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## **Exploring and Expanding the Land Amenity Values Terrain**

### **Introduction**

Land has many, multifaceted values to people. Throughout history, the values provided to people by land and its relative scarcity has resulted in minor and major competitions for the possession, use, and management of land. The struggle for survival leads to competition for land as an input for producing the basic necessities of life such as food, shelter and clothing. Conflicts over land to provide basic necessities for survival have occurred over and over again in past civilizations. These type of conflicts over land can be observed today in many underdeveloped parts of the world.

In most developed parts of the world, market forces are doing an adequate job of allocating land to the production of life's necessities in a nonviolent manner. In agricultural land markets for example, market generated prices for food and fiber products play a pivotal role in determining how much land will be allocated to, say, corn and cotton production. Similarly, the demand for and supply of land for housing are captured in market prices and transactions which, in the absence of some type(s) of government restrictions, determine how much land in a region will be allocated to housing. Since VonThunen, economists have been quite familiar with and accepting of the market-driven allocation of land to different uses according to its "highest valued use."

If market prices and transactions capture and reflect all relevant values of land, allocation of land to its "highest valued use" via market forces should be automatic assuming all other necessary assumptions hold. There are good theoretical reasons to believe that land markets adequately reflect the value of land as an input into the production of economic commodities in the nature of

private goods such as food, fibre, timber, and mineral products. Land, however, provides additional services beyond the role as inputs in commercial production processes which are more in the nature of public goods. Certain types of land amenity values fall into this category. Economic theory suggests that the value of public good land services will not be adequately reflected in land markets. Other types of land amenity values will likely escape land markets altogether because of their incommensurable or intangible nature.

Economists typically do not venture outside of the commensurable land value terrain into the incommensurable or intangible land value terrain. Yet, as Crosson (1985) argued over 10 years ago, resolution of competing demands and interests in the use and allocation of land requires that the full scope of land values be taken into consideration. This theme is being repeated often in contemporary times, particularly in developed countries such as the U.S. where land use conflicts increasingly are centered on the amenity values of land, rather than value of land as an input into commercial economic production.

In the next section, some background discussion on why we as a society seem to care so much about land values is provided. Following this discussion, a framework for empirical assessment of these values focusing on amenity values is presented. Application of these values in the rural policy arena is then discussed. Some concluding thoughts are provided in the final section.

### **Land or Landscape Values: Why Do We Care?**

The struggle over defining the values of land to individuals and society is nothing new in America. For example, Thomas Jefferson believed strongly that close ties with the land provided “character building” values that would result in the type of independent, moral, and productive citizens needed to support a growing, free democracy. In another corner was Alexander Hamilton

who did not completely share these sentiments with Jefferson. Hamilton viewed land values more narrowly as he focused on the use of land as an input into the economic engine needed to drive the new country. These differing perspectives on the value and importance of land to individuals and society, as well as differences of opinion of other issues, led Jefferson and Hamilton to advocate different and perhaps competing visions for the development of America (Crosson, 1985; Hite and Dillman, 1981).

The Hamiltonian view of land values apparently was more in line with a young, developing America. Throughout most of American history to date, including the history of economic thought, the predominant view of land has been as an input into commercial productive process just like any other input (Crosson, 1985). In the world of economics, this traditional view of land values has been passed along from one generation of economists to the next primarily through the neoclassical production function. Using the neoclassical production function, one of the first lessons introductory economics instructors teach their charges is that land along with labor and capital provide the big three inputs for production of commercially valuable economic commodities. Values of land other than its marginal productivity in the production of food and fibre products, widgets, or some other commercial commodity are typically not discussed in microeconomic theory courses.

The traditional view of land as a commercial input has contributed to a historical emphasis in rural areas and rural/agricultural policy on “productivism.” Productivism as applied to land implies a commitment to intense, industrial, and expansionist use of land supported by public policy primarily to increase productivity and commercial output. In the rural U.S. at least up to the mid 20th century, productivism has been the guiding force behind land use and policy (Lowe et al,

1993; Reed and Gill, 1997). The results of productivism can be seen throughout the rural landscape - agricultural operations producing an abundance of food and fibre products, private industrial forests where trees for lumber products are grown with utmost technical precision, and large dams and reservoirs built to provide electricity to fuel all manners of industrial production and output.

Productivism has served America well, helping to transform it in a relatively short historical time period from a struggling, developing nation to a highly developed “super power” with unprecedented standards of living. In a developing nation, necessities of life such as food, shelter, and clothing are often critically scarce. As a result, there is high individual and societal demand for increased outputs of these necessities with a corresponding high derived demand for the use of land as a commercial input. In this context, productivism naturally emerges as a means for organizing and utilizing land and other inputs to deal with the scarcity of life’s necessities.

As a nation develops, two fundamental changes occur that put pressure on the established emphasis on productivistic uses of land in rural areas. First, productivism helps to mitigate the scarcity problem related to life’s necessities to the point that it is no longer a major national concern. In the United States and many European nations, for example, an equally troubling concern for individuals and society are the large surpluses of food and fibre produced by the agricultural industry. Second, as a nation develops, demand for noncommercial land values such as amenity values tend to increase at a relatively greater rate than demand for more food and fibre production. The reason from economic theory for these different demand changes is that because they are in the nature of luxuries, the income elasticity of demand for noncommercial land values is greater than the income elasticity of demand for necessities such as food and fibre (Bromley and Hodge, 1990).

Economists, rural sociologists, geographers and other observers of changes in rural development patterns agree that many rural areas are moving into a postproductivism era. This postproductivism era is characterized by more diverse economic activities and attitudes with respect to the use and allocation of land. A key characteristic of a rural area experiencing postproductivism is a migration into the area of new residents attracted by landscape amenities, and increased visitation by nonresidents seeking recreational and leisure opportunities supported by landscape amenities. In addition to “on-site” benefits of landscape amenities to rural area residents and visitors, postproductivism in a rural area also receives support from “off-site” beneficiaries of landscape amenities. These off-site beneficiaries include people in urban, suburban, and exurban areas who enjoy cleaner air and water supported by the countryside (Flynn and Marsden, 1995; Lowe et al, 1993; Reed and Gill, 1997; Troughton, 1996).

Many people in rural areas of the United States remain geared toward productivism and represent the traditional “stakeholders” in rural policy. Accordingly, many local, state and federal institutions involved in rural development and policy continue to lean towards productivism. The new stakeholders in rural development and policy are the residents and nonresidents of rural areas who are more in the postproductivism camp. Institutions that serve the interests of the postproductivism stakeholders are not well-developed. The presence of these different sets of stakeholders and the lack of institutions set up to handle and mediate the interests of both groups sets the stage for land value and property rights conflicts in need of resolution (Bromley and Hodge, 1990; Reed and Gill, 1997).

