



Watershed Academy Web

Distance Learning Modules on Watershed Management
<http://www.epa.gov/watertrain>

The Economics of Sustainability

NOTICE: This PDF file was adapted from an on-line training module of the EPA's *Watershed Academy Web*, found at <http://www.epa.gov/watertrain>. To the extent possible, it contains the same material as the on-line version. Some interactive parts of the module had to be reformatted for this non-interactive text presentation.

This document does not constitute EPA policy. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Links to non-EPA web sites do not imply any official EPA endorsement of or responsibility for the opinions, ideas, data, or products presented at those locations or guarantee the validity of the information provided. Links to non-EPA servers are provided solely as a pointer to information that might be useful to EPA staff and the public.

Introduction

Watershed managers, like all environmental professionals, often encounter decision points where economics and environmental protection must be considered together. This module covers seven topics that are relevant to the socioeconomic aspects of the watershed approach in issue papers developed in EPA's former Office of Policy, Planning and Evaluation.

The central theme is best expressed in [The Economics of Sustainability Issue Brief](#), which reviews the differences between traditional mainstream economic concepts and economic viewpoints that incorporate more conscientious stewardship of the "natural capital" which sustains all life. [The Environmental Protection and Jobs Issue Brief](#) attempts to clarify the terms of the environment-employment debate, at local scales and economy-wide scales. In [The Use of Economics in Environmental Decision-Making](#), some of the political history of environmental economics (particularly cost-benefit analysis) applied to government policy making is reviewed.

The module also offers how-to guidance on economic techniques. The [Community Economic Profiles Issue Brief](#) describes two methods for organizing economic data to profile a community, namely comparative benchmarking and trend analysis. The [Value-Added Processing Issue Brief](#) describes how communities can approach economic activities in ways that alter and add value to their resource base and local economy, and [Conservation-Based Green Marketing](#) illustrates three communities' own experiences with marketing "eco-friendly" products. [Nature-Based Tourism](#) describes the potential of this growing industry to bolster local economies while supporting environmental protection of some of our finest ecological resources.

The Economics of Sustainability

Overview

This Issue Brief reviews the differences between the conceptual framework of mainstream economics (the neoclassical school) versus an ecological economics based on viewing the economy as dependent on the environment as a source for all its inputs to production and as a sink for all its waste outputs (the source/sink framework). The general consensus on sustainability among economists is based on the "constant capital rule" -- the notion of living off interest or income and not consuming capital. With this starting point, the Issue Brief then describes the division with the economics profession over the definition of capital and therefore what needs to be maintained and preserved. A "Strong Sustainability" view (from ecological economics) is contrasted with a "Weak Sustainability" view (from neoclassical economics).

I. The Conceptual Starting Point in Economics: Is there Something Missing Here?

Let's all go back in time to Economics 101. Maybe you were exposed to this diagram in college or maybe in high school. Along about the first day or certainly the first week of class, the teacher puts this diagram on the board. Or maybe you saw it in Chapter One of the classic economics text written by Paul Samuelson. Anybody remember this *Circular Flow of Exchange between Firms and Households* diagram from Econ. 101?

This is the basic conceptual starting point for economics. Like all highly stylized diagrams, it's obviously an over-simplification, but, even considering that, is there something missing here? Where do all the inputs (raw materials and energy) from production come from? Where do all the waste outputs go? Unfortunately, this isn't an isolated instance where economics has a little "blind spot". It's actually quite pervasive in economics to believe that the physical world is irrelevant to the economy. Before about the 1940's, the old production functions at least included "land" as the third factor of production (land being a euphemism for all of the environment, all natural resources). With the publication of his classic 1947 textbook, Paul Samuelson dropped natural resources from the production function so that we have: Output $Q = f [K, L]$ where $K =$ capital and $L =$ labor. Samuelson did this because he considered man-made capital and natural capital (or resources) to be so substitutable that it was redundant to mention them as two separate entities! Herman Daly (author of *Steady State Economics* in 1977, *For the Common Good* in 1989, and *Beyond Growth* in 1996) has a rather graphic analogy for this failure of mainstream economics to address the physical context for the economic process. In Daly's words, it is "as if biology tried to understand animals only in terms of their circulatory system, with no recognition of their digestive tract." (Daly, 1988)

Figure 2 shows the digestive tract of the economy. In Figure 2, we see the economy as a subsystem of the global ecosystem -- an economy that draws matter and energy from the environment and returns it to the environment in the form of waste. Herman Daly suggested that we expand our analytic vision to include our economy's dependency on the environment. The economy is not really a closed, isolated system; it is a sub-system of the biosphere, receiving and transforming matter and energy. The biosphere serves as both *source & sink* for the economy.

Daly called this one-way passage of matter & energy through the economic system *throughput*.

Throughput is the flow of matter-energy from nature's sources through the human economy. Nicholas Georgescu-Roegen (author of *The Entropy Law and the Economic Process*, 1971) first traced the nature of throughput to its origin in the second law of thermodynamics or the entropy law, the law of physics that Einstein considered the least likely to be overthrown. Georgescu-Roegen's work, by the way, extended the 1970 work by several economists at Resources for the Future (Kneese, Ayres, and d'Arge) who had developed their "materials balance" framework showing that whatever goes in the economy as a material input eventually leaves as waste and pollution. Georgescu-Roegen's book took this one step further, showing that not only is there a "materials balance" between what enters and what leaves an economic process, there is additionally an irreversible one-way change from available energy to unavailable energy.

GNP, we might note, is really an index of an economy's throughput. And, inasmuch as our nat'l macroeconomic policy is one of maximizing GNP, we're maximizing throughput (ecological cost). Daly suggested that our policy goal should really be more one of maximizing the ratio of economic service to ecological cost (what Daly calls "throughput"). We might call this eco-efficiency or using less materials, water and energy inputs in the production and consumption process and emphasizing products that are more durable, repairable and reusable.

This word "sustainability" or the phrase "sustainable development" has become a big one. It has become a catch-all phrase that now refers to almost anything -- from recycling to planting trees to integrated policy analysis to sustained growth of output to the use of environmentally-adjusted national accounts or alternative indicators. David Pearce, the British economist at the Center for Social and Economic Research on the Global Environment (CSERGE) in the UK, has collected these various definitions of sustainability in his 1989 book *Blueprint for a Green Economy*. The most commonly used definition comes from the 1987 World Commission on Environment & Development: "development that meets the needs of the present without compromising the ability of future generations to meet their economic needs." The purpose of this paper is to introduce some of the issues involved in charting an economic direction that might achieve intergenerational equity or sustainability.

II. Sustainability for Economists Means Living Off Interest & Not Consuming Capital

If you ask the question, *what are we trying to sustain?* -- almost everybody will agree that we're trying to sustain human welfare, that we're trying to leave our children at least as well off as we are. But, defining the components of social welfare is a harder task. Components of a social welfare function might include: quality & quantity of leisure time, quality of relationships, access to natural environments & recreational opportunities, housing, job satisfaction, sense of community, peace of mind, health, income, etc. No one can really write a perfect definition for social welfare, but no one's equation is really wrong either. Certainly, in almost everyone's equation, income would be included. It's an important, albeit incomplete, part of our welfare. Since we're talking about the economics of sustainability, let's focus on *income* -- what it means to economists and what is required to sustain it.

For an economist, "income" might be something different than the size of your monthly check. We have to go back to J.R. Hicks, who in his 1946 book *Value & Capital*, defined income as *the*

maximum amount that can be consumed without eventual impoverishment. It's kind of like interest on a savings account or the growth rate of a natural resource. In other words, if you have a \$1000 in savings accruing 8% interest, unless you dip into capital, you can spend only \$80/year before you start making yourself poorer in the long run. This is *Hicksian income* and it's the defining characteristic of sustainability because it is that amount which can be appropriated in perpetuity. That's quite different from the size of your monthly paycheck or national income accounts -- which bear little relation to income derived from our stocks of natural resources.

All economists can agree on this, whether from the left or right sides of the spectrum: the main operational principle for sustainable economic activity is to keep capital intact. It's also called the "*constant capital*" rule. When we live beyond our income, we're left worse off. Unfortunately, agreement breaks down after this. The most obvious division is between those who subscribe to *strong* versus *weak sustainability*.

III. The Debate Over Strong vs. Weak Sustainability

First, we need some definitions of capital. What is capital? It's our stock of productive wealth -- that which generates a flow of services. There are at least three kinds of capital:

man-made capital (Km) -- all the tools, machines, buildings, technologies and infrastructure that enhance productivity

human or social capital (Kh) -- the skills and knowledge of the workforce

natural capital (Kn) -- the earth and its living systems

Weak sustainability is about maintaining total capital stock ($K = Km + Kn + Kh$) without regard to proportions, with one kind of capital being substitutable for another. While it heeds the Hicksian call for limiting consumption to the "interest" or flow of services produced by that capital stock, weak sustainability aggregates all capital together. There is no "special role" for natural capital. This is a key tenet of the neoclassical paradigm where Nature is just a sector of the economy for which other sectors can substitute. Weak sustainability advocates would acknowledge that natural capital is indeed depreciating (e.g. that we're losing arable land, topsoil, fisheries; we're depleting groundwater, polluting watersheds, etc.), but they subtract this depreciation from total investment in the economy.

Sometimes an equation can make something crystal clear, even for those who dislike math. Shown in Figure 3, the so-called *genuine savings rule* developed by Kirk Hamilton (Hamilton, 1994) relies upon the comparison between investment (in man-made capital) and the combined values of resource depletion and pollution. If $S \geq 0$, then investment in man-made capital is more than compensating for the losses of natural capital driven by resource depletion and pollution.

If $S > 0$, then the economy is weakly sustainable. This is equivalent to: if $I > r + p$, given:

S = savings = $I - r - p$, where:

I = investment in man-made capital

r = resource depletion

p = total cost of pollution

Weak sustainability is achieved so long as we invest more than the combined depreciation of natural capital and man-made capital. $S > 0$ so long as investment [in man-made capital] exceeds depreciation of natural capital. Robert Solow of MIT is the most prominent advocate of weak sustainability in this country. According to the concept of weak sustainability, if you're running out of one kind of fish, you can just substitute another. (That's actually a quote from Robert Solow!) Our economies can convert most of the world's environment into man-made artifacts and we'd be as well off. A Starbucks coffee shop can substitute for a wetland. Beautiful music from a CD ROM can substitute for our disappearing songbirds. A more educated populace can substitute for a dwindling supply of arable land and fertile soil. It's all part of the everything-is-substitutable, everything-has-a-price world of neoclassical economics.

Here follows a bit of a digression on the subject of environmentally adjusted national accounts (EANA's). Some of what you see in the equation for weak sustainability above (the terms r and p) refer to the aggregate monetized values for environmental degradation. Of course, this is an abstraction in the above equation, but it has long been suggested that the cost of our environmental ills should be subtracted from our measures of economic welfare. Environmental economists and others have long been aware of this "green critique" of GNP as a measure of economic welfare. Many environmental economists are working on the full integration of environmental costs and benefits into the national income accounts themselves, particularly given that GNP is used as a target of economic policy. The best and most recent example of this kind of alternative indicator can be seen in Figure 4 which depicts the Genuine Progress Indicator, GPI, for the years 1950-95. GPI attempts to add up the goods and services consumed in the economy whether or not money changes hands. Thus it adds the value of household work and parenting and volunteer work. Then it subtracts out the three categories of expense: defensive expenditures (which compensate for past costs), social costs, and the depreciation of environmental assets.

IV. Strong Sustainability = Environmental Sustainability: $K_n(t+1) > K_n(t)$

Strong sustainability means treating natural capital (K_n) separately --on the assumption that we cannot substitute man-made capital for it. To put it in layman's terms, strong sustainability rejects the idea that our built infrastructure adequately compensates future generations for ecological losses. Man-made capital cannot, regardless of price, replace the services and amenities provided by nature -- most especially life-support services, like protection from UV radiation, climate regulation, the food chain, the balance between alkalinity and acidity, the storage, movement and purification of water, etc. Many economists (and other unknowing advocates of "weak" sustainability) are suggesting that any feature of the natural world can be traded for something else. Nature cannot, like other inputs to production, really be managed according to its marginal product. Its viability must be protected. If impaired, the unique services of ecological systems have no substitute; and irreversible harm or collapse can ensue.

The threat of irreversibility is enough for the strong sustainability advocate to favor a more *precautionary approach* to drawing the line on humankind's use of the environment. The precautionary principle says that where there are threats of serious or irreversible damage, we should not wait for full scientific consensus or proof that monetized benefits exceed monetized costs before taking action to ensure that the environment is protected.

In addition to the overarching operation of the second law of thermodynamics, we have many other examples of irreversibility. There is no known way of removing greenhouse gases from the atmosphere or of restoring lost plant and animal species. Neither, at a certain point, will fishing boats be an adequate substitute for fish. Nor will sawmills function without their natural complement -- trees. A rainforest cannot be regenerated once deforestation depletes the soil and eliminates the seed. Although it is theoretically possible to tear up asphalt poured into parking lots and roads, it is highly unlikely that we'll ever reverse decisions to urbanize and suburbanize and bring back the open space, forests and farmlands we have lost to urban sprawl. For strong sustainability advocates, the specter of irreversibility puts much of the environmental debate on a different playing field. They believe we should think much more carefully before closing off options to future generations.

We are loosely and abstractly calling all of these ecological life support assets and services "natural capital". Although not everyone will like this term, the ecological economists first used it as a way of pointing out the tremendous wealth of the earth and its living systems. You might also think of this in terms of *carrying capacity*. To not deplete the natural capital that we leave to future societies, the scale (size) of the economy should be within carrying capacity. Carrying capacity is the uppermost limit on the number of species an ecosystem or habitat can sustain, given the supply and availability of nutrients.

How do we determine this? Fundamentally, one can use something like either "life cycle analysis" (tracing the environmental effects of a product from its origins through its consumption, and disposal or re-use) or "input-output analysis" (tracing inter-industry exchanges within a regional economy), focussing again on those two essential functions -- the source and sink functions of the environment. There are lots of ways to get at violations either on the source or sink side. I'll suggest a few here. Ecological footprint analysis, which originated in Canada, is an example of a carrying capacity calculation. A recent analysis by Asa Jansson of Sweden's Institute of Ecological Economics looked at the amount of wetlands that would be needed to assimilate the nitrogen emissions of the 85 million people in the Baltic Sea drainage basin. (Jansson, 1996) The answer comes out to be some 3-9 times the present available area of wetlands. Even more dramatically, on a planetary scale, another calculation cited by David Orr at the Oberlin Environmental Studies Center in Ohio involves looking at what happens when we extend our American lifestyle to the rest of the world's 5.7 billion people. We come up about 3 planets short.

There are several principles for guiding an economy to a scale that is within carrying capacity. The first has to do with the "source" of the economic process: *harvesting rates for renewable resources should not exceed regeneration rates*. This principle can be applied to our relationships to managed resources: activities like over-forestry, over-fishing, over-grazing, depleting groundwater aquifers faster than their recharge rates, etc.

Frequently this principle has been interpreted in the quantitative terms of *maximum sustained yield* or MSY, simply chopping forests at their growth rates. Some ecologists have objected to the single-minded focus on yielding one output from an ecosystem -- whether it is fish or forests; and that is because MSY has always been more of a quantitative measure; and, as such, has been somewhat inadequate to depict the requirements of sustaining a managed resource or a more natural ecosystem. More and more, we see ecological economics interpreting sustainability in

broader, qualitative terms: in terms of an ecosystem's health, its resilience, its ability to withstand stress. In this vein, Figure 5 depicts a sustainability principle that gets to the more qualitative dimension of ecosystem health. The authors of this principle are part of an educational group in Sweden called "The Natural Step". In their words:

The physical basis for the productivity and diversity of nature must not be systematically deteriorated. This means: the productive surfaces of nature must not be diminished in quality or quantity ... because our health and prosperity depend on the capacity of nature to reconcentrate and restructure wastes into resources. (Robert, Holmberg and Eriksson, 1994, italics added)

At the other end of the economy's digestive system, the strong sustainability principle is: *waste emissions should not exceed the assimilative capacity of the environment*. This is the "sink function" discussed earlier. Thomas Malthus' premonition of limits to growth based on finite inputs may need to be restated. What is posing limits to human activity is more the availability of "sinks" or ecosystem functions to assimilate our emissions.

In recent decades, we've had lots of measures of unsustainability --the build-up of toxic chemicals in our soils, sediments and organisms, loss of arable land and groundwater depletion, greenhouse gases, losses of biodiversity at levels ranging from species to ecosystems. All of this information tells us about unsustainability. Sustainable development may not require its own new set of indicators so much as it may require paying attention to existing evidence that we've exceeded the assimilative capacity of the environment.

