

SUSTAINABLE CAPITALISM

A MATTER OF COMMON SENSE

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THE THREE ECONOMIES OF SUSTAINABILITY

Economic Philosophy

The term *deep ecology* was first brought to public attention by a Norwegian philosopher, Arne Naess, in 1973. Naess argued that the environmental movement existed at two levels, "shallow" and "deep." The shallow movement was concerned primarily with social welfare issues, such as pollution and depletion of natural resources. The deep movement was concerned with the fundamental philosophical issues of how humans *should* relate to their natural environment. Naess argued that Western philosophy reflects an outdated view of the world, in which humans see themselves as separate from each other and from their natural environment. A deeper understanding, however, reveals that humans are not truly separate or isolated, but instead are integrally interconnected with each other and with the world around them. Humans are "part of the flow of energy, the web of life," he wrote.¹

The overall economy is an organization. It simply functions at a higher level of organization than does the individual business or non-profit organization. The economics of sustainability addresses the issue of sustainable development from a *deep* philosophical perspective. Thus, in managing a sustainable economy, the first priority is to transform one's worldview from that of the economic individual in isolation to that of the person in society and in nature. The second priority is to accept the fact that the persons managing the economy are

inherently a part of the economy, and, thus, management choices are inevitably personal and subjective. The most important issues affecting economic sustainability concern social values and moral judgments regarding how people *should* relate to each other and to their natural environment. Economists, if they are to be relevant, can no longer disassociate themselves from questions of equity and ethics because they are an integral part of the social and ecological economies they are studying. The fundamental economic issues relate to first principles, things that cannot be proven but that we nonetheless know to be true. The *non-ethic* of neoclassical economics becomes an explicit personal value judgment within the context of the sustainable economy. So at this point, we can drop the pretext of third-person disassociation from the writings in this book. Written discourse on this particular subject is not only less stilted, but also is more realistic when phrased in the personal terms of *we* and *us* rather than *they* and *them*.

Sustainability is a long-term, people-centered concept, and we are the people at its center. The purpose of sustainable development is to maintain a desirable quality of life for people—of current and future generations—but, indeed, for people. Some find fault with this anthropocentric interpretation of sustainability. Some deep ecologists, for example, contend that other forms of life may be just as important as human life in the long-range scheme of things. However, the *deep* in “deep ecology,” as explained previously, simply refers to the level of human thinking, not to any particular ecological philosophy.²

The economics of sustainability is built upon the premise that our individual well-being is integrally related with the well-being of the entire human society, with all other living species, and with nonliving elements of our natural environment. However, if we humans were not concerned *uniquely* with sustaining the quality of *human* life, there would be no *economic* issue to be addressed. The economy is a human creation, and economics addresses the allocation of scarce resources to meet the needs of humans. So if we weren't particularly concerned about humans, we could simply depopulate the earth of humans to a point at which the sustainability of other species and resources would no longer be in question, or at least would not be threatened by humans.

We humans, like other species, have innate instincts for survival, reproduction, and self-gratification; that's all part of our nature. Thus, we will not reduce our claims on earth's resources for the sole purpose of ensuring the sustainability of other species or of the earth. But the

fact that we are concerned *uniquely* with sustaining the human species does not dictate that we are concerned *exclusively* with sustaining the human species. We will protect other species if we perceive it to be in our broader and higher self-interest to do so. Contrary to neoclassical economic thinking, our self-interests are not exclusively individualistic in nature. Our interests as members of our particular societies and of the human race are integrally linked with the integrity of the rest of the biosphere. Thus, our self-interest may be served best through sharing and stewardship, including preservation of other species, rather than through expressing our animalistic urges for immediate self-gratification.

The quality of human life has inseparable individual, interpersonal, and spiritual dimensions, as explained in previous chapters. Thus, the new sustainable economy may be viewed as a whole composed of three inseparable economies—the individual or private economy, the social or public economy, and the ecological or moral economy. *Economy*, as used here, is a reflection of the Greek word for economics, *oikonomia*—which refers to study of resource stewardship for the overall well-being of the household, society, and natural environment—rather than limiting economics to managing scarce resources for the wealth of individuals.³ Each of the three economies of sustainability are distinct, but are clearly interconnected with and interdependent on the others, as are the individual, interpersonal, and spiritual dimensions of our quality of life.

