

Natural Resources in the Boardroom: Implications for Management Education

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Natural Resources (NRs) underpin all human material productivity. Their scope is both transboundary and transgenerational. As such they transcend authority conventionally associated with governments and with individual corporations, provoking well-described imperfections of both. And, they accumulate effects of marginal decisions, across boundaries and over time. NR availability constrains opportunity to realize Human Rights recognized in the Universal Declaration, related *e.g.* to the material standard of living, public health, or access to education¹. And, NRs are fundamental to any approach to the twin challenges of sustainability and development.

Understanding NR interactions is *available now* to any business person with a portable computer and network access. Individuals command decisions at this scope within an *informed global network of persons*,² who must cooperate at scales of space and time that are consistent with those of the resource itself. The associated obligation requires a shared sense of moral direction. Management education must prepare persons for this dimension of moral complexity.

Of the three necessary elements in NR understanding³ – “physics”, ownership/governance, and value – the last two are perfused with moral content. The first carries a burden of understanding, the prelude to moral reasoning. It is useful to pare situations to their bare essentials: Natural Resources and Humans, both irreducible elements of creation, and explore what human institutional forms their interactions require.

Accordingly we recommend a three-part “unit” within management education:

- Natural Resource Systems, emphasizing natural and social interactions;
- Human Rights and Responsibilities, and their philosophical foundation;
- Institutions of Governance: forms, capabilities, needs.

The overriding theme is Responsible Stewardship in the service of authentic human flourishing, and its realization first among professionals, and then in corporations and governments.

1) Natural Resources

Resource abundance and distribution exhibits complex dynamics over space and time. It reflects natural processes that exhibit their own dynamic; and their human utilization reflects the facts of value, ownership and a host of collateral considerations contributing to governance.

Resources can be roughly sorted into a 2-way classification illustrated in Figure 1; the generic cases of oil, water, and fisheries are illustrated.

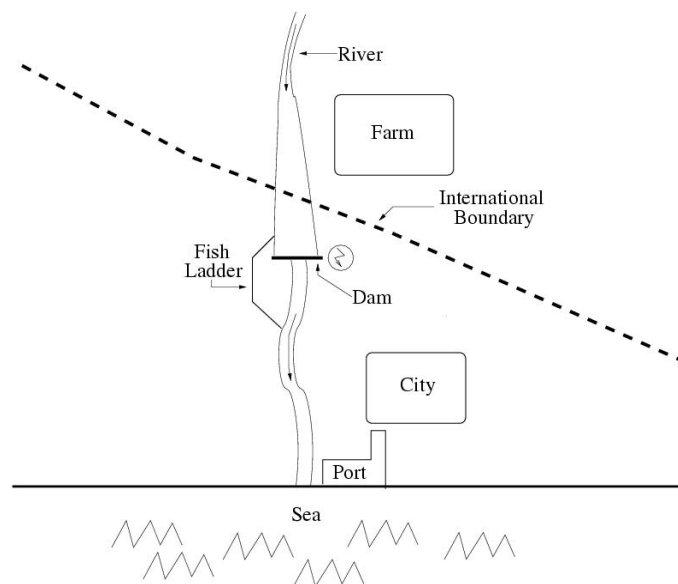
	Exhaustible S	Renewable Q
Sterile	Oil	Water
Living	Fish ← → Fish	

Figure 1. Classification of Natural Resources

Much can be said about these categories. Modern analytical tools support simulation and optimization of natural resource systems in all of these categories, on platforms widely available: laptop computers, networked data bases, simple simulators including excel and matlab. The wide availability of Linear, Integer, and Mixed-Integer Programming capability in otherwise very simple packages (e.g. the Excel Solver) makes the on-line use of simulation and decision theory a very real possibility. Such a decision-support capability is available today in contemporary corporate settings, matching the global scale of operations.

Scarcity pervades each category, in various specific senses. In all cases, however, there is a context of finiteness that must be shared among individuals who must collaborate at the relevant scale – achieving collective management of a common-pool resource.

Below we illustrate a simple example water-resource system, analyzable in the environment described above. One only has to imagine the collection of persons and institutions concerned with governance here. Without conceptual coherence – a sense of what is to be achieved – we have chaos.



2) Human Rights

The Universal Declaration of Human Rights⁴ (UDHR, 1948) is arguably the greatest document of the 20th century. It is aspirational, expressing “a Common Standard of Achievement”; it binds no one except by its moral authority (reflecting an “overlapping consensus”⁵ in moral and political theory.) Two subsequent Covenants (1966) (on Civil and Political Rights, and on Economic, Social and Cultural Rights) have been widely ratified (1976), acquiring the force of international law. The themes of Natural Resources and their responsible use toward realizing Human Rights, permeate these documents.