V. Framing Questions for Communities: Going from the Macro Vision of Sustainability to Micro Directions

Georgescu-Roegen has said that our economic choices should not be based on the principle of maximizing utility, but rather on minimizing regret. On reflection of the growing popularity of "sustainability" is a widening recognition that macro-indicators like GNP are completely divorced from biological and physical planetary realities.

The ecological economists are calling for "ecological tax reform", shifting the tax base away from labor-derived income and investment-derived income toward taxes on activities we want to discourage: resource extraction, pollution, waste disposal and energy use. Again, here's an area where economists of all stripes agree: building environmental costs right into the price system would instill enormous prudence in our production and consumption decisions. Your after-tax income would be much more a function of the energy that you consume, the ecological costs of the products that you buy, and the amount of waste you discard. Unfortunately, concepts such as these still receive almost no attention from the national media or political leaders.

That's what strong sustainability might mean on the national scene. What about the local level? Today's local economies are no longer "local" and certainly not "closed loop" because they're increasingly enmeshed in the larger regional, national and international economies. As a result, it is very difficult to assess the "sustainability" of production and consumption processes when sources and sinks related to that local area span the entire globe.

The problem of assessing sustainability at the local level -- in light of the imports and exports that take place -- is, in fact, nearly intractable. Frankly, it would take an economy as isolated as a tribal community in outer Mongolia to trace biophysical flows of materials, energy and water from *source* to *sink* -- from the beginnings of productions to the tail endings of consumption.

Hence, talk about a Sustainable Seattle, a Sustainable Chattanooga, or a Sustainable San Francisco or a Sustainable Charlottesville is unfortunately premature and could undercut ultimate achievement of a more environmentally-based sustainability. Not to suggest that changes made by these communities flying under the banner of sustainable development aren't positive and encouraging and directionally correct. The admirable steps they have taken are just the beginning, not the end, of the path to sustainability .

Absent a total picture of biophysical flows from source to sink in a local economy, community sustainability efforts will have to build on what we already know is unsustainable and what we know is directionally correct. Let me suggest some examples of economic directions that seem to be consistent with the economists' injunction to "live off interest" and "not consume capital." Three examples of applications of the hard sustainability principle are: developing eco-cyclical processes, using plant matter for energy rather than fossil fuels, and increased reliance on local sources and local production.

Eco-cyclical processes

"Closing the loop" in the economy, as Barry Commoner first suggested over two decades ago, provides some directional guidance at the local level. More recently, a Swedish environmental group called "The Natural Step", formed in 1989, is centering its sustainability-oriented educational program around what they call "ecocyclical processes" or replacing linear processes with cyclical ones. The Natural Step employs the term "eco-logic" to mean using the rules of how ecosystems function to orient the human economy. In nature's no-waste economy, each "waste" from one process becomes the raw material for another process.

At least three fields of study exemplify the eco-cyclical approach of capitalizing on synergies gained from designing economic processes: agroecology, industrial ecology and eco-forestry. A few examples: turning livestock residue into fertilizer, using crop residue as an input into another agricultural or industrial process, using game ranching rather than cattle ranching, using constructed wetlands for wastewater processing (Colby, 1992).

The "waste equals food" principle provides guidance toward defining that part of our productive world that is truly "interest" or "income" or "flow" as opposed to "stock" -- that part which we can consume without eventually impoverishing ourselves or our descendents. Paul Hawken, author of the 1993 book *The Ecology of Commerce*, calls it "the restorative economy" -- meaning one that works in symbiosis with natural systems of production and consumption.

Transitioning away from fossil fuels toward plant matter

Most of the energy flow through our economy is based on stored carbon -- exhaustible fuels, the use of which is, by definition, unsustainable. While Daly has thought about the ethics and pace of transitioning away from exhaustible fuel sources, others have specified ways in which to convert to renewable energy sources. Amory Lovins may be the most famous advocate of this

"soft path". David Morris, author of *The Carbohydrate Economy: Making Chemicals and Industrial Materials from Plant Matter* (1992) describes a number of bioprocessing techniques that enable the use of plant materials (like hemp or whey) to be used as industrial fuels, chemicals, electricity, consumer products and sometimes food. The ultimate goal of this approach is to use energy at a rate no greater than the rate at which solar energy falls upon the planet.

Shorter Supply Lines

The average food product travels 1300 miles from where it is grown to where it is consumed (Daly, 1996). A more sustainable economy is a more localized, decentralized economy: one with shorter supply lines where inputs to production are drawn from an area close to the site of production and to the locus of consumption. Since most of what we consume now, is imported, we know much less about the environmental costs imposed by those products. Our cars, our clothes and our food are all mostly brought from afar. Unfortunately, prices of these goods are also set by national and global forces -- far from the control of local governments. Local economic development decisions, however, can shape the kinds of goods and services that are produced and the extent to which the local economy must import from elsewhere.

It is well known that locally-produced goods and services have one prime advantage over goods imported from other places: buyers know more about what they're getting, where it came from, and how it was produced. Consequently, both producers and consumers are likely to take more responsibility for their choices, knowing, for example, that our local corn crop may be threatened by urban development or that value could be added by using the corn husks in energy production. When the costs of production are borne close to where those products are consumed, people are more likely to act responsibly.

Current transportation prices come nowhere near the level of reflecting the full environmental and social costs of production. Almost all forms of transportation are subsidized by the federal government either directly or through the tax mechanism: our roads, our trucking system, our freight trains, and our air transport. Consequently strawberries & lettuce shipped to the East Coast from California do not carry a price that reflects those environmental and social costs of transportation (not to mention water and other farm subsidies). With energy prices so artificially low and agricultural production in the West so heavily subsidized, our food supply and distribution systems are exacting a higher ecological toll than would be the case if local sources of production were encouraged.

Interim Strategies and Development Options in a Second-Best World: Value-Added, Nature Tourism, and the Service Sector

In some cases, communities must mediate the immediate and pressing conflicts between economic direction and environmental protection. Local communities are not looking to soon become "closed loop", to change their energy supplies to more renewable methods or to shorten their supply lines. For the time being, they need development options that simply bring money into their area to create or maintain jobs, to provide tax revenues to support local schools and

other governmental functions. Several economists and non-profit groups are provided good advice along these lines.

In many beautiful and scenic spots in the West, the Wilderness Society economist Ray Rasker, author of their workbook *Measuring Change in Rural Communities*, is working with communities who have traditionally depended heavily upon mining or logging. Rasker conducts a workshop for local residents, business people and government officials that profiles that community's economy using recent data available from the Bureau of Census. Typically, as local economies mimic the national pattern of an increasing workforce employed in the "service sector", the curves that are plotted for that community show job growth in "service sector" or information-based firms, with jobs declining in the extractive sector. Thus communities find they have alternatives to mining or logging. Oftentimes, nature tourism or wilderness based recreation is a way of preserving the best of a bioregion while providing income and jobs to local residents. This allows communities to do a better job of controlling certain production externalities, although consumption externalities go unchecked.

Similarly, Tom Power, a University of Montana economist and author of *Lost Landscapes and Failed Economies* (1996) has advocated a strategy of attracting footloose firms (those that can operate by modem) or footloose income (retirees whose monthly checks follow them wherever they go), as an alternative to unsustainable logging, or extraction of non-renewable resources.

Thus, while retirees may not want to log the forests in their region, they will continue to buy goods from the global economy that are produced without much concern for resource renewal, recycling, ecological disruption, etc. While retirees may enjoy their scenic view and fight mightily against local logging, they will likely continue to drive energy-inefficient cars made of non-renewable resources, while living in houses that will consume electricity that may be produced by destroying the salmon runs of a previously wild and scenic river. They almost most definitely will consume food that is produced by our chemical and fertilizer dependent system of agribusiness, where soil erosion and run-off are as much an output of the productive process as corn and wheat.

Value-added schemes are also a heavy favorite of the alternative development advocates. Rather than exporting natural resources in their rawest state, a value-added strategy means encouraging local processing of timber, fish, corn or wheat, or minerals. Transforming raw materials into intermediate or final products allows a community to maintain a larger number of jobs per unit of resource extracted locally. For example, trees can be cut into logs, then lumber, then crafted into furniture, toys or other objects. Rather than having all jobs rely on direct extraction, the community can diversify somewhat and slow the rate of resource extraction.

These local development schemes can certainly forestall a mode of production that might have devastating environmental impacts, BUT none of these strategies (whether ecotourism, wilderness-based recreation, footloose income, etc.) really comes to grips with the complete biophysical and ecological picture of sustainability that we need to hold in mind. Hence the title of this section: *Interim Strategies and Development Options in a Second-Best World*. While acknowledging the value of these strategies in particular places and particular circumstances, let us still recognize the inherent contradiction in these efforts: namely that the local "sustainability" effort depends on an unsustainable larger economy.

Concluding Thoughts

Sustaining an economy does not mean keeping it in existence. It means holding the *inputs* (resource demands) and outputs (waste disposal) of an economy to sustainable levels: respecting the *source* and *sink* functions of the environment. Even if we did allow for the notion of *economic sustainability*, it would be illusory since the economy is dependent on the environment for nearly all phases of the economic process. Thus, the essence of sustainability is finding those modes of production and consumption that can fit within the constraints posed by ecological limits, i.e. the limits on our natural environments to both supply resources, assimilate waste and continue their own capacity to endure and support life.

Definitions and Abbreviations

Assimilative capacity -- the ability of the biophysical world (air, water and soil media) to absorb the waste products generated by economic activity

Capital -- the set of all physical things capable of satisfying human wants; a stock that yield a flow of services; abbreviated as K.

Defensive expenditures -- expenditures which compensate for past costs or the unwanted side effects of production; an expenditure regrettably made necessary by some other act of production.

Externality -- an activity that has unintended consequences for others and is not reflected in the price system.

GNP -- Gross Domestic Product; total dollar value of the nation's output

GPI -- Genuine Progress Indicator; a revised measure of the nation's well being that accounts for defensive expenditures, social costs and the depreciation of environmental assets and natural resources.

Hicksian income -- that which can be consumed without depleting capital

Investment -- capital formation; addition to stock of productive wealth; abbreviated as I.

Natural capital -- biodiversity, wetlands, fossil fuels, minerals, rivers, forests, etc.; the non-produced or natural stock that yields a flow of services; abbreviated as Kn.

Neoclassical economics -- the school of economic thought that translated the ideas of the classical economic theorists (e.g. Adam Smith and David Ricardo) into a mathematical calculus based on optimizing or achieving a specified goal at minimum cost (and maximum efficiency). Neoclassical theory focuses on allocation or achieving the most efficient distribution of scarce resources.

Service -- satisfaction of wants and needs

Throughput -- physical flow of matter and energy from nature's sources through the human economy and back to nature's sinks

NNP -- net national product; equal to GNP minus depreciation of man-made capital

References

Cairncross, Frances. *Costing the Earth: The Challenge for Government; the Opportunities for Business*. Boston: Harvard Business School Press, 1992.

Daly, Herman. *Steady-State Economics: The Economics of Biophysical Equilibrium and Moral Growth*. San Francisco: W.H. Freeman and Co., 1977.

Daly, Herman and John B. Cobb. *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*. Boston: Beacon Press, 1989.

Daly, Herman. *Beyond Growth*. Boston: Beacon Press, 1996.

Daly, Herman. "Sustainable Development: From Concept and Theory Towards Operational Principles," Paper presented to the Italian Ministry of the Environment, Milan, March, 1988.

Farrell, Alex. "Sustainability and the Design of Knowledge Tools," Working Paper Number 96-03-09, Wharton Risk Management Center, 1996.

Frenay, Robert. "Bio-Realism", *Audubon Magazine*, Sept.-Oct., 1995, p. 70-106.

Georgescu-Roegen, Nicholas. *The Entropy Law and the Economic Process*. Cambridge: Harvard University Press, 1971.

Gutes, M. Cabeza. "The Concept of Weak Sustainability." *Ecological Economics*, vol. 17, June 1996, pp. 147-156.

Gowdy, John. "Sustainability as a Concept of Social Science: Economic Concepts of Sustainability", paper prepared for UNESCO project, Frankfurt, Germany, November 1996.

Hamilton, Kirk. "Green Adjustments to GDP," *Resources Policy*, 1994.

Jansson, Asa, "The Ecological Footprint for Waste Assimilation of the Human Population in the Baltic Sea Drainage Basin," Paper presented to the International Society for Ecological Economics, Boston, MA, August, 1996.

Kneese, A.V., R.U. Ayres, R. d'Arge. 1970. *Economics and the Environment: A Materials Balance Approach*. Washington, D.C. Resources for the Future.

Lintott, John. "Environmental Accounting: Useful to Whom and for what?" *Ecological Economics* 16 (1996), 179-190.

Economics 16 (1996), 179-190.

Morris, David and Irshad Ahmed. *The Carbohydrate Economy: Making Chemicals and Industrial Materials from Plant Matter*. Institute for Local Self-Reliance, Washington, D.C., 1992.

Ormerod, Paul. *The Death of Economics*. New York: St. Martins Press, 1994.

Pearce, David and R. Kerry Turner,. *Economics of Natural Resources and the Environment*. Baltimore: Johns Hopkins University Press, 1990.

Pearce, David. "Green Economics", *Environmental Values* 1 (1992) 3-13.

Pearce, David, Kirk Hamilton, and Giles Atkinson. "Indicators for Sustainable Development: Economic Principles as Informed by Ecology." In Batie, Sandra, Ed., *Developing Indicators for Environmental Sustainability: The Nuts and Bolts*. Proceedings of the Resource Policy Consortium Symposium, Washington, D.C. June 12-13, 1995, pp. 17-31.

President's Council on Sustainable Development, *Eco-Efficiency Task Force Report*, Washington, D.C.

Power, Thomas Michael. *Lost Landscapes and Failed Economies*. Washington, D.C.: Island Press, 1996.

Rasker, Ray. *Measuring Change in Rural Communities; A Workbook for Determining Demographic, Economic and Fiscal Trends*. The Wilderness Society, 1994.

Robert, Karl-Henrik. "Educating the Nation: The Natural Step", *In Context*, No. 28, Spring 1991, 10-15.

Robert, Karl-Henrik. "Socio-ecological Principles for a Sustainable Society." Paper presented to conference of International Society of Ecological Economics, Costa Rica, 1994.

Smith, Fraser. "Biological diversity, ecosystem stability, and economic development." *Ecological Economics*, vol. 16, March 1996, pp. 191-204.

Published: 03/28/97

Environmental Protection and Jobs: A Guide to the Basics

Overview

This Issue Brief attempts to clarify the terms of the environment-employment debate from two different angles: the macro (economy-wide) level and the micro (local) level.

Introduction

Environmental protection strategies of all stripes must constantly face the question of their effects on job creation and retention. The environmental movement has often been portrayed as being out of touch with economic realities and charged with promoting job destroying policies. Business people, labor leaders and politicians have worried about the effects of national environmental regulations on American "productivity" (output produced in relation to inputs such as capital, labor and energy), "competitiveness" (our international balance of trade) and "profitability" (rates of return). At the national level, the debate has been most acrimonious for environmentally sensitive industries (such as chemicals, petroleum and gas, fabricated metals) and for those federal lands policies affecting the extractive sectors (such as logging, grazing and mining). At the community level, employment effects frequently dominate debates over land use decisions: whether open space is to be protected or "developed"; whether public funds are to be used for greenways or highways; whether taxes on low-density development are structured to reflect the full costs of urban sprawl. At both the national and local levels, the policy debate has been characterized more by polemics and brickbats than by a well-grounded conceptual framework, careful empirics, an appreciation of the difference between long-run and short-run effects, and a sense of society's value-based choices.

In place of sober reasoning that organizes complex choices and traces consequences to a full range of criteria, two extreme views dominate this debate. At one extreme, optimists are proclaiming "win-win" as a dominant paradigm, believing that environmental protection and job creation, productivity and competitiveness will go hand-in-hand. At the other extreme are predictions of job losses, insults to productivity, and loss of competitiveness in international trade.

Amidst these two extremes, the terms of the debate need to be clarified. This *Issue Brief* will attempt to clarify the terms of the environment-employment debate from two different angles: the macro (economy-wide) level and the micro (local) level.

The Economy-Wide Level

The question here is whether environmental protection causes more jobs to be lost economy-wide than it creates, i.e. how it affects net U.S. employment. There have been several studies that address this question. Although "environmental protection" can take many forms, it is important to note that all of these studies are limited to the national regulations issued by EPA -- pursuant to a series of national environmental laws passed by Congress. Naturally, there can be many other forms of environmental protection, but most other policy instruments, particularly those that involve the tax system or land use decisions, are not within EPA's discretion. These alternatives include: taxes on emissions or certain inputs like energy or virgin materials, removal of harmful subsidies, performance agreements with various industry sectors, or changing policy-induced environmentally harmful inefficiencies in agriculture, transportation, industry and energy. While there is a wide array of choices for environmental protection, most environmental protection in the U.S. has been achieved with old-fashioned regulations. These studies address those *national rules* that have required industries to abide by certain pollution control standards.