The Ecological Economy

The ecological economy is the foundation on which rest the other two. All individual economic resources are either ecological or social in origin. All material economic resources—minerals, chemicals, gases, fibers, foods, and so on—are products of the earth. All human economic resources—labor, management, entrepreneurship, creativity, determination, and so on—are products of human society, which also is inherently dependent upon the earth. The sustainability of the individual economy ultimately depends upon the health of the social and ecological economies.

From a “shallow” ecological perspective, the natural ecosystem also contributes to the economic value of goods and services in ways that are not reflected in the marketplace. In the mid-1990s, a group of

economists attempted to assess the nonmarket economic value of global ecosystem "services," including the provision of atmospheric gases, waste assimilation, nutrient flows, and the storage and purification of water. Although such resources have no market value, they can be assigned an alternative or opportunity value by estimating how much it would cost to provide similar services using alternative market-valued means. The group reported their estimated value as a range, from \$36 trillion to \$58 trillion (1998 dollars).⁴ This compares with a gross world product of only \$39 trillion in 1998, suggesting that natural ecosystems contributed as much or more in total *economic* value as did all intentional human economic activities. And these nonmarket economic values include only the productivity from ecological capital that is *not* converted into economic capital, but nonetheless can be measured or estimated in terms of dollars and cents. The group did not attempt to place economic values on the smell of fresh air, the feel of the sun, open spaces, scenic landscapes, or moonlit nights. Some things are truly "priceless."

From a "deeper" ecological perspective, we humans simply cannot exist without the natural resources of the earth,—although many have lost sight of this fact in the highly specialized, industrial economy of today. People cannot live without sunlight, air, water, and soil. Most have at least been reminded of our tenuous dependence on the natural resources of the earth by the industrial pollution of air and water. However, many people became concerned about air and water only when supplies of clean air and water became scarce and thus took on economic value.

Other natural resources are no less essential to our sustainability. Many of these resources have some economic value, but their economic value falls far short of their intrinsic value to humanity. Land, for example, is often valued more as space than as a resource for growing food because, in the United States at least, food is still relatively abundant. Many people never stop to think that humanity is as dependent upon healthy soil as we are upon clean air and water. Virtually all of life arises from the soil—even life that resides in the ocean. Without the mineral and biological resources of the earth, life on this planet would be impossible. Soil is just one among many undervalued yet necessary resources of the ecological economy.

We humans can't absorb enough energy to keep us alive directly from the sun or the earth. Living organisms, mostly plants, convert solar energy, soil, water, and air into energy forms that can be con-

sumed by animals, including humans. We get the energy to fuel our bodies from the energy stored by other living things—plants, animals, and other living things. All energy present on the earth today, including fossil energy, was either stored in the earth at its time of formation or has been captured from the sun and stored since then by living organisms. The only source of new energy is from the sun. The ecological capital of the earth is made up of the existing stocks of available and stored energy and the interconnected web of life by which solar energy can be collected, transformed, and stored.

We humans currently are using fossil energy far faster than we are capturing new energy from the sun. More than 80% of total energy consumption in the United States is from fossil fuels, and nuclear energy accounts for just over 10%.⁵ The *renewable* energy usage amounts to less than 10%, and, of that, hydroelectric power accounts for almost half and solar energy accounts for less than 1%. The sun generates about 35,000 times as much energy as humans use.⁶ Even with about one-third of total solar energy never reaching the earth, the sun clearly provides sufficient energy to support more life on earth, including more humans, if we can learn to make better use of solar energy, which is the ultimate source of all renewable energy. Instead, we are currently depleting the ecological capital of the earth as we use stored fossil energy and degrade the health and productivity of regenerative living ecosystems.

