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NETWORKS IN NATURE:
APPLYING CULTURAL ECOLOGY FOR STEWARDSHIP

A Thesis
Presented in
Partial Fulfillment of the
Requirements for the Degree of
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Abstract

The purpose of this research is to describe the historical context and systemic structure of the Western agrarian estate model to locate opportunities for strategic solutions to environmental degradation in a way that balances cultivated and conserved natural resources. In part 1, landholders are identified as a point of leverage in the agrarian system. Part 2 goes over the historical development of the Western estate and state traditions, which support landholders by having instituted land administration and information systems to enfranchise their activity. The systemic theory that underlies the Western model is outlined in part 3, describing how social and ecological arrangements are within a biophysical context. Part 4 discusses how information about interactive social and biophysical contexts can be applied to support environmental management as a cultural activity. Such an understanding focuses attention to natural resources and community as a singular system. To illustrate, part 5 is a case study that profiles a unique company, Iroquois Valley Farmland Real Estate Investment Trust, whose activities and way of thinking are reflective of the need suggested by the research: their activities enfranchise land managers in a way that balances the needs of natural resource ecosystems, specifically soil, and the needs of the communities who rely on the productivity of those resources, specifically agricultural produce. As a whole, the thesis engages in a pragmatic inquiry to describe the fundamental and reciprocal interconnectedness of human society, culture, and the natural environment in an effort to show the foundational importance of considering these as a complete system, an understanding which can guide refinement and evolution of economic and livelihood managerial practices in an effective, respectful, and generative way.

Key words

Natural Resource Management; Land Stewardship; Cultural Ecology; Sustainable Livelihood; Western Civilization

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In the case of decaying societies, it is most correctly prescribed that if they wish to be regenerated, they must be recalled to their origins.

For the perfection of all associations is this: to work for and to attain the purpose for which they were formed, so that all social actions should be inspired by the same principle which brought the society itself into being.

Pope Leo XIII

Rerum Novarum, or Rights and Duties of Capital and Labor

Introduction

To remedy the exhaustive and pollutive effects of the last several centuries' economic activity, it can be instructive to look to the beginnings of the Western economic system to better understand how the cultural administrative structures that exist today had once been more conscious of the natural environment which supports biological life. To do so, it is important to understand that human society is not separate from nature, but is wholly and inevitably contained within its ecology. This thesis attempts to clarify the contemporary situation by understanding environmental management as culturally ecological, considering the place-context of social activity. First, the agrarian foundation of the Western estate is outlined to show that livelihood engagement with an environment is led by individuals who base their decisions on their personal and shared knowledge of a place. The historical development of that relationship is then discussed to explain the structure of the Western land administration system that has endured to today, as well as to note the original awareness it contained of human links to the natural environment. This system is expounded upon to illustrate the conceptual infrastructure of livelihood-based economic and land management activities, which are integrally situated in the biophysical world.

In the beginning of the Second Millennium, the Western European estate model maintained a balance between the needs of settled society and those of the wider wilderness that supported its existence. Today, changes in environments and climates demonstrate that having lost sight of the realities of an immediate place and its natural processes has implications for the ecological stability of that location. By recognizing the agency

of individuals, the thesis suggests that contextual information about a place can influence the outcomes of decisions that landholding stewards make for a place by substantiating their ways of thinking about their activities and interrelationships. Using this contextual information for management is applied cultural ecology, a pragmatic activity that learns from action and refines practice to improve real effects. Since landholders rely on information as reference to guide their decisions about use of resources and maintenance of environments, they carry a unique amount of leverage over the condition of the natural environment and ecosystems. Their actions have real effects on the Earth and its biological ecosystems and populations. The original wisdom of the Western system recognized this bound interconnection; contemporary society can find substantial security in more faithfully adhering to such a consciousness of place.

Considering the history of the Western agrarian model is useful because it describes the base logic of the Western economic system, which itself is a large scale, collaborative livelihood activity. Looking at the origins and delineating the structural components of this system allows us to see that environmental and economic managerial strategies are ultimately social activities that are based in personal relationships to the land and within communities. Land management is led by individuals who make decisions based on their experiences and their understanding of how to use available resources to meet the needs of communities and environments. Implicating both people and place, decision-makers have real effects on a location's condition, including the health of a population (through food and ecosystem services) and the availability and conditions of resources (through production, marketplace activity and environmental maintenance). Today, the Western industrial economic model has become unsustainable, polluting and exhausting area-wide environments and natural resources, and has been guided by short term, market-based interests. Describing the original wisdom of the Western agrarian model as one that was more harmoniously integrated and conscious of its own ecology-in-place can help decision-makers direct resources and manage land in a way that reflects a social system and economy that balances the needs of people and supportive environments for today and for the future.

Having mentally removed itself from nature by Enlightenment dualism and technological innovation, the contemporary West can better understand that to survive, it must recognize that mental processes are constantly engaged with the physical environment that constitutes and facilitates its existence. Having moved away from original wisdom has allowed for distanced reflection, setting the stage for a revitalizing era of social

reacquaintance with environments, where action can be facilitated by contextual information that allows society to be more knowingly and carefully self-reflective than in the past. We have learned that industrialism has been a double-edged sword in its exacting power, both in creation and destruction. Its products and effects are ultimately guided by individuals, their thought processes, and their decisions made. The Industrial Era has enhanced human capacity for work, data storage, and communication, but does not substitute for the manual and cognitive exercises that are the active interrelationships between people, knowledge and biophysical conditions. The challenge for Western society is to utilize individual and collective ways of thinking as the medium through which meaningful action is performed.

Part 1 – Agrarian Foundations

Regional and global environments are the aggregate of many smaller divisions and point-sources of activity and externalities, so locating and supporting the responsibilities of decision-making about land cover and resource use is a way to encourage more holistic environmental management strategies. By looking at the medieval origins of the Western state, we will see that, at first, agricultural expansion was kept relatively at bay by a forest law, one of the first environmental laws in the Western system and a fundamental cultural aspect of original Western estate management. Subsequent economic development, however, overrode that protective instrument, and through imperial expansion, the Western economy evolved into today's global system.

Historical Condition

The story of any culture is one of an interaction between people and place, a negotiation between the needs of a community and realities of the environment and its available resources. Fundamentally agrarian, the modern Western model of land management took its essential form in the European Middle Ages, developing and refining administrative processes to provide for communities under its charge. A strategic model for territorial administration in the service of providing resources for populations, the large-scale, industrial economy of today has, at its core, maintained continuity with its original estate managerial structure, while its

success has at the same time obscured the original awareness of a place-based cultural system. Conventional understanding of the West is that it has linearly moved from an agrarian economy to an industrial one and beyond, taking its current form as an information-based service economy that outsources its productive and manual processes, including accompanying negative externalities in the form of environmental pollution and degradation of natural resources. It is indeed true that collective national attention has steadily moved away from physical processes to more abstract preoccupations, although it does not negate immediate biophysical needs of our bodies and environments.

The twelfth century estate management system was one which balanced cultivated, settled land with areas preserved in their natural conditions. This is important because as environmental managerial practices shifted from this balanced model to one which gave primacy to cultivation, large-scale agriculture has overridden and exhausted ecosystems like forests, grasslands and soil systems. We have historically seen the effects of degradation in the form of Roman deforestation of the Mediterranean, the Dust Bowl in the United States, and the ongoing destruction of equatorial rainforests for plantation cultivation. The right balance and integration of human use and protected preservation is different for each area of the world, where the needs of local communities differ based on available resources and cultural economic practices. What may be more important than the proportions of cultivation to conservation are the design and strategic managerial practices that affect the use, maintenance and preservation of natural resources. Provision of resources is a short-term oriented activity, and maintenance and conservation are longer-term ones which ultimately result in whether or not ecosystems like forests and soil can be generative in a way that provides for not only human society's needs, but also support non-human communities of plants and animals who affect the condition and functionality of ecosystems. Sustainability is a question of balancing the needs of today with those of tomorrow, and therefore there are both short- and long-term aspects to managerial decisions. Since "economy" is synonymous with "livelihood" as strategic activity of securing the necessities of life, it is important for decision-makers who manage resources to find the balance between short- and long-term managerial concerns. More fundamentally, then, it is a question of balancing use and maintenance of environments.