On an economy-wide basis, over a half-dozen macroeconomic studies have shown the economy-wide effect of environmental regulation to be either negligible or slightly positive (more job gains than losses). Eban Goodstein of the Economic Policy Institute provides an exhaustive account of these studies in his policy paper, "Jobs and the Environment: The Myth of a National Trade-Off" [Goodstein, 1994]. Basically, the reason is this: any policy that creates spending will create jobs. Environmental regulations have induced spending on pollution control; and since the pollution control industry is about as labor intensive as industry as a whole, the balance sheet for "jobs created vs. jobs destroyed" is about even. Moreover, to the extent that some of these studies show that regulation can increase aggregate employment, this is typically due to environmental spending being either labor intensive (recycling and sewage construction) or requiring capital goods produced in this country (air pollution control equipment).

This means that job losses in such industries as high-sulfur coal mining and electric utilities are more than outweighed by gains in pollution control jobs. This is not to minimize the real suffering created in *particular* industries or communities by regulation-induced unemployment. A U.S. Dept. of Labor study shows that some workers (around 1,300 per year in recent years) have lost their jobs because of environmental concerns. [U.S. Dept. of Labor, 1990] Rather, it is to say that the job gains on the other side of the balance sheet roughly equal the losses.

Economist Robert Repetto at the World Resources Institute cautions against judging environmental policies by their effects on jobs: "Virtually *any* expenditure, however foolish or unproductive, will generate employment. The Corp of Engineers generated employment when draining our nation's wetlands; it will create jobs again when restoring stream flows and undoing the damage its previous projects have done. That's close to digging holes in the ground and filling them in again, but it creates jobs." [Repetto, 1995]. Urging us not to over-interpret, either with joy or despair, the employment effects of particular environmental policies, Repetto insists that the real question is *what we want the economy to produce*. If we want unpolluted air, water and undegraded natural resources, the role of public policy is to achieve those goals with minimum costs and human suffering. Rather than protecting particular industries (such as high-sulfur coal mining or logging old growth forests) that are out of sync with the public's collective environmental goals, the job of government is to ease the transition --through retraining

programs, incentives to greener industries, unemployment compensation -- toward more environmentally benign modes of production.

One final point in regard to macroeconomic studies: although they can yield important insights, they all suffer from the same defect shared by all highly aggregative studies -- overgeneralization. It is far more instructive to get down to specific choices, specific landscapes, peoples affected, and specific consequences.

The Local Level: Defining Winners and Losers

At the local or regional level, the jobs-environment question is very *context-dependent* and thus broad generalizations about job effects are less useful. No longer narrowly focused (like national rules restricting emissions to air or water or some other media), community-based environmental protection spans a huge gamut of concern. Public authorities face an enormous number of decisions that impact the environment: everything from local zoning, park land programs, open space acquisition, permitting and transportation decisions as reflected in "master plans" to the whole tax structure: property taxes, impact fees, utility fees. Private sector tools and practices are equally diverse: they include conservation easements, land trusts, participation in federal programs like Conservation Reserve, best management practices such as those promoted by the Natural Resource Conservation Service. Because the gamut of environmental policies is so broad, it is not advisable to draw conclusions, one way or the other, about the general connection between jobs and environment before studying the specific issue at hand.

To get a handle on the jobs-environment connection in a *particular* context, at least five questions will need to be asked:

Does the decision, action or policy cause money to be spent?

- 1) If yes, who must pay for it and what is the nature of the expenditure (large capital project or a non-structural, labor-intensive project)?
- 2) What are the financial resources of this sector (producing firm, consumers, group of firms) that must pay the cost? What are the technological resources to adjust to this change?
- 3) What are the linkages between the most directly affected sector/firm and other "downwind" economic interests? How are the "downwind" parties affected?
- 4) Finally, is there a major difference between short-run and long-run employment effects?

First, as a generalization, those policies or decisions that cause money to be spent will tend to have the highest job-creation effects; those that prevent money from being spent or somehow reduce spending will not measure up well on the job scorecard. In addition, when money is spent on more labor-intensive pursuits (e.g. stream restoration), job creation numbers go higher. (Some environmental decisions will not have obvious consequences in terms of immediate spending. Buying land or conservation easements to put in a land trust merely effects a transfer payment from one party to another. As a result, the "economic boost" to the community will hinge upon the spending choices made by the party receiving new money.) If the area of concern is simply *local*, then a second-order issue must be addressed: whether expenditures benefit local people. Certain techniques from the field of *regional economics* can be used to determine what proportion of a given expenditures benefits local residents. By breaking down an expenditure

into its various components (a schedule of "final demand") and gathering the regional purchase coefficient (RPC) for those components (i.e. the extent to which they are produced locally), it is possible to glean what portion of an "investment" goes to regionally produced products or services. Commodities and services with high RPCs have a lot of "leakage", that is, revenue lost to the local economy, and vice versa.

Second, identifying *who pays* and *how the money will be spent* is an obvious point, but one that oftentimes explains the politics behind an environmental policy decision. If, for example, the community is considering tax breaks to encourage the agricultural use of land, the result is simply that the agricultural sector will owe less taxes and then there is no vector of "final demand" (list of goods and services to be purchased). Of course, less taxes may result in less government spending which may affect employment, but that circuitous link will not be addressed here. On the other hand, if the community is considering something more pro-active, like a watershed restoration project, then it becomes important to know how that money is being spent. Input-output analysis (I/O) can be used to calculate the job creation impacts from particular expenditures. An I/O model takes into account the direct, indirect and induced employment effects that flow from an "investment". Direct employment refers to the jobs created in the first round of expenditures (e.g. hiring equipment operators, engineers, landscape designers). Indirect employment is created by the purchase of goods and services (e.g. equipment, tools, office supplies). Induced effects are those created by the respending of wages of those employed, directly and indirectly, by the project.

Third, if the decision, action or policy causes the private sector to undertake an expense that might not otherwise be chosen, it is important to know the financial status of the affected firm(s). The firms' ability to absorb the cost will largely determine whether any job losses will result -- either through layoffs or reduced output. For example, if a community considers requiring extensive stormwater control systems for all new developments, the resulting impacts on developers and those employed by them will depend upon their ability to absorb additional costs. Obviously firms with reserves or sufficient operating margins will be less apt to reduce their workforce in response to a performance-based requirement. Similarly, real layoffs can occur when affected firms are without adequate reserves or profit margins to absorb the cost.

Fourth, environmental policy is replete with cases where economic interests compete over a natural resource -- where one party's gain is another party's loss. Industries discharging into a river have interests that run counter to local fishermen and tourist-based firms. All non-point source polluters (urban drainage systems, agricultural run-off) compete with each other over the assimilative capacity of a water body. Tree growers receiving acid rain precipitation have interests that counter to coal-fired utility producers. Foresters can compete with dairy producers for activity along a rivers' streambank. Recreational fisherman can compete with economically motivated fishing interests over policies which influence the type of fish species in the river. When these kinds of trade-offs occur, the job impacts analysis gets more complicated because each sector's response must be gauged; and some of those inter-linkages depend upon having scientific estimates of cause-and-effect from the natural system to each economic stakeholder. A decision to ban river dredging might aid fishing but hurt river-based transportation. Job losses must be subtracted from job gains. Needless to say, gauging the net effect is much more complicated than just estimating the most immediate effects.

Fifth and finally, natural resource dependency lies at the heart of many of our economic activities, and hence our environmental policy decisions. The timing questions that arise from our economy's dependency on natural resources is whether long-run economic use (and hence employment) is protected, perhaps at the expense of short-run gains? This can arise from natural resource utilization issues such as soil erosion, over-forestry, over-fishing, and over-grazing where society's long-run economic interests are better served by restraining today's usage. Of course, many of these natural resource decisions are made by the national government and/or flow from global economic forces, but communities can also impact decisions related to forestry, fishing, grazing, and agriculture. In all of these areas, there is a dependency on the underlying integrity of the natural resource and there are frequently trade-offs between the more profitable short-run exploitation and long-run, more sustainable use. Even if long-range future forecasts are not possible, our analyses should highlight the benefits of more restrained use of natural resources, or conversely, the long-run dangers of over-exploitation.

Conclusion

Taken together, these five screening questions should help frame and sharpen the job-environment debate at the local level. If expenditures are involved, regional economists can produce some quantitative predictions of job impacts of particular decisions. The analysis becomes much more complicated when multiple sectors are competing for the services of a natural resource.

More importantly, to repeat and amplify Robert Repetto's point: *environmental policies should not be judged solely at the level of effects on employment*. Although this *Issue Brief* is limited to that subject, environmental protection decisions should be judged in terms of a number of other criteria: quality of life in all its dimensions (recreation, aesthetics, traffic congestion, taxes, etc.), human health, intergenerational equity, cultural and religious values, ecosystem functioning and biodiversity. One way to organize the pros and cons of various choices to make a matrix, with policy choices down one side and categories of consequences listed across the other. On that matrix of multiple impacts and consequences, this note is confined to one column: jobs. With careful analysis and reasoning, the conventional wisdom about jobs and the environment might be in for a few surprises.

Suggested Reading and Other Resources

Goodstein, Eban. 1994. "Jobs and the Environment: The Myth of a National Trade-Off." Economic Policy Institute, Washington, D.C.

Hustedde, Ronald J., Shaffer, Ron and Pulver, Glen. August 1995. *Community Economic Analysis: A How To Manual*. North Central Regional Center for Rural Development, Iowa State University.

Jaffe, Adam B., Peterson, Steven R., Portney, Paul R., and Stavins, Robert N. "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?" *Journal of Economic Literature*, Vol. XXXIII (March 1995).

Repetto, Robert. 1995. "Jobs, Competitiveness, and Environmental Regulation: What are the Real Issues?" World Resources Institute, Washington, D.C.

Templet, Paul H. and Farber, Stephen. "The Complementarity between Environmental and Economic Risk: An Empirical Analysis," *Ecological Economics*, 9 (1994), 153-165.

U.S. Army Corp of Engineers, Institute of Water Resources, *Economic Development and Employment Effects of Non-Structural Stream Restoration*, IWR Report 94-FIS-18, November 1994.

U.S. Department of Labor, "Mass Layoffs in 1987-1990," *Bulletin* (Bureau of Labor Statistics). 1990

If you have questions, or you would like to get more information about this topic and available documents, you may contact Holly Stallworth, e-mail address stallworth.holly@epamail.epa.gov.

Published: 03/27/97

The Use of Economics in Environmental Decision Making

Notice: The opinions expressed herein are strictly those of the author and do not represent any official policy or opinion of the U.S. Environmental Protection Agency.

Overview

This article depicts some of the history of the use of economics at EPA, spurred by the Executive Orders mandating cost-benefit analysis for environmental regulations. Economic analysis that developed pursuant to this Executive Order often left out certain long-held principles: public goods theory -- and the impossibility of simulating market demand for goods held "in the commons" and the precautionary principle -- or the need to act in a risk-averse manner when full information and full certainty is not yet available.

The Current Economics Paradigm at EPA

The use of economics at the Environmental Protection Agency is largely defined by administrative decree. Since 1981, EPA has been required to do a cost-benefit analysis for "major" regulations (defined as those with economic impacts exceeding \$100 million) as part of a Regulatory Impact Analysis. President Reagan's Executive Order 12291 imposed by administrative decree, a decision criteria of maximizing net benefits over costs, regardless of whatever health or technology-based standards were specified in the statute. The Office of Management and Budget (OMB) was given the task of reviewing these "Regulatory Impact Analyses" for conformance with the Executive Order's requirements. Thus began a decade long conflict between EPA, which was charged with carrying out health or technology-based standards in statutory mandates, and OMB, charged with enforcing the Executive Order and the primacy of cost-benefit calculations. Frequently, regulations would remain locked in this bureaucratic hornet's nest until lawsuits and resulting court-ordered deadlines forced them out. In the middle of this entanglement, environmental economics at EPA took form.

The Executive Order introduced not only intractable conflict between EPA and OMB, it ushered in a new kind of political economy in regard to environmental issues -- one where the environmental quality was treated less as a *public good subject to value-based decisions* but as a *private good where price-based calculations were deemed to best inform*. This departed significantly from other public policy issues such as police or fire protection or national defense - where decisions arose from society's values, beliefs, common needs, sense of social justice or risk aversion. Public goods theory developed since the days of Adam Smith long recognized the need for government intervention in a number of select areas plagued by the "free rider" problem -- also called the "tragedy of the commons". A classic example would be the fisherman who is unwilling to curtail his harvest from an over-exploited fishery because his private gains from over-fishing run counter to society's long-run interest in maintaining the fishery. Many environmental goods and services meet the test of a public good -- indivisibility of ownership or consumption. Therefore private parties, acting on the basis of self-interest, will not have sufficient incentive to pay their fair share or protect a common property resource.

The historical treatment of public goods in economic theory presumed a need for government intervention where common property resources would not be adequately protected by private interests. Ignoring this, the cost-benefit requirement imposed a traditional supply-and-demand analysis on environmental goods. To comply with this Executive Order, EPA's economists and consultants to EPA began what is now a 15 year old experiment in constructing demand curves (monetary values) for environmental goods.

It may be that the Executive Orders have left EPA little choice, but, as I've argued in previous writings (Stallworth, 1995), a powerful asymmetry was created by this requirement for cost-benefit analysis: the "burden of proof" was placed on EPA to demonstrate dollar-based "benefits" exceeding costs. The market-based paradigm discounted, even ignored, non-quantified beliefs and values. Regulatory impact analyses became a Sisyphean task of constructing a patchwork of environmental and human health information to construct dose-response functions, followed by an attempt to "value" the regulation by placing a monetary number on the avoided damages to human health and the environment. In so doing, policymakers were forced to state a dollar value for lives saved, diseases avoided, trees left standing, clean air, clean water, visibility, scenic beauty, intrinsic value, value to future generations and so forth. The multiplicity of effects, the numbers of people involved and the psychic nature of many of the issues all combined to make the measurement problem extremely difficult, highly uncertain and sensitive to starting assumptions. Traditional cost-benefit analysis involved in the 1930's and 1940's for water resources investments became increasingly strained as EPA faced large-scale problems with complex and uncertain ecological consequences. All of these empirical problems became grists for OMB's critical review and intervention in the rulemaking process.

While there are certainly effects of policy choices that can be measured in dollars terms (e.g. jobs, profits, sales, etc.), the great bulk of this work has gone to extraordinary lengths to convert non-marketed goods and services into consumer-based preferences that can be priced. Douglas MacLean (1981) has argued, quite persuasively I think, that the willingness-to-pay monetized approach is the "low road" to the task of comparing different values. Instead, MacLean prefers moral inquiry and moral reasoning for resolving what are essentially moral conflicts. Similarly Sagoff (1986) has pointed out that the values that guide consumer preferences may be different from those that drive political choices and desires for what the government might do. Both MacLean and Sagoff protest the attempts to capture in dollar terms such things as the loss of ecological resources for future generations or the spiritual comfort we might derive from protecting old growth forests. While most enthusiasts of cost-benefit analysis will acknowledge the presence of these non-monetizable effects, their allegiance to the monetized version of cost-benefit analysis remains strong. In practice, most neoclassical economists continue to recommend options with positive net benefits and dismiss policies with negative net benefits despite their acknowledgements of the numerous caveated shortcomings and flaws in a monetized analysis.

Although the Executive Order of the Reagan-Bush administrations was replaced in October 1993 with Clinton's version, Executive Order 12866, the new Clinton EO preserved the basic structure of the cost-benefit requirement. Originally, the Clinton Administration did allow some room for those benefits which could not be monetized and placed some procedural reforms into the regulatory review process such as a time limit on OMB's review of regulations. However, recent new guidelines emanating from Clinton's OMB have turned the tide back in favor of the

monetized standard. This "guidance" issuing from the Clinton Administration OMB aims at standardizing the way agencies "value" (i.e. monetize) the impacts of their programs.

Whatever the politics that have elevated cost-benefit analysis, it poses nightmarish difficulties for policy analysis and debate at EPA. In addition to the troublesome aspects of valuing human life and impacts on human health, the dollar based standard for environmental policy faces a daunting array of ecological effects for which we can never hope to have dollar values. Ecological functions like nutrient cycling, carbon sequestration, oxygen production, groundwater recharge, air purification, sediment control, erosion control and climate regulation all comprise elements of the planet's life support systems which defy monetization and for which the *precautionary principle* might be a more appropriate standard.

Goal Setting Based on the Precautionary Principle

The *precautionary principle* asserts that action should be taken in advance of scientific proof when further delay may prove unacceptably costly to society and nature. This principle simply turns the burden of proof in the opposite direction and says that society must be willing to take preventive action in the context of risk and uncertainty. Full scientific certainty is not required to justify protective actions that safeguard ecological functions that support and maintain life on earth. To be "precautious" means recognizing and respecting the margins of tolerance in ecological systems; and certainly not broaching them.