As indicated in the preceding chapter, we must use the earth as a dump or a *sink* for our wastes, as well as a source of energy to sustain life. There is no "away" where we can throw our wastes, except into the natural environment. And by dumping our waste into the environment, we are degrading or destroying its usefulness to humans.⁷ When we pollute air or water, poison the soil with chemicals, or allow the soil to erode, we are destroying ecological capital. Some things we dump into the environment could be reused or recycled, thereby turning wastes into useful resources. However, some waste is unavoidable, because of entropy. Therefore, ecological capital is lost, both through avoidable waste and through the unavoidable tendency toward entropy.

As far as we know, the first and second laws of thermodynamics are inviolable. Thus, in a sustainable economy, the uses of energy and matter, as resources and as sinks, must be equal to or less than the sum of the inflow of solar energy and our reclamation of resources from the natural environment. The sustainability of human life on Earth is related directly to our ability to maintain our stocks of ecological capital. Ultimately, we

must reconcile the individual and social economies with the ecological economy, if we are to sustain life, including human life, on Earth.

From a deep ecological perspective, the sustainability of human life on Earth depends upon our willingness and ability to reexamine and redefine our relationships with each other and with the earth. Much of the past work in sustainability has focused on opportunities in the shallow ecological economy, largely accepting the context of existing economic and social relationships as given.^{8,9} However, "deep" sustainability deals not only with relationships as they are, but also asks what those relationships *should* be and *must* be to sustain a desirable quality of human life on earth.¹⁰

The *World Book Encyclopedia* provides three definitions of *ecology*: the branch of biology that deals with the relation of living things to their environment and to each other; the branch of sociology that deals with the relations between human beings and their environment; and the balanced or harmonious relationship of living things to their environment.¹¹ All three are appropriate and relevant to the subject of deep sustainability. The ecological economy is about the *rightness* of our relationships with the earth and with each other; it is part of the moral and ethical economy.

The Social Economy

The concept of a social economy is less well understood and appreciated than is that of the ecological economy. First, the social economy is not the macro-economy, which is simply an aggregation of all individual economic enterprises. The social economy deals with the interconnectedness of people within society, not just the adding together of individuals. The purpose of the macro-economy is to facilitate the building of a stronger individual, private economy. The purpose of the social economy is to facilitate the building of a stronger society by encouraging positive personal relationships among people.

Social capital is the essence of civilized society.¹² Social capital is reflected in the ability of people to relate to each other; to form families, communities, and nations; to agree on processes of governance and trade; and to define shared principles and values, which are essential for any *civilized* society. "Social capital consists of the stock of active connections among people: the trust, mutual understanding, and shared values and behaviors that bind the members of human networks and

communities and make cooperative action possible."¹³ Analogous to stocks of fossil energy, our current stocks of social capital have been built up over centuries by past human civilizations, as human societies became more *civilized*. Also analogous to stocks of fossil fuels, there is growing evidence that we are depleting our stocks of social resources at a rate far in excess of our rate of social regenerations, as human societies become less *civil*.¹⁴ As social resources are depleted, societies tend toward incivility, just as surely as the depletion of energy resources causes natural systems to tend toward entropy. Our social resources are at least as important as our ecological resources in supporting and sustaining a desirable quality of human life.

Stocks of social capital are built up through the processes of human *culture*, which is the learning and knowledge that is passed from one generation to the next, as people struggle, successfully or not, to achieve more peaceful, productive, and harmonious relationships. Anything that contributes a higher quality of life through more-positive human relationships builds stocks of social resources. War, crime, confrontation, argument, destructive competition, and other forms of human conflict destroy social capital. Cultures that have lived in peace for centuries can become bitter enemies in the aftermath of simple misunderstandings. Misunderstandings can lead to conflicts, conflicts to confrontations, and confrontations to wars. Accordingly, our ability to live and work together is destroyed, the social capital is depleted, and the quality of life is diminished.