Estate Stewardship

The question that begins the agrarian agenda is, “*how may we best use the land?*”¹ An equally fundamental question for landholding stewards is, “*how may we best care for the land?*” These questions necessarily have many answers since each of the planet’s millions of human and natural neighborhoods and small parcels of land are different from the rest, defined by topography, soil type, climate, ecology, history, culture and local need^{2 3}. In Western society, these two questions were responded to first by using estate management principles to provide for the needs of a community, and then by supporting that estate system with wider land administration of regulations, arbitration options, and support programs that have evolved into the contemporary Western nation-state system. Looking at the foundational principles of land management upon which current state and economic systems are based can show where there are opportunities and leverage to respond to the pressing issues resulting from the conditions of the Earth’s natural environments.

The medieval state was one which relied on information for oversight of estate managerial activity by on-site land managers. Increasingly since, negative externalities such as land degradation from exhaustive agricultural practices and pollution from commercial activity have occurred with little consequence due to lack of immediate exposure to the effects, accompanying scrutiny, and oversight of localized activity. Great advances in technology and material production have come at the expense of attention to the biophysical conditions of natural ecosystems and personal and community health. Today, however, we’re able to use these same technologies to refocus and reinvest in our cultural situations, which are both social and environmental.

Landholders are stewards of capital that has been entrusted to them; they cannot be passive, so a main issue is how to design appropriate long-term ownership and stewardship strategies^{4 5}. Land tenure security and quality information support land management responsibilities, which can guide knowledgeable use of resources, inform standards and regulation development, and provide security for confident decision-making. The information must be channeled to those whose actions carry an amount of leverage within a system. Landholders

¹ (Wirzba, 2003)

² (Ibid.)

³ (Holmgren, 2002)

⁴ (Krosinsky & Robins, 2008)

⁵ (Levitt, 2005)

make decisions on the condition and use of land and natural resources, so supporting and informing their activities directly supports attention to environmental quality. As over-stretched economies threaten to cause institutional and environmental degradation, modern technologies and knowledge can be engaged to focus attention on the reconstitution of local, cultural and civilizational foundations- that is, natural environmental resources and the communities that depend upon and maintain them.

An ethic of stewardship calls for complex responsibilities of care-taking and giving-back; the idea of the immeasurable value of the resource is central⁶. Many farmers rate the social value of their land more highly than its market price- their need for land is as much psychological as financial⁷. Aldo Leopold's twentieth century conceptualization of land ethic reflects this ancient relationship to the Earth and concern for nonhuman habitat. He considered such an ethic to enlarge the boundaries of community to include soil, water, plants and animals as a singular collectivity⁸. Land ethic is demonstrated by pro-environmental behaviors and conduct; it is the individual and not the government or markets who is ultimately responsible for such behavior⁹. The agrarian estate model firmly positions land managers as the decision makers on the conditions and use of environments and resources under their control.

Landholder Leverage

Socioecological structures (cultures, communities and economies) are concerned with livelihoods: the ways of securing the necessities of life. Livelihood strategies are implemented to achieve goals based on certain contexts, institutions and available assets¹⁰. Thinking of situations as systems can help decision-makers anticipate and avoid negative longer-term consequences of well-intentioned solutions by identifying high-leverage interventions. Doing this focuses limited resources for maximum and lasting system-wide improvement, motivated and supported by continuous learning¹¹. These interventions are a form of risk management, which

⁶ (Wirzba, 2003)

⁷ (Dale & McLaughlin, 1999)

⁸ (Heberlein, 2012)

⁹ (Ibid.)

¹⁰ (Dalal-Clayton & Dent, 2001)

¹¹ (Stroh, 2015)

focuses on understanding and communicating the right information to the right people at the right time¹². As such, it is important to locate responsibility within a system by looking for ways the system creates its own behavior¹³ ¹⁴. In land management, it is the individuals and groups whose actions have real effects on the condition of environments. The value of information that supports these activities comes from delivering actionable knowledge to the people who can and will use it; without the right processes and people, the tools are of little value¹⁵.

Responsibility for actions taken in any situation is supported by feedback sent to decision makers, and this remains true for the design of land administration systems: information systems are required by a wide variety of users, ranging from agencies at all levels of government to landholders, lawyers, surveyors, valuers, and real estate managers¹⁶. Good management of land and property is an essential component of economic and social development, so land administration must not be treated in isolation from other activities. Administration is necessary, but not sufficient alone, to ensure that development is beneficial and sustainable¹⁷. Missing information is one of the most common causes of system malfunction, and adding or restoring information can be a powerful intervention since better information will bring better understanding of a system and create opportunities for generative operation¹⁸ ¹⁹.

The function of a land administration system is to support the management of real property, including the physical Earth and all things attached to it. Land information systems underpin this administrative process and support public agencies and private actors in the management of resources. This way, decisions can be made more effectively, and governments are better able to enforce environmental, and other, regulations²⁰. If sustainable development is to be a reality, then states, organizations and land managers need to model and measure the impact of human activity on the natural environment- that is, to use the data evidenced in scientific

¹² (Coleman, 2011)

¹³ (Ibid.)

¹⁴ (Meadows, 2008)

¹⁵ (Loshin, 2013)

¹⁶ (Dale & McLaughlin, 1999)

¹⁷ (Ibid.)

¹⁸ (Ibid.)

¹⁹ (Meadows, 2008)

²⁰ (Dale & McLaughlin, 1999)

research and community knowledge²¹. This information is needed to monitor activities in order to identify areas needing attention, to evaluate strategies for dealing with problems or opportunities, to assist in selecting the right course of action, and to facilitate the implementation of the decision²². Estate-management driven social networks were established early in the history of the Western land-management model, and these facilitated the coalescence of large-scale jurisdictional administration, resting on social conventions like private property, wide-area community collaboration, and interpersonal conflict resolution.

Part 2 - The Historical Estate

In the early twelfth century, the contemporary Western state model began to emerge from an ongoing interaction between the developing French and English states. The Norman colonization that came with William the Conqueror's claim to and taking of the English throne in 1066 was important because his administrative style contained a concern for the natural environment as an important part of social culture and a check on civilizational encroachment onto wilderness ecosystems. The king's influence and decision-making power over his territory as his own estate is an important aspect of the early Western state model, although the importance placed on preservation was put to the side in subsequent state development to favor less-hindered crop cultivation. Exploring the origins of these institutions and instruments for environmental management will illustrate the fundamental systemic decision-making structures that can be enhanced by modern technology and information resources.

Origins of the Western State

Between 1000 and 1300, the essential elements of the modern state took shape: political entities with a basic core of people and lands; permanent institutions for financial and judicial business; groups of professional administrators; and a central coordinating agency. The early stage of state-building and bureaucracy in England

²¹ (Williamson et al, 2010)

²² (Dale & McLaughlin, 1999)

and France was one of estate managers, and this outlook continued to dominate the bureaucracy even after new and more specialized offices were developed²³. Estate managers centralized the scattered revenues of a landholder's territories, and the availability of these managers allowed lords and kings to preserve their disparately located lands²⁴. By 1300, the king of England had sovereign power: he made laws which were binding on men in the kingdom, and he taxed his lay subjects directly and repeatedly. Since his area-wide influence evolved into the authority to grant and/or confirm titles to property, it became natural that the king and his court would settle disputes over possession of and rights to land²⁵.

The first permanent institutions in Western Europe dealt with internal and not external affairs²⁶. These medieval states were law-states, and the typical expression of internal sovereignty was the right to make law, to act as judge, and to appoint judges^{27 28}. These structures for judicial administration were preconditions of internal order, security of profits, and recognition of claims²⁹. The duty of the king was to see that justice was done throughout his realm, and the prestige of the courts of law allowed most disputes to be settled by peaceful means³⁰. The area-wide stability cultivated by connections between local communities and ruling courts created opportunities and incentives to develop permanent governance institutions for land and communities based on the twin ideals of keeping the peace and protecting possession.

Bureaucratic Tendencies

It is difficult to create permanent, impersonal institutions without written records and official documents³¹. The creation of such institutions was facilitated by registries on identity and rights, important for any kind of arbitration that might be engaged in by the courts. As such, the tie between sovereign and subject

²³ (Strayer, 2016)

²⁴ (Ibid.)

²⁵ (Ibid.)

²⁶ (Ibid.)

²⁷ (Ibid.)

²⁸ (Benton, 2010)

²⁹ (Ibid.)

³⁰ (Strayer, 2016)

³¹ (Ibid.)

was defined as a legal relationship, and the state, as centralizer of the civic community, became recognizer of legitimacy and personhood. The rule of law depends on particular kinds of rules about rules, or statements about ordering, that encompass the relations between rule, exception and the structural relation of multiple arenas of law and political authority³². The bureaucratic principle of value-free, rule-bound neutrality in administration provided the level of indifference needed for rules to be considered the same for everyone and for all to be treated equally under the law³³.