### **Land or Landscape Values: What are They?**

When two groups do not see eye-to-eye on an issue, a first step towards an acceptable solution is for each group to have a better understanding of what is important or valuable to the other group. What are the various types of land or landscape values that may be of importance to productivists, postproductivists, or both? To address this question, the full scope of land values is discussed in this section with an emphasis on amenity values.

The National Agricultural Lands Study published in 1979 was indicative of a growing national interest and concern in the loss of agricultural land and associated values of this land. The following quote from the National Agricultural Lands Study suggests the broad scope of agricultural land values of concern:

“As prime farmland disappears, food is not our only loss. The quality of our lives is diminished. There are garish signs and glaring storefronts where leaves once caught the rain and filtered the sunlight. There is asphalt where fields and woods once beckoned and refreshed the spirit. There is the loss, also, of farm family life, and the values that spring from living close to the land” (Fields, NALS, 1979).

How many different types of values can you pick out from the above quote? Several fundamental types of land values are embodied in this quote which have been discussed in more detail by a number of authors in articles published since the late 1970s, particularly in the early 1980s, but continuing to today.

An early influential paper on the subject of agricultural land preservation and values was written by Bruce Gardner and published in the *American Journal of Agricultural Economics* in 1977. Gardner (1977) delineated four major types of values provided jointly by agricultural land: 1. local and national food production; 2. provision of local jobs in the agricultural sector; 3. better and more organized development of urban and rural land; and 4. environmental amenities.

Crosson (1985) provides further elaboration on agricultural land values in an article appropriately entitled, "Agricultural Land: A Question of Values." In this article, he first discusses the market values of agricultural land starting with the tremendous market value of food and fibre products produced on agricultural land. He also highlights the considerable employment benefits provided by jobs in the agricultural sector. Both Gardner (1977) and Crosson (1985) argue that private land markets adequately allocate agricultural land to the production of food and fibre products and the associated support of jobs in the agricultural sector.

Crosson (1985) also points out the market value of agricultural land for development purposes. In the absence of development subsidies, agricultural land is converted to residential, commercial, and industrial uses whenever the market value of the land in nonagricultural uses is higher than the market value of the land in agricultural uses. In the spirit of VonThunen, both Gardner (1977) and Crosson (1985) argue that private land markets adequately value and reallocate agricultural land from agricultural to nonagricultural uses.

Gardner's (1977) fourth category of agricultural land values, environmental amenities, was defined broadly as open space and other general amenities of agricultural land of an environmental and public good nature. Crosson (1985) included visual amenities provided by open space as a type of intangible value of agricultural land. Other intangible values of agricultural land according to Crosson (1985) include wildlife habitat, "character building" values gleaned from rural life, and the value of a "sense of community" promoted by farming life. Gardner (1977) and Crosson (1985) agree that unlike market values derived from food and fibre production, employment, and development, the externality nature of the above amenity-type values means that private land markets are not likely to adequately allocate land to the support of these values.

A number of studies conducted mostly in the 1980s attempted to quantify the amenity-type values of agricultural land. Amenity-type values were defined somewhat differently by each study. Halstead (1984) referred generally to the “nonmarket value” of agricultural land including wildlife habitat, scenic vistas, and recreation. Bergstrom et al (1985) defined environmental amenities associated with agricultural land to include scenic value and the environmental qualities of agricultural land which generate nostalgic value. Nostalgic value is related to the virtues people since Jefferson ascribe to living close to the land. Beasley et al. (1986) defined amenity values to include scenic values and historical values of agricultural land. Bowker and Didychuk (1994) refer to the “external benefits” of agricultural land which they define to include open space, scenic vistas, wildlife and traditional country life.

Rosenberger and Walsh (1997) define three categories of amenity-type values which they classify as nonmarket values of agricultural land; open space values, environmental amenities, and cultural heritage. Open space values include visual, recreational and therapeutic benefits. They define environmental amenities to include watershed protection, soil conservation, plant and animal habitat, and the biological diversity supported by these amenities. Cultural heritage value is defined as the value of agricultural land as part of the unique cultural or natural heritage or history of an area (Rosenberger and Walsh, 1997).

Landscape amenities have also been a topic of considerable interest in the rural development, land planning, and environmental planning fields. Duffy-Deno (1997) and Reed and Gill (1997), for example, discuss the role of landscape amenities such as scenic beauty and open-space in attracting new residents and recreational visitors to rural areas. As with the economic valuation studies mentioned in the previous paragraph, a major concern in the land use and

environmental planning literature is with the value of undeveloped land on the urban-rural fringe (e.g., greenbelts). Amenity-type values identified in the rural development and planning literature include recreational values, open space, scenic beauty, symbolic values, environmental quality, and the shaping and containment of urban sprawl (Correll et al., 1978; Duffy-Deno, 1997; Lee and Fujita, 1997; Lee and Linneman, 1998; Reed and Gill, 1997).

Philosophers, working primarily in the area of environmental ethics, have identified and discussed values associated with nature then can be applied to land and landscapes. A general dichotomy of land values suggested by philosophers are *instrumental values* and *intrinsic values* (Ferre, 1988). Instrumental values of land are derived from the active or passive use of land to support or generate services which are useful or valuable to people, plants, animals, and ecological systems as a whole. Intrinsic values of land are the values of land which are independent of active or passive use by some other entity.

The source of intrinsic values is a rather deep ethical, philosophical, and theological question. Some schools of ethical/philosophical/theological thought identify the source of intrinsic values of land as the land itself. For example, Aldo Leopold's "land ethic" outlined and discussed in his book, *The Sand County Almanac*, suggests that land values include the values of land elements such as plants and animals to themselves. Leopold's "land ethic" is an important foundation for modern schools of ethical thought which hold to the inherent value of the biotic and abiotic elements of land and landscapes to themselves including biocentrism and ecocentrism (Oelschlaeger, 1991). Consistent with biocentrism, the *biocentric intrinsic value* of land refers here to the value of living land elements to themselves. Consistent with ecocentrism, *ecocentric*

*intrinsic land value* refers here to the value of living and nonliving land elements to themselves and to the land or landscape ecosystem as a whole.

Other schools of ethical/philosophical/theological thought identify the source of intrinsic values as God or other spiritual beings or entities. Judaism, Christianity, and Islam teach that God created the land and everything else in the universe. This creation has an inherent value to the creator which is apparent in common Judeo-Christian land and nature scriptures found in the Old Testament of the Bible such as Psalm 104. Consistent with the idea of the inherent value of land and nature derived from its creator, *theistic intrinsic land value* refers here to the value of living and nonliving land elements to God independent of active or passive use by anyone or anything else on earth.

Buddism, Hinduism, and parts of Native American spiritualism teach that various types of spiritual beings inhabit the land and its elements. The presence of these spiritual beings provide value to land that is not dependent on active or passive use by anyone or anything else on earth. Thus arise, for example, “Sacred Groves” which are preserved by Hindus for the benefit of the spiritual beings that are believed to inhabit the grove of trees. The inherent value of living and nonliving land elements derived from a multitude of spiritual beings or entities is referred to here as *pantheistic intrinsic land values*.