Although it is unlikely that a single principle will ever provide adequate direction for hundreds and thousands of environmental policy questions, the precautionary principle at least offers a directionally correct sensibility for restoring the burden of proof to those forces that exert change on the ecosystem.

Applying the precautionary principle to the cost of environmental regulation would mean treating the cost of regulation as something more like an insurance premium rather than a payment for tangible, measurable, proven benefits. Properly used, "benefit" implies something that promotes our well-being, whereas protection of human health and the environment is more often the avoidance of harm. This distinction may appear semantic until one considers that since 1911, neoclassical economic theory has recognized the fundamental asymmetry between losing something and gaining something. This perspective is clearly needed for an issue like global warming, where a decade of foot-dragging in the U.S. has been justified by calls for full scientific proof and more research. Admittedly "precaution" as a standard lacks a definition from which to prescribe specific standards and actions, yet it seems directionally more prudent than our current dollar-based, cost-benefit standard -- with its bias toward waiting for more data and calling for more research. The precautionary principle meshes better with the *timing* issues involved in environmental policy: where the cost of waiting can be high.

Precaution is more important when prediction is difficult. Ecological systems have not been shown to be "smooth and continuous" but rather to have discontinuities that defy our linear predictions. For issues like biodiversity conservation and the preservation of ecosystem functions, the "thresholds" of tolerance embraced in the precautionary principle are based primarily on ecological information. Rather than treating ecosystem protection solely as a consumer issue, economists must look to other who can best express the ecological basis of

sustainability. We must look to foresters for indicators of sustainable forestry; agronomists for indicators of sustainable agriculture; aquatic biologists for indicators of sustainable fisheries; terrestrial ecologists for direction on sustainable rangeland management, etc. In a truly interdisciplinary economics that is rooted in our dependency on natural resources, these bio-physical indicators of sustainability need to be elevated on a par with more traditional economic measures of success: growth rates of output, sales, labor productivity, etc.

Whatever its merits, the precautionary principle may not save us from the wrenching moral, ethical, and economic dilemmas that are part of modern environmental decision making. But at least the debate would shift to this more sober perspective that recognizes the risk of significant and irreversible harm. Rather than debating until all uncertainties were removed, our policy analysis would be better served with a focus on the technical requirements of maintaining options for future generations in terms of biological diversity, ecological integrity and resource productivity. Full scientific certainty should not be required to justify government intervention to safeguard ecological functions that support and maintain life on earth.

What follows are some suggestions for research efforts in the economics of environmental policy that can better capitalize on the true usefulness of economics.

Alternative Directions

While much of EPA's economics is defined by the laws passed by Congress and imposed by presidential Executive Order, it is important that the Agency not limit itself to the cost-benefit/monetization paradigm but rather develop other approaches that "push the envelope" toward an economics that is more solution oriented. Rather than pounding square pegs into round holes with the monetary hammer, environmental economics can contribute to the search for solutions, e.g. searching for efficient, cost-minimizing solutions and tracing real economic impacts.

Over two decades ago, William Baumol and Wallace Oates (1971) declared that we would never have enough information to estimate the dollar benefits of pollution control. Baumol and Oates felt that the search for the Pareto optimal point (which required full monetization of the externality) was a fool's errand that should be abandoned. They advocated instead what they called a "sub-optimizing" approach, i.e. searching for the most efficient means of achieving a *pre-determined* environmental goal, a goal set by whatever political, social and scientific processes pertained to the problem at hand. Although Baumol and Oates called it "least cost theory", today it might be recognized as *cost-effectiveness analysis* and this can take many forms.

Cost-effectiveness analysis was the centerpiece of the old Carter executive guidance on regulatory matters. Accepting that social values and other non-economic criteria must play a starring role in setting environmental goals, a cost-effectiveness analysis falls within what Baumol and Oates called the *sub-optimizing approach*. Rather than seeking the *optimal point* or environmental goal, economics is best used to find the least cost solution for pre-determined environmental goals. Accepting that people want to preserve old growth forests and the species who live there for reasons that cannot be monetized, cost-effectiveness analysis yields to the social forces, scientific information, stakeholder negotiations and political debate. After a goal

has been set, the economist's tools of trade -- optimizing, marginal analysis, etc. -- are then applied.

Cost-effectiveness analysis (seeking the least cost solution for a given environmental goal) and *incremental cost analysis* are now touted by the Corp of Engineers. In a recent set of publications from their Institute for Water Resources, the Corp has discarded the monetization framework in favor of non-monetary goals, such as preserving ecosystem structure/function or socially-valued services. Methods such as the Habitat Evaluation Procedure, the Habitat Evaluation System and the Wetlands Evaluation Technique are used to express environmental goals. Principles of constrained optimization from economics are then used to choose from among various water resource plans.

Another alternative framework is *economic impact analysis*. Rather than converting complicated human health, ecological and quality of life effects into a dollar based metric, *economic impact analysis* only addresses the market activity that results from some regulation, development or government action and is thus limited to what can be measured in dollar terms. As a subset of this, *fiscal impact analysis* addresses impacts on government revenues. But note that tracing dollar-based *impacts* of policy choices is a different game from translating complex effects on human health, quality of life and ecological systems into dollar-based estimates. Much in the same way toxicology is used to trace effects of a pollutant on human mortality or morbidity or ecotoxicology may define effects on an animal population, economic impact analysis defines effects on those groups in society that may gain or lose in economic terms. Unlike cost-benefit analysis, it restricts attention to economic effects that can be measured in market terms (jobs, profits, prices) and does not attempt to construct surrogate markets to convert the entire realm of policy consequences -- ecological, human health or quality of life -- into dollar values. Economic impact analysis does not attempt to convert social values into dollar-based estimates.

Rather than total effects (total costs minus total benefits), we need to begin our analysis with a sense of the "winners and losers" in environmental policy, i.e. who benefits and who gains from particular options, programs or prices. Economists know that the marginal utility of a dollar (or other gain) is not constant across groups, thus it is necessary to have disaggregated information so that we can see the conflict played out between real stakeholders with starkly different economic characteristics. Consider the vast socio-economic differences between the indigenous fish-consuming populations of the Columbia River Basin and the Bonneville Power Company who profits from subsuming most of the water rights for hydroelectric power. Consider also the differential impacts of restoring the oyster beds of the Chesapeake Bay. In this case, a proper economic impact analysis should aim to show the relative impacts on two main user groups: Virginia's oyster fishing industry and Maryland's. Currently, these two sides are at loggerheads over the introduction of a oyster species from Japan that is more resistant to the protozoan diseases that have plagued the current oyster. Since Virginia's oyster industry is failing and Maryland's is still viable, Maryland has not wanted to undertake the risk (potential environmental injury) associated with introducing this non-native mollusk into the Chesapeake Bay.

Tracing the effects of environmental policy to different consuming and producing sectors is the basis of a more sober use of economics. With an eye toward equity, a comprehensive "economic impact analysis" identifies the groups, firms and communities most likely to realize gains or losses or both.

While the cost-benefit framework only addresses the policy choice in a "yes-no" fashion (to protect or not to protect), a more useful analysis would be directed at the full set of trade-offs and consequences of various policy choices. We might call this "*trade-offs analysis*" although the term has little currency outside one Corp of Engineers report (1995) that constructs a framework for trade-offs analysis combining stakeholder participation, multi-objective planning, game theory and group processes. Under this rubric, the Corps offers a framework for their task of setting the operating schedule of a dam.

No doubt policy frameworks will need to be adapted in response to specific policy questions. It would not be surprising if what works for the Corp of Engineers's need to determine water levels for a dam does not work for the Environmental Protection Agency trying to establish water quality standards under the Safe Drinking Water Act. Policy menus and tools vary widely. No doubt, the full set of trade-offs can be quite complex, extending into many dimensions and platforms. For an issue such as logging in the Pacific Northwest, some platforms on which "trade offs" should be defined include: local quality of life (hunting and trapping, fish consumption), aesthetic values and spiritual beliefs, ecosystem health (such as possible loss of salmon habitat, effects on soil erosion and water quality), and jobs/income (fishing jobs vs. logging jobs; income/profits relative to financial strength) in both the long-run and short-run. These platforms for assessing trade-offs will likely have to be tailored to each specific problem.

Conclusion

The fundamental policy question is a difficult one: whether one state of the world is better than another. Treating this issue merely as a consumer problem does not do justice to the extraordinary dimensions of environmental policy. We operate on a stage marked by intergenerational impacts and effects on non-human species. Even when combined with other disciplines in a holistic analysis, economics cannot save us from these difficult decisions. Economists can only hope to make the trade-offs of policy choices clear.

"Sustainability," that word so much in vogue in environmental policy, is a construct that properly shifts our attention to a concern for future generations, but the sustainability movement needs more precise empirical terms. Theoretical discussions of sustainability must give way to facts about particular sectors or economic activities: energy, agriculture, transportation, forestry. These particular problems require particular solutions, not conceptual or theoretical frameworks which can ill accommodate the facts associated with a particular issue. Sustainability may ultimately be the product of a thousand little pieces of a puzzle strung together.

The enormous task facing my discipline is to come to grips with the ecological conditions for sustainability, namely to live off our "income" from natural resources while protecting "natural capital." With each unique policy question, this will have to be approached from a thousand different directions. When applied to the search for solutions and consequences, economics can contribute to a more holistic policy analysis that points us to the "best" policy -- in the sense of achieving the greatest good for the greatest number for the longest period of time.

References

Baumol, William J. and Oates, Wallace E. "The Use of Standards and Prices for Protection of the Environment." Swedish Journal of Economics, (March 1971), 42-54.

Corp of Engineers, Institute for Water Resources, Evaluation of Environmental Investments Procedures Manual, Interim: Cost Effectiveness and incremental Cost Analyses. IWR Report 95-R-1, May 1995.

Corp of Engineers, Institute for Water Resources, Trade-off Analysis for Environmental Projects: An Annotated Bibliography. IWR Report 95-R-8, August 1995.

Daly, Herman E. and John B. Cobb, For the Common Good: Redirecting the Economy Toward Community, the Environment and a Sustainable Future. Boston: Beacon Press, 1989, p. 72.

Eberle, David W., "Valuation of Non-Market Goods: A Methodology for Public Policy Making," unpublished dissertation in the Department of Economics, Boise State University, 1996.

ECO Northwest, "A Method for Estimating the Economic Effects of Habitat Protection." Final Report for U.S. Fish & Wildlife Service, Portland, Oregon, January 1994.

King, Dennis M., Curtis C. Bohlen and Pierre R. Crosson, "Natural Resource Accounting and Sustainable Watershed Management: With Illustration for the Upper Mississippi River Watershed," A Report for the President's Council on Sustainable Development, UMD Ref. No. UMCEES CBL-95-037, February 1995

Lipton, Douglas W., Katharine F. Wellman, Isobel C. Sheifer and Rodney F. Weiher, Economic Valuation of Natural Resources: A Handbook for Coastal Resource Policymakers, National Oceanic and Atmospheric Administration, Coastal Ocean Office, Decision Analysis Series No. 5, NOAA Coastal Ocean Office, Silver Spring, MD, June 1995.

MacLean, Douglas E., "Comparing Values in Environmental Policies: Moral Issues and Moral Arguments," Regulation Magazine, Jan. - Feb. 1981, p. 83-106.

Sagoff, Mark, "Economic Theory and Environmental Law," 79 Michigan Law Review (1981) 1393-1401.

Skrzycki, Cindy, "Agencies Question OMB's Cost-Benefit Balancing Act," Washington Post, 11-3-96, p. B1.

Stallworth, Holly, "The Cost-Benefit Paradigm for Environmental Protection: An Economist's Perspective on the Methodological, Theoretical and Ethical Problems," New Solutions, Fall 1995, p. 14-19.

Young, Terry F., and Congdon, Chelsea H., "Plowing New Ground: Using Economic Incentives to Control Water Pollution from Agriculture," Undated Environmental Defense Fund report.

Published: 05/22/97

Community Economic Profiles

Overview

This Issue Brief describes ways to profile a local economy. Two ways of organizing economic data are summarized: comparative benchmarking and trend analysis. Comparative benchmarking allows a comparison of one community's economy with similar areas (areas of like typology). Trend analysis helps communities understand where their economy has been and where they are today. Under "Where to Find Further Information", readers are given locations, prices and phone numbers for pursuing the software tools and publications necessary to follow either of these two approaches.

Introduction

When local governments and citizens decide to develop a community plan for sustainable development, it is helpful to begin with background information that characterizes the community's economy, natural resources, and socio-cultural conditions. This information cannot, by itself, offer answers to policy questions or development options, but it can be used to describe current conditions, hopefully with an eye toward understanding relationships between certain aspects of community life. Economic information is merely one part of a full array of "indicators" needed to profile a community -- spanning the gamut from economic production to leisure opportunities to crime to civic/community involvement. Together, this baseline profile can help a community clarify its goals, assess the relative importance of various aspects of community welfare, and compare perceptions of the local economy against actual measurements. While a general profile can span a wide array of topics, this *Issue Brief* is confined to one portion of that assessment: ways of characterizing the local economy.

In making decisions about the community's economic and environmental future, it is helpful to know the general character of the economy: whether unemployment is high or low, to what extent the community is dependent upon imports, how the community's mix of businesses and sources of income compares to similar areas; whether huge income disparities exist between segments of society. Below is a description of two ways to profile a community's economy, followed by a description of some additional tools for community economic analysis.

Comparative Benchmarking

A community might want to compare its performance on a range of economic indicators with its peer communities (areas with a similar population size, density, sectoral mix, etc.), with statewide averages and with the nation. This analytic approach is known as *comparative benchmarking* -- a process in which a community is measured in relation to similar areas. The Corporation for Enterprise Development (CFED), a non-profit organization that supports community based strategic planning, offers its comparative assessment tool known as the *Regional Performance Benchmarks System*. This software tool (available from the address listed at the end of this *Issue Brief*) characterizes counties into typologies" or areas of similar

economic and demographic structure. "Benchmarking" allows a comparison with similar areas of one community's statistics on the basis of several categories: high value services (e.g. earnings growth in legal, health, engineering, finance-related businesses), manufacturing modernization (e.g. new capital expenditures per worker), tourism/retirement/retail, workforce/education (e.g. educational levels by age), self employment, resource-based development, and "bedroom" communities. Within each category are a range of five to ten performance indicators, some of which are given in parentheses above.

Trend Analysis

Although not conceptually different from comparative benchmarking, *trend analysis*, is offered by The Wilderness Society (TWS) in their recent publication *Measuring Change in Rural Communities: A Workbook for Determining Demographic, Economic and Fiscal Trends* for helping communities understand where their economy has been and where they are today. The Wilderness Society has worked with a number of western communities who have found a disparity between their beliefs about the local economy and actual measurements. Indeed, much of the impetus for TWS's workbook comes from a desire to address misconceptions about the relative importance of extractive industries -- timber, ranching, mining -- in the West. Assembled in this easy-to-use workbook are many of the same economic performance indicators mentioned above. Rather than a pre-packaged software, TWS leads its readers through a series of data collection exercises, pointing to information from the U.S. Bureau of Economic Analysis, U.S. Bureau of the Census, and State Data Centers. Through a series of exercises, it teaches users how to conduct trend analysis of basic demographic, economic and tax structure data that can be useful in reaching decisions about local economic development and services.

Other Concepts from Community Economic Analysis: Leakage and Local Self-Reliance

Local self-reliance is a phrase coined by the Institute for Local Self Reliance (ILSR, cited at the end) to refer to the wealth that can be generated from local resources, building on income flows and ownership patterns to benefit local residents, businesses and enhance community life. ILSR has traced various forms of development options in relation to the *leakage* (dollars leaving the community) they generate. ILSR has demonstrated, for example, a relatively high leakage for fast food franchises, where ILSR estimates two-thirds of dollars spent leave the local area. In all areas of a community's economic choices, ILSR's focus is on extracting the most efficient usage from local human, capital and natural resources. With an emphasis on the primacy of locale -- neighborhoods, cities, counties, regions -- ILSR proffers a vision of self-reliant communities that depend on local resources of food, energy, and materials.