Not only did the bureaucratic regularity establish a sense of legitimacy for legal authorities, it was further encouraged by regular participation of local leaders in the administration. In England, internal security was preserved not by the use of force but by the acquisition of timely knowledge and the establishment of a network of personal relationships between the working members of the king's council and influential local leaders; this increased centralized knowledge of local conditions for administration and governance³⁴. The individual security made possible by this collaborative style of rule further stabilized the estate governance system. The collectivity of landholders under the king's area of influence acquiesced his sovereignty for the sake of the public order that his system offered, while keeping him accountable (enforced through Magna Carta) to the subordinate rulers and population who relied on his administration and enforcement of justice. It was the bureaucratic structure of the estate-system that supported defense of individual rights of legitimized enfranchisement with systematically gathered and registered evidence.

The historically collaborative nature of Western territorial administration relies on a certain amount of information, especially to be used by estate managers and state administrators, and this remains true today for legislative regulation by officials and the groups who provide them with researched information on which to base policy and decisions. These basic administrative foundations of the Western state system and livelihood culture are fundamental to the support of environmental management practices. Since landholders and territorial administrators are responsible for the condition of an estate or a state, based on the enforceable rights to decision-making about the condition of an area, the leverage found in their individual positions, responsibilities

³² (Benton, 2010)

³³ (Graeber, 2015)

³⁴ (Strayer, 2016)

and managerial choices have real implications for the sustainability of their practices and the resulting real effects on land, natural resources and communities.

Forest as Civilizational Balance

The word 'forest' originates as a legal term, referring not to woodlands in general but only to royal game preserves. Norman kings had taken it upon themselves to place public bans on vast tracts of woodlands to forbid cultivation, exploitation or encroachment by the public domain in order to insure the survival of wildlife, which in turn would insure the survival of a fundamental royal ritual: the hunt³⁵.

These hunter-kings appear as the first public or institutional conservationists in Western history. If forests in the juridical sense had not been introduced during the Middle Ages, forests in the natural sense may well have begun to disappear from the face of civilized Europe long ago³⁶. What constituted a forest was governed by the idea of privilege granted by the king to wildlife to live in freedom and safety within the afforested areas of his kingdom. These laws were to preserve the vert and venison, the former indispensable to the survival and well-being of the latter. In this way, we see that forests were treated as habitats; to house wildlife, the chase of which linked humanity to wilderness through the prehistoric need to hunt, it was essential that these habitats were in the condition to support it. If the forest ceased to be a sanctuary for wildlife, it was no longer considered a forest.

An essential dimension of the king's personhood belonged to the forest, as it was in wilderness that the hunt ritualized and affirmed the king's ancient nature as civilizer and conqueror of the land³⁷. This cultural dimension of society was embodied and represented by the king, his primal nature permitting him to be both protector and ruler of his kingdom³⁸. By privileging certain places as forests, the king declared them off-limits to the encroachment of history. The very space of history must be contained, restricted and held in check under the assumption that the voracious world of social humanity must be prevented from assimilating the land entirely to

³⁵ (Harrison, 1992)

³⁶ (Ibid.)

³⁷ (Ibid.)

³⁸ (Ibid.)

its own ends: the wilderness beyond the walls of the court belonged every bit as much to nature as the civilized world within those same walls³⁹. It was felt that sanctuaries of original nature must continue to exist, and in such sentiment the ecological environment is considered as habitat not only for the wild animals in the woods, but for civilization within the wider natural world.

The social and physical dependence we have on the natural world for its supportive processes was undeniable to the Norman rulers. Forest laws were most widespread in the late twelfth and early thirteenth centuries but diminished with the Charter of the Forest in 1217, which was issued in the spirit of Magna Carta to scale back some of the restrictions placed on the population in regard to their interactions with woodlands and uncultivated areas. Making those lands available for farming encouraged conversion of those fertile lands to pasture and crops, which gave primacy to livelihood economics over conservation needs of wider, supportive ecosystems. A thousand years ago, land managers did not have the scientific information that exists today that would have explained and supported the legitimate need of conservation laws and balanced managerial practices. Reflecting on the historical development demonstrates the essential logic of the original and robust administrative structure of the West that has endured and developed over the centuries.

Part 3 – Estate-Based Livelihood System

The historical estate model of Western territorial management has provided landholding stewards with a robust land administration system to support in-place environmental management. Wide-area communities collaborate in the group livelihood that is social economic activity, and the decision-making process that guides activity is underpinned by an understanding of the actions, resources, living beings, and ecosystems of a place. Delineating the systemic structure of this arrangement can help explain the place of decision-making land managers within the system, and how their choices have effects on the real environment.

³⁹ (Ibid.)

Oikos

The Western state is one based on estate management of several parcels of land over a territory, and the influence that can come from wide-area administration. The European states which emerged after 1100 combined, to some extent, the strengths of both empire and city states: they were large and powerful enough to have excellent chances for survival, and at the same time, they managed to get a large proportion of their people involved in, or at least concerned with, the political process, succeeding in creating some sense of common identity among local communities⁴⁰. The area-wide arrangement was reflective of smaller, more individual estate management structures, and is ultimately a scaled version of the same place-based, livelihood logic.

The English word for “state” is from the French word “estate,” itself from Latin, meaning “condition”. The Western state system considers its territory a type of singular estate, a networked aggregation of many smaller parcels. The Greek word and concept for “estate” is “oikos,” referring to the interrelationships of a family, a family’s property, and the house. The Western state recognizes itself as an “economy,” which means “customs or habits of an ‘oikos.’” “Ecology” is also derived from this term, and refers to the logic, the structure, the active habits, and the managerial processes of an area. This oikos settlement arrangement is a landscape, and parallel with the concept of ecology, refers to the functional interrelationships of different elements of a place⁴¹. The community oikos and the unitary oikos are conceptual “homes,” and are analogous to habitats. Whether the habitat is a forest for animals, the wilderness containing civilization, settled homesteads, or the biosphere itself, oikos principles remain the base logic of these structures: active life within a supportive environment.

The cultural landscape of a place refers to the dynamic physical relationships, processes and linkages between societies and environments. How individuals perceive the environment and the values, institutions, technologies and political interests of a place result in strategic planning, management goals, and objectives⁴². Humans exist not separately from but rather within the biophysical world as meaning-giving social organisms who constitute their landscape through acts of naming and dwelling, and who in turn are constituted in multiple

⁴⁰ (Strayer, 2016)

⁴¹ (Johnson, 2007)

⁴² (Thorbeck, 2012)

ways by both physical and social processes and situations that influence their production⁴³. These are acts of cultural economy: practical engagement with the real world is an active one, and human and natural systems are dynamic and interconnected in continuous cycles of mutual influence and response^{44 45}.

Nature and culture are interactively related in landscape: each creates and defines the other, and one cannot be made sense of without an understanding of the other. Behind the timber frame of a house lies a complex system of timber management, starting with the maintenance of woodland ecosystems over decades and even centuries⁴⁶. Since livelihood and economic activities are dependent on and wholly contained within the natural environment, the condition of this space concerns all actors involved. In considering how stewardship of a place can best be performed, it is essential to question the nature of the space and place, in terms of location, resources, use values, and what it means to those who use resources from there⁴⁷.

Livelihoods as Action Situations

Livelihoods, or the ways that we obtain the necessities of life, are action situations. Action situations are the arenas in which people make decisions that have impacts, outcomes, costs and benefits. The context of these arrangements has important conditioning effects and implications on the decisions that need to be made, as well as the results of those. It is important to be able to visualize this system and recognize the position of individuals within wider contexts because such awareness serves as a basis for self-reflection, for recognizing responsibilities as well as opportunities within a wider systemic situation. This information can serve as the basis for conversations among decision-making stakeholders, which can then guide the actions taken by individuals who are in the position to have real effects on contextual conditions. Figure 1 is a conceptual model of an action situation as outlined by Elinor Ostrom:

⁴³ (Johnson, 2007)

⁴⁴ (Ibid.)

⁴⁵ (Thorbeck, 2012)

⁴⁶ (Johnson, 2007)

⁴⁷ (Ibid.)