Unlike intrinsic values, instrumental values of a particular land element are derived from the active or passive use of this element to generate, produce, or support some good or service useful and valuable to people or some other living or nonliving land element. Instrumental values can be divided up into noneconomic and economic instrumental values. Noneconomic instrumental values associated with land include *biocentric instrumental land value* and *ecocentric instrumental land*

*value*. Biocentric instrumental land value is the value of land elements to plants and animals. For example, different types of soil have instrumental value to particular plants as source of nutrients needed for life. Ecocentric instrumental land value is the value of land elements to all living and nonliving components of land ecosystems. For example, ecocentric instrumental land value would include the value of soil as a foundation for surface rock formations. The argument in philosophy and ecology circles is that the function of soil within the land ecosystem as a foundation for rock formations has value outside and independent of human activities which give rise to economic values.

Biocentric and ecocentric instrumental land values focus on the noneconomic instrumental values of land elements to biotic and abiotic components of land ecosystems. Noneconomic instrumental land values also include certain types of *anthropocentric instrumental land values*. Anthropocentric instrumental land values are derived from the active or passive use of land elements to generate, produce, or support goods or services of value to people. Philosophers such as Holmes Rolston and economists including Crosson, and Hite and Dillman identify a number of landscape values that can be classified as noneconomic anthropocentric instrumental land values. These include at least particular types of aesthetic values, historical values, cultural values, security and stability values, mental health values, physical health values, and spiritual health or religious values (Crosson, 1985; Hite and Dillman, 1981; Rolston, 1985).

Economists and philosophers have also identified a host of economic anthropocentric instrumental land values. Because economic values are always dependent on human preferences, the terms “economic” and “anthropocentric” in the label “anthropocentric instrumental land value” are redundant. We can therefore shorten the label somewhat to economic instrumental land values.

Economic instrumental land values include a number of *active use values* including material consumption value, recreational use value, on-site scenic appreciation value, and commensurable mental, physical, and spiritual health values involving on-site use. Economic instrumental land values also include a number of *passive use values* including commensurable existence values, historical values, cultural values, job satisfaction values, security and stability values, off-site aesthetic appreciation values, off-site recreation and leisure values, and mental, physical, and spiritual health involving off-site passive use (Crosson, 1985; Hite and Dillman, 1981; Kline and Wichelns, 1996; Rolston, 1985; Rosenberger and Walsh, 1997). The various values of land or landscapes from an interdisciplinary perspective are summarized in Figure 1.

### **Land or Landscape Function and Value Linkages**

How can we organize all of the various notions of land and landscape values to facilitate policy analysis and decisions? To accomplish this organization, it is useful to think of a particular land area or landscape as an asset with various *functions* as illustrated in Figure 2. In the productivism tradition, the focus of rural land and landscape values in rural policy analysis and decisions has been on the use of rural land and landscape elements as commercial inputs. The use of rural land and landscape elements as commercial inputs includes using soil and water resources as inputs into the production of commercial agriculture, forestry, mineral, and manufactured products. For the most part, rural development policy in the United States has historically emphasized the goal of maximizing the use of rural land and landscape elements as commercial inputs (Bromley and Hodge, 1990; Reed and Gill, 1997).

Land and landscapes also function as “places” which support what philosophers and sociologists refer to as “values of place” (Norton). For residents, land or landscapes function as

place to live and work. In a rural area, these residents include “long-time” residents who work locally in traditional jobs in the agricultural, natural resource extraction, and manufacturing sectors and “new” residents who work in local or nonlocal nontraditional jobs in the recreation and tourism, “high technology,” business service sectors, or are retired and living off of transfer payments from pension funds, retirement accounts, and other nonlocal sources of income.

Land and landscapes in rural areas also provide a place to visit. In many rural areas of the country, recreation and tourism catering to nonresident visitors is a booming business. Most of this recreation and tourism is nature-based - e.g., hunting and fishing, camping, hiking, boating, lake and river swimming, water skiing, off-road touring, snow skiing, and snowmobiling. Agricultural-based tourism such as visiting “dude ranches” has been an established business activity in many parts of the country and is taking hold in other areas of the country.

Another broad function of land and landscapes especially in rural areas is the provision of “space.” Space here is defined from a human interaction perspective, as in the phrase “you’re in my space.” Specifically, space refers here to the physical distance between people as they engage in various life activities (e.g., work, play) and the interrelated frequency of interaction between people as they engage in these activities. One of the apparent reasons people enjoy visiting and living in rural areas is that rural land and landscapes provide them with more space.

The provision of flora and fauna habitat is often identified as an important function of land and landscapes by philosophers, ethicists, economists, ecologists, biologists, and other social and physical scientists. In recent years, the preservation of rural land and landscapes as habitat for endangered plant and animal species has been a contentious rural policy issue. Heated debate between and among residents and nonresidents of the Pacific Northwest over the preservation of

“old growth” forest landscapes to provide habitat for the endangered spotted owl is a familiar and obvious example.

Another function of land and landscapes is provision of unique physical terrain. Physical terrain includes mountains, rolling hills, gorges, valleys, plains, marshes, and beaches. Use and management of physical terrain features may also be a controversial area of rural policy at certain times and regions in the United States. Clashes may arise, for instance, between and among residents and nonresidents of rural areas over the preservation and management of unique physical terrain features. Debates in both the eastern and western United States over mining practices (e.g., strip mining) that temporarily or permanently alter the physical terrain and appearance of a rural landscapes are cases in point.

A major function of land and landscapes is provision of a natural water supply system. With respect to water quantity, land and landscapes provide both a flow and stock of surface and subsurface water supplies through watershed run-off into rivers and lakes, and the seepage of surface water into subsurface aquifers. With respect to water quality, land and landscape elements (e.g., plants, soil) help to filter out chemicals in surface and subsurface water supplies which are potentially harmful to human, plant, and animal health. The function of rural land and landscapes as a natural water supply system is an especially important issue from a rural and urban development policy perspective.

The land or landscape functions shown in Figure 2 support the various land or landscape values discussed previously and listed in Figure 1. The function of land and landscapes of providing commercial inputs primarily supports the value people derive from consuming commercial goods, or material consumption value. The function of land and landscapes as a place to work also

supports material consumption value as well as job satisfaction value, and security and stability value. The function of land and landscapes as a place to live supports job satisfaction value, security and stability value, cultural value, historical value, recreation and leisure use value, aesthetic appreciation value, and mental, physical and spiritual health values. The function of land and landscapes as a place to visit supports cultural value, historical value, recreation and leisure use value, aesthetic appreciation value, and mental, physical and spiritual health values.

The function of rural land and landscapes of providing “space,” more specifically “open space,” support recreation and leisure use value, aesthetic appreciation value, existence values, intrinsic values, biocentric and ecocentric instrumental values, and mental, physical and spiritual health values. The functions of providing flora and fauna habitat, unique physical terrain, and a natural water supply system arguably have an important role in supporting all of the values shown in Figure 2.