Sometimes, social capital is depleted through deliberate acts of oppression, exploitation, discrimination, injustice, or even indifference. Unfortunately, such acts seem to become commonplace as capitalism tends toward corporatism. A corporatist economy places no value on human relationships, other than those that can be transformed into economic capital for financial gain. Corporations are not real people and thus gain no purely personal value from relationships. Corporations, lacking human compassion, tend to weaken the social fabric of families, communities, and nations as they transform social capital to economic capital in their relentless pursuit of profits and growth.

Stocks of social capital also are depleted through ordinary acts of human incivility, which appear to be an inevitable aspect of any human society. It's been said that 95% of all human conflict is caused by poor communications and the other 5% by clear communications. Misunderstandings among people are inevitable, and, sometimes, people simply do not agree, even when they understand each other

perfectly. This unavoidable loss of social capital is analogous to entropy in the ecological world. Thus, social capital must be continually replenished if human relationships are to remain positive and quality of life is to be enhanced over time.

If human civilization is to continue to advance, humanity must learn to conserve and continually rebuild its stocks of social capital. But a sustainable economy must also encourage and support continual social investments by encouraging the formation of new and more-positive personal relationships. Stocks of social capital must be built at rates exceeding their natural rates of depletion, plus rates of any unnecessary exploitation, if human civilization is to advance. This is the fundamental nature of the social economy.

The Individual Economy

The individual or private economy is by far the best understood and most widely appreciated of the three economies. It's the only concept most people associate with the word *economy*. The purpose here is simply to place the private economy within the context of the other two. The role, scope, and functions of the private economy are quite simple and straightforward, at least in concept. The private economy provides the means by which we meet our needs as individuals, and collections of individuals, through our transactions with other people and through our interactions with the natural environment. If we lived totally independent and self-sufficient lives, we would have no need for an economy. But our lives can be made better through specialization and trade and thus we need to relate to other people. Our lives also can be made better through the utilization of natural resources that are beyond our physical grasp; therefore, we need to trade to acquire benefits from those resources to which we would not otherwise have access.

The macro-economy—an aggregation of individual enterprises—is a separate aspect of the private economy. Macroeconomic policy plays a legitimate and important role in the function of the individual economy; however, it does nothing to sustain or support the social or ecological economies. In fact, current macroeconomic policies promote degradation and accelerate depletion of both social and ecological capital, by promoting maximum economic growth.

The relationship of the individual private economy to the other two also is straightforward. The private economy cannot provide ecological and social benefits directly, but first must convert both ecological and social resources into economic resources. Ecological resources are extracted from the natural environment—through mining, logging, or farming—and are converted into marketable raw materials for manufacturing, construction, or processing. Natural resources that were once owned in common, and used for the benefit of all, are converted into private goods for sale to the highest bidder. Without privatization, no incentive would exist for private investment in the resource extraction process, and, thus, nothing would be produced for sale in the private economy.

Social resources are extracted from society through employment, collaboration, or negotiation and are converted into economically valuable human resources that produce goods, provide services, or make deals. Social resources that once supported positive personal relationships among people are converted in labor, joint ventures, and commercial advantages—all commodities for sale to the highest bidder. Without privatization of these social resources, there would be no individual incentive to make deals and or invest in enterprises that employ people, and there would be no jobs in the private economy.

The individual or private economy is an important dimension of any modern society. The conversion of ecological and social resources into economic resources is both necessary and legitimate, if our level of living is to exceed subsistent self-sufficiency and if we are to have sovereignty in our individual decisions. However, we must recognize that when we convert natural resources into economic resources, less ecological capital is left for future extraction. When we take minerals from the earth, cut old-growth forests, or farm ecologically fragile soil, we are disrupting the natural ecosystem in ways that may degrade its ability to remain healthy and productive. When private economic development diminishes or endangers other living species, the ability of nature's ecosystems to assimilate and store solar energy for the future development may be impaired.

Certainly, we realize that humans benefit from resource extraction, but we must recognize also that humans benefit directly from the natural environment—from breathing fresh air, drinking pure water, and simply living in a clean, healthy, and aesthetically pleasing environment. People also benefit from being good stewards of the air, water, and soil; stewardship helps give purpose and meaning to our lives.