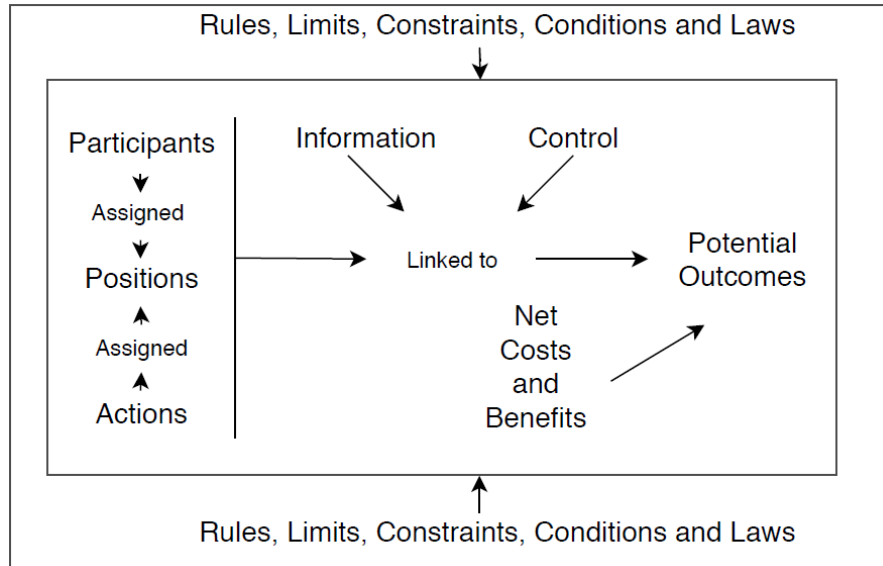


Figure 1. Action situation (Ostrom, 2005)

Participants-in-position make decisions based on their control over a situation and the information they have about it. Rules exist to guide, constrain, and inform action, and exist as norms, conventions, laws, and physical limits. Rules have influence on action situations and effect what kinds of outcomes are possible or expected, to a degree. They are part of the wider context of activity, among other exogenous variables such as biophysical and material conditions, attributes of a community, and the effects of the outcomes and impacts of the aggregate of action situations being performed at any time. Figure 2 shows the action situation in context:

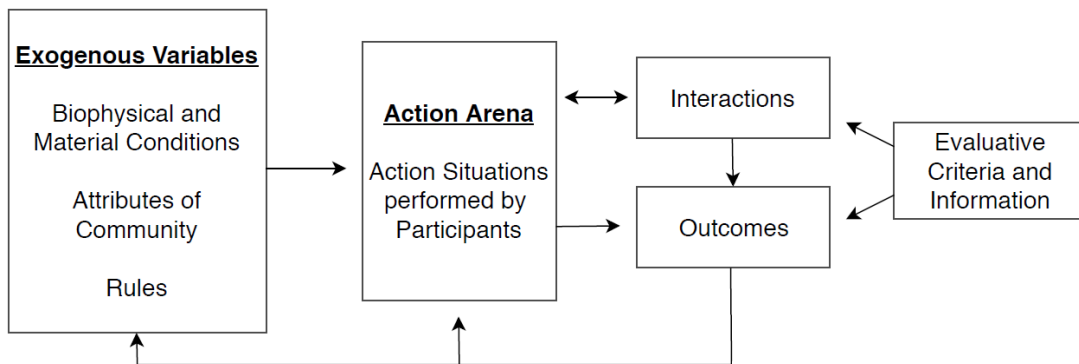


Figure 2. Action situation-in-context (Ostrom, 2005)

The action arena, where participants perform in action situations, is affected by exogenous variables and the outcomes of those and other actions performed. The evaluative criteria on gathering data and information about interactions and outcomes of decisions made can influence the outcomes of actions taken. Figure 3 shows a livelihood situation as an action-arena with its conditional exogenous variables:

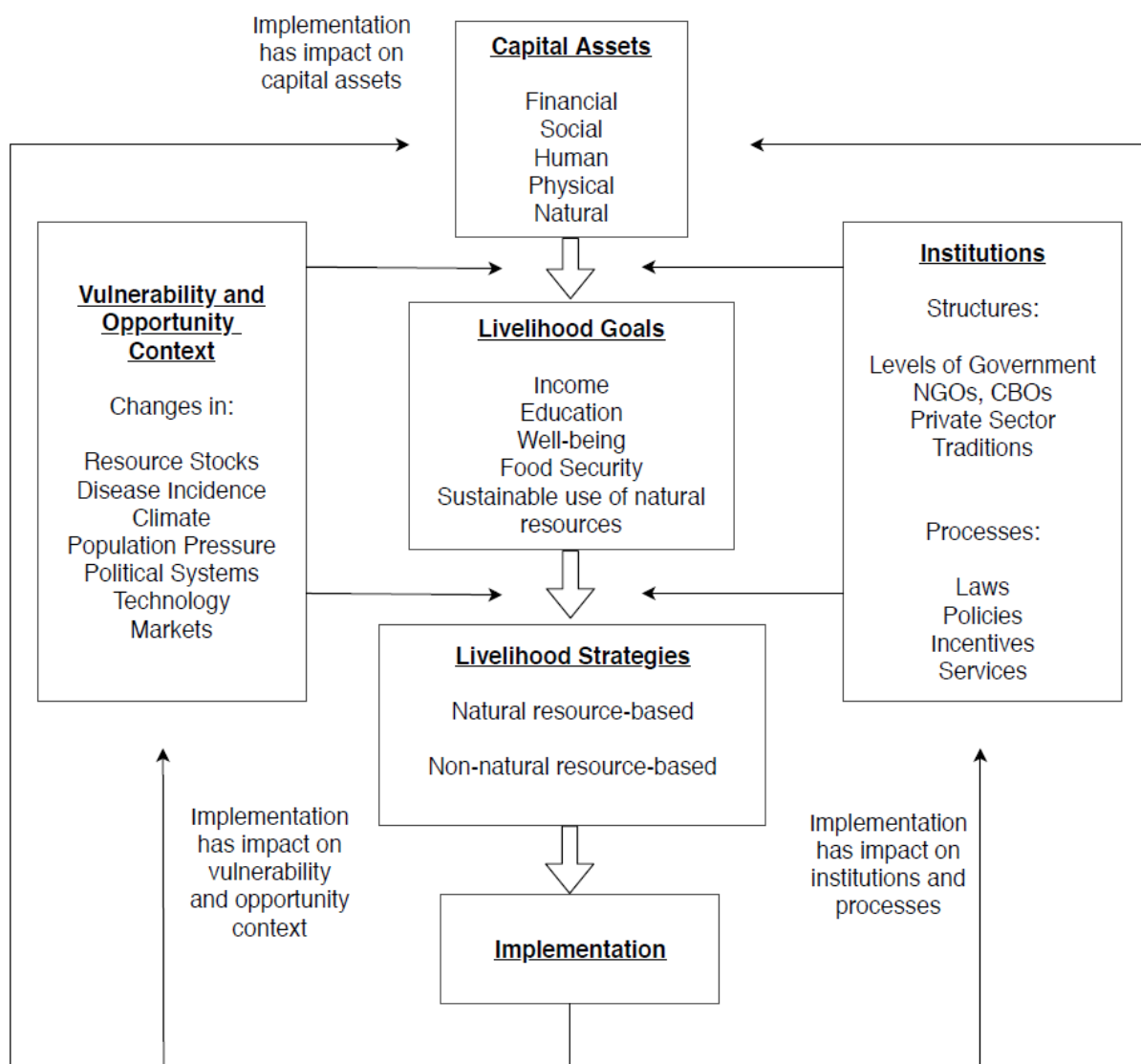


Figure 3. Sustainable Livelihood Framework (Dalal-Clayton & Dent, 2001)

The sustainable livelihood framework shows variables that can create a referential narrative about the action situation, including the institutions and the locational context, the capital resources and people involved, and the goals the livelihood strategies are aimed at attaining. Livelihood strategies are implemented by decision-

makers, who guide resource use and management practices. These practices have direct effects on ecological and community context, since human lives are situated firmly in the biophysical realm. This is the logic of permaculture, where agricultural and social design is reflective of patterns found in natural ecosystems.

Livelihoods-in-Nature

Decisions made by actors in a livelihood strategy, or any other action situation, have effects on the context: the ecosystems and environments within which they are located, and the aggregation of society and economy at large. Today, with telecommunication and information technologies, we are better able to gather information on the effects being made on individual situations and wider contexts. Figure 4 shows this place of human lives within physical and cognitive contexts:



Figure 4. Permaculture Territory of Support (Holmgren, 2002)

The level of human life is where decisions are made, and these have effects on society and on fundamental, constituent natural resources and ecosystems. Since the decision-making arena is nested in wider supportive scales, the individual decision-maker is at the nexus of culture: economic decisions and their effects on a place are the result of how an environment is viewed and understood, both collectively and idiosyncratically.