The Basic Documents. The Charter of the United Nations⁶ (1945) anticipated a Declaration of Rights. The UDHR Preamble reveals the intention that rights and their realization are its central concern. Individual articles are short on direct reference to Natural Resources; but three articles are worth noting:

—“Every person has the **right** to a **standard of living** adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care ...” (Art 25)

—“Everyone is entitled to a **social and international order** in which the rights and freedoms set forth in this Declaration can be fully realized” (Art 28)

—“Everyone has **duties** to the community in which alone the free and full development of his personality is possible.” (Art 29)

Clearly, economic wellbeing is among the **rights**; and a proper social order is necessary to their fulfillment. Perhaps most noteworthy, everyone has a **duty** to provide. While it is common to look to governments as the providers of rights, Article 29 is clear that it is “Community” in general and not solely governmental organizations.

The International Covenant on Civil and Political Rights (ICCPR) was finalized in 1966 and came into force in 1976. It affirms the purpose of the UN and the UDHR in placing Human Rights at centerstage; and their inherent origin. And significantly, it magnifies the sense of responsibility introduced in the UDHR. The Parallel Covenant on Economic, Social, and Cultural Rights (ICESCR) shares the same Preamble, with minor rewording.^{7 8} While the UDHR expresses intentions, the two Covenants, once ratified, bind the states parties with force of law.

Scarcity and Economic Rights.^{9 10} The Economic Covenant has at its core, the assumption of scarcity, and we have argued above that any economic right implies a right in the inherent Natural Resources. Articles 11 (standard of living; hunger) and 12 (health) of the ICESCR are noteworthy. Both articles are remarkably comprehensive; they invite elaboration, especially when confronting implementation options. This is achieved through the General Comments.

Implementation of ICESCR – the General Comments¹¹. Initially, interpretation of the ICESCR was the responsibility of the UN Economic/Social Council. In 1985, this authority was transferred by ECOSOC to the Committee on Economic, Social and Cultural Rights. Beginning in 1989, that Committee has been issuing ‘General Comments’ on the Covenant, resolving ambiguities and matters of implementation. The Comments are *interpretative* of recognized rights, they do not assert *new* rights. They are considered authoritative in international law and bind the States Parties.

Among others, the rights to food, housing, healthy environment, and water are asserted in the Comments and have immediate implications for Natural Resources.

Right to Food. Relative to Article 11, the Right to Food has been refined in General Comment 12 (1999).

In it the right to food is asserted along with a right to Natural Resources necessary to its production. Adequacy, sustainability and availability are aspects of this right.

Right to Housing. Also relative to Article 11, the Right to Housing is elaborated in General Comment 4 (1991). Sustainable access to the resources necessary to housing, and to the related infrastructure, is echoed here.

Right to a Healthy Environment. Article 12 is elaborated in General Comment 14 (2000). It connects Health to the rights to food, housing, safe water, sanitation, and the environment. (There is mention of the array of professions necessary for realization.)

Right to Water. General Comment 15, (2002), expanding on both Articles 11 (Standard of Living) and 12 (Health) makes clear the Right to Water, invoking both quantity and quality of supply..

The General Comments clarify many things relevant to the present discussion:

- That natural resources are foundational to human rights
- That resource scarcity is to be dealt with in a rights context, logically *prior* to financial considerations
- That there are responsibilities for fulfillment beyond the instruments of government
- That rights of *access* are generally recognized, not rights to own
- That rights of future generations are recognized
- That a sustainability criterion is pervasive
- That subservient to ICESR Articles 11 (Standard of Living, Hunger) and 12 (Health), the comments confirm and elaborate Rights to Food, Housing, Healthy Environment, and Water.
- The implementation details beyond simple government responsibility begin to emerge in the comments.

As constituent parts of ratified Covenants, the Comments elevate Natural Resources to the level of Rights enforceable in national law, across countries in which multi-national corporations are active.

3) Rights and Responsibilities

Rights imply responsibilities. This duality is stated in the foundational UDHR (Art. 29). It continues to be a central concern of the General Comments.