Whenever we use the private economy to extract from nature at rates faster than nature can regenerate, we are degrading the productivity of the ecological economy and we ultimately will degrade our overall quality of life.

We must recognize also that when we convert social resources into economic resources, fewer social resources are left to support societies of the future. When we go from voluntarily helping each other to working for each other, we have transformed a personal relationship into a business arrangement. When we start using our personal relationships with other people as business contacts, we have started to transform friends into prospects and social gatherings into business conferences, and, eventually, we begin to compete rather than cooperate. The means by which we relate to each other becomes defined by common business practices, rules, or laws rather than by a sense of caring and compassion. Of course, humans do benefit from their business relationships, but we must realize that humans also benefit from purely social relationships—from belonging, caring, sharing, and loving. When an individual economy extracts social resources at rates faster than it reinvests in building trust, integrity, and civility, it degrades the productivity of its social economy and will ultimately degrade our overall quality of life.

The Hierarchy of Sustainability

An economy is a complex system with many significantly interrelated elements and feedback mechanisms. Neoclassical economists, recognizing the inherent difficulties in dealing with complex systems, chose to focus on a few key economic relationships, and in doing so, created an illusion of manageability. This is a typical reductionist approach to science: to deal with complexity by focusing so narrowly on specific parts of systems that the relationships eventually appear simple. However, other scientific approaches to dealing with complexity are equally valid. Hierarchy theory, for example, offers an alternative to the mechanical, reductionist approaches by focusing on issues of scale, levels of organization, levels of observation, levels of explanation, and the relationships between these levels.¹⁵ The hierarchal approach to scientific inquiry may appear less tidy than the linear logic of reductionism, but it is no less logical or rational. It simply utilizes the logic of creativity, inspiration, and imagination as much as linear thinking. Most impor-

tantly, the hierarchal approach to science attempts to deal with complexity as it exists, rather than by creating an artificial simplicity.

A sustainable economy is inherently complex and hierarchal, in that it integrates the individual, social, and ecological economies into a harmonious whole. Individuals are forced to rethink the conventional wisdom of “more is better” and to search for success through harmony and balance among the individual, social, and moral aspects of their lives. If we are already at a point of balance or harmony, anything we do to improve a single dimension of well-being will disturb the balance and will thus make us worse off than before. If our economy is out of balance, we can restore harmony by devoting less time and energy to the dimension that we are overdoing and thus improve our overall well-being by actually doing less.

An element of tension or stress always exists among the economic, social, and moral dimensions of our lives, if for no other reason than that they all demand investments of our limited time and energy. However, tension is not the same as conflict, and stress is not the same as distress. Tension is often necessary to build strength. Similarly, there always will be tension and stress in a sustainable economy, even when the private, public, and moral economies are in harmony. Tensions become conflict and stress becomes distress only when one dimension is made stronger by weakening the others. With positive stress, however, the strengthening of one dimension creates a healthy tension that challenges, encourages, and strengthens the other dimensions as well.

Admittedly, the most difficult challenges in managing a sustainable economy are likely to arise from the integration of the economic, social, and ecological dimensions in order to maintain a positive, dynamic balance or harmony among the three. Some issues clearly relate to the private economy—the costs and benefits accrue almost exclusively to individuals. Other issues are clearly social—the rewards clearly depend on positive personal relationships. Ecological *oikonomia* is a matter of stewardship—one generation ensures equal opportunities for future generations as a matter of ethical or moral principle. Challenges arise, however, when issues have important economic, social, and ecological dimensions—at the margins or interfaces among the three.