Economic activities are an engagement with the social and physical situational arrangement, which is the environment itself.

The Western settlement pattern scales from homestead to farm to wilderness, or from town to country to wilderness. Figure 5 shows this arrangement based on permaculture principles and the Isolated State by Johan Von Thunen, which both are based on a 6-tier radius from settlement to wilderness:

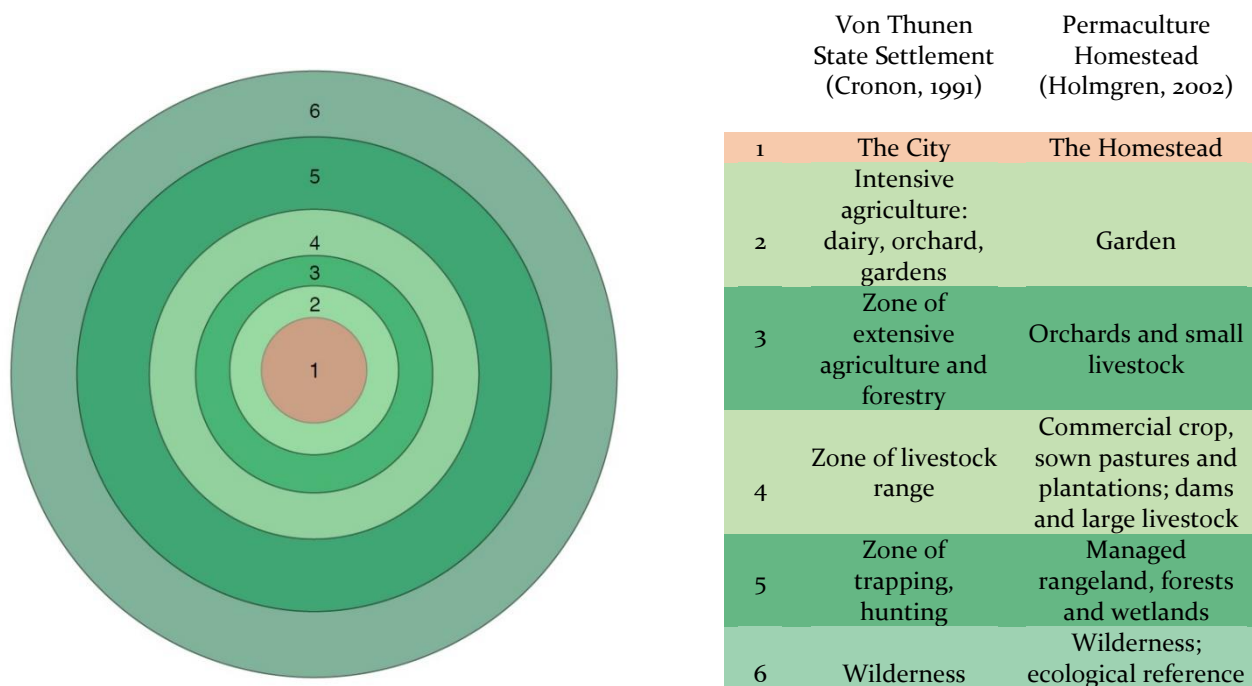


Figure 5. State and Homestead Settlement Pattern

The civilizational arrangement shown in Figure 5 is reflective of the estate settlement pattern applied by the eleventh and twelfth century Anglo-Normans, with a balance between built and cultivated areas, and the wild, natural environments that support them. Levels 1-4 are the most intensely developed and used for human purposes, where level 5 of the continuum contains the ecosystems managed for hunting and reserve. The estate model would consider wilderness, level 6, the supportive foundation of the other, human levels. Whether wilderness is protected in the interest of habitat for biodiversity or protected for ecosystem services for bioregional stability, it appears fundamental that a certain proportion of foundational natural resources and environments should be maintained within the plan of any settlement model. The appropriate proportion is

variable based on specific places and scales. Figure 6 outlines the livelihood situation within the ecological context to show that decisions made and implemented through strategies have direct effects on the settled community and the natural environment within which it is located:

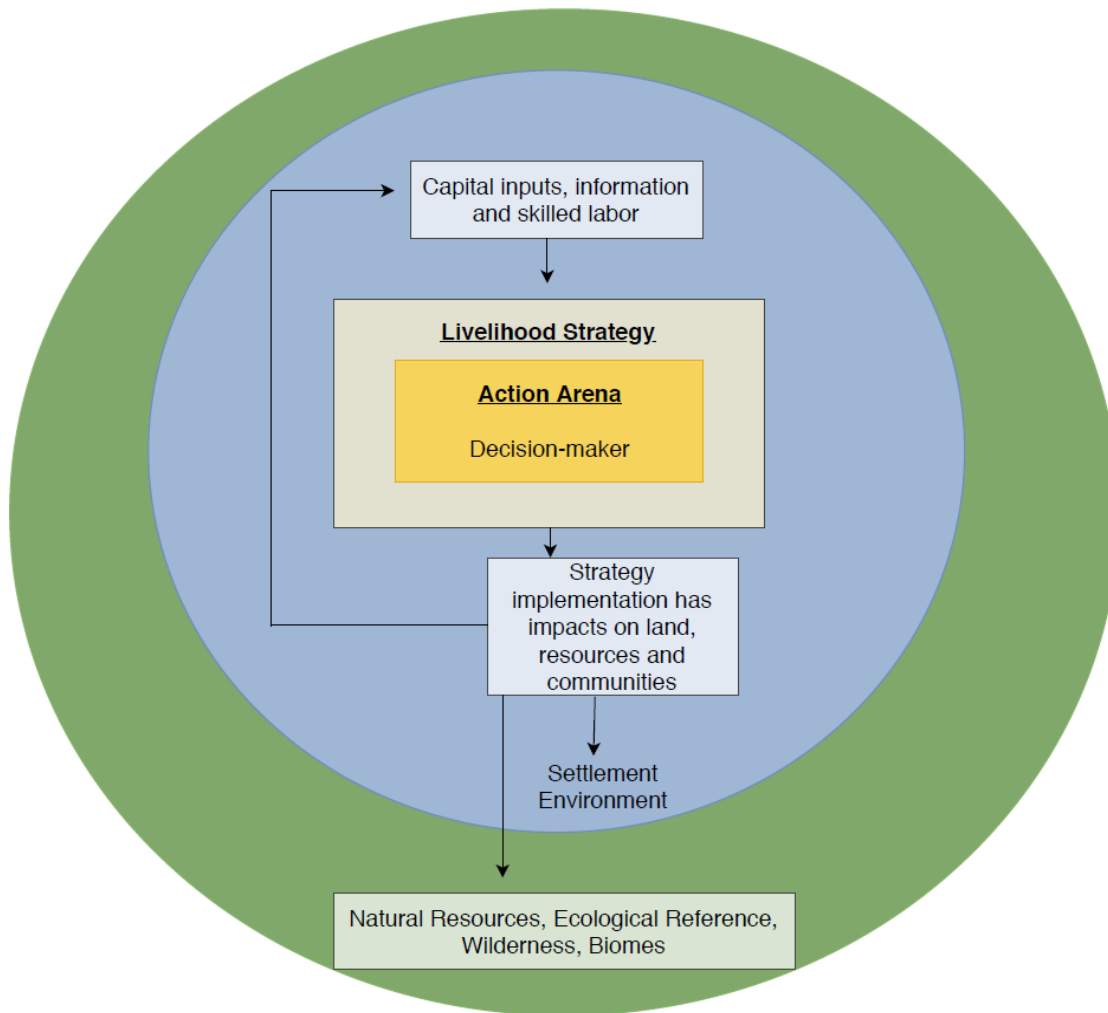


Figure 6. Livelihood Situation in Ecological Context (Ostrom, 2005), (Holmgren, 2002), (Dalal-Clayton & Dent, 2001), (Cronon, 1991)

In Ostrom's action arena, the decision-maker develops strategies based on information and needs of the community and the environment, which produce outcomes as the results of actions taken by participants involved. This information is developed through evaluation of current practices and through conversations among interested stakeholders based on their best practices in the context of regularly created information. The context of livelihood action situations within a place is expressed categorically by exogenous variables, which

inform and constrain possible actions, interactions and outcomes. The aggregation of these variables results in an expression of the biophysical and material conditions, as well as the attributes of the community and the rules which guide activity; these are all affected by the impacts of strategy outcomes. The landholder, in position as decision-maker on the condition of the biophysical situation under their control, is the point of intervention in deciding how land is used, both socioeconomically and in terms of a cultivation to conservation ratio. Holistic ecosystem management would consider social needs and the needs of the natural resources and environment as a singular place-based system, as suggested by permaculture principles. As a singular system, the health of the environment directly relates to the health of society through food production and ambient ecosystem services, and therefore decisions made on the balance between cultivation and conservation have implications for the condition of a place and the health of its inhabitants.