### **Commodity and Amenity Values**

In rural policy and development, “commodities,” “commodity interests,” and “commodity values” are frequently used terms. In these cases, “commodity” takes on a more specific meaning than the use of the term in economic theory to refer to goods and services in general. When government agencies such as the U.S.D.A. and land-grant university administrators talk about commodity values, they are referring primarily to values associated with the production and consumption of “private good” commercial products using land as a commercial input including food and fiber products, timber products, and mineral products. In Figure 2, commodity values would include material consumption value, and some portions of job satisfaction value and security and stability value.

Which of the land values shown in Figure 2 can be classified as amenity values of land?

Land amenity values are defined here to be the direct benefits people receive from the sights, sounds, smells, and presence of the land or landscape around them. A key part of this definition is that amenity benefits are derived directly from the land or landscape and not from consumption of commercial products produced using the land as a commercial input. As a commercial input, land provides indirect benefits to people through the consumption of final commercial products such as food, fiber, and timber products. Thus, in Figure 2, material consumption value would not generally fit the definition of land amenity value.

Another key component of the above definition of land amenity values is that these values accrue directly to people - e.g., they are anthropocentric values. Thus, intrinsic values, biocentric instrumental values, and ecocentric instrumental values as defined previously would not generally be classified as land amenity values. All of the other values shown in Figure 1 except for material consumption value, intrinsic values, biocentric instrumental values, and ecocentric instrumental values have significant land amenity value components. In the land value literature, cultural value, historical value, recreation use value, aesthetic appreciation value, existence value, job satisfaction value, security and stability value, mental health value, physical health value, and spiritual health value have been discussed in the context of land amenity values (Beasley et al., 1986; Bergstrom, et al., 1985; Bowker and Didychuk, 1994; Crosson, 1985; Halstead et al., 1992; Hite and Dillman, 1981; Kline and Wichelns, 1996; Rolston, 1985; Rosenberger and Walsh, 1997).

Some amenity value components are captured in market prices and transactions while other components are not. For example, amenity values associated with recreation use may be captured at least partially in prices landowners charge people to lease their land for consumption and(or)

nonconsumptive recreational activities. Also, amenity values associated with aesthetic appreciation may be captured at least partially in the price of rural land sold for residential purposes.

Many land amenity values, however, are in the nature of nonmarket values meaning that they are not reflected in market transactions and prices. The nonmarket nature of certain land values results from characteristics of nonrivalry and(or) nonexclusiveness. The extent of nonrivalness in the consumption of land values is dependent on congestion levels. Figure 3 classifies the land values shown in Figure 2 according to the degree of rivalness and exclusiveness under conditions of low human congestion. In this case, the bulk of land amenity values fall into the “nonrival, nonexclusive” cell and the “nonrival, exclusive” cell. Primarily because of the nonexclusive characteristic, values in the “nonrival, nonexclusive” cell are in the nature of nonmarket values. An example is the value people derive from viewing open landscapes from public, uncongested highways. Values or goods in the “nonrival, nonexclusive” cell are known commonly as pure public values or goods.

Because of they can be made exclusive, the values in the “nonrival, exclusive” cell can potentially be “privatized” and captured in market trade and prices. For example, at least sections of a large farm, woodland area, or ranch can be closed-off from public access or view. The aesthetic appreciation values derived from viewing these private areas becomes a type of private good or value. Specifically, as long as human congestion is low, values in the “nonrival, exclusive” cell may be classified as uncongested private goods. The benefits provided by uncongested private goods may be capitalized into the market value of the land sold for residential and(or) recreation and tourism purposes.

Figure 4 classifies the land values shown in Figure 2 according to the degree of rivalness and exclusiveness under high human congestion. High human congestion occurs, for example, when more and more people travel public highways or move into the countryside to enjoy open-access land amenities such as aesthetic appreciation values. Eventually, congestion sets in causing values in the “nonrival, nonexclusive” cell to move into “rival, nonexclusive” or the “rival, exclusive” cell. In the “rival, nonexclusive” cell, values are still available on a nonexclusive basis, but because of congestion people can no longer enjoy land amenity values on a nonrival basis. For example, public lands such as National Forests are open for many types of recreational activities on essentially a nonexclusionary basis (except for obtaining necessary nonrationed license). However, in many parts of the United States, National Forests are so congested during certain times of the year that recreational use on these public land becomes a rival activity. Conflicts between hikers, mountain bikers, horseback riders, and off-road vehicle touring who often attempt to share the same trails or roads is a case in point.

In the same way, at a certain congestion level, the values in the “nonrival, exclusive” cell that were formally available on a nonrival basis will become rival. At this point, many of the values in the “nonrival, exclusive” cell will move into the “rival, exclusive” cell. The “rival, exclusive” cell contains pure private goods or values. An example in the land amenity area are private, exclusive quail or pheasant hunting preserves in the South. The quantity and quality of quail or pheasant on these preserves available for hunting are carefully regulated. Access by a limited number of hunters is strictly enforced and is very expensive.

Figure 5 lists potential techniques for valuing different types of public and private goods. These techniques can be applied to measure land amenity values categorized by degree of rivalness

and exclusiveness. Land amenity values in the nature of pure private goods can be valued using traditional market price valuation techniques. The economic impacts of expenditures associated with these values can be measured using economic impact analysis techniques such as input-output analysis. The noneconomic social effects of these values can be assessed using various types of social effects or impact assessment. Land amenity values in the nature of uncongested private goods can potentially also be valued using market price valuation techniques. Economic impact analysis and social effects assessment can be used to assess economic and social impacts associated with uncongested private goods and values.

Because of the lack of market prices, nonmarket valuation techniques must be employed to measure the economic value of land amenity values in the pure public good cell. The travel cost method may potentially be used, for example, to quantify public nonconsumptive recreation use values derived from countryside landscapes. It may be possible to use the hedonic price method to quantify nonrival, nonexclusive aesthetic appreciation values which are capitalized into the value of land sold for residential and(or) recreation and tourism purposes. The contingent valuation method can potentially be used to quantify the commensurable portions of all land amenity values in the nature of pure public goods. To the extent enjoyment of pure public good land amenity values involves actual expenditures, the economic impacts of these expenditures can be measured using economic impact analysis. Noneconomic social benefits derived from enjoying pure public good land amenity values can be assessed using social effects or impact assessment (Bartik, 1988; Cheshire and Sheppard, 1995; Correll et al., 1978; Garrod and Willis, 1992; Lee and Fujita, 1997a; Lee and Fujita, 1997b; Lee and Linneman, 1998; Rosenberger and Walsh, 1997; Young and Allen, 1986).