Sustainable economies are hierarchical in a systemic sense, in that the individual or private economy is a subsystem of the social or public economy, which in turn is a subsystem of the moral or ecological economy. In hierarchy theory, *upper-level* systems are the context of, are the constraints on, act more slowly than, have greater integrity and

strength than, and are made up of *lower-level* systems.¹⁶ This concept of hierarchy hinges on the distinction between purpose, which comes from above, and possibilities, which come from below. The ecological economy is the context of, the constraint on, acts more slowly than, has greater integrity and strength than, and is made up of the social and individual economies. The ecological economy, being moral and ethical in nature, gives purpose to the social and individual economies. However, the ecological economy also is clearly dependent upon the social and individual economies, which limits its potential and restricts its possibilities. Whether the ecological ecosystem is robust and productive or anemic and barren is largely dependent upon the functioning of the private and public economies.

At first thought, nature might seem to be dominant over society and society dominant over the economy. However, the private economy can either enhance or destroy the civility of society, which in turn can enhance or destroy the health of the natural ecosystem. So the private economy limits the possibilities of the public economy and society limits the possibilities of the natural ecosystem. Thus, an interdependent relationship exists among the three—none can survive independent of the others. Of course, nature might well survive the ravages of both the economy and our current society, but it likely would be a nature incapable of sustaining human society, at least as we know it.

The hierarchy of sustainability arises from the source of organizational principles or rules by which the system as a whole must function. The concept of ecology presumes there are inviolate laws of nature, which define a higher order that gives purpose to humanity and within which all else, including human society, ultimately must function in harmony. An economy is a creation of a human society and its purpose is to serve the needs of that society. And a society inevitably sets, or at least chooses to accept, the rules by which its economy functions. Thus, there is a natural hierarchy among ecosystems, social systems, and economic systems. Violation of this hierarchy principle is neither impossible nor uncommon, but continual or egregious violations, quite simply, are not sustainable.

Laws Versus Principles

The fundamental issue in managing any economy is the allocation of resources among competing ends. Neoclassical economics provides us

with a logical means of allocating our scarce resources—including time and money—in acquiring scarce goods and services to maximize our individual material well-being. In contrast, sustainable economics provides us with a logical means of allocating all our resources—including our energy, attention, commitment, and passion, as well as time and money—to sustain a desirable quality of life.

For the individual economy, differences between neoclassical and sustainable economics are mainly matters of perspective. For example, the laws of supply and demand are derived from the fundamental law of neoclassical economics, the law of diminishing marginal returns. Beyond some point, the economic value or utility of consuming an additional or marginal unit of anything will be less than the value or utility realized from consuming the previous unit. As anything becomes less scarce, each unit becomes less valuable. The price, or sacrifice, a consumer is willing to pay declines as the quantity consumed increases. And thus we have the law of demand: The quantity demanded varies inversely with price.

Beyond some point, the economic value of anything resulting from the use of an additional or marginal unit of a production input—land, labor, capital—will be less than the value of production realized from the previous unit. To make anything less scarce, to produce more, its producers must receive a higher value per unit to offset higher marginal costs of inputs. The price, or reward, that the supplier must receive increases as the quantity supplied increases. And thus we have the law of supply: The quantity supplied varies directly with price.

Economists freely admit the difficulty in actually holding other things constant, making it difficult to actually quantify supply, demand, and price relationships. Some early economists worried about the oversimplifications of neoclassical economics. Thorstein Veblen, for example, suggested that higher prices may actually make some things more valuable to some people, and they will buy more, not less, at higher prices.¹⁷ But, most economists seem to accept the economic belief in definite, quantifiable supply, demand, and price relationships as if they were physical laws of human behavior. In reality, economies are complex systems and many things other than price affect both quantities supplied and quantities demanded, including incomes, tastes and preferences, production technologies, prices, and the availability of substitutes. None of these other things remains constant as prices and quantities change. But economists narrow the focus

by assuming that the relationships of economic interest can be isolated within the complexity of society and the natural environment.