Defining this balance requires on-the-ground participants to have information about the needs of both a place and the people in that place to best respond to those needs through specific strategies. Contemporary strategies that are reflective of this include, on a small scale, organic agriculture and farm-to-table local production, and on a larger scale, organizations that focus financial and informational attention to support biophysical conditions such as nature conservation groups or national park services. While it is difficult to assume that everyone will behave ethically, justly and for the common good, those in-position with information on the needs of a place are enfranchised in a way that supports their understanding, thought processes and subsequent development of strategies that respond to needs of both environment and society.

Part 4 – Land Administration and Stewardship

The Western civilizational structure, as based on the estate model, is a collaborative livelihood action situation, comprised of many other action situations at every scale. Since environmental and resource management practices and projects are kinds of action situations, understanding the activity as a system can help guide best practices by showing the whole context affected by managerial decisions. Looking at the wisdom of the original Western estate management and territorial administration system that is the foundation of the modern land management paradigm can guide how to think about environmental problems that exist today. This

wisdom includes clear and secure property rights and laws, collaborative information development and environmental management structures, and robust land registry and administration systems with rights and juridical options. Historically, an element of legally enforced conservation was also present. The informational, financial and technological resources we have today can facilitate land administration systems in a way that can respond to the needs of stewards for their environmental management practices, supporting continued social development in a way that negotiates a balance and integration of environmental consciousness into modern economic activities.

Information as a Resource

In an action situation, information is a variable that has an effect on decisions and outcomes. The value associated with data is created when it comes together in a meaningful fashion, serving as a base for an analytic process to yield insightful information that can be used in decision making⁴⁸. This orientation is the understanding of a situation, which informs how goals can be reached. Goals are leverage points within an action situation because they guide the activity, and since the effect of achieved or missed goals is the result of actions taken, the orientation provided by contextual information creates the paradigm that conditions how individuals work within a system⁴⁹. Paradigms, the sources of systems, are the shared social agreements, understanding and mindsets about the nature of reality, common goals and information flows⁵⁰.

The way a situation is understood has real effects on decisions made and actions taken, and therefore the use of information and models by decision-makers is important in efforts toward better environmental management. People who manage to intervene in systems at the level of paradigm engage a leverage point that can totally transform a system. Paradigms are very hard to change, but there is nothing physical or slow about the process of paradigm change; it is a click in the mind⁵¹. Paradigms are the mindset out of which systems, goals, structures, rules, delays, and parameters arise, ultimately resulting in the store of behavioral repertoires that are

⁴⁸ (McKnight, 2014)

⁴⁹ (Meadows, 2008)

⁵⁰ (Ibid.)

⁵¹ (Ibid.)

human cultures⁵². If the cultural paradigm were to be one that embraced environmental information to guide how natural resources and economic activities are performed, such a mindset could have positive implications for the condition of environmental, cultural and community health as a singular system.

The complexity of discovering actionable knowledge grows in lock-step with the volume of data. It is no longer difficult to capture, store and manage that data; rather, the challenge is to distill and deliver the relevant pieces of knowledge to the right people to enhance the millions of opportunities for decision-making that occur on a daily basis⁵³. Models and frameworks are important for this distillation and synthesis process, and when used together act as qualified narrative and visual aid, which can help decision-makers understand complex situations. Models make precise assumptions about a limited set of parameters and variables, and frameworks organize diagnostic and prescriptive inquiry on a general set of variables⁵⁴. Theories enable analysts to specify which components of a framework are relevant for certain kinds of questions and to make broad working assumptions about these elements, to diagnose a phenomenon, explain its processes, predict its outcomes, and create strategy based on these conditions and expectations⁵⁵. Good analysis provides the context for people to create value so they can make higher quality strategic decisions on tactical and operational matters⁵⁶. Human judgement remains vital to decision-making, and must grow to utilize more information, and to utilize it more deeply⁵⁷. The way actors use information will make the difference in the quality of their activity by informing, guiding and making more effective the skills and expertise of analysts, scientists and practitioners⁵⁸. The combination of data, processes and the people involved creates the most effective, integrated strategy⁵⁹.

System modelers say that we change paradigms by building a model of the system, which takes us outside the system and forces us to see it whole. Paradigms, based in information and communication, can be directed to achieve a purpose⁶⁰. If the purpose is to encourage more environmentally-conscious social systems,

⁵² (Ibid.)

⁵³ (Loshin, 2013)

⁵⁴ (Ostrom, 2005)

⁵⁵ (Ibid.)

⁵⁶ (McKnight, 2014)

⁵⁷ (Ibid.)

⁵⁸ (Ibid.)

⁵⁹ (Ibid.)

⁶⁰ (Meadows, 2008)

integral information can supportively guide land-use and other cultural and economic decisions. Evidence-based strategy design can help communities and environmental regions clarify the issues that need to be resolved by working with science to create options that respond to those issues⁶¹.

Pragmatic Analysis

Individuals use philosophical, psychological and physical tools to discover and engage with the deeper patterns of our world; by understanding how these patterns work, they can be shaped. The patterns and connections observed give insights to trends, and when coupled with data about a situation, these insights can be used to guide action. The way we interpret facts influences the actions we take, so we need to be aware of our philosophy- that is, the way we understand the conditions and environment around a situation or problem^{62 63}. Interrogation of our own understanding is a pragmatic method of inquiry, one which maintains an awareness of a larger perspective when interpreting evidence⁶⁴. Interpretation is how we connect data and articulate conclusions. It is how subjective individuals process objective information, which then influences and guides their actions. This information and the resulting practices establish a culture based on the patterns of behavior.

This thesis has been discussing the Western estate system of land administration to understand how it can be pragmatically managed to attend to environmental problems with informed and strategic solution development. Information and the way it is understood and applied is a direct link to the goals and outcomes of behavior of a decision-maker. Strategic intent comes from foresight, a well-articulated point of view about tomorrow's opportunities and challenges⁶⁵. Foresight comes with being able to analyze information and recognize trends to anticipate future conditions and apply that information to today's plan of action. A pragmatic strategy, then, is one in which analysis and planning are guided by beliefs that have been developed through a process of conscious reflection and interpretation.

⁶¹ (Thorbeck, 2012)

⁶² (Nahser, 2013)

⁶³ (Ramo, 2016)

⁶⁴ (Nahser, 2008)

⁶⁵ (Nahser, 2013)

The Western model of environmental management is a collaborative effort, based in social relationships between managers, landholders, and the central registry that maintains an information sharing network across the territory. We can consider these territorial and legal administrative activities as pragmatic, concerned with learning for effective management, maintenance, and security of an area. Since these social networks are located across a territory, sharing knowledge about that place is important because it creates a community with shared interests and shared understanding. The context of an environment is important due to its static spatial properties; individuals can move through space, but territory is an immobile environment on which communities rely. The concept of a place, then, is anchored in the jointly created experience of a community because society can only function through collaboration with others across the physical space. This is facilitated by communication about a situation, and the conditions that are established by practices used based on understanding from that communication.

Design, Planning and Strategy for Stewardship

Modern land administration systems must focus on training and understanding people's existing cognitive capacity about land⁶⁶. The key is to see land administration not as an end in itself, but a means to an end, and supporting the process is management of land related information⁶⁷. Given technological trends, the most effective management is likely to lie in spatial enablement through various sets of information⁶⁸. This occurs when decision-makers capitalize on the power that is generated from information about a place⁶⁹. For no purpose is technology making more strides than in the area of information management, and individuals must be adaptive in their use of it⁷⁰. Environmental management is enhanced by the integration of information into design of strategy, which has real effects on the condition of environments and natural resources.

⁶⁶ (Williamson et al., 2010)

⁶⁷ (Dale & McLaughlin, 1999)

⁶⁸ (Williamson et al., 2010)

⁶⁹ (Ibid.)

⁷⁰ (McKnight, 2014)

Design is collected information that informs a plan, and while planning focuses on generating a series of executable actions, design focuses on learning about the nature of a problem⁷¹. Planning is problem solving, and design is problem setting⁷². One of the objectives of design lies in valuing and explaining the long-term consequences and benefits of short-term decisions. Information is not simply facts: primary data must be interpreted to answer specific questions. Knowledge is created through analysis, and this knowledge can be critical when used to form a plan of action for solving some kind of problem⁷³. Decision-makers in land management need expertise just as much as they need data for good, relevant baseline information about the land, and the impact of land use on the environment itself⁷⁴. Decision makers can't respond to information they don't have, so without a strong institutional capability in land use planning, decisions will continue to be made on short-term political and financial grounds⁷⁵ ⁷⁶. Given the increasingly complex societies in which all humans live, information on the condition, optimal use, and sustainability of land as a resource is essential⁷⁷.