An extremely comprehensive publication related to the subjects of local self-reliance and leakage is a manual of Iowa State University entitled *Community Economic Analysis: A How To Manual* (cited below). This version of economic analysis explores the differences between two sets of market forces -- local and nonlocal. Based on the simplified image of a community's economy as a barrel with money and goods flowing into the top and spilling out of the bottom, this publication traces through economic concepts and terms that can be used to track the inflow of outside income, the leakage of income, and the flow of resources between local and nonlocal markets. This publication emphasizes that the traditional development strategy of attracting

manufacturing firms into the community (increasing inflow to the barrel) is often pursued at the expense of other strategies that stop leakage from the barrel. Those strategies that "reduce leakage" include: encouraging the start-up of new, local firms and helping existing firms become more efficient, encouraging local firms to buy supplies from each other, etc. The concepts reviewed in this manual can provide some guidance about which economic development strategy might be most appropriate. Some of the economic concepts covered include: employment multipliers, marginal propensity to consume locally, percentage of money spent locally, assessing the size and shape of a community's trade area, and ways to measure the efficiency of local firms. These tools can be used to shed light on development options -- either those that bring money into the local area or those that plug money leakages draining the local area.

Conclusion

While a community economic profile can supply you with basic information, it cannot tell you what you should do. It is not an end result. This information should be used to generate informed discussions by citizens regarding choices in their area. To get a cause-and-effect relationships between certain development options and their impacts (in term of economic performance, environmental quality and quality of life, for example), decision makers usually must dig deeper -- assessing the effects of one development options against another in terms of a host of criteria. Nevertheless, a community economic profile is a way to organize information on the monetary aspects of a community's health. It is one part of a total picture that includes the environment, quality of life and the whole gamut of social and cultural phenomena.

Where to Find Further Information:

For a copy of the *Regional Performance Benchmarks Systems*, contact:

The Corporation for Enterprise Development (CFED)

777 North Capitol Street, N.E.

Washington, D.C. 20002

202-408-9788

Cost is \$35

For a copy of *Measuring Change in Rural Communities: A Workbook for Determining Demographic, Economic and Fiscal Trends*, contact:

The Wilderness Society

900 Seventeenth Street, N.W.

Washington, D.C. 20006-2596

Cost is \$10

For a copy of *Community Economic Analysis: A How To Manual* by Ronald J. Hustedded, Ron Shaffer, and Glen Pulver (August 1995), contact:
North Central Regional Center for Rural Development
Iowa State University
317 East Hall
Ames, IA 50011--1070
515-294-8321
Cost is \$5

For an excellent publication on the entire range of community indicators, we recommend Maureen Hart's *Guide to Sustainable Community Indicators* (May 1995), obtainable from:

QLF/Atlantic Center for the Environment
55 Main Street
Ipswich, MA 01938
508-356-0038
Cost is \$12.50

For a host of publications pertaining to issues of humanly scaled, sustainable local economies, contact:

The Institute for Local Self-Reliance
2425 18th St., NW
Washington, D.C. 20009-2096
202-232-4108

The county extension office or planning office will frequently have local economic information available. State Data Center, available in each state and sponsored by the U.S. Bureau of Census, can also be helpful. Two publications of the Department of Commerce are *County Business Patterns* and *Census of Business*.

Published: 03/27/97

Value-Added Processing

Overview

Discusses how communities can 'add value' to their natural resource base and local economy, and justifies how and why these resources can be utilized in more sustainable ways.

Introduction

More communities are taking charge of their local environmental quality and quality of life issues. This active approach allows communities to address activities and concerns that are linked to environmental quality, such as economic development strategies, local economic stability, and resource use. Communities can tie these concerns together in a positive way by re-evaluating their natural resource base, tapping into local human capital, improving their environmental quality through more responsible activities, and utilizing locally harvested raw materials in a sustainable manner. This holistic approach allows communities to bring more money into the community by using local materials, providing local employment opportunities through processing of the materials, and marketing and selling the finished products. These activities 'add value' to the local resources by increasing employment opportunities and increasing the wealth brought into the community. This contrasts with a common practice of selling raw materials to other processors in other communities who make more money off of the resources with each step of the production process, and take in the revenues that are made from the markets where the products are distributed. An important environmental benefit to locally adding value is the realization of a community's interdependence upon natural resources - if a community's local industry depends upon a supply of local resources and materials, that community could realize long-term or continuous benefits from sustainable uses of those resources, as opposed to using up the resource and losing a local industry.

This paper describes how some communities have taken advantage of some Value-added processing activities.

What is Value-added processing?

Value-added processing is the transformation of a raw material (through the production process) using local labor, to a more finished product that has a higher value than the sale of the raw material for export. Each successive level of processing allows the product to be sold at a higher price than the previous product or original raw material. For instance, trees can be cut into logs, then lumber, then crafted into furniture, toys, or other objects. The table below shows this and other examples of Value-added processing activities.

Raw Material or Primary Product	Secondary Product	Tertiary Product
logs	lumber building materials chips	furniture, boats, toys, buildings, instruments
wheat (grain)	flour	pasta, baking mixes, baked goods
corn (grain)	corn meal corn flour	tortillas, baked goods, ethanol
whole fish	steaks fillets cubed	smoked fish, smoked sausage, fish sticks

Another way for a community to add value to its resource base is to take advantage of product differentiation schemes and marketing strategies. Products marketed in this way are often called 'specialty products' because the raw materials are locally harvested and the resulting locally made products are often marketed as items unique to an area. Examples include Appalachian made wood instruments and Alaskan smoked salmon. Sometimes products have built up such a good reputation that the name alone sells the product for a premium price. This exclusive offering, particularly if the product or region has a reputation for quality goods, is known to be located in a unique natural setting, or is produced by people living an attractive lifestyle, allows the product to be sold at high prices. Consider the importance and value that people have placed on Washington apples, Idaho potatoes, Alaskan King Crab, Hawaiian pineapple, Maine lobsters, Amish furniture, Andean wool, Maryland crabs, and Florida orange juice, just to name a few.

Why is Value-added processing important to communities?

Communities can increase their wealth by processing their own raw materials. For instance, lumber can be sold for more money than cut logs, filleted fish is more convenient for consumers and can be priced higher than whole fish, and a locally made jelly or a pie made from locally grown berries can be more appealing or worth more money to a visiting consumer than loose berries. This added value can bring more dollars into a community.

An example of Value-added processing's importance to communities is that more jobs can be generated in community-owned and operated processing streams than simple resource extraction operations. And, the forest industry is quite cyclical - but remanufactures have shown a greater resiliency than commodity pulp and lumber producers. This is good news for communities, for whom job security is an important issue.

As an example, the mechanization of forest industry sectors can work against a community, as in the case of Ontario, Canada where logging rates have increased with the invention of new harvest and processing technology. This new machinery is capable of processing higher volumes of wood with fewer employees, with the result of leaving workers without jobs. Whereas logging activities have increased almost 75% between 1965 and 1990, logging workers have suffered a drop in employment of over 40% over the same time period. Mechanization occurred since the

1950's when loggers switched from hand saws to chainsaws to larger machines, which allowed logging companies to increase production. But this more expensive capital (initially purchased to reduce labor costs) drove logging companies to maximize operation hours in order to increase output, thus increasing sales which were to cover increased capital costs.

What about community economics?

Communities are interested in having strong economies. A strong economy is in part dependent upon the amount of money that comes into a community, the amount of money that is generated by the community, and the amount of money that is circulated throughout the community. When more money is directed into and spent within a community, it provides more money for wages and also provides the resources for creating local economic opportunities through the provision of capital for the financing of local investments. The opposite effect is the loss of local revenues through 'leaks' in local spending, which occur when local residents and business spend their money in other communities for goods and services, or when raw unprocessed goods are shipped elsewhere for further processing. This can also happen when large companies locate a business within a community. True, some jobs are created, but most of the revenues still go back to the company headquarters. Leaks can also occur not only from a lack of local entrepreneurs but they can also occur from a lack of local marketing, packaging and shipping companies.

It is important to realize that although plugging the leaks through local spending is important to keeping wealth within a community, *it is also necessary to have money come from outside the community into the local economy in order to increase the monetary wealth of the community.* This occurs through the offering of and actual consumption of local goods and services by persons living outside the community.

How does Value-added processing tie into environmental protection?

When a community chooses to create a product by processing their raw materials into higher value products, it makes sense that if they want to continue to benefit from that particular source of revenue, it is vital that the natural resources are harvested in a sustainable manner. This dependence of a community on a renewable resource would hopefully bring a community closer to the reality and value of a sustainable resource. The longer the resource is available, the longer the community can bring in income. Also, a healthier environment produces a higher quality of the raw materials, which in turn can result in a higher quality finished product that is worth more money. To go a step further, if a community is able to increase the value of a resource through Value-added processing, it is possible for the community to reduce the amount of resource harvested while creating more jobs. This is an important concept for communities that are exploring sustainable resource use.

Managing a resource to be renewable is also one way to ensure the future of a strong economy. However, when a community chooses to extract a resource that is not renewable (such as metal ores, oil, or gas), a local economy may choose to use the locally generated revenues from the resource to invest in the creation of a more sustainable industry that will provide continued revenues to the community once the non-renewable resource is exhausted, or once the community decides to cease the harvest of that material.

How can Value-added processing increase a community's wealth?

In the Northwestern US, and in much of Canada, a good portion of the timber is harvested by large companies that hire local labor to cut the trees. But the companies are often based somewhere outside the community - consequently, the profits made from the sale of the logs leave the local community when they go back to the company headquarters. Potential community profits are also lost when the exported raw materials are processed outside of the community, resulting in a product that sells for a much higher price than the raw logs. When a community takes advantage of Value-added processing activities, it automatically keeps more of the profits from the harvest and sale of raw materials, the wages from the labor and also the revenue from selling the finished product. When the local sellers spend their earnings within the community, those dollars continue to circulate money within the community. An agricultural example:

If wheat is valued at \$150 per ton, and processed wheat products on the grocery shelf are valued around \$2,000 to \$3,000 per ton, the processor makes 13 to 20 times more money than the wheat producer, on each ton of wheat.

An example of a community utilizing Value-added processing

Goose Creek Lumber in Kootenay, British Columbia, Canada employs 28 workers who produce a number of wood products, including garage door components, window stock, and materials for veneer overlay. It takes about 28 truck loads of logs per year for Goose Creek to employ one full-time worker, compared with 160+ truck loads of logs needed to sustain one worker in a highly automated sawmill. This more labor intensive use of materials allows Goose Creek to employ more workers while requiring fewer logs for processing. Goose Creek realizes the social and environmental benefits with Value-added processing since more work done with less wood results in more secure jobs in the BC forest industry.

Although it may seem odd to compare these two types of operations, (sawmills and manufacturers) it is important to realize that timber activities in Canada often end at logging or sawmills - these logs and lumber are often shipped off to the US, Japan, and other places for further processing. If these logs remained in Canada, the communities with Value-added processing companies could enjoy the benefits of increased jobs and profits. For example, it takes 500,000 board feet to maintain one job in highly automated sawmills versus the 500,000 board feet that can generate on average 4.5 ft jobs in a combined sawmill and manufacturing facility. Expressed another way, 500,000 board feet of wood can generate \$53,000 in wages with automated production, versus \$160,000 in wages generated from Value-added processing activities. Although Value-added processing wages may be slightly below the forest industry average, they are still comparable. Another incentive to Value-added products is that they are often geared to niche markets, and therefore are less vulnerable to the booms and busts common in commodity lumber and pulp production. This results in more secure jobs.

Who is doing Value-added processing?

- Oregon State University has developed a program in *Value Added Forestry*, which will address economic development, job growth, and community stability issues by looking at

secondary manufacturing opportunities. They will also look at obstacles to secondary manufacturing, including transportation, distance from markets, and worker training. The "value added forestry team" is comprised of five members who have specializations in wood products and utilization, forest products management and marketing, wood processing technology, and the development of technology transfer programs for loggers, hardwood and softwood sawmill personnel, and other secondary manufacturers. The group's efforts will address the changes taking place in Oregon's forest industry, which ships over two-thirds of its lumber out of state for further processing. Scott Reed is the Extension program leader - (503)737-1728.

- Alaska has decided to encourage Value-added activities and improved marketing of products through their "Marketing Alaska Initiative" in order to encourage expansion of Alaska's private sector. Products include timber, fish, specialty seafood in the form of smoked sausages, and Alaska Wild Berry Products, which produces chocolate products and jellies from Alaska berries.
- Traditional Appalachian crafts and cottage industries often use local materials in their construction and reflect the traditional lifestyles and cultures that originated them. An added value to this tradition is the establishment of studios that teach local families ways to make money while continuing the local crafts and mountain lifestyles. Products include folk toys and Cherokee traditional baskets, pottery, masks, and carvings which show tribal craftsmanship before European contact. Also, dulcimers, corn husk dolls, painted gourds, birdhouses, carved wooden animals, textiles, furniture are produced in the region. Penland Gallery began as a local studio and currently encourages craft artisans to produce contemporary work. Penland School of Crafts is located in Penland, North Carolina (704) 765-6211.
- The Long Beach Model Forest is one of ten model forests in Canada, one in Russia, and two in Mexico. It is located on Vancouver Island, British Columbia, and it serves as a testing ground for new approaches to forest use. It is part of a larger program that is working toward a shift in the approach from sustained yield to sustainable development. This shift from forest management to ecosystem management also considers economic and environmental outputs. The Long Beach Model Forest includes Windfall Cedar Products of Tofino, which produces cedar shake blocks used for shakes and shingles, and wood blocks for stringed instrument soundboards. Other manufacturers in the LBMF salvage unwanted lumber, manufacture wood products (furniture, cabinets, boats, etc), and operate specialty mills. The Long Beach Model Forest Society makes more efficient use of available wood, employs and generates wealth, and provides local markets for primary wood manufacturers. They can be contacted by calling (604) 726-7263, or by Fax (604) 726-7269.
- Value-added processing is one of fastest growing industries in Saskatoon, Canada. Products include bakery mixes, meat products, beer, chocolates, pea starch, flour, perogies, Saskatoon berry preserves, etc.

List of Organizations, Agencies, Consultants, NGOs

BC Wild is a non-profit conservation group based in Canada that, "is dedicated to healthy environments, economies, and communities that can be sustained in the long term, with a primary focus on wilderness protection and sustainable forest practices." Visit their WWW Site at <http://www.helix.net/bcwild/> . Or, contact BC Wild by mail, Box 2241, Main Post Office, Vancouver, B.C., V6B 1H2 Phone: (604) 669-4802, Fax: (604) 669-6833, or E-mail at twebb@helix.net.

Value-Added Cooperatives are joint ventures formed to involve producers of various materials and crops in the processing activities of their products, which adds value to their agricultural commodities. These cooperatives provide a new income source to farmer and rancher members, and provide them with an "ownership stake further up the farm-to-consumer food chain. The cooperatives often require a cash investment, and the commitment to deliver raw agricultural commodities to the processing plant. Many cooperatives also enter highly competitive markets. The following list describes some cooperatives in the process of development, and some already in operation.

Northern Plains Premium Beef - Bismarck, ND - Ryan Taylor 701-537-5539
Proposing a beef packaging plant to process beef from coop members

Farmers Choice Pasta Company, Leeds, ND - 701-466-2405
Plant to produce fresh-frozen specialty pasta

Indiana Family Farms Pork Marketing Cooperative, Anderson, IN - Vanessa Smith - 317-872-9991

Pacific Northwest Sugar Company, L.P., Moses Lake, WA - 509-766-1933
grower-owned sugarbeet cooperative, to bring production back to Columbia River Valley

Minnesota Valley Alfalfa Producers, Granite Falls, MN - 612-564-2400
process alfalfa for animal feed and biomass to fuel a power plant

Tri-State Corn Processors, Rosholt, SD - Herb Heesch - 605-537-4585
Plans to build ethanol plant using members' corn.

Dakota Growers Pasta Co., Carrington, ND - 701-652-2855
Developed to produce semolina flour from growers' wheat

South Dakota Soybean Processors, Volga, SD - 605-627-9240
Soybean processing plant to make feed and oil

High Plains Straw Cooperative, Perryton, TX - 806-435-9303
Wheat producers involved in company that processes wheat straw into wall and panel systems for interior building construction materials.

Nebraska Energy, LLC, Aurora, NE - 402-694-3635
Ethanol plant requires farmer owners to commit to deliver corn

Snowflake Products, Argyle, MN - 218-437-8222, or Dan Evans 218-4745-5344
Plant to process and sell dehydrated juiced vegetables

Glacier Frozen Foods Co-op, McIntosh, MN - 218-563-7372
Plans to build plant to freeze vegetables grown by members

Great Northern Garlic Growers Cooperative, Minot, ND - 701-839-6036
Pool members' garlic to meet larger market needs, storage facility, processing plant to clean, package and dehydrate garlic.

Woodnet "Enables small and mid-sized independent wood products manufacturers to collaborate, whenever appropriate, in order to solve common problems or to take advantage of common opportunities." It also links manufacturers and assists members to produce Value-added products for niche markets. The regional focus is on Washington, Idaho, Oregon, Montana, and Alaska. Speakers are also available for events, and the organization provides a range of business assistance services. Contact Gus Kostopulos, Executive Director, 127 East First St, Suite 4W, Port Angeles, WA 98362. Telephone 360-452-2134, Fax 360-452-7065.