The inverse relationship between scarcity and value is an essential first principle of economics, but it is a principle of a living system and not a mechanistic law of physics. A principle is a foundational truth, an aspect of pure knowledge, which may or may not be reflected under any specific set of conditions. Principles exist only as abstractions; they can be observed only indirectly, through imperfect examples. Laws, on the other hand, are statements or descriptions of a relationship or sequence of phenomena that invariably occurs under specific conditions.¹⁸ Laws can be validated because the conditions under which they operate can be controlled. Principles can be corroborated, but never completely confirmed, because the conditions under which they operate are always changing, and thus, cannot be controlled.

The economic first principle linking value and scarcity seems to operate in the social and ecological economics, as well as in the individual economy. As social beings, humans value relationships. Scarcity in relationships might be thought of as increasing isolation. The greater the isolation, the more scarce are relationships. A person who has a close-knit family and many good friends is considered a fortunate person. Solitary confinement, at the other extreme, is considered to be among the harshest of human punishments. In general, more good relationships seem to be preferred to fewer.

A negative correlation between the number of relationships and the value of a marginal or additional relationship might also be hypothesized. Having one good friend, rather than none, may make a tremendous difference in quality of life, as might having three rather than two. But the value of having fifty friends rather than forty-nine, while positive, may be much less than the marginal value of the first one or two. Of course, relationships are not necessarily positive. We might prefer to have a few less enemies, even if it meant fewer relationships. This is analogous to being asked to consume more of something that we don't like; we don't prefer more of it, but instead, avoid it. In both cases, however, having some of something, even something we don't prefer, may still be better than having nothing.

In general, as we add positive relationships, at some point the value of each marginal relationship tends to diminish, hence the principle of diminishing value of relationships. Obviously, the cost and value of relationships cannot be expressed as neat, linear, monotonic, or even continuous mathematical functions. The value of human rela-

tionships may be inherently difficult to quantify, but in principle we know it exists and is important.

Relationships also have marginal costs, as well as marginal value. And as with the law of supply, the costs of an additional relationship might be expected to rise as the total number of relationships rise—at least over some relevant range. Relationships require time and attention to develop and maintain, in addition to any sharing of material possessions among friends. As more time and attention are taken away from pursuing economic or personal interests, the value of the sacrifice becomes greater. As we have less money or less time, the value of each dollar or minute increases. Thus, the marginal opportunity cost of relationships rises as we develop more relationships.

The same principles also seem to hold true for ecological relationships. As ethical and moral beings, most humans value stewardship, which means doing something for others, even if there is no expectation of an individual material benefit in return. Stewardship helps give purpose and meaning to life; its only reward is greater peace of mind. People benefit from taking care of the natural ecological environment because it is a *right* and *good* thing to do.

In the case of ecosystems, ecological integrity might be thought of as abundance, and thus ecological impairment might be analogous to scarcity. As the integrity of an ecosystem becomes increasingly impaired, the risk of permanent damage or its eventual death increases. The more impaired the ecosystem, the greater will be the benefit of a marginal increment of environmental stewardship. As an ecosystem approaches optimum health, it becomes increasingly capable of repairing incremental damage, adapting to the threat, and eventually self-renewal. The marginal benefits of ecological stewardship decline as an ecosystem becomes less impaired. As with relationships, the marginal value of ecological stewardship cannot be expressed as some linear, monotonic, or continuous mathematical function. Ecosystems are living systems. The processes of life, health, and death do not follow some precisely predictable pattern.

Environmental stewardship has costs as well as benefits. It requires money, time, effort, attention, and commitment that could be devoted to some other economic or social activity. As explained, the marginal economic and social sacrifices become greater as more money, time, and attention are devoted to stewardship. Therefore the marginal opportunity cost of stewardship rises as more resources are devoted to maintaining higher levels of ecosystem integrity. Although

the linkages between scarcity and marginal values and costs of ecological stewardship may not be quantifiable, we know they exist.

Substitutes, Complements, and Balance

At this point, the economist may be tempted to calculate economic equilibria for individual, social, and ecological economies, by equating their diminishing marginal benefits with increasing marginal costs. However, this would be possible only if the three were independent or separable, which they clearly are not. We cannot simply assume that our individual quality of life will be unaffected by our social and moral quality of life, when our common sense tells us the three are but separate aspects of the same whole. Obviously, all three compete for the same scarce resources—money, time, effort, attention, and commitment. Again the neoclassical economist may be tempted to derive a conceptual economic equilibrium by allocating these scarce resources among the individual, social, and ecological economies to simultaneously equalize the ratios of marginal benefits to marginal costs.