Design thinking is at the intersection of often-conflicting demands, recognizing constraints of today's materials and uncertainties while envisioning tomorrow's possibilities⁷⁸. Approaching information development holistically and combining data sets allows new information not apparent in isolation to be created⁷⁹. Insights drawn from analysis and discussion of such information can guide practical activity for managerial and stewardship goals. Enacting solutions takes a lot of coordination, but real changes are more likely to happen on a farm-by-farm basis than at the country level⁸⁰. For this reason, some of the most effective institutions for stakeholder coordination and negotiation are local-level land user groups, community organizations, and stakeholder partnerships who work with government-level entities⁸¹. Sustainable development cannot be achieved without the participation of local communities in the development process, so it is important that

⁷¹ (United States Army, 2006)

⁷² (Ibid.)

⁷³ (Dalal-Clayton & Dent, 2001)

⁷⁴ (Dale & McLaughlin, 1999)

⁷⁵ (Meadows, 2008)

⁷⁶ (Dalal-Clayton & Dent, 2001)

⁷⁷ (Dale & McLaughlin, 1999)

⁷⁸ (Liedtka & Ogilvie, 2011)

⁷⁹ (Dale & McLaughlin, 1999)

⁸⁰ (Shah, 2013)

⁸¹ (Dalal-Clayton & Dent, 2001)

participants be linked into an active group of engaged individuals⁸² ⁸³. Human beings have the capacity to overcome the environmental challenges we face; we should be concerned about these problems but maintain a sense that our current condition is not one that we are incapable of ameliorating to a large extent if the right steps are taken⁸⁴.

Applying Cultural Ecology

Environments influence the needs of communities, possibilities of action, and the opportunities and barriers based on the condition of and resources available in a location. Social networks of information, which influence knowledge and decisions made about outcomes, are directly linked to ways of being. The information exchanged in these networks, though, must be meaningful and relevant to end-users for it to be useful for practical application, and analysis is a way of examining and filtering data to organize and create information. Analysis is done with a theoretical framework: a way of thinking about and sorting relevant information, and how to apply it. Pragmatic design based on analysis can be a solid support for strategy development and decision-making because it informs users on why a context is as it is and thus makes the user better able to interact with it in a functional way.

Any given project needs to have the appropriate mixture of strategies tailored to meet local conditions⁸⁵. If strategies are operational plans to realize goals, information on the context of activity, when in the hands of decision-makers, can influence outcomes and the quality and condition of environments. In general, populations adapt to climatic change in two different ways: they change their behavior, or they make defensive structural investments⁸⁶. Behavioral changes involve small or large changes in actions people undertake, and defensive structural investments are capital investments that individuals or firms make to minimize the effects of climate, such as air conditioners, building of seawalls, the installation of irrigation infrastructure or revitalization of degraded land. Both behavioral and structural adaptations will play an important role in the future of economic

⁸² (Field, 2016)

⁸³ (Shah, 2013)

⁸⁴ (Field, 2016)

⁸⁵ (Ginn, 2005)

⁸⁶ (Houser et al., 2015)

development, although adaptive measures are unlikely to occur without adequate information regarding the risks that these investments and behavioral changes are intended to address⁸⁷. Analysis and interpretation, as elements of critical reflection, support deliberation on problems requiring solutions. It is a process of pragmatic inquiry, regularly re-visiting a problem and taking time to synthesize different angles, to reflect, and to critically assimilate all of the data to ask, “*why is this happening*” or, “*how can this be changed?*”⁸⁸

Considering the cultural conditions of a situation can support decision-making in strategy development and planning by providing contextual information. Cultural ecology, as a way of thinking about people in a place, views the development of a cultural group as the result of interactions with the surrounding environment and resources, while these groups in turn shape ecological properties through exploitation of resources and use of technology. Cultural ecology also refers to concepts and applications of power and resources, and since societies have a significant cognitive component to their structures, the power of social and individual agency in decision-making cannot be understated⁸⁹. Since those who make decisions on the use of land affect the physical condition of it, there is reason to believe that landholders are a point of leverage in implementing solutions to environmental problems.

Ecological Decision-Making

The connections between an entity and its environment are primordial; every action takes place in a space, which provides the material and energy for that action. That space itself is contained within a more foundational, supportive place, and this situation underlies the current economic and social issues which are currently resulting from widespread exploitative and exhaustive practices in environmental management. Until the European Industrial Era, cultures around the world observed nature very closely and adapted their way of life accordingly. Laws of religion and nature provided rules for human behavior based on obligation and the proper role of an individual within a community and in relation to the life-sustaining Earth. Modern industrial practices have interrupted awareness of regular social reliance on and engagement with environmental and productive

⁸⁷ (Ibid.)

⁸⁸ (Martenson & Taggart, 2015)

⁸⁹ (Ibid.)

processes, although we are increasingly able to use the technology and benefits resulting from industry to better understand and manage natural resources with a more conscious awareness of the effects of economic livelihoods on the biophysical health of life on Earth. Because the Western European nation-state serves as the base of the dominant international economic model, working through the systemic structure of this tradition can illuminate the points of leverage and opportunity to develop solutions for environmental degradation within this system.

Considering livelihood strategies as action-situations as described by Elinor Ostrom highlights the central role of individual agency in determining the use and maintenance of environments through their control over and information about a context, which influences the outcomes of decisions made. Referencing permaculture principles as the biophysical context can support the activities of those individuals in making decisions on how to manage the natural resources that generate the produce and raw materials that provide for society's needs while maintaining high quality natural resources and ecosystems. The balance is necessary because natural system processes such as soil generation and plant growth make those natural resources and ambient ecosystem services available in the first place. Supporting and maintaining natural resources in good and generative condition is a direct action that has effects on provision for economic and biophysical needs of humans and non-humans alike.

Since landholders make the decisions on this land-use balance and the strategies employed to manage environments, they are well-positioned to have real effects on the conditions of natural ecosystems and resources. In this way, farmers decide whether or not to practice agriculture that maintains and encourages soil development, and foresters direct how their ecosystems are managed and harvested. By evaluating their own practices with place-based and community knowledge, landholders can manage pragmatically with evaluation and ongoing learning to improve the ecosystemic functioning of generative environments. Scientific, economic and social information generated by many different stakeholders can be integrated to give holistic perspectives to guide managerial practices that take into account the different situations that are affected by land management. While there are various contextual opportunities and barriers, and many competing economic incentives to manage land in one way or another, the ultimate choice made by landholders on how to use and how to care for ecosystems and natural resources has both environmental and social implications.

Part 5 – Case Study of Iroquois Valley Farmland Real Estate Investment Trust

The original wisdom of the Western estate livelihood model is one which is managed by people-in-place who have an intimate and lasting relationship to land and natural resources. Increasingly, individuals are aware of the environmental and social impacts of industrial agriculture, prioritizing their health by buying organic and locally produced foods. Local food systems are reflective of the ancient agrarian model of place-based production: organic management integrates cultural, biological and mechanical practices that foster cycles of resource generation and maintenance, promote ecological balance, and conserve biological diversity⁹⁰. This model prioritizes place and people, and profits are the result of high-quality economic activity. Organic farming is good for the local economy, one reason being the improvement in job creation based on the additional labor needed⁹¹. The reflection and learning that has been enabled by modern technology has shown the importance of re-integrating food systems into localities in a way that is respectful of the natural resources that support productive generation. A unique company has recognized this fact and bases their business model on facilitating and encouraging a return to the original wisdom of the ecological agrarian model.

Iroquois Valley Farmland Real Estate Investment Trust is an organization that recognizes the important leverage that landholders have in relation to the productivity and maintenance of the environment. The company is a private capital solution focused on making the food system healthier while helping organic family farmers stay on the land. This activity is one which embodies the essential virtue of an ethic of place, where land, people and produce are explicitly recognized as a singular system, which itself is both integral to and supported by a foundational natural ecosystem. Practicing organic farming results in several appreciable impacts: farmers are able to produce healthy food from healthy soil, contributing to healthy communities; real estate and ecological values are increased by soil regeneration; and well-maintained productive capital produces steady profits and return. Since investments in natural resources, communities and families have generational implications, the company is comfortable with slow growth, considering farmland investment a long-term commitment. This view of agriculture is one which is congruent with the realities of the systemic situation of the agrarian estate model, where the

⁹⁰ United States Department of Agriculture. (2016). Guidance: Natural Resources and Biodiversity Conservation.