Congested public goods in the “rival, nonexclusive” cell will not generally have market prices. Land amenity values in the nature of congested public goods must therefore be measured using nonmarket valuation techniques. For example, the travel cost method may be used to measure the economic value of nonexclusive recreational use in a congested National Forest. If congested public good land amenity values are capitalized into the value of rural land, the hedonic price method can potentially be used to quantify these land amenity values. The contingent valuation method can potentially be used to measure all congested public good land amenity values. As with pure public good values, if actual expenditures are associated with congested public good land amenity values, the economic impacts of these expenditures can be measured using economic impact analysis. Noneconomic social effects can be measured using social effects or impact assessment techniques (Bartik, 1988; Cheshire and Sheppard, 1995; Correll et al., 1978; Garrod and Willis, 1992; Lee and Fujita, 1997a; Lee and Fujita, 1997b; Lee and Linneman, 1998; Rosenberger and Walsh, 1997; Young and Allen, 1986).

### **Aggregate Values by Landscape Type**

The aggregate land value for a particular landscape is the sum of the different land values shown in Figure 2 for that landscape. The magnitude of aggregate land value and the portion of aggregate land value represented by different types of amenity and nonamenity values will vary across landscapes. Consider first an urbanized landscape characterized by high human development and congestion. In this landscape, as shown in Figure 6, aggregate land value is dominated by pure private good values and congested public good values. Land amenity values in the form of pure public goods and uncongested private goods are relatively sparse in this landscape.

Aggregate land value in the suburban landscape (Figure 6) is also dominated by pure private goods and congested public good values. Although more of the pure private goods values may be in form of private amenity values, most of the pure private good value is made up of material consumption value. Congested public good values include, for instance, the use of congested public parks and other open areas for recreation. These areas will not likely be as congested as similar areas in the urbanized landscape, but are congested nonetheless. As shown in Figure 6, land amenity values in the form of uncongested private goods and pure public goods are still relatively low on average. Suburbs on the rural fringe will have higher levels of land amenity values in the form of pure public goods and uncongested private goods as compared to suburbs on the urban fringe.

On the other extreme from an urbanized landscape, consider a frontier/natural landscape with relatively little human development. In this type of landscape, as shown in Figure 7, land amenity values in the form of pure public goods will be relatively abundant. Because of the lack of human development, pure private good values, amenity or otherwise, will be sparse. Land amenity values in the form of uncongested private goods will also be relatively abundant. There will be few congested public goods in this type of landscape.

Figure 7 depicts the mix of public and private goods in a traditional agrarian economy landscape. In this landscape, human development is evident mainly through the presence of farming and natural-resource extraction operations such as fishing, timber harvesting, and mining. Because land and other natural resources are still relatively abundant in relation to human use and congestion, land amenity values in the form of pure public goods and uncongested private goods are

relatively abundant. The higher levels of commercial economic activity and human activity lead to higher levels of pure private goods and congested public goods.

A relatively new type of landscape emerging in the United States is the *exurban* landscape. The exurban landscape is an agrarian economy landscape or a frontier/natural landscape experiencing an influx of new residents from urban areas who have skipped over the suburbs to move to an area where they can enjoy the relative abundance of land amenity values in the form of pure public goods and uncongested private goods while continuing to work in jobs closely related to their urban careers. In fact, many of these people may continue to physically commute or “telecommute” to jobs headquartered in urban areas. Some may start new careers in their new rural landscape home, but in nontraditional areas such as the recreation and leisure industry, arts and crafts industry, cottage industries, or the high tech industry. The increased economic activity spurred on by exurban residents increases the level of pure private goods and congested public goods in the landscape. However, as shown in Figure 8, land amenity values in the form of pure public goods and uncongested private goods are still relatively abundant.

Figure 9 summarizes the mix of commodity values and amenity values typically found in different landscapes. Moving from an urbanized landscape to a frontier/natural landscape, public good values and land amenity values typically rise, and private good values and material consumption values typically fall. The magnitude of aggregate land values will rise and fall across landscapes according to how the sum of the different types of material consumption values and land amenity values change across landscapes. Empirical assessment of different land values would be needed to determine how aggregate land values change across landscapes.

Moving to a larger scale, a *regional landscape* is made up of a mix of various types of landscapes as shown in Figure 10. Aggregate land value for a regional landscape is the sum of commodity values and amenity values associated with each individual type of landscape within the broader regional landscape. Comparison of aggregate land value across different regional landscapes would also require empirical assessment of commodity and amenity values .

### **Landscape Value Planning and Management**

The preceding sections indicate that there are a broad array of commodity and amenity values provided by different types of landscapes. Two relevant policy questions are: 1) What is the desired mix of value provided by a particular landscape or landscapes? and 2) How can this desired mix be achieved and maintained? Consider first a *productivist* landscape or landscapes in which commodity values are the primary values of interest. Figure 11 shows the primary beneficiaries and land management institutional representation for this type of landscape or landscapes. Primary beneficiaries of commodity values in rural areas are commodity producers, commodity consumers, landowners, and long-time residents. These beneficiaries have traditionally had strong representation in local government planning boards, local elected officials, state agricultural agencies, state resource management agencies (e.g., state forestry commission), federal agricultural agencies (e.g., ASCS), federal resource management agencies (e.g., U.S.D.A. Forest Service, Bureau of Land Management), and private commodity NGOs (e.g., Farm Bureau, other commodity associations).

When a landscape or landscapes move into postproductivism, there is demand for both landscape amenity and commodity values. The demand for amenity values, in particular, adds new residents and nonresident visitors to the list of primary beneficiaries of landscape values. The

demand for amenity values also results in government agencies and NGOs who primarily represent amenity value interests becoming involved in landscape management in a rural area. Government agencies include local recreation and tourism development boards and state recreation and tourism agencies. NGOs include conservation and environmental organizations and local chambers of commerce in some areas.

A major challenge in rural areas experiencing postproductivism development is dealing with “value conflicts” between people whose interests are primarily with commodity values, and other people whose interests are primarily with amenity values. Commodity value interests are generally well-represented in various land management institutions because of the private good nature of commodity values. There is a direct incentive for commodity producers, for example, to become involved in land management issues because their income and livelihood may depend upon it. Amenity value interests may not be as well-represented in various land management institutions because of the public good nature of these values (Bromley and Hodge, 1990; Reed and Gill, 1997). A “free-rider” problem may occur, for example, because if one person or group takes on the burden and costs of becoming involved in land management institutions to protect amenity value interests, everyone in the community who enjoys nonrival, nonexclusive amenity values will benefit from these actions.

As a result of uneven representation in established land management institutions, new institutional arrangement for resolving value conflicts between commodity value and amenity value advocates in postproductivism rural areas may need to be developed. These new institutional arrangements may include more “bottom-up” organizations including citizen advisory committees, stakeholder advisory committees, local action or interest groups, round tables, and public forums.

Many of the federal land management agencies such as the U.S.D.A. have increased the use of stakeholder advisory committees, round tables, and public forums in an attempt to resolve value conflicts between people who would like to maximize the use of National Forests and Rangelands for commodity values (e.g., timber harvesting, mining, grazing) and other people who would like to maximize the use of National Forests and Rangelands for recreation and other amenity values.