Where Else Can I Go To Find Out More or Get Help?

List of Articles, Publications, Websites, Internet Addresses and other examples

Baker, K. 1994. *Petter Looks to Boost Wood Supply for Value-Added Sector*. Ministry of Forests, Economics and Trade Branch. British Columbia, Canada.

The Forests Minister of British Columbia has announced a credit system designed to increase the availability of wood supplies to local Value-added manufacturers. The credit system is designed to monitor the amount of wood made available to remanufacturers, who issue credits to their suppliers and which provide suppliers greater access to logs.

Bean, W. and D. Runsten. 1993 - *Value Added and Subtracted: The Processed Potato Industry in the Mid-Columbia Basin*. Columbia Basin Institute, Portland, OR.

An ideal region for potato production, but industry's worker welfare, poor environmental record, and need for subsidies question the true value of the industry to the region. Large companies own the processing plants

Jobs Through Agriculture and Value Added Agriculture, Morrow/Umatilla Regional Strategy. Press release from Oregon Governor Neil Goldschmidt. 14 March 1989.

Discusses the importance of Value-added processing of agricultural commodities in local economies in the Mid-Columbia region.

Mobley, W. H. 1993. *Texans Missed a Chance to Back Value-added Industries*. Texas A&M University System. Unpublished paper.

The Texas legislature failed to pass an amendment that would have made it easier to create thousands of jobs in the state's second largest industry -- agriculture. Some agricultural products that have potential for Value-added processing in Texas include -- cotton for processing into thread for clothing manufacturers; forest products; and specialty foods like onions for onion rings, the incredibly sweet 1015 onion, and the development of a mild jalapeño for salsa.

Oregon Department of Agriculture. 1995. "World Food Day 1994," Story of the Week.

[http://www.oda.state.or.us/cgi/AppleSearch.acgi\\$RETRIEVE,23,5,5678,0,5,0](http://www.oda.state.or.us/cgi/AppleSearch.acgi$RETRIEVE,23,5,5678,0,5,0)

Oregon sends Value-added food products to developing nations. Products include dehydrated potato flakes and microwaveable meals (to Pacific Rim). Article compares American food expenditures with other countries and talks about the importance of lower cost technological advances in food production.

Oregon Department of Agriculture. 1995. *Governor appointed council works to expand Oregon's value-added agriculture*, in Story of the Week.

http://www.oda.state.or.us/Information/sow/Food_Council.html

Governor John Kitzhaber has appointed a 12-member council through an executive order to increase the amount of Oregon products and markets. The council is to identify opportunities and impediments to the expansion of Oregon's agricultural processing sector, and recommend ways to change state laws, programs, services and policies to enhance the industry. Oregon currently adds only 32%, compared to the national average of 55%. Doubling Value-added agriculture can add \$3 billion to Oregon's economy and create 21,000 more jobs. The state's processors include large and small scale operations.

Oregon Department of Agriculture. 1995. *Despite a drop in production this year, the industry has a bright future in Oregon*, in Story of the Week.

http://www.oda.state.or.us/Information/sow/Oregon_cranberries.html

Cranberry products of Oregon are discussed. Most of revenues stay in local communities. The berries also diversify Oregon's economy when timber harvests are shrinking elsewhere on the coast.

Rost, B. 1996. *Oregon State University to Operate Food Innovation Center*. From "Story of the Week," Oregon Department of Agriculture.

http://www.oda.state.or.us/Information/sow/Food_Innovation.html.

The new Center will provide technical assistance to Pacific Northwest firms that manufacture, package and market food products to realize the full economic potential of Oregon agriculture. Food products will be marketed worldwide in ways that fulfill customer needs in each market. The intent is to make Pacific Northwest foods more competitive on the international market. The last 10 years have seen a 60% increase in the value of Oregon crops from in-state processing, compared to the national average of 70%.

Snetsinger, J. 1995. *Timber Offer Means \$6 Million Value-Added*. Ministry of Forests. Prince Rupert Forest Region. British Columbia, Canada Website article.

A new \$6 million Value-added plant will be constructed in British Columbia from a joint venture between a forest products company and a pulp and timber company. At least 90% of the new jobs are expected to be filled by First Nations people.

Vaughn, E. 1995. *Ethanol: A Growing Value-Added Market Leading to Energy, Economic and Environmental Security*. Renewable Fuels Association.

The use of corn in fuel production is discussed. Value-added products include high protein food and feed co-products that result when corn is converted to ethanol. Each acre of corn produces an estimated 288 gallons of ethanol, 1437 pounds of gluten feed, 345 pounds of protein gluten meal, and 173 pounds of corn oil. This represents a sale value of \$500 while the associated economic activity generates \$4,440 in gross output. The anticipated clean air act markets are expected to result in ethanol industry growth.

Wall, John. 1996. *Putting More on the Plate*. Penn State Agriculture. University Park, PA.

This article discusses ways Pennsylvania attempts to maintain its strong food processing industry.

Graphic Examples of Value-Added

Value-Added Product Stream showing % of Final Product Value for Various Steps in the Process				
Raw Farm Materials (Wheat, Milk, Butter, Oil, ect.)	Flour Miller	Baker	Transportation	Retail Marketing Other Processes, Etc.
4%	2%	70%	4%	20%

Published: 05/02/97

Conservation-Based Green Marketing

Overview

To illustrate the concepts of green labeling and green marketing, this issue brief depicts three examples of communities that have embarked upon the road to sustainable economies by making more effective use of local natural and human resources and enhancing their economy by manufacturing and marketing products and services in a more environmentally-benign manner. This paper also includes highlights of organizations, Internet resources, reading material, and people to contact for additional information.

Introduction

To illustrate the concepts of green labeling and green marketing, this issue brief depicts three examples of communities that have embarked upon the road to sustainable economies by making more effective use of local natural and human resources and enhancing their economy by manufacturing and marketing products and services in a more environmentally-benign manner. The last six pages highlight organizations, Internet resources, reading material, and people to contact for additional information.

What is Green Marketing?

There are a growing number of consumers eager for products whose production does less harm to the environment. Green marketing is the process by which businesses produce, label, distribute, and/or sell goods and services (many times at a premium price) to consumers who prefer purchasing products that are generated in a more environmentally-responsible manner. To tap into and expand this market, firms operating in a more "environmentally friendly" way work to distinguish themselves as "green". "Green" consumers, in turn, create more demand (and business opportunities) for goods and services whose production and consumption incorporate environmental and social costs.

A vital step in green marketing is ensuring consumers that the product was produced in a manner that was environmentally sound. This is done by "certifying" products - kind of like a "Good Housekeeping Seal of Approval". The product or input into a product (for example, timber that has been harvested at sustainable rates using low-impact logging practices) is then labeled so consumers are provided with the necessary information to make educated choices.

Certifying Green Products

There are numerous national and international programs for certifying and labeling timber and agricultural products and consumer goods whose production and use are less harmful to the environment (i.e. energy efficient lighting, chlorine-free paper, etc.). For durable consumer goods, the field of green certification and labeling is relatively new and the two key domestic

organizations, Green Seal, a nonprofit organization, and the for-profit Scientific Certification Systems (SCS -formerly known as Green Cross) have only been in existence since 1990.

Green Seal certifies products that meet their product-by-product environmental standards and rewards these companies by allowing them to use their emblem - a blue globe with a green check mark. Green Seal only tests products when the manufacturer pays for the testing. However, Green Seal helps create demand for the product by identifying buyers for its Environmental Partners Program. As of December 1995, Green Seal had developed standards for 77 varieties of consumer good products; 313 products manufactured by 16 companies have received Green Seal's eco-label. "Energy Ideas: Green Seal: The Green Stamp of Approval." Volume 4, Number 1. Winter 1996. A Publication of the Center for Study of Responsive Laws Government Purchasing Project. Page 5.

SCS, a for-profit venture, differs from Green Seal in that this organization verifies and certifies the accuracy of environmental claims voluntarily submitted by a manufacturer concerning a product. SCS's Environmental Claims Certification Program does not employ a specific set of standards or criteria; rather, they determine whether products actually justify terms like "biodegradable", "energy-efficient" and "water conservation". If SCS determines that these claims are truthful, they issue the SCS Cross and Globe logo. The verification cost must be borne by the company; these costs can run between \$2,000 - \$6,000 per individual claim. Ibid #1.Pg.14. SCS also has a "Certified Eco-Profiles" program that evaluates the life-cycle burdens of a product and the results are printed on a label affixed to the product - similar to the nutritional information label on food products.

The most extensive national source for environmentally friendly products and services is the *National Green Pages*, published by Co-op America (see section called Contacts for this and other listings). Co-op America is a listing authority that screens businesses that wish to become members and have their products and services advertised in the *National Green Pages*. Co-op America does not use specific criteria or pay scientific certification companies to individually test each product that is listed in this document. Businesses, however, must fill out a questionnaire for Co-op America that explains how their company applies social and environmental responsibility principles. The *National Green Pages* contains over 1,800 products ranging from organic cotton sheets to solar-powered lawn mowers. This directory also includes service providers (i.e., landscape firms, bed and breakfasts, etc.) that incorporate environmental responsibility into their business credo.

Groups that certify and manage "green" forestry practices have also just recently come into existence. In 1993, the Forest Stewardship Council (FSC) established the FSC Checkmark for natural forest management. This Checkmark accredits certifiers - individuals and organizations - as being competent to perform certifications in accordance with FSC's principles and criteria. FSC principles include criteria like selective cutting, less road building, creation of natural preserves, and leaving ample time for forest regrowth. The certification program is also based on locally-defined forest-management practices that allow for flexibility in the development of national and regional standards that fit ecological, social and economic circumstances. Recently, both the World Wildlife Fund and The Wilderness Society were accepted as members of FSC.

Conservation-Based Development

Principles of Conservation-Based Development

- Manage natural resources to restore and maintain biological diversity;
- Seek social as well as business returns;
- Prefer native species to introduced ones;
- Process and add value to raw materials before exporting them;
- Harvest no more than what is replenished naturally;
- Use new technologies to increase productivity rather than just using more resources;
- Apply the highest standards of energy efficiency;
- Use and control waste to prevent damage to the environment; and
- Improve industry standards for restorative fishing, farming, and forestry.

Principles developed by Shore Trust Trading Group, Ilwaco, Washington. The goal of conservation-based development is to help entrepreneurs succeed in environmentally and socially sound economic enterprises. However, there are many institutional and informational barriers to communities and businesses developing conservation-based green marketing ventures. Much of the business, financial, and political and governmental infrastructure in this country is based upon large-scale production. Also, fear of change and lack of understanding of the linkages between the economy and environment impede a faster shift to "green marketing." To succeed, conservation-based communities, businesses, and entrepreneurs must create local organizational capacity, secure access to resources (i.e., credit and markets), and enhance entrepreneurial capacity within the community.

Also, for businesses to develop "green" products they need to develop new business plans, production methods, product lines, and marketing plans. Many times traditional lenders are apprehensive about financing new types of ventures. In addition, much of the time traditional business lenders are reluctant to underwrite "soft" investments (e.g., training, third-party certification, etc.). The challenge for conservation-based entrepreneurs and businesses is to understand and address the environmental and community aspects of their business activities while dealing with the short-and long-term challenges of doing business.

There are many private; non-governmental organizations; and local, state, and federal government agencies that are involved in community and economic development, assisting small- and medium-sized businesses with all aspects of "doing business" (e.g., developing a product, securing financial capital, marketing, etc.). Few organizations, however, actively focus on developing businesses and products that conserve ecosystems, enhance local economies, and achieve community goals (see environmentally-compatible development contacts for a listing).

Below are examples of three, diverse communities that are working to achieve a healthy economy, community, and environment, and have incorporated green marketing into their strategies.

Bringing It All Together: Real-life Places, People & Products

This section provides examples of the integration of green marketing with broad-based community efforts to improve the quality of the environment, economy, and social fabric.

Example I: The Rangelands of Montana - Gallatin Valley: Predator Friendly Wool™

In the Gallatin Valley of Montana agriculture and sheep and cattle ranching are a way of life that spans generations. Most ranchers minimize domestic animal loss to predation by shooting, trapping, and poisoning predators. In 1994, however, two sheep growers in the Valley decided to raise sheep and grow wool in a manner that does not involve the killing of native predators like wolf, coyote, bear, mountain lion, and eagle. A group of people in the Valley formed - conservationists, woolgrowers, business people - to work together and develop strict criteria for raising sheep and woolgrowing using non-lethal predator control. A nonprofit corporation, Predator Friendly, Inc. was started. For a small fee, to cover administrative costs, Predator Friendly, Inc. certifies a rancher and labels their product (i.e., wool) as "predator friendly"™.

To make this idea a reality, the Growers' Wool Cooperative was established. The Cooperative only includes members who have been certified by Predator Friendly, Inc., however, it was devised so both ranchers and non-ranchers can have a stake in the business. Wool growers can either be immediately paid for their wool (in 1996, ranchers were paid \$2/lb. when the going rate for conventionally raised wool was around \$0.55 a pound) or they can "invest" their wool in the cooperative until the yearly batch of wool is sold by the cooperative. For those individuals that decide to invest, if at the end of the year the cooperative realizes a profit, they receive dividends. Non-ranchers also can have a stake in the cooperative by purchasing preferred shares. By setting up the cooperative in this manner, both ranchers and non ranchers can share in the risk and rewards of their business venture.

The Growers' Wool Cooperative faced substantial barriers. Becky Weed, one of the co-founders of the Cooperative, expressed how difficult it is to "get capital together, devise how to market their products and still do ranching." She also lamented that the technical assistance she has received has been fragmented and that qualifying for nonconventional and commercial loans was an extraordinarily long and challenging process.

The first order of business was to raise capital for their new business. Becky heard about a special State of Montana seed capital fund for marketing innovative agricultural products. Becky was excited about this possibility and after fulfilling all the requirements of the application process the State's fund director convinced her that she had a good chance of qualifying. After many, long hours preparing a business and marketing plan and briefing the State on their efforts, she was told months later that she was "overqualified" and that she and the Growers' Wool Cooperative should pursue commercial funding. Becky became further discouraged after she received rejection after rejection from commercial banks. Finally, she was able to get a line of credit from a local bank because the loan officer knew her husband and had lent money to them previously. Becky had to secure the loan with a mortgage on their farm.

Becky's first Growers' Wool Cooperative product was blankets. The Cooperative located a mill in Utah whose owners were willing to keep the cooperative's wool in a separate batch. That mill

processed wool without solvents, bleaches or other harsh chemicals and also recycled fabric and yarn. Becky does not yet have final gross sales or profits numbers for the sale of the blankets; however, the price paid for the wool being used in the blankets is \$4.00 per pound which is much higher than the price of approximately \$1.00 per pound for conventionally-raised wool.

By 1996, six ranching families from Montana and Idaho were involved in the Cooperative. Because the costs of the Utah mill were too high, they moved their yarn milling process to a mill in Oregon and expanded their products line to include sweaters and hats. Also, the sweaters are now hand-loomed by local Montana artisans in their homes. To market their products, the Cooperative is developing their own catalogue and they are making contacts with larger wholesale catalogue companies and retail businesses to carry their product line.

According to Becky, starting Growers' Wool Cooperative has been an interesting and challenging journey. These families have had to withstand many obstacles including hostility from some members of their ranching and agricultural community. They have been accused of being "kooky" animal rights extremists who are trying to control agriculture. The cooperative members try to dispel this hostility and to ensure their fellow ranchers that they are not condemning their way of life and current business practices but they, personally, want to pursue ranching methods that incorporate the real costs of agriculture.

For more information about Predator Friendly, Inc. or Growers' Wool Cooperative or to receive a list of available products call Becky Weed at 1-406-388-4945.

Example II: The Pacific Northwest - Willapa Bay: Hardwoods, Oysters and Cranberries

The Willapa Watershed in Northern Washington State - 680,000 acres of streams, rivers, and ocean bay- contains a rich fishery that produces oysters, clams, crabs, chinook salmon, coho along with dense inland forests abundant with hardwoods, wild mushrooms, and wildlife. Even though Willapa Bay is one of the most pristine estuaries in the continental United States, much of the region's biological riches have dwindled, including wild salmon runs, sturgeon, and old-growth forests. Also, many of the residents are living in poverty (the region ranks in the bottom third of Washington's per capita income and the State has listed this area as economically distressed).

In 1991, Spencer Beebe, an Oregon Native who had 20 years of experience working to protect tropical forested ecosystems, decided to turn his attentions to the temperate rainforests of the Pacific Northwest. He founded Ecotrust, a non-profit organization dedicated to conservation and economic development in the Pacific Northwest. Beebe and Ecotrust decided that Willapa Bay was an ideal place to pursue conservation-based development because, "Although it has rich natural resources, the long-term trend is one of decline: economic and ecological. {Ecotrust} wanted to show that ecological vitality is the basis for economic vitality." "Beyond the Spotted Owl: Investing in 'Green Market' Enterprises Can Be Good for Both Business and the Environment." The Ford Foundation Report. Winter 1995, Volume 26, No. 1, p.7. Ecotrust collaborated with The Nature Conservancy (TNC) to make this vision a reality.