Hohfeldian Rights. Hohfeld¹² provided useful clarity on the notion of Right. Four types are distinguished: claim-right; liberty; power; immunity. The first two (claim-rights, liberties) are the most common but not exhaustive. Each has three parts: party A, party B, and the action verb V in question. There is a correlation between right and duty in this analysis; their expression is reversible. For example: A has a *claim-right* that B should V, if and only if B has a *duty* toward A to V.

This 3-term schema is “act-oriented”. The popular 2-term scheme (A has a right to B) is “thing-oriented”, neglecting the action V. It must be translated into a 3-term version for practical use. When the 2-term form is used, the duty to fulfill a right goes unassigned or is defacto assigned to ‘everyone’ or ‘the state’. This works in the case of negative rights that can be protected by law

against all infringement. But in the case of positive rights, it is necessary to assign positive responsibility.

Thing-oriented Human Rights are problematic in the case of a finite resource R. If “no one may interfere with A’s right to R” then the end point is a race to total exhaustion of R. If “no one’s enjoyment of R shall be infringed” then all rival use is prevented. Imprecision here about responsibility, and the details of rival resource use, makes wildly different outcomes possible; the rights language becomes dysfunctional.

The Natural Law Base of Rights and Responsibilities. Finnis¹³ provides a comprehensive description of the Natural Law basis for Human Rights¹⁴. The account is rooted in an elaboration of seven Basic Forms of Human Good: Life, Knowledge, Play, Aesthetic Experience, Sociability (friendship), Practical Reasonableness, Religion. These are logically separate and describe constitutive aspects of the human person (as opposed to merely instrumental goods).¹⁵ They are the basis of Human Rights.

Interesting among these is Sociability. It involves “.. acting for the sake of one’s friend’s purposes, one’s friend’s well-being.”¹⁶ It is a fundamental form of good, and therefore underpins part of the ‘why’ of the goodness of human rights and the concomitant obligation to act. Action on the part of others’ fulfillment is itself constitutive of Human Rights; and therefore any instrument that severs rights from responsibilities is not faithful to an authentic view of the human.

There is obvious overlap here with the contemporary description of “Common Good” when generalized beyond the limits of politics¹⁷. (Economics has developed the related notion of “merit goods”¹⁸ although the notion is controversial.^{19 20 21})

George emphasized the natural law basis of rights and duties; and the importance of being precise about correlative duties. “The rights language can be useful, but clarity is necessary about each right, how it is to be honored, and by whom”²², reinforcing the Hohfeldian discussion above. Maritain described a process of natural law being recognized in common law, then in *positive law and social institutions generally*²³.

Pacem in Terris. In 1963, John XXIII issued *Pacem in Terris*²⁴, addressed to “all men of good will”. This document met with considerable ecumenical approval^{25 26 27}, in the height of the cold war. In it the UDHR was praised and related explicitly to the Natural Law base; and the duality of rights and responsibilities is clearly emphasized.

The work goes beyond restating the UDHR, its Natural Law principles, and the duality of rights and responsibilities; toward the responsibilities of persons in all walks of life toward fulfillment. Included are responsibilities of professionals to engage the task and to construct *institutions* toward fulfillment.

Benedict XVI re-emphasized the importance of universal human rights, and their natural law foundation in natural law and revelation, in his 2008 address to the United Nations.

Responsibility and its Underemphasis. There is wide consensus about the duality of rights and responsibilities. It extends beyond the realm of philosophy to the arts, religion, education, science, and social science. The search for social structures that channel personal responsibility into coordinated action, has proven difficult.

Glendon ²⁸ called attention to the distortions apparent in current discussions when rights are severed from responsibility. The orientation toward human flourishing is applauded; but in focusing only on individual freedom, and forming language around that, one loses a sense of obligations to fulfill rights. This is understandable in the light of history; yet ultimately needs repair. Several authors (*e.g.* Hodgson²⁹; Etzioni³⁰) reviewed similar themes.

4) Institutions Connect Rights and Responsibilities

The connections among Rights and Responsibilities are diffuse, remote and complex. The ‘problems’ are remote from action, diffused broadly among many people; and the remedies require both expertise and coordination among many actors. Not knowing how to connect the two leaves one helpless:

“No wonder many of us find it more comfortable to persevere on the abstract concept of human rights: the numerous and disparate areas for which we could assume responsibility threaten to overwhelm us.”³¹

The problem of coordination is itself a matter of Responsibility. It demands that individuals both acquire important skills, and deploy them within social structures that deliver Rights. *The social architecture -- institutions and their interactions -- is not given; it needs to be invented.*

“One of the greatest challenges, especially for individualistic Americans, is to understand what institutions are - how we form them and how they in turn form us - and to imagine that we can actually alter them for the better.”³²

A standard remedy is to look to governmental structures for the coordination. This is historically reasonable given the reconstruction problems that were prevalent at mid-century³³. But government is not enough. In particular, Natural Resources do not conform to political boundaries. Nor do they align with corporate spheres of influence. Yet, Natural Resources exert fundamental constraints on the human prospect, now and in the future. It is *human* expertise, directed through *human* organizations, that is needed. The organizations themselves must be developed toward this end. *Humans are responsible* as simultaneous bearers of rights and duties.