### **Summary and Conclusions**

Americans appear to have a special attachment to land that spans over a broad array of concerns and interests. These broad concerns and interests lead to a multitude of interdisciplinary values that people derive from land. Land or landscapes can be thought of as assets with a number of major functions. These functions include use as a commercial input, a natural water supply system, unique physical terrain, flora a fauna habitat, space, and a place in which to live, work and visit. The functions of land or landscapes support economic and noneconomic land or landscape values ranging from material consumption value to nonuse values including existence value and intrinsic value.

Two general categories of anthropocentric land or landscape values are commodity values and amenity values. Commodity values are derived from commercial commodities produced using land as a major input including food and fiber products, timber products, mineral products and manufactured goods. Amenity values are derived directly from the land and have large nonconsumptive or passive use components. Amenity values include recreational use value, scenic appreciation value, existence value, and certain types of cultural, historical, and health values.

The classification of land or landscape values into private or public values is an important distinction to be made for empirical valuation and land policy implementation. A major determinant

of the private or public good nature of land or landscape values is their degree of exclusiveness and rivalness. *Rival and exclusive* values such as material consumption value are in the nature of pure private goods. *Nonrival and nonexclusive* values such as existence value are in the nature of pure public goods. In between classifications include *nonexclusive, rival* values and *exclusive, nonrival* values. An example of a nonexclusive, rival value is public consumptive recreation use value under conditions of low or high human congestion. An example of an exclusive, nonrival value is private historical value under conditions of low or high human congestion.

Commodity values of land or landscapes fall primarily into the rival, exclusive category. Market price valuation techniques can therefore be used to quantify these values. Under conditions of high human congestion, some amenity values may fall into the rival, exclusive category. However, because of the lack of established markets for these values, market valuation techniques may not be readily applicable to these values.

Most amenity values will fall into the exclusive, nonrival category, nonexclusive, rival category, or nonrival, nonexclusive category. Revealed or stated preference nonmarket valuation techniques must be used to quantify values associated with “pure public goods” in the nonrival, nonexclusive category. Values in the rival, nonexclusive category are typically associated with “congested public goods.” Because of the nonexclusive nature of these values, revealed or stated preference nonmarket valuation techniques must be used to quantify these values. Values in the exclusive, nonrival category are typically associated with “uncongested private goods.” Because markets may exist for uncongested private goods, values associated with these goods perhaps can be quantified using market valuation techniques.

The economic effects of values associated with pure private goods such as commodity values can be measured using economic impact analysis techniques. To the extent that actual market expenditures are incurred to enjoy values associated with pure public goods, congested public goods, and uncongested private goods, economic impact analysis techniques can also be used to measure the effects of these values on local and regional economies. The enjoyment of amenity values of different types often involves actual market expenditures. Thus, economic impact analysis can and has been used to measure the economic effects of amenity value expenditures on local and regional economies. Social effects assessment can be used to assess the noneconomic effects of all types of land values on individuals and communities.

The distribution of land values associated with different types of private and public goods varies across landscapes. A highly urbanized landscape typically provides a high proportion of pure private good values such as commodity values and a low proportion of pure public good values including amenity values. On the other extreme, a frontier/natural landscape provides a low proportion of pure private good values such as commodity values and a high proportion of public good values such as amenity values. Landscapes in between these extremes including suburban, agrarian economy, and exurban landscapes provide more balanced mixes of private of public good values and commodity and amenity values. The aggregate value of each type of landscape must be determined on a case by case basis through empirical valuation.

A regional landscape is made of different mixes of specific landscapes including urbanized, suburban, agrarian economy, exurban, and frontier/natural landscapes. The aggregate value of each regional landscape is a function of the land values provided by each landscape and the interaction of values between landscapes in the region (e.g., substitute and complement effects). Holistic

empirical valuation studies which account for value interactions between different landscapes must be conducted to determine the aggregate value of particular regional landscape.

Within a particular landscape or in a regional landscape, people residing inside or outside of that landscape will have different preferences for the current and future mix of land values; for example, commodity vs. amenity values. Productivism, which has been a traditional focus of public policy in rural areas, focuses on commodity values. Many rural areas in American are moving into a postproductivism era which focuses on both commodity and amenity values. When a rural area moves from productivism to postproductivism, value conflicts often arise between individuals and groups whose primary interests are commodity values and individuals and groups whose primary interests are amenity values. Rural institutions for handling such conflicts may not be well-established. There is a need to explore what institutions will be most effective in rural areas for moderating and solving value conflicts between people who desire different mixes of commodity and amenity values from land and landscapes.

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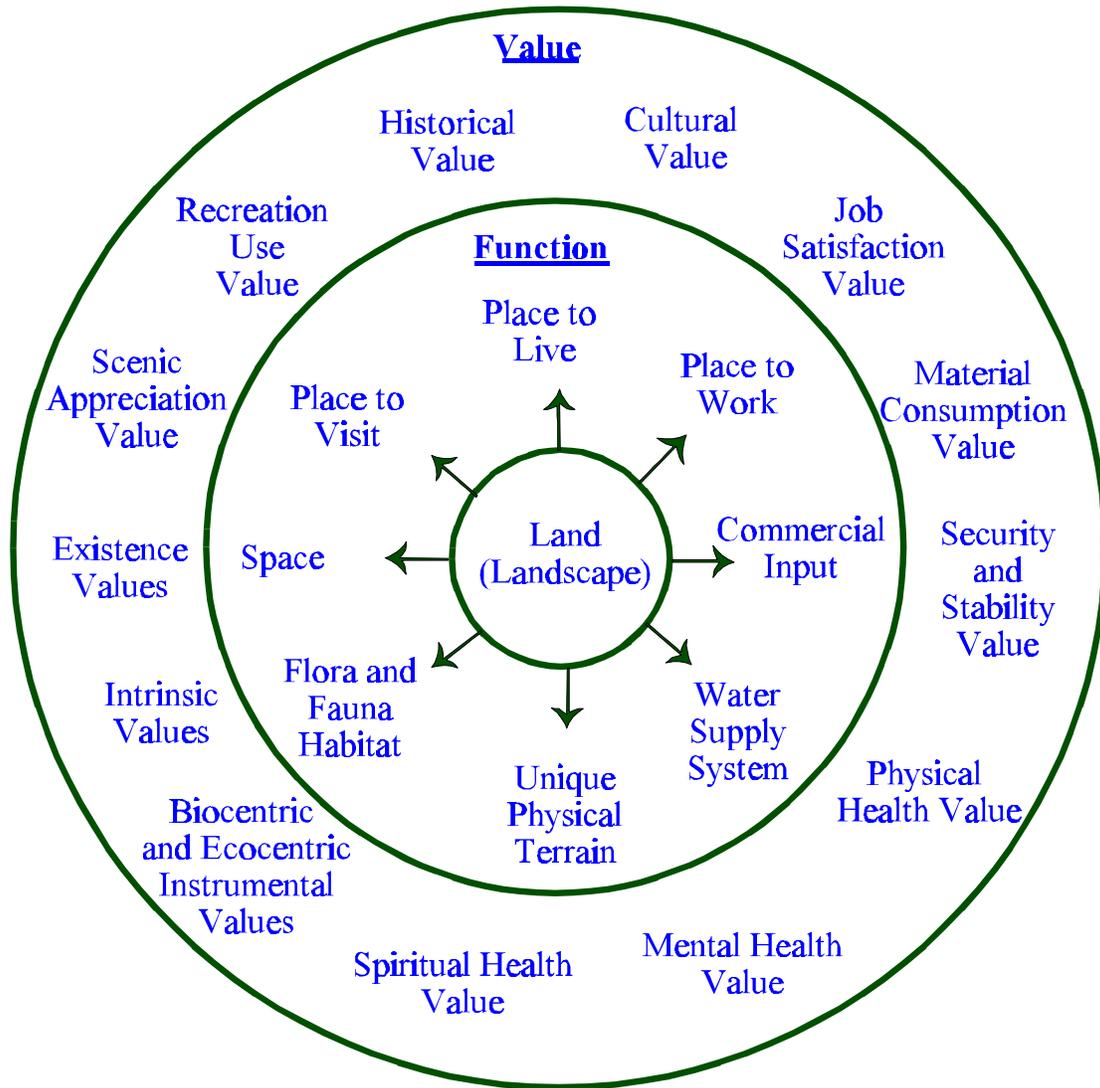
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**Figure 1. Interdisciplinary Rural Land or Landscape Values**