At first the local people were suspicious of Ecotrust and TNC, but then a diverse group of farmers, fishermen, small-business owners, oyster growers, Native Americans, etc. formed the

Willapa Alliance. This Alliance is an independent, grass-roots organization that provides the community with a forum to address the challenges facing their community. Ecotrust acknowledged that it was incumbent upon them to earn the trust and respect of the people of Willapa, and during the past two years all parties have come to appreciate the role they play in helping to preserve the ecological integrity of Willapa Bay.

These three partners (Ecotrust, TNC, and the Willapa Alliance) commissioned studies of the area's social, economic, and ecological health. The community valued the uniqueness, natural beauty and economic potential of the resource base and many members of the community possessed creativity, energy, and initiative. However, the partners realized that for the fledgling businesses to survive and grow they needed additional business skills, access to markets and credit, and financial capital. To obtain this expertise the partnership located the South Shore Bank of Chicago, the nation's first community development bank.

With South Shore Bank's assistance, in the summer of 1994, Ecotrust created the Shore Trust Trading Group. The Shore Trust Trading Group is a non profit affiliate who finds green markets, provides technical assistance, and supplies high-risk, nonbank credit to companies that produce environmentally-sensitive products. Since their inception, Shore Trust Trading Group has lent over two million dollars to eighteen "environmentally sensitive" firms within the temperate rainforests of the Pacific Northwest. The stories of two of these small businesses and their green products follow.

Skamokawa Creek Enterprises was founded by Tim and Sharon Schmitz. The idea behind its creation was to demonstrate that income could be generated by harvesting timber from the region's forest in a way that does not decrease the ability of the forest to naturally renew itself. Ecotrust helped the Schmitz's locate a company that sells hardwoods from forestry operators who practice ecological stewardship and social responsibility. This company placed an order with the Schmitz's to purchase the fast-growing, underutilized hardwood, alder. Tim and Sharon Schmitz obtained a loan to cover the costs of harvesting the alder. The Schmitz's, as independent loggers, make arrangements with woodlot owners to draft a forestry land management plan, cut the timber and share the proceeds with forested land owners. With the proceeds from this transaction, Ecotrust helped the Schmitz's draw up a business plan and marketing strategy to sustainably harvest and mill more alder and add value to the lumber by making it into wainscoting. This wainscoting is marketed and sold as a sustainably forested wood product.

Another example is Goose Point Oysters owned and operated by Dave Nisbet. Oysters are very susceptible to water pollution, so oyster farmers are keenly interested in maintaining high water quality so they can continue to harvest oysters from the bay. In September 1992, Ecotrust-Shorebank assisted Dave Nisbet in developing a supplier relationship with Nature's Fresh Northwest, an Oregon supermarket chain that features high-quality natural products. Consumers of high-quality, premium-priced food products like to know where their foods come from and the health and safety of those products. Together they created brochures and videos to educate consumers about Willapa Bay, the quality of the oysters, and how to prepare and cook oysters. Because of these efforts, sales have doubled every year.

In December 1995, Ecotrust and Shorebank Corporation of Chicago received the rights to create a bank which when capitalized at approximately \$12.5 million dollars (a goal they should reach by spring 1997) the ShoreTrust, The First Environmental Bancorporation will open. ShoreTrust,

The First Environmental Bancorporation, will be a bioregional bank holding company comprised of ShoreTrust Trading Group, ShoreTrust Lands Corporation (a non-profit lands trust corporation), and ShoreTrust Bank, a regulated commercial bank. ShoreTrust Bank will be capitalized with an equity offering and \$10-12 million dollars from EcoDeposits, FDIC-insured accounts including CDS, savings, money market, and checking account. ShoreTrust Bank will be the wholesale commercial lender providing credit to businesses in Ecotrust targeted communities in the temperate rainforests of the Pacific Northwest who otherwise may have much difficulty securing capital from "traditional" banking sources.

Example III: The Northeast Forest Community; Forest Friendly Paper©:Forest-Friendly © Demonstration Project

At the time of colonization, the forests of the Northeast United States were brimming with trees and wildlife. These trees, which had been growing over hundreds of years represented an inexpensive, high-quality sawlog resource to the colonists and the British empire. Gradually, up until the end of the nineteenth century, sawlog resources, along with biodiversity, water quality protection and other non-timber forest resources were depleted by high-grading, overharvesting and other inappropriate land management. As remaining reserves became harder and more costly to access the timber companies moved westward.

By the early 1900's the NE forests became commercially more suitable for pulpwood used in the emerging paper industry. Today, the NE forests have more heavily forested acres than in 1930's, but these forests contain a different variety of trees and wildlife than the forests of our colonial predecessors. High quality sawtimber stands have been replaced by fir tree plantations highly susceptible to the spruce-budworms which can wreak havoc and destroy huge tracts of forest.

Unlike the western United States, most of the approximately 26 million acres of forest in New York, Vermont, New Hampshire, and Maine is held privately, much of it by a handful of companies (85% or 22.1 million acres are privately owned). And, in these forests, paper dominates the forest product markets.

Starting in 1993, The Wilderness Society (TWS) researched working in a 30- county area of the Northeast forest community that stretches from the eastern tip of Maine to Tug Hill west of New York's Adirondack Park. TWS was drawn to the NE forests because, "improving the management of pulpwood-producing lands is essential to the long-term ecological and economic health of the region." And improving the ecological health of the area depends upon creating market opportunities forest products that are produced in a way that are ecologically-compatible with the region.

In May 1996, TWS along with The Forest Partnership of Burlington, Vermont initiated a demonstration project that includes harvesting pulpwood from sustainably managed forest, tracking the raw fiber and intermediate products through the production stage, and marketing the paper to national and international markets.

The first stage was to identify forest lands certified as "well-managed" by an independent certification organization. Currently, three forest landowners with a total of 1 million acres have

been certified by organizations accredited by the Forest Stewardship Council. This certification ensures that these forest owners manage their forests in a ecologically sustainable manner. The partners are joined by Lyons Falls Pulp and Paper of Lyons Fall, New York, the nation's first manufacturer of totally chlorine-free paper. Lyons Falls will produce and market Forest-Friendly Paper©. TWS/TFP and Lyons Falls have already located their first customer - a stationer in the United Kingdom committed to supplying sustainable, chlorine-free products.

TWS's plans for future work in forest products certification includes: increasing the number of landowners who become FSC certified; starting a loan fund so small landowners can afford to get FSC certification; expanding the market for Forest-Friendly© products; conducting case studies on the financially viability of these products; identifying barriers and constructing solutions to overcome these obstacles; and creating a public education campaign that explains why a healthy forest ecosystem that provides amenities like clean air and water, recreational opportunities, and wildlife habitat depends on the continued economic and ecological health of the system.

Conclusion

Long-term conservation depends upon the efforts of people who work, live and care about the environmental health of their community. The fortune of local economies, communities, and ecosystems go hand and hand, and long-run sustainability depends upon an alliance between these three critical elements. While it is true that economic and "good" jobs for resident are vitally important to communities, inappropriate, incompatible development presents threats to the local environment and the community's fabric. Ibid #3, p.15. A growing coalition between communities interested in ecosystem health and socially responsible investors and consumers can move us toward an economy in which people's needs are met equitably and within the earth's productive capacity.

Environmentally Compatible Economic Development Contacts:

Ecotrust
#1200 N.W. Front Street, Suite 470
Portland, Oregon 97209
Alana Probst, Director
1-503-227-6225, Fax: 503-222-1517
email: alana@ecotrust.org
Internet: <http://www.ecotrust.org/bank.htm>

Mission is to integrate conservation and development by building on the cultural and economic traditions of local communities throughout the western coastal rain forests of North America.

Shorebank Corporation of Chicago
71St & Jeffery Boulevard
Chicago, Illinois 60649-2096
tel: 1-800-669-7725
Fax: 1-312-493-6609

To open an FDIC-insured EcoDeposits- IRA, CD, Money Market, Checking or Savings Account contact Susan Grosky at 1-800-669-7725, or email: ecodeposits@sbk.com.

ShoreTrust Trading Group
Port of Ilwaco
P.O. Box 836
Ilwaco, Washington 98624
Tel. (360) 642-4265
Fax. (360) 642-4078
email: diane@ecotrust.org

Internet: <http://www.ecotrust.org/sttg.htm#principles>

A non-profit business development organization that offers business assistance, new marketing strategies, and credit to business people who live and work in the Willapa region.

The Willapa Alliance
Post Office Box 278
South Bend, Washington 98586
Tel. (306) 875-5195
Fax (306) 875-5198
Email: alliance@willapabay.org
Internet: <http://willapabay.org/~alliance/>

A private, non-profit community organization that addresses some of the economic and environmental challenges facing the Willapa Bay region.

The Nature Conservancy -- Center for Compatible Economic Development (CCED)
7 E. Market Street, Suite 210
Leesburg, Virginia 22075
W. William Weeks, Director
Tel: 703-779-1728
Fax: 703-779-1746
email: ecodev@cced.org

CCED has launched compatible economic development programs on the Virginia Eastern Shore, in Appalachia's Clinch Valley, and the ACE Basin of South Carolina. With assistance and funding from EPA's Office of Sustainable Communities and Ecosystems, CCED plans to work in additional dozen ecosystems in the next two years.

The Wilderness Society
900 17th Street, N.W.
Washington, D.C. 20006-2596
(202) 833-2300
spencer_phillips@tw.soc

Predator Friendly, Inc.
HC89 Box 4306
Big Timber, Montana 59011
(406) 388-4945
Dade Tyler or Becky Weed
email: FORWOOL@imt.net

Northwest Area Foundation
East 1201 First National Bank Building
332 Minnesota Street
Saint Paul, Minnesota 55101-1373
612-225-3869
fax 612-225-3881

Their mission is to contribute to the vitality of eight-state region (MN, Iowa, North Dakota, SD, Idaho, Washington, and Oregon) by promoting economic revitalization and improving the standard of living for the region's most vulnerable citizens. NWF believes that the conservation and preservation of natural resources will generate economic activity and provide jobs into the future.

Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, Colorado 81654-9199
Tel. (970) 927-3851.
Fax: 970-927-4510
Michael Kinsley
Email: Kinsley@RMI.org

Many publications and reference materials on sustainable economic development, energy efficiency, agricultural policy, and other community development issues.

Center for Northern Rockies
PO Box 1448
Livingston, Montana 59047
Phone: (406) 222-0730
Promotes sustainable development in Northern Rockies.

Corporation for Enterprise Development
777 North Capitol Street, NE, Suite 410
Washington, D.C. 20002. Tel. (202) 408-9788.
Conducts economic assessments for communities and helps to develop community development plans. Variety of publications, including case studies.

Sustainable Forestry Labeling & Certification Programs

SmartWood certification program of Rainforest Alliance
1 Millet Street
Goodwin Baker Building
Richmond, Vermont 05477

Richard Donovan, Director
Phone: (802) 434-5491

New York Office
65 Blecker Street, 6th Floor
NY, NY 10012
Email: www.rainforest-alliance.org

Scientific Certification Systems
1611 Telegraph Avenue, Suite 1111
Oakland, California 94612
Phone: (510) 832-1415
Fax: (510) 832-0359

Forest Stewardship Council and World Wildlife Fund -- FSC Checkmark
Avenida/Hidalgo 502
Oaxaca, 68000
Oaxaca, Mexico
FSC was established in 1993 to ensure and accredit certifiers as being competent to perform certification for natural forest management

EPA's Office of Policy, Planning and Evaluation; Renewable Natural Resources Division
401 M. Street, SW
Washington, D.C. 20460
Tel: 202-260-2757

The Wilderness Society
900 17th Street, N.W.
Washington, D.C. 20006-2596
Phone: (202) 833-2300
Ecology and Economics Research Department
-- Financing Forestry Certification, Forest-Friendly Paper© Demonstration Project, and FSC certified member since May 1996
spencer_phillips@tw.s.org

The Appalachian Sustainable Forest Center
50 Lair St
Mt Vernon, Ky 40456-9806
APPALWOOD - The Forestry Certification Program

National Green Marketing Contacts:

Real Goods, 1-800-762-7325
Seventh Generation, 1-800-456-1177

The National Green Pages (\$5.95), available from and FREE with a \$25 membership in Co-op America, WDC, 202-872-5307. This document lists 1,800 businesses and organizations around the country that have met Co-op America's guidelines on environmental and social responsibility.

Green Business Letter
(Tilden Press)
1519 Connecticut, NW Suite 301
WDC, 20036
1-202-332-1700

The Green Business Letter is a journal of corporate environmental policies and practices. It discusses facilities management, waste and energy saving techniques, products, business strategies, personnel practices, and other environmentally-friendly resources for small and large businesses.

Recommended Reading

Hawkins, Paul. The Ecology of Commerce. HarperCollins Publishers, Inc., New York, NY. 1993.

Daly, H.E. and Cobb, J.B. Jr.. For the Common Good: Redirecting the Economy Toward Community, the Environment, and the Sustainable Future. Boston, MA: Beacon Press. 1989.

Power, Thomas Michael. Lost Landscapes and Failed Economies: The Search for a Value of Place. Island Press, Washington, D.C. 1996.

The Ford Foundation Report. "Beyond the Spotted Owl: Investing in "Green Market" Enterprises Can Be Good for Both Business and the Environment." Winter 1995, Volume 26, No. 1. Pgs. 4-11.

Northwest Report- A Newsletter of the Northwest Area Foundation. " Entrepreneurs and Ecosystems: Building Sustainable Economies. " Number 19, January 1996. Pgs. 10-15.

The Nature Conservancy. A Citizen's Guide to Achieving a Healthy Community, Economy & Environment. Center for Compatible Economic Development. 1996.

The Nature Conservancy. The Nature Conservancy. Building a Community-Based Initiative for Compatible Economic Development. Center for Compatible Economic Development. 1997.

Stallworth, Holly. "Jobs & The Environment" - Office of Sustainable Ecosystems and Communities Issue Brief #3. EPA's Office of Policy & Planning. Washington, D.C.. 1996.

Harris, Lisa. " Value-Added Processing" - Office of Sustainable Ecosystems and Communities Issue Brief. EPA's Office of Policy & Planning. Washington, D.C.. 1996.

Internet (national green marketing):

Yahoo! search engine at http://www.webdirectory.com/Products_and_Services

Jade Mountain at <http://www.indra.com/jade-mtn/index.html>

EcoExpo at <http://www.ecoexpo.com/EcoExpo>

EcoMall at <http://www.ecomall.com/> - Largest assortment of environmentally-friendly products on the Internet. Web site includes green companies, products and services, eco news, links, article, and other helpful resources.

Green Labelling Contacts:

Domestic

Green Seal (private, nonprofit)
1730 Rhode Island Ave, NW, Suite 1050
Washington, D.C. 20036-3101
Tel: 202-331-7337 ext.22
My Ton, Research Associate

Scientific Certification Systems (SCS - formerly known as Green Cross)
1611 Telegraph Avenue, Suite 1111
Oakland, Ca. 94612-2113
Tel: 510-832-1415
Fax: 510-832-0359

International

Canada - Environmental Choice Program (ECP) & the EcoLogo Label
Operated by Environment Canada, a Division of the Canadian Federal Government
TerraChoice Environmental Services, Inc.
2197 Riverside Drive, suite 300
Ottawa, ON K1H 7X3
tel: 613-247-1900
fax: 613-247-2228

Japan - Japan Environment Association - EcoMark label

European Community Ecolabelling Program (complements existing labelling programs such as German Blue Angel, the French Green Leaf, and the Nordic Swan)

UK Ecolabelling Board
7th Floor, East Bury House, 3034
Albert Embarkment, London SE1-7TL, UK
Attn: Jerry Rendell
TEL: 44-718201199
Fax: 44-718201104

Germany's Blue Angel
Umweltbundesamt, ZAD
Bismarckplatz 1
Berlin, Germany 33
Tel: 49-30-231-45706

Published: 05/02/97

Nature-Based Tourism

Overview

This paper discusses the value of nature-based tourism not only as a means of promoting an appreciation of nature and the outdoors, but also as a lucrative industry. Information is provided that may assist communities that are interested in exploring Nature-based tourism as a potential industry for their local communities.