Institutional Development. Ostrom³⁴ addressed the general problem of governing Common Pool Resources. This important development introduced three related (and widespread) theoretical structures: the game-theoretic prisoners’ dilemma; Hardin’s *Tragedy of the Commons*; and Olsen’s *Logic of Collective Action*. All 3 share the setup: people act in self-interest within a system, but cannot change it or its rules. Embedded in this first assumption is only two inevitable and extreme outcomes: a) dictatorial authoritarianism over resources; or b) free destruction of resources under a dictatorship of individual liberty. In both outcomes, absolute authority is imposed from without.

A series of case studies disproves the necessity of these outcomes. Individuals *can* evolve a governance system that does better than these extremes; and Ostrom offers empirically-supported ‘design rules’ that carry explanatory power.³⁵ Overall, the ‘model’ of the person-in-community is clearly at fault, hence simple prevailing theories fail to explain the facts. Subsequent studies develop the game-theoretic foundations of these ideas further.³⁶ A more general theoretical foundation for institutional analysis includes subsequent developments.³⁷ One take-away message: people can make the rules – they are not necessarily prisoners of an imperfect model of the human being.

Pogge³⁸ emphasized personal responsibility for rights violations, channeled into institutional reform, in particular redressing imperfect overlap of governmental and corporate entities.

Drobak³⁹ emphasized the close coupling of social norms and positive law; the strong causative influence of norms on the law. The importance of a valid model of the human being in devising institutional forms, is highlighted by Stout⁴⁰, who is careful to distinguish behavior (observable) from motivation (deducible with the right model). The widely discussed model of *homo economicus* is addressed not by questioning the assumption of rationality, but by looking at “other-regarding preferences” as a way of evaluating the assumption of selfishness. This and related work reinforce the importance of the conceptual model of the human person in the construction of institutions – beyond those of positive law – and the interpretation of human interactions within them.

Sen⁴¹ emphasized that legal analogies to moral thinking are often incomplete or inadequate, in particular relative to human rights. “...normative rights cannot be adequately understood as potential legal rights in waiting, and the analogy with legal rights ... may well have muddied the waters.” Among the difficulties mentioned are the perfect correlation between right and duty, a useful construction in positive law but limiting in natural law and in its expression in behavioral norms.

Diouf⁴² commented on the overlap of governance, and ultimately the reliance on personal responsibility.

It is not possible to suggest a single institutional structure here. But, absent clarity about aspirations, none can emerge and survive. Accordingly, any statement of responsibility must emphasize a broad front of institutional creativity, with a uniform set of goals. In fact, creating that institution for our time is among the largest and most vital challenges we face.

Three Institutional Forms. There are two classic types of governance institutions, governmental and corporate. Much is written about the right sorting of authority among these forms. We assert a *third form*, the *professional* institution⁴³.

Figure 2 illustrates this idea. This is a ‘4-agent’ scheme with the three institutions at the vertices, connected by solid lines indicating coordination. People are represented at the center, connected to all three institutional types. These connections are dotted to emphasize that people are simultaneously clients and providers – bearing both rights and responsibilities.

Creative cooperation is necessary among the three institutional types. Each must understand its unique contributions, accept the necessity of positive synergy with the others, and bring this vision ‘home’ to its own members. In the present context, this translates into ‘fitting’ institutional form to the essential problem of Natural Resource governance; and innovating within the forms.

Institutions mediate between rights and responsibilities. These three forms represent three distinct **loci of responsibility**, three types of engagement, three ways of structuring the delivery of rights.

- Institutions of Government enact and enforce laws, organize currency and markets, manage interface with other nations, protect civil society
- Corporate institutions deliver goods and services through market mechanisms
- Professional institutions cultivate and aggregate specialized knowledge; and direct it to its destinations.

These are our instruments. They all overlap in Natural Resources Governance.