⁹¹ Iroquois Valley Farmland REIT, PBC Private Placement Memorandum

livelihood action arena is nested within the natural environment and is based on interactions with the natural resources resulting from non-human ecological processes. By directing capital resources to support such activity, Iroquois Valley Farmland is not only reflective of the inclusive land ethic of historical agrarianism, but effectively facilitates the regeneration of the place-based design that is considerate of the natural environment and resources within which it is inexorably nested.

The organization's model distributes responsibilities for the main aspects of land management in a collaborative and involved way through engagement with different types of real capital: asset resources are acquired by the support of investors, tenure security is ensured by Iroquois Valley Farmland, and generative maintenance and production is performed by local farmers. Increased value of the land comes from improved soil quality and productivity, and organic farms are more profitable and more ecological than conventional farms since their robust soil systems are better able to perform in drought, withstand heavy rain, use less energy and inputs by maintaining high quality soil, and create fewer greenhouse gases. The holistic nature of organic management ecologically and holistically integrates the interests and needs of the environment and communities, enriching the supportive natural resources and environment that provide and allow for individual and community livelihoods. By directing financial assets to support agriculture and natural resource management, the company oversees investments in a way that maintains the functional ecosystems that have provided much in terms of real capital for social development.

Iroquois Valley Farmland's activities encourage a conscious and productive relationship of people to the land. They are facilitating a culture of environmental awareness and responsible agricultural practices by promoting a mindset of non-farmer responsibility for the support of agricultural resources and communities, which directly enfranchises local farmers as stewards of land and producers of resources. All stakeholders involved are participating in a shared behavior, solidifying a cultural norm that results in positive structural change to the environment while being economically and socially productive. The company effectively facilitates a contemporary action that is a continuation and reinforcement of the historical cultural consciousness of land and community that is foundational to localized agrarianism. Embracing this virtue that has otherwise been subdued invigorates communities and the natural environment on which human livelihoods are based. There is much history behind the Western estate model, and the example of Iroquois Valley Farmland demonstrates that

there is real value to encouraging such a way of thinking. The primordial condition of the agrarian model gives confidence in the soundness of investing resources, tools and attention to supporting a social-ecological balance. The company's activities are an effective embrace of the original wisdom of the agrarian model and a substantiation of the logic of people as stewards of land. By referencing the historical and contemporary effectiveness of this original wisdom, an ongoing and fundamental narrative is continued, one that respects the integrated situation of human society in nature.

Conclusion

Consciousness of people and place has an effect on the understanding that guides interactivity and the resulting outcomes and impacts of action taken. Reflecting on environmental conditions with scientific and community knowledge and practical theories like permaculture, systems thinking, and pragmatic use of information can help guide cultural activity and decision-making to respect the ecology of a place, both independently of and in relation to human livelihoods. Conscious stewardship balances and integrates the needs of natural ecosystems and resources with social needs, which are entirely dependent on the wider environment. A culture of conscious stewardship is facilitated by robust, collaborative knowledge and communication networks that maintain information about the conditions and needs of a place. Only by recognizing wider systems and constituent parts can we design solutions and engage with resources to invigorate communities and environments for the most generative and healthy conditions.

Looking at the agrarian origins of the Western state model shows that, in the beginning, there was a balance maintained between cultivation and conservation. This balance reflects a permaculture system: an agricultural model that is sustainable and self-sufficient in its supportive ecosystemic processes. Small-scale, family farms are the base of the Western European agrarian model, and since economic practices are guided by decisions and strategic operations, individuals are the leverage point in economic and ecological systems that have an effect on the conditions of the land that provides for both biological and social needs of individuals and communities. Information and technology can support livelihood arrangements in the interest of regenerating land and natural resources by substantiating decision-making processes. Cultural ecology, as a way of thinking,

supports landholders in their managerial capacities because it focuses on people being within and interacting with an environment, and is useful for planning strategy, directing resources, and evaluating activity. The original wisdom of the Western estate model is that agriculture reflects a deep sense of human obligation and connection to the ecology of a place: a process of respectful maintenance and generation through labor, knowledge and skill, not simply a process of extracting value. Recognizing such wisdom can reinforce and deepen individual and community interaction with the physical world in an ecological way that facilitates, integrates and balances the vitality of natural resources and community developmental health.

Appendix

Methodology

This thesis develops a narrative about the impact that decision-makers have on the real economy and environment in order to provide a philosophical and contextual foundation for conversations about the act of land stewardship. The narrative relates the original wisdom of the paradigm's creation, one which recognized the cultural need for a balance between civilization and the natural world within and upon which it exists. Discussing the historical context and systemic foundations of livelihoods of the Western model aims to emphasize the importance of the orientation and intentional purpose that is produced from communication of contextual information based on substantial reflection.

The opening quote by Pope Leo XIII was chosen because he refers to the logic of an activity's purpose, which he suggests can be found by reflecting on its original, authentic condition. The sentiment is congruent with the research, as it is concerned with reflection on the systemic and historical relationship between people, work and the environment. The developmental process is an essential part in analyzing any problem to identify solutions, and delineating the history makes original intent and design of a system more clear and easier to work with in the present. The problem of environmental management today is finding the balance between cultivated civilization and the natural environment; the narrative shows that this is not a new problem. Looking at the origins of our current system shows that a solution existed in the past in the form of conscious environmental managerial practices and legal frameworks, which can be referenced as we find ourselves urgently needing to apply a similar sustainable balance.

To build the narrative about the Western land management model, the thesis uses different types of inquiry. The collective activity of analysis, synthesis of information, and evaluation of practice is pragmatic, based in real conditions and in service of real needs. This is important in management for effective design, performance, and ongoing development of any activity since context is constantly changing, and therefore requires ongoing awareness and a grounded perspective of a situation. Pragmatic theorists consider three principles in analysis: context, continuity and fallibilism. This paper applies those perspectives by considering the contemporary problem of balancing civilization and conservation, the historical continuity of the agrarian estate model in the twelfth century (the core system of which has endured to today), and the fallibility of humanity in terms of the necessity of continual reflection and learning for continued innovation, adaptation and relevance.

To illustrate the historical and systemic model applied in a contemporary way, the case study for the paper focuses on a unique company, Iroquois Valley Farmland Real Estate Investment Trust, whose activities and way of thinking are reflective of the need suggested by the research. Their activities respond to the complications of today's social-environmental problems by enfranchising land managers to balance the needs of natural resource ecosystems, specifically soil, and the needs of the communities who rely on the productivity of those resources, specifically agricultural produce. The company's activities demonstrate the logic of "placeness" of livelihood situations, responding in a focused way to human and environmental needs by recognizing the importance of natural processes that facilitate community sustenance. As the paper shows, the company's activities are an effective embrace of the original wisdom of the agrarian model and a substantiation of the logic of people as stewards of land.

The research for this paper was done through analysis of relevant literature with the goal of creating an integrated and inclusive systemic description. It is based on qualitative data because the phenomenological discussion looks at the historical development of the Western land administration system and then discusses the importance of engaging with that system for conscious and considerate management of environments, sustainable livelihoods, and the resulting ecological health of communities and ecosystems. Social science theories of systems thinking, institutional analysis of action-situations, information development, and pragmatic use of information are employed to articulate how contextual information about a situation can be applied in a culturally ecological way. The thesis is focused on the support, enfranchisement and facilitation of environmental

managerial method and practice, and since it is based in frameworks and theory, the aim is for the conclusions to be adaptable to a variety of locations (based on variable contextual information) and need-situations (problem analysis, solution design, and strategic planning).

The research was undertaken in the belief that activities need to be analyzed in their historical context because this reveals the reason and logic by which an activity was first instituted, and then allows reflection on how that system evolved and exists within a contemporary situation. This reflection supports strategic refinement and adaptation for maximum effectiveness of management given current and projected needs. The knowledge that is created by contextual analysis provides a certain amount of legitimacy to action since it demonstrates self-awareness and consciousness of the effects that processes and activities have on an environment and other individuals and groups. The recognition of being part of something bigger than oneself is empowering, and by analyzing an activity and wider trends, meaning is recognized, which gives confidence to actors. Inquiring into the nature of a context is an important and essential skill in directing any endeavor because life is based in communication: sharing information to understand and respond to an incessantly changing environment.

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