Support of local agricultural industry	Land input for recreational activities	Ecological life-support
Support of local resource extraction industry	Support of local tourism industry	Provision of genetic diversity
Support of local agricultural jobs	Provision of wildlife habitat	Intrinsic value
Support of local resource extraction jobs	Provision of open space	Existence value
Job satisfaction value	Provision of scenic views	Therapeutic value
Support of job security and stability	Support of aesthetic enjoyment	Physical health value
Support of community security and stability	Surface water storage	Religious/spiritual value
Support of national security and stability	Ground water recharge	Educational value
Provision of local food supplies	Natural water filtration	“Natural laboratory” value
Self-sufficiency in production of food items	Support of rural life values	Protection of cultural heritage
Dispersion of food production	Provision of character building opportunities	Nostalgic value
Continued production of unique food products	Support of national identity/ideals	Environmental amenities
Land input for residential development	Cultural symbolization value	Countryside amenities
Land input for commercial development	Historical value	Promotion of orderly development

**Figure 2. Land or Landscape Functions and Values**



**Figure 3. Landscape Value Classifications Under Low Human Congestion**

	Rival	Nonrival
Exclusive	<ul style="list-style-type: none"> <li>Material Consumption</li> <li>Private Consumption Recreation Use</li> <li>Individual Job Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>Private Nonconsumptive Recreation Use</li> <li>Private Scenic Appreciation</li> <li>Private Cultural Value</li> <li>Private Historical Value</li> <li>Private Security and Stability</li> <li>Private Physical Health</li> <li>Private Mental Health</li> <li>Private Spiritual Health</li> </ul>
Nonexclusive	<ul style="list-style-type: none"> <li>Public Consumptive Recreation Use</li> </ul>	<ul style="list-style-type: none"> <li>Public Nonconsumptive Recreation Use</li> <li>Public Scenic Appreciation</li> <li>Public Cultural Value</li> <li>Public Historical Value</li> <li>Public Security and Stability</li> <li>Public Physical Health</li> <li>Public Mental Health</li> <li>Public Spiritual Health</li> <li>Existence Value</li> </ul>
		<ul style="list-style-type: none"> <li>Biocentric Instrumental Value</li> <li>Ecocentric Instrumental Value</li> <li>Intrinsic Value</li> </ul>

**Figure 4. Landscape Value Classifications Under High Human Congestion**

	Rival	Nonrival
Exclusive	Material Consumption Individual Job Satisfaction Private Consumption Recreation Use Private Nonconsumption Recreation Use Private Scenic Appreciation Private Physical Health Private Mental Health Private Spiritual Health	Private Cultural Value Private Historical Value Private Security and Stability
Nonexclusive	Public Consumptive Recreation Use Public Nonconsumption Recreation Use Public Scenic Appreciation Public Physical Health Public Mental Health Public Spiritual Health	Public Cultural Value Public Historical Value Public Security and Stability Existence Value
	----- Biocentric Instrumental Value Ecocentric Instrumental Value	----- Intrinsic Value

**Figure 5. Valuation Techniques for Values Associated with Different Types of Public and Private Goods**

	Rival	Nonrival
Exclusive	Pure Private Goods ("Commodities")	Uncongested Private Goods
	Market Price Valuation Techniques	Market Price Valuation Techniques
	Economic Impact Analysis (e.g., CGE, Input-Output)	Economic Impact Analysis (e.g., CGE, Input-Output)
	Social Effects Assessment	Social Effects Assessment
Nonexclusive	Congested Public Goods	Pure Public Goods
	Revealed-Preference Extramarket Valuation Techniques (e.g., travel cost method, hedonic price method)	Revealed-Preference Extramarket Valuation Techniques (e.g., travel cost method, hedonic price method)
	Stated-Preference Extramarket Valuation Techniques (e.g., contingent valuation method)	Stated-Preference Extramarket Valuation Techniques (e.g., contingent valuation method)
	Economic Impact Analysis	Economic Impact Analysis
	Social Effects Assessment	Social Effects Assessment

**Figure 6. Private and Public Good Values Associated with Urbanized and Suburban Landscapes**

The Urbanized Landscape

Pure Private Goods	Uncongested Private Goods
Congested Public Goods	Pure Public Goods

→High relative value of individual and public amenities leads to more interest on use of remaining undeveloped land as stock and flow of amenity services.

The Suburban Landscape

Pure Private Goods	Uncongested Private Goods
Congested Public Goods	Pure Public Goods

→Unstable balance between commodity and amenity values - competing land value and policy interests often lead to “value struggles” on urban-suburban and rural-suburban fringes.

**Figure 7. Private and Public Good Values Associated with Frontier/Natural and Agrarian Economy Landscapes.**

The Frontier/Natural Landscape

Pure Private Goods	Uncongested Private Goods
Congested Public Goods	Pure Public Goods

→Amenity values are relatively abundant and accrue mostly to non-resident visitors. High relative value of commodity production leads to high interest on use of land as a commercial input (productivism).

The Agrarian Economy Landscape

Pure Private Goods	Uncongested Private Goods
Congested Public Goods	Pure Public Goods

→Economic activity is centered on agricultural and natural resource commodity production. Amenity values accrue mostly to long-time residents and occasional visitors.