Introduction

Nature tourism is travel and recreation for the appreciation of nature and the outdoors. Areas that attract nature tourists range from pristine wilderness to community parks. Economic benefits of nature tourism accrue to those in a community who provide goods and services to tourists. Properly planned and managed, nature tourism can have minimal impacts on the environment, protect and enhance social and cultural values, and enhance the economic well-being of residents. Proper planning and a clear understanding are needed for a community to develop a nature tourism industry that protects the natural resources upon which their livelihood depends. "Ecotourism" is defined as travel and recreation to natural areas that is designed to contribute substantially to those areas' conservation and enhancement, through education and the dedication of tourism dollars to protect natural resources. Ecotourism is a relatively small component of the total nature tourism industry, but is growing rapidly.

Breadth of Nature Tourism Activities

- The fastest growing nature tourism -- growing 30% annually -- involve nonconsumptive activities: bird and other wildlife watching, hiking and backpacking, nature study and photography, boating, biking, camping and picnicking, and allied activities.
- 76.5 million Americans enjoy viewing wildlife, and 24.7 million observe and/or feed birds.
- In 1991, Americans spent:

-- \$4.4 billion for food and lodging to view nonconsumptive wildlife
-- \$198 million for guide services and \$88.6 million for equipment rentals
-- \$5.7 billion for nonconsumptive equipment expenditures

- Camping, hiking, backpacking, and boating are enjoyed by tens of millions of Americans.
- There are 35.6 million American anglers and 14.1 million hunters.
- Nature tourism and recreation generates over \$20 billion in economic activity and 234,000 jobs

Localized Studies of Expenditures by Nature Tourists in Communities

A 1993 study in Texas found that a typical American birdwatcher spends nearly \$700 in the State on a vacation, and foreign tourists each spend nearly \$1,900. Another study of ten National wildlife refuges in 1993-94 estimated direct annual expenditures in surrounding communities by visitors:

<i>National Wildlife Refuge</i>	<i>Visitors/yr.</i>	<i>Local expenditures</i>	<i>Avg. visitor's local spending</i>
Chincoteague (VA)	95,970	\$9.71 million	\$62 - \$101
Salton Sea (CA)	60,000	\$3.1 million	\$38 - \$57
Santa Ana (TX)	99,000	\$14.42 million	\$88 - \$145
Bosque del Apache (NM)	90,788	\$3.3 million	\$25 - \$37
Quivira (KS)	27,855	\$636,000	\$29 - \$37
Laguna Atascosa (TX)	82,000	\$3.98 to \$5.63 mil.	\$83 - \$117
Magee Wildlife Mgmt. Mgmt./Ottawa (OH)	432,722	\$5.61 million	\$21 - \$29
Edwin B. Forsythe (NJ)	130,000	\$4.01 million	\$25 - \$41

Help for Communities and Entrepreneurs

A multitude of resources are available to local governments, communities, tourism business entrepreneurs, nongovernment organizations, and concerned communities who want to develop and promote nature-based tourism. Planning and technical assistance are available to help develop nature tourism plans from, for example:

- State nature tourism associations
- State Sea Grant Programs
- State universities, departments of recreation, parks, economics, and hotel management
- State parks and fish and wildlife departments
- National Park Service, U.S. Department of the Interior
- United States Tourist Council
- Other communities who can share their experiences promoting nature tourism
- County and regional vacation and tourism bureaus
- U.S. Fish and Wildlife Service's refuges (visitation data and some expenditure data)
- Tourism Policy Council, U.S. Department of Commerce

Community tourism promoters need to evaluate natural resources in an area and find what is special locally, and market those special resources. A community must have a plan to protect their resources before they use them, or risk destruction of the resources which attract tourists. For example, some counties and other jurisdictions in the western United States have found it beneficial to protect recreation and wildlife lands using tax dollars to enhance the quality of life and promote nature tourism in fast-growing places such as Jefferson and Boulder Counties, Colorado; Kings County (Seattle), Washington; and Flagstaff, Arizona. Community tourism promotion activities have been successful that specifically attract certain types of recreation users -- birdwatchers, for example -- by printing guides with suggestions for finding species, maps of the area, and lodging/food establishments. Birdwatching festivals have increased dramatically in the last decade across the country, capitalizing on local species and phenomena (e.g., crane

migration in Nebraska, shorebird migration on the coasts, and songbirds throughout the country). Many coastal communities on both coasts and Alaska and Hawaii have promoted tourism based on marine (whales/mammals, sea birds) and shoreline (e.g., shorebirds and scenery) resources.

Some Examples of Natural Resources That Attract Nature Tourists

- An old-growth or other healthy forest
- A marsh, swamp, or bog
- A scenic river or other corridor trail
- A mountain landscape with trails
- A cave that can be opened to visitors
- High biodiversity, particularly birds
- Open space and other parks
- Healthy grassland or prairie
- Geologic features
- Whitewater for boating and related recreation
- Whales and other large mammals

The Potential Pitfalls of Nature Tourism and How to Avoid Them

Nature tourism activities, even with proper management and government institutions, can and do damage natural resources. The management objectives of nature tourism include minimizing those damages. Popular sites often are overused and degraded. As a result, they can lose many ecological functions and amenities, such as wildlife and their habitats, that made them destinations in the first place. Many National, State, and other parks, wilderness areas, and other public lands and waters experienced such overuse and deterioration of recreation and other values. Improper location and design of tourism development have destroyed beaches and dunes, ruined scenic views, and eroded fragile resources. Sprawling housing and commercial development in suburban and ex-urban areas destroy wildlife habitat; the U.S. Environmental Protection Agency's Science Advisory Board noted in a 1990 report that the destruction of wildlife habitat is one of the most serious ecological problems facing the earth.

To avoid negative community effects and to develop tourism that supports the surrounding human and physical environment, holistic management objectives must be driven by local control of tourism. Tools are needed to assure protection of a community's social, economic, and environmental interests -- land-use restrictions, if necessary; education of tourists/recreation users; restricted numbers of visitors or permit limits for certain types of recreation, if necessary; public ownership or conservation easements on private lands in sensitive areas; special management areas on sensitive public lands; habitat management and protection; and so forth.

Developing a Nature Tourism Industry That Benefits the Community

State and local parks and wildlife management areas can usually be better managed for the enrichment and continuance of wildlife diversity, as well as other public lands (for example,

institutional and military properties). Private landowners also can provide habitat protection, and some communities and private organizations offer incentives for that protection (such as conservation easements, special tax treatment, and cost sharing for habitat restoration). Assessing and monitoring the impacts of nature tourism on natural resources also is an important responsibility of nature tourism promoters.

Developing an attractive tourist economy that is part of a community's economic base requires careful planning and coordination among those who design, build, manage, and market natural tourist attractions. The design, planning, and management of tourism facilities have a large impact on how a community is perceived by potential visitors. Vacation service jobs --cooks, maids, waiters -- don't pay well, may be seasonal, and do not provide important benefits such as health care insurance. To help residents benefit more from tourism, State and local governments, for example, can promote:

- local ownership, management, and operation of small businesses like bed-and-breakfast places and locally-owned restaurants, guide services, and related tourism service needs.
- guidelines for transportation planning, water and energy conservation, and other resource use issues for tourism facilities' development and management that protect local quality of life.
- local education on tourism development, such as a training program for community leaders, tourism-related business managers, and prospective business persons; or develop and distribute a nature tourism handbook for communities and landowners that communicates the importance of preserving and managing natural resources.
- provide monetary and other incentives to private and public landowners to preserve natural resources and habitats that attract nature tourists.
- a marketing strategy that provides centralized access for potential visitors seeking nature tourism and travel information. An inventory of a community's natural, scenic, historic/cultural/heritage, and recreation resources can be an effective way for a community to develop a marketing strategy that celebrates the special appeal of a community. Using existing infrastructure, a community can evaluate opportunities that already exist to package a marketing strategy that appeals to nature tourists.

Help to Promote, Develop, and Manage Nature Tourism Opportunities

A multitude of resources are available to local governments, communities, tourism business entrepreneurs, nongovernment organizations, and concerned communities who want to develop and promote nature-based tourism. Many sources offer planning and technical assistance to help develop nature tourism plans, and to address management and monitoring concerns. Below is a listing of some sources that were contacted or referenced in preparing materials on nature tourism in the Office of Sustainable Ecosystems and Communities home page.

Federal agencies

Economics Clearinghouse, National Park Service, U.S. Department of the Interior. Encourages up-to-date information exchange on the economic impacts of rivers, trails, and greenways.

Included are case studies, economic impact analyses, benefit and cost estimation techniques, and other reference materials. Rivers, Trails and Conservation Assistance; National Park Service, Western Region; 600 Harrison Street, Suite 600; San Francisco, CA 94107-1372. Tel. (415) 744-3975.

National Coastal Resources Research and Development Institute. Clemson University's Recreation, Travel and Tourism Institute. Tammy Kibler, Tourism & Business Specialist, South Carolina Marine Extension Program, Room 804, Horry/Georgetown Technical College, 2050 Hwy. 501 East, P.O. Box 1966, Conway SC 29526-1966. Tel. (803) 347-2878.

National Park Service, U.S. Department of the Interior. Examples of support include publications such as **Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors: A Resource Book**, Fourth Edition (1995) and **Guiding Principles of Sustainable Design** (sustainability in facility planning and design, useful for ecotourism facilities). National Park Service, Denver Service Center. Rocky Mountain Region; Recreation Grants & Assistance; Division (PL); P.O. Box 25287; Lakewood, CO 80225. Tel. (303) 969-2850. Or contact any recreation planning office in the National Park Service's Regional Offices (Alaska, Mid-Atlantic, Midwest, North Atlantic, Pacific Northwest, Southeast, Southwest, Western, Washington, D.C.).

Nonprofit organizations

The Conservation Fund -- 1800 N. Kent Street, Suite 1120; Arlington, VA 22209. Tel. (703) 525-6300, Fax (703) 525-4610. Helps to protect ecosystems, develop greenways, develop economic assessments for conservation objectives, and other environmental protection activities. Publications and case studies that address the conservation of a variety of natural resources.

Corporation for Enterprise Development -- 777 North Capitol Street, NE, Suite 410; Washington, D.C. 20002. Tel. (202) 408-9788. Conducts economic assessments for communities and helps to develop community development plans. Variety of publications, including case studies.

The Ecotourism Society -- P.O. Box 755; North Bennington, VT 05257. Tel. (802) 447-2121, Fax: (802) 447-2122. The Ecotourism Society is an international nonprofit organization dedicated to finding the resources and building the expertise to make tourism a viable tool for conservation and sustainable development. Pres., Dr. Gerardo Budowski. There is a newsletter, **The Ecotourism Society Newsletter**. Courses are offered on ecotourism management, including co-presented courses with George Washington University in Washington, D.C., Tourism and Hospitality Management Program. The courses are for planners, resort owners, managers, tour operators, architects, engineers, and others involved in developing nature tourism facilities. They have courses in investment and financing for sustainable hotels and resorts; and planning, designing, and operating "ecolodges" (that minimize the effects on the local environment and culture as well as being efficient in the use of resources). Publications include: **The Ecolodge Sourcebook for Planners & Developers**, Donald E. Hawkins *et al.*, editors, 1995; and **Ecotourism: An Annotated Bibliography for Planners and Managers, Third Edition**, Paul F.J. Eagles *et al.*, editors, 1995.

Heartland Center for Leadership Development -- 941 O Street, Suite 920; Lincoln, NE 68508. Tel. (402) 474-7667. Programs and publications to help rural communities develop local leadership, including practical resources and policies for the survival of small towns.

Lincoln Institute of Land Policy -- 113 Brattle Street; Cambridge, MA 02138-3400. Tel. (617) 661-3016. Publishes reference materials on land use, public policy, and sustainable development.

National Fish and Wildlife Foundation -- 1120 Connecticut Avenue, NW, Suite 900; Washington, D.C. 20036. Internet homepage is <http://www.nfwf.org>. The NFWF has publications and other information about fish- and wildlife-related recreation, such as the annual directory of birding festivals and other avitourism information, expenditures and visitation data associated with fish and wildlife conservation, and so forth.

The Nature Conservancy, Center for Compatible Economic Development -- 7 East Market Street, Suite 210; Leesburg, VA 22075. The Nature Conservancy evaluates and promotes opportunities for communities to pursue tourism business that is compatible with the conservation of biodiversity and environmental protection.

Rocky Mountain Institute -- 1739 Snowmass Creek Road; Snowmass, CO 80164. Tel. (970) 927-3851. Many publications and reference materials on sustainable economic development, energy efficiency, agricultural policy, and other community development issues.

United States Tourist Council -- Drawer 175; Washington, D.C. 20013-1875. "A nonprofit association of conservation concerned individuals, industries, and institutions who travel or cater to the traveler. Emphasis is on historic and scenic preservation, wilderness and roadside development, ecology through sound planning and education, and support of scientific studies of natural wilderness. Chairman & Executive Director, Stanford West, Ph.D.

Private consultants

FERMATA, Ted Lee Eubanks, President. 2200 Parkway; Austin, TX 78703. Tourism development and environmental consultation.

Dr. Paul Kerlinger. 31 Jane Street, 14D; New York, NY 10014. Environmental and ecotourism consultant.

State and local agencies

County tourism and vacation bureaus. Directors of these organizations actively promote tourism and many are aware of the opportunities for local businesses to profit from nature-based tourism. Contact your local county or State government to find out if there is help to develop and promote nature tourism in your local community.

Flagstaff Open Space & Greenways, City of Flagstaff Planning Division, 211 W. Aspen Ave., Flagstaff, AZ 86001. (602)779-7632

W.F. Harrah College of Hotel Administration, University of Nevada, Las Vegas, Box 456023, Las Vegas, NV, 89154-6023. Wesley S. Roehl, Ph.D., organized a recent "Environments for Tourism Conference." Other hotel administration departments in universities also may be a source of information and help for community development of nature tourism opportunities.

State Sea Grant Programs. State Sea Grant programs have programs that promote the wise use of coastal resources to attract nature tourists while promoting sound management practices. South Carolina, for example, has a Nature-Based Tourism Association, South Carolina Marine Extension Program of the South Carolina Sea Grant Consortium.

State and local parks departments and Fish & Wildlife/Game departments typically have data on visitation to area parks and other public lands. The Texas Parks and Wildlife Department and Texas Department of Commerce have formed a partnership to develop a publication (below) that discusses the opportunities for tourism development and promotion, based on nonconsumptive uses of wildlife and natural resources. The Texas report also prescribes policy needs in the State to better develop nature tourism. Other States may be working on similar programs.

Publications

Anton, John, Caroline Davis, Chuck Teller, and Dr. Edward Bergman, 1993. **Eco-tourism in Tyrrell County: Opportunities, Constraints, and Ideas for Action.** Prepared by the Institute for Economic Development, University of North Carolina, Department of City and Regional Planning, February. Prepared for The Conservation Fund, United States Fish and Wildlife Service, Tyrrell County, Town of Columbia, and Tyrell County Community Development Corporation. 66 pp.

Blank, Uel (no date). **The Community Tourism Industry Imperative: the Necessity, the opportunities, its potential.** Venture Publications, State College, PA, 200 pp.

Boo, E. 1990. **Ecotourism: the Potentials and Pitfalls, Vol. 1.** World Wildlife Fund, Washington, D.C.

The Center for Rural Pennsylvania, **Pennsylvania Ecotourism: untapped potential**, March 1995 (47 pp.).

Petit, D., D. Pressman, and T. Rich, 1995. Breaking Through Boundaries -- Federal Agencies in Flight!", **1994 Annual Report of Partners in Flight.**

Sem, John, 1989. **Using Tourism and Travel as a Community and Rural Revitalization Strategy.** Conference proceedings, *Tourism and Travel Workshop, Proceedings of the National Extension Workshop*, May 10-12, 1989, Tourism Center, Minnesota Extension Service, University of Minnesota, St. Paul, MN, 215 pp.

Strauss, Charles H., Bruce E. Lord, and Stephen C. Grado, 1995. **1994 Regional Report -- Economic Impact of Travel and Tourism in Southwestern Pennsylvania.** School of Forest Resources, The Pennsylvania State University, University Park, PA, July 21, 85 pp. Published by Southwestern Pennsylvania Heritage Preservation Commission, Holidaysburg, PA, John J. York, Marketing Director.

Texas Parks and Wildlife Department and Texas Department of Commerce (no date). **Nature Tourism in the Lone Star State -- Economic Opportunities in Nature, A report from the State Task Force on Texas Nature Tourism,** 24 pp.

Tibbetts, John, 1995. Nature-Based Tourism, in **Coastal Heritage Five-Year Report, Summer 1995, Into the 21st Century: Ensuring South Carolina's Economic Growth & Quality of Life.** pp. 16-18.

U.S. Department of Commerce, Tourism Policy Council. **Tourism: Putting the Pieces Together.** Summarizes the process for developing and implementing a tourism strategy.

If you have questions, or you would like to get more information about this topic and available documents, you may contact Brad Crowder, e-mail address Crowder.Brad@epamail.epa.gov.

Published: 05/02/97