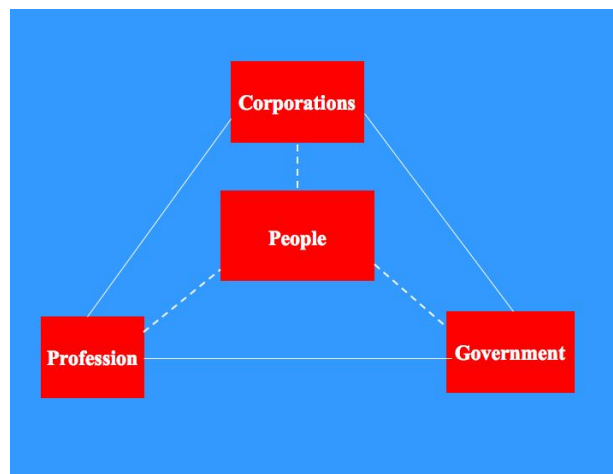


Figure 2. Three Institutional Forms of Governance⁴⁴.

Synopsis: Management Education

We recap the three axes of management education suggested at the outset.

1) Natural Resource Systems. It is a premise here that quantitative analysis that integrates physical and social dynamics, is achievable in the boardroom. Emergent texts facilitate the exposition⁴⁵. They require supplements from conventional management topics including common property resources, market imperfections, public goods, and public finance. There are excellent new resources^{46 47 48 49} that supplement more classic treatments⁵⁰. Catholic principles including the universal destination of material goods; the stewardship of creation; the

individual/person distinction; and the inherent dignity of every person, need to perfuse this entire treatment.

2) *Human Rights and Responsibilities*. As suggested above, a fundamental understanding of the contemporary Human Rights regime is necessary. Special knowledge is needed of the intersection with Natural Resources. In addition to the materials cited and the source documents, there are several excellent overviews.^{51,52, 53} and the cited work of Finnis, Maritain, and other Natural Law theorists is foundational to any Catholic interpretation. It is critical to connect Rights to Responsibilities and to express the latter in professional action⁵⁴; and to understand the difficulties with a one-sided emphasis on Rights alone.⁵⁵

3) *Governance*. The role of professionalism is foundational to governance in this arena. Central to its understanding is the dual requirement of professionalism⁵⁶ – specialized knowledge, and its *direction toward the common good*. Presence of agreed-upon objectives in the latter, distinguishes professionals from occupational specialists. A Catholic anthropology enlightens the sense of common good in the manner described by e.g. Finnis. As Natural Resources spill outside conventional bounds of corporations and governments, the only recourse to proper governance is the professional exercising responsibility appropriate to the scale of the phenomena, and sharing that responsibility with individuals in other organizational units. Developing this sense of responsible governance toward shared goals, is beyond conventional educational goals that emphasize knowledge *per se*. The educational literature distinguishes “Cognitive” outcomes from “Affective” ones, the latter involving internalization of values. Affective outcomes may well be the distinguishing feature of Catholic education,⁵⁷ with moral formation occurring in the “Affective Domain” of learning.

All of these themes are imperfectly covered in isolation; the need for a broad, pan-professional commitment is needed⁵⁸. Where better to expect to see this than at the catholic university? There we have the opportunity to develop the common ideas of catholic philosophy and theology, anthropology, and responsibility for stewardship in the context of real contemporary problems, with the authentic development of the human person at the heart of all analyses.

About the Author: Daniel R. Lynch is MacLean Professor of Engineering Science at Dartmouth College in Hanover, NH; and Adjunct Scientist at the Woods Hole Oceanographic Institution. Lynch earned the BS and MS in mechanical engineering from MIT in 1972. He subsequently worked as a power engineer and as a quality assurance engineer in the manufacture of medical devices. In 1975 he entered Princeton University to pursue study in Water Resources, earning the PhD in 1978. He is an expert on simulation of the coastal ocean and in coupled physical-biological dynamics.

Current investigations focus on Sustainability, Natural Resources, and Professional Education. Included are visiting or sabbatical appointments at The University of Notre Dame (Melchor Visiting Chair) Fall 2001; and The Catholic University of America, School of Philosophy, 2003-04. He serves on the ASCE *Body of Knowledge* and *Sustainability* Committees.

Dr. Lynch is currently on leave at the Woodrow Wilson School of Public and International Affairs of Princeton University, where he is pursuing the project “Human Rights and Natural Resources: Recognition, Governance Structures, Realization”. While in residence at WWS, Lynch will also be completing the forthcoming text *Natural Resource Management for Scientists and Engineers*, in preparation for 2008 release.

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