**Figure 8. Private and Public Good Values Associated with Exurban Landscapes**

The Exurban Landscape

Pure Private Goods	Uncongested Private Goods
Congested Private Goods	Pure Public Goods

→High amenity values attract new residents and business who increase private good production in nontraditional areas including recreation and tourism, arts and crafts, cottage industries, “high tech” industries, and the business service sector via “telecommunicating.”

## **Land or Landscape Commodity Values:**

Indirect value to consumers of land or landscapes derived from the use of land as an input into the production of commercial (generally, rival, exclusive) goods which when consumed, provide utility or satisfaction to consumers.

Indirect value to producers derived from the use of land as an input into the production of commercial (generally, rival, exclusive) goods which when sold, provide income to producers.

Indirect value to people in a community whose incomes are increased by the multiplier effects initiated by the production and consumption of commercial products using land as a primary input (e.g., food and fiber, timber products).

## **Land or Landscape Amenity Values:**

Direct benefits people receive from the sights, sounds, smells and presence of the land or landscape around them.

Direct benefits people receive from thinking about or reflecting upon the existence of land or landscapes and the natural and human characteristics of this land or landscapes.

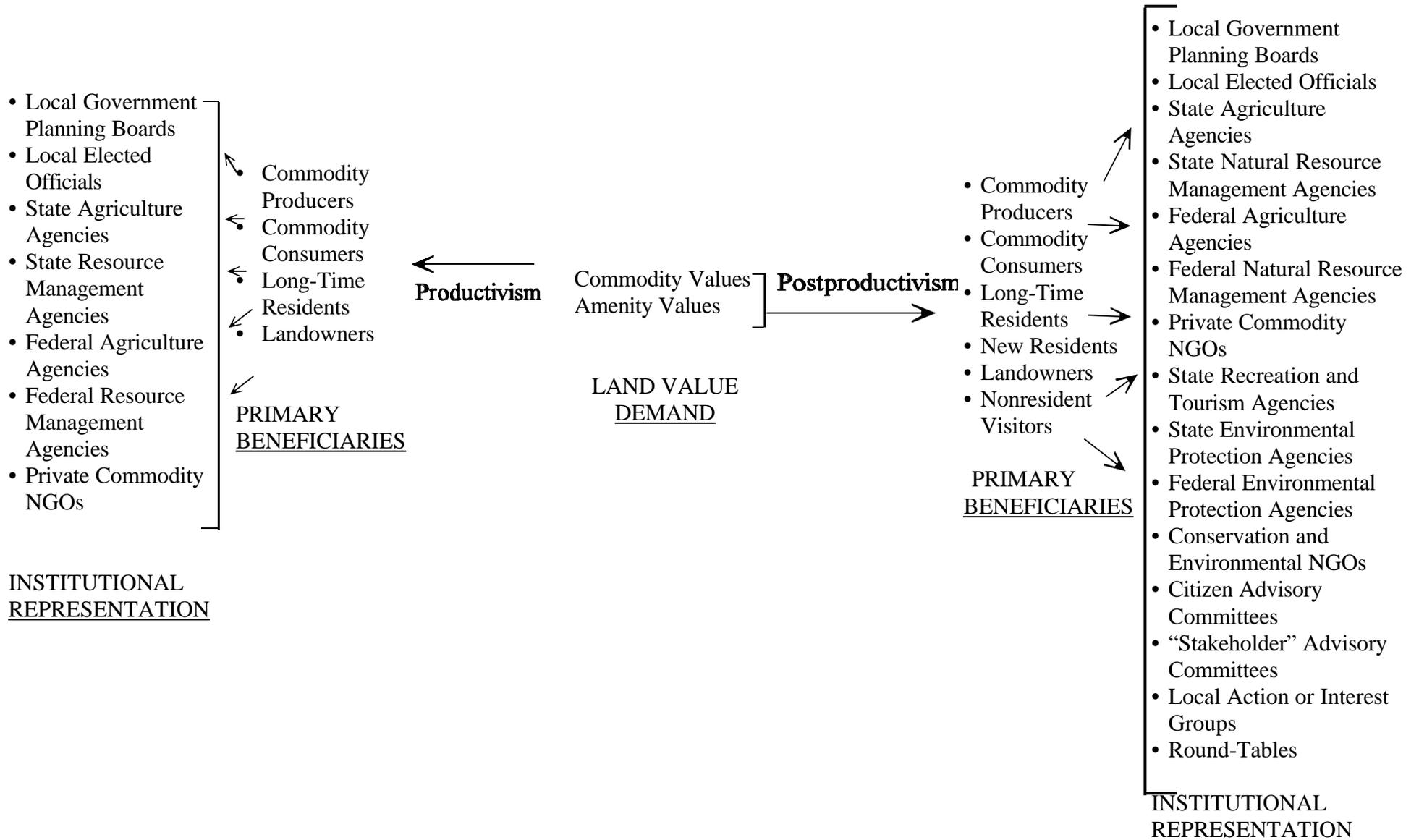
Indirect benefits people receive from the use of land to support recreational and leisure activities which when engaged in, provide utility or satisfaction.

Indirect benefits to producers from the use of land as an input into production of recreation and leisure goods and services which when sold, provide income to producers.

Indirect value to people in a community whose incomes are increased by the multiplier effects initiated by the production and consumption of recreation and leisure goods and services (e.g., recreational activities, nature crafts).

*“As prime farmland disappears, food is not our only loss. The quality of our lives is diminished. There are garish signs and glaring storefronts where leaves once caught the rain and filtered the sunlight. There is asphalt where fields and woods once beckoned and refreshed the spirit. There is the loss, also, of farm family life, and the values that spring from living close to the land” (Fields).*

**Figure 11. Land Value Demand, Primary Beneficiaries, and Land Management Institution Representation**



### **Land or Landscape Commodity Values:**

Indirect value to consumers of land or landscapes derived from the use of land as an input into the production of commercial (generally, rival, exclusive) goods which when consumed, provide utility or satisfaction to consumers.

Indirect value to producers derived from the use of land as an input into the production of commercial (generally, rival, exclusive) goods which when sold, provide income to producers.

Indirect value to people in a community whose incomes are increased by the multiplier effects initiated by the production and consumption of commercial products using land as a primary input (e.g., food and fiber, timber products).

### **Land or Landscape Amenity Values:**

Direct benefits people receive from the sights, sounds, smells and presence of the land or landscape around them.

Direct benefits people receive from thinking about or reflecting upon the existence of land or landscapes and the natural and human characteristics of land or landscapes.

Indirect benefits people receive from the use of land to support recreational and leisure activities which when engaged in, provide utility or satisfaction.

Indirect benefits to producers from the use of land as an input into production of recreation and leisure goods and services which when sold, provide income to producers.

Indirect value to people in a community whose incomes are increased by the multiplier effects initiated by the production and consumption of recreation and leisure goods and services (e.g., recreational activities, nature crafts).