However, the equal marginal approach to deriving equilibria assumes that marginal costs and marginal benefits are continuous, linear, monotonic relationships, and in this case, they are not. This traditional economic approach also assumes that the cost–benefit relationships are static, or stable; however, all three economies of sustainability are clearly dynamic in nature. But perhaps most important, equating ratios of marginal costs and benefits would result in an optimum balance only if the individual, social, and ecological benefits were substitutes, meaning that more of one can make up for less of another.

Although they may appear to be substitutes in a very narrow time frame, with respect to issues of sustainability and quality of life, they are more accurately viewed as complements rather than substitutes. Herman Daly, a noted ecological economist, points out the very limited extent to which natural capital, manmade capital, and human capital are substitutable, arguing that these three forms of private economic capital instead are more generally *complements*.¹⁹ The limited degree of substitutability and the high degree of complementarity are even clearer in the case of relationships among private, social, and ecological capital.

Once a position of balance and harmony is achieved, more of one without more of the others only serves to create imbalance and dis harmony, and detracts from overall quality of life. The three dimensions, individual, social, and ethical, are inevitably interconnected. Obviously, if we spend more money, time, attention, and the like on one dimension, we have less to devote to the others and we consequently disturb the balance. But even if we gain individual benefits without investing more money, time, or energy—by receiving some gift, winning the lottery, or becoming more self-centered—the change will inevitably affect our social relationships and our sense of ethical or moral well-being. We will probably then need to spend more of our scarce resources on relationships and stewardship in order to restore balance and harmony. Likewise, even if we expend additional money, time, or energy in gaining more social or ethical benefits, we will have changed the balance. We will then need to spend more of our scarce resources on individual benefits to restore the balance. Such is the logical process of maintaining some sense of dynamic equilibrium among the complementary dimensions of quality of life.

The objective of this chapter is not to develop a new theory of optimization for the three economies of sustainability but instead to illustrate that existing principles of economics are both relevant and useful in allocating resources for sustainability. However, the fundamental principles of economics must be viewed as living principles rather than mechanistic laws. Minimums, maximums, and optimums must be viewed as dynamic approximations, rather than as precise fixed values, and must be derived through insight and judgment, rather than through mathematical modeling. Values based on conventional economic scarcity can be measured in dollars and cents. But in evaluating social scarcity, every person is of equal worth, and in matters of morality, including environmental ethics, scarcity relates to truth and rightness, rather than to either dollars or votes. The first principles of economics provide a sound foundation for a new economics of sustainability, but economists must be willing to recreate much of the rest of neoclassical economic theory.

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 CHAPTER EIGHT

MANAGING THE MORAL ECONOMY

Society, Ecology, and Morality

The moral economy provides the cultural context within which the private and public economies must function. Without moral guidance and restraint, there can be no assurance that either the private or the public economy will serve the long-term interest of society. The moral economy is rooted in the concept of *deep ecology*, in the philosophical *rightness* of our physical and social relationships. Management of the sustainable economy begins with the moral and ethical questions of how we *should* relate to each other and *should* relate to our natural environment. The answers to these questions cannot be determined and dictated by those in positions of power and authority. A sustainable economy is a knowledge-based organization; it must be managed by leading, nurturing, and empowering rather than ordering, directing, and controlling. Thus, the social and ethical values held by the people of a society must provide the moral context within which their economy functions. And although they might prefer to remain aloof from ethics and morality, economists can no longer escape the fact that they are a part of the economy—affecting and affected by the object of their study.

The moral economy guides and constrains the public and private economies by providing the fundamental principles by which they must function. As discussed previously, first principles exist by nature and thus are beyond the discretion of society or humanity. However,