) 1787. *First Critique: Critique of Pure Reason*. [V3(A)/V4(B)]
(C2) 1788. *Second Critique: Critique of Practical Reason*. [V5]
(C3) 1790. *Third Critique: Critique of Judgment*. [V5]
(TP) 1792. *Theory and Practice*. [V8]
(RL) 1793. *Religion Within The Limits of Reason*. [V6]
(PP) 1795. *Perpetual Peace*. [V8]
(MJ) 1797. *Metaphysics of Morals: Principles of Justice*. [V6]
(MV) 1797. *Metaphysics of Morals: Principles of Virtue*. [V6]
(AT) 1800. *The Anthropology*. [V7]
(OP) 1803. *Opus Postumum*. [V21; V22]

Kuflik, Arthur. 1984. "The Inalienability of Autonomy." *Philosophy and Public Affairs* 13: 271-298. Reprinted in Gillroy and Wade 1992. Pp. 465-90.

Laver, Michael. 1981. *The Politics of Private Desires*. New York: Penguin Books.

_____. 1986. *Social Choice and Public Policy*. Oxford: Blackwell.

Lehman, Scott. 1995. *Privatizing Public Lands*. New York: Oxford University Press.

March, James and Herbert Simon. 1958. *Organizations*. New York: John Wiley & Sons.

Moore, G.E. 1903. *Principia Ethica*. Cambridge: Cambridge University Press.

National Research Council. 1983. *Risk Assessment in the Federal Government: Managing the Process*. Washington, D.C.: NRC Press.

Odum, Eugene P. 1975. *Ecology: The Link Between the Natural and Social Sciences*. New York: Holt, Rinehart & Winston.

_____. 1993. [2nd. ed.] *Ecology and Our Endangered Life-Support Systems*. Sunderland, MA: Sinauer Assoc.

Olson, Mancur. 1971. *The Logic of Collective Action*. Cambridge MA: Harvard University Press.

Ostrom, Elinor. 1990. *Governing the Commons: The Evaluation of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Page, Talbot. 1973. *Economics of Involuntary Transfer*. Berlin: Springer-Verlag.

_____. 1978. "A Generic View of Toxic Chemicals and Similar Risks." *Ecology Law Quarterly* 7: 207-244.

Page, Talbot and Douglas MacLean. 1983. *Risk Conservatism and the Circumstances of Utility Theory*. Pasadena, CA: California Institute of Technology. Mimeo.

Primack, Richard B. 1993. *Essentials of Conservation Biology*. Sunderland, MA: Sinauer Associates.

Rodricks, Joseph V. 1992. *Calculated Risks: The Toxicity and Human Health Risks of Chemicals in Our Environment*. Cambridge: Cambridge University Press.

Ryan, Philip. 2021. *Facts, Values, Policy*. Polity Press.

Schattschneider, E. E. 1960. *The Semi-Sovereign People*. Hinsdale, IL: The Dryden Press.

Searle, John R. 1967. "How to Derive "Ought" from "Is"" in Phillipa Foot, *Theories of Ethics*. Pp. 101-14.

Sen, Amartya K. 1974. "Choice, Orderings and Morality" in Stephen Korner, ed. *Practical Reason*. New Haven: Yale University Press, Pp. 54-67.

_____. 1982. *Choice Welfare and Measurement*. Cambridge, MA: Harvard University Press.

Shrader-Frechette, K.S.. 1993. *Burying Uncertainty: Risk and the Case Against Geological Disposal of Nuclear Waste*. Berkeley, CA: University of California Press.

Simon, Herbert A. 1982. *Models of Bounded Rationality Vols. 1 & 2*. Cambridge, MA: MIT.

Smart, J.J.C. and Bernard Williams. 1973. *Utilitarianism: For and Against*. Cambridge: Cambridge University Press.

Taylor, Bob Pepperman. 1992. *Our Limits Transgressed: Environmental Political Thought In America*. Lawrence, KS: University Press of Kansas.

Viscusi, W. Kip. 1983. *Risk by Choice*. Cambridge, MA: Harvard University Press.

_____. 1992. *Fatal Tradeoffs: Public and Private Responsibilities for Risk*. New York: Oxford University Press.

Willig, John T. 1995. *Environmental TQM*. New York: Wiley.

FIGURE 1

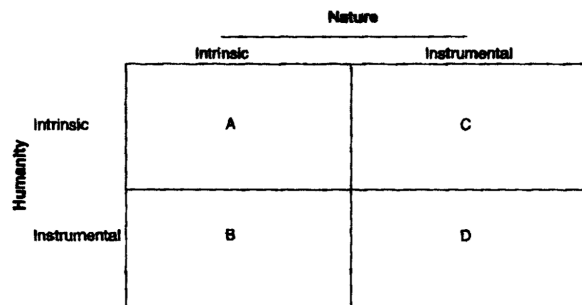


FIGURE 2

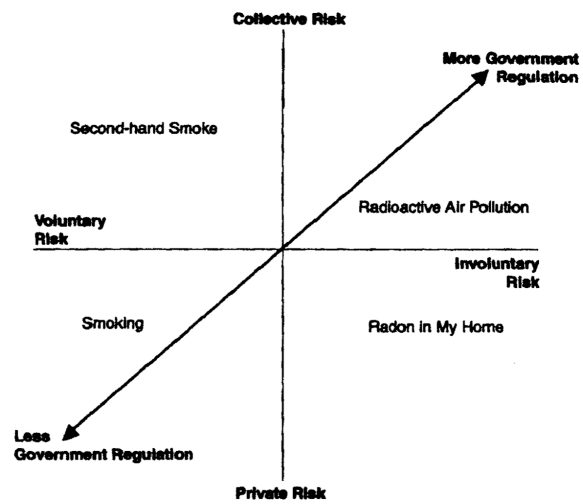


Figure 3

PPLD: MARKET

The Individual <i>Passion ↔ Reason</i>	Collective Action <i>Utility ↔ Right</i>	Role Of The State <i>Passive ↔ Active</i>
Self-Interested Consumer Where Passion Is Driving Reason	PRISONER'S DILEMMA: SOLVED BY INVISIBLE HAND: Collective Action In The Name of Social Welfare/Utility With Merely A 'Thin' Theory Of Right As Wealth Preference	MINIMAL STATE: Passive To Empower Markets & Mimic Them When Market's Fail
Policy/Law Operating Imperative = KALDOR-HICKS EFFICIENCY: Hypothetical Transfer As A Potential Pareto Improvement		
Material Instruments of The Policy-Maker = PRIVATE PROPERTY-Goods Priced By Money in Terms Of Supply-Demand. Allocated To Maximize Or Optimize Wealth		
Shorthand Policy-Legal Priority = COST-BENEFIT As Equation For Present Value $PV = \sum_{t=?} B_t - C_t / (1+r)^t$		

PPLD: Kant

The Individual <i>Passion ↔ Reason</i>	Collective Action <i>Utility ↔ Right</i>	Role Of The State <i>Passive ↔ Active</i>
Moral Agent: Practical Reasoning Potentially Moral Agent With a Predisposition To Act Ethically & Predilection To Self-Preservation	Assurance Game: Duty To Facilitate Right Over Utility In The Empowering of Moral Agency	Active State: Anticipating Requirements of Justice From Autonomy In Providing Assurance For Active Citizenship
Policy/Law Operating Imperative = {Justice-From-Autonomy} Ethical ↔ Juridical ⇒ Principle of Right		
Material Instruments of The Policy-Maker = {Innate Right To Achieve Active Citizenship} Freedom = Protecting Ecosystem Integrity Equality = (Re) Distribution of Property Independence = Providing Opportunity		
Shorthand Policy-Legal Priority = The Baseline ⇒ (E ^I , p _i , o _i)		