

3. Putting Principles into Practice – Examples of Natural Resource Economies That Incorporate Social and Environmental Goals

Systemic Problems Require Structural Fixes

As commodity systems produce an undifferentiated raw material stream, producers compete with one another to produce the greatest volume for the least cost. Competition on these narrow grounds leads commodity systems toward ever higher production levels and ever lower prices. This focus on high production and low costs puts pressure on the ecosystems, families, and communities of commodity producing regions.

Commodity producers are not naïve about these cycles. Living within them day after day, they understand quite clearly the nature of the traps they are caught in — traps that are the sum of individually rational decision-making based on the "rules of the game." But, as any farmer, sawmill owner, or fisherman can tell you, seeing the traps is not enough to avoid them. Such problems cannot be solved at the level of individual producers. Problems arising out of collective behavior will defeat the solutions available to individuals.

A few isolated producers opting out of the efficiency race cannot break the overproduction cycle. In fact as long as most producers increase their productive capacity, anyone who doesn't do so quickly loses customers and loses sales. Harvesters can't afford to incur costs to stay within the sustainable yield of the resource if their competitors invest less in stewardship and offer the same product for a lower price.

Acting as individuals, the only viable option for producers to escape the traps of a commodity economy is to leave the system altogether and focus on a product that can be marketed outside of the structure of that commodity system. This can be accomplished by programs that preserve the history and identity of the product. From wines and cheeses of specific European regions, to high quality lamb delivered directly to restaurants in New York City, to farmers markets and community supported agriculture, there are many examples of producers who have created — or re-created — alternatives to conventional commodities. These examples are very important. They connect people back to the raw materials of consumption, and provide vibrant examples of what healthy food, lumber, and fiber systems look like. By linking consumers directly with the producers of basic raw materials, such initiatives preserve some of the information that is lost in the process of commodification.

While farmers' markets and sheep-milk cheeses deserve all of the attention they receive, we also need to understand other options available for transforming commodity systems. We need to look for solutions that are effective at a larger scale and that are applicable to those raw materials, such as soybeans or paper pulp, that are not well suited to specialty niche markets.

Commodity systems currently dominate world agriculture, fishing and forestry. They affect millions of people and much of the Earth's surface. For the foreseeable future, Iowa will grow more food than can be eaten locally, while New York and Chicago will always need to import food. Landlocked populations will desire fish. Coffee, tea, and cocoa won't be local crops for much of the world's people. The escape of individual producers from these poorly functioning systems — as important as it is — is unlikely to alleviate the pressures that commodities are

placing on ecosystems and communities around the world. When a few producers move off into a niche market, they leave the dominant system, with all of its pressures on resources, ecosystems, and communities in place behind them.

For this reason, the following chapter explores how raw materials can be produced in large amounts and traded around the world with rules and incentives that incorporate goals for the long-term sustainability of the resource, ecosystem, and local communities. This would be a new kind of natural resource economy, something in between the niche markets for specialty wines or handcrafted wood products and the industrial monocultures focused solely on low-cost high-volume extraction of materials from the earth.

As far as we can tell, such natural resource economies do not exist anywhere, yet. But across commodities, all over the world, people are experimenting with changes to the structure of commodity systems in order to balance productivity with other goals. Each of these experiments gives us a window into possibilities. By understanding the successes and the vulnerabilities of these experiments, we begin to understand the packages of agreements, policies, monitoring techniques, and regulations that together would characterize a productive, efficient natural resource economy integrated into the ecology and communities of its region.

Following are examples of some of the most promising cases we know about. These are commodity systems that have undergone structural changes — changes in rules, incentives, or penalties — and that have attempted to balance productive capacity with environmental and social goals. The examples are from all over the world, from fisheries, agriculture, and forestry. Some of the changes were accomplished by collective agreement of producers, some were accomplished by demand from consumers, and some were created by the action of governments. But each of these stories also shares with the others common threads.

In each example, people found the will and the power to change "the rules of the game." They reshaped the system they live or work within so that it could respond to goals broader than high production and low costs. Whether it is balancing the harvest rate with lobster reproduction rate, or paying the costs of good stewardship and fair incomes, these programs demonstrate that commodity systems can respond to social and ecological limits.

But, in all of these stories — even the most successful — the restructured commodity system still exists within and responds to a larger economic system. And so, at the same time that they give us hope for a new kind of commodity system, these stories remind us that change is required not just at the level of particular commodity but also in the structures and assumptions of the global economy.

Escaping Traps Using Government Taxes and Payments

Thus far we have looked at two quite different mechanisms for keeping the productive capacity of a commodity system in balance with the ecological and social resources of that system. Via collective agreements, producers can take cooperative action to maintain balance between productivity and social and environmental goals. Certification schemes provide a way to link up the producers who are serving environmental and social goals with the consumers who care about those goals.

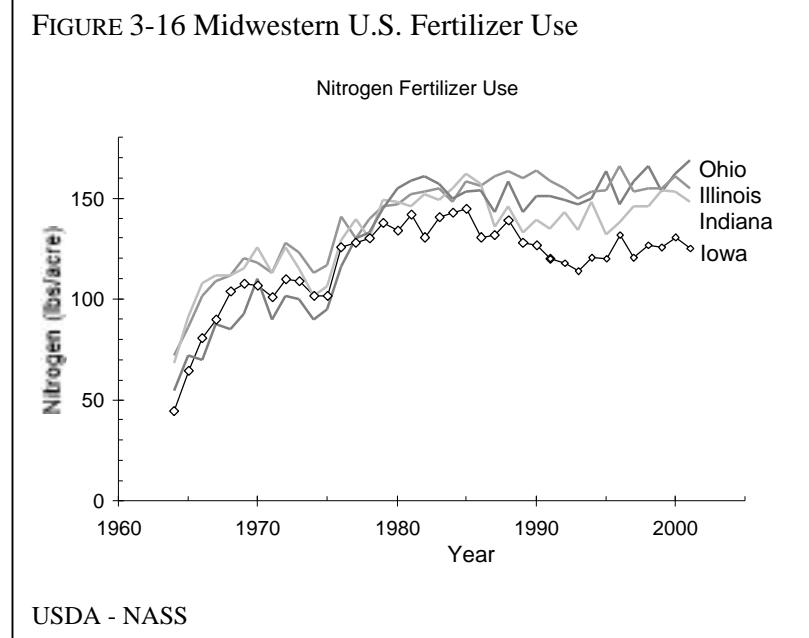
A third approach to incorporating social and environmental goals and avoiding the traps of commodity systems relies on the unique powers of governments to shape incentives and rules. Using the tools of taxes and incentives, governments can interject new goals in commodity systems, so that producing the most for the least cost is no longer the only strategy of the commodity system.

In this section, we consider three examples of such policies. One case — a program to tax the use of nitrogen fertilizer in Iowa — is a government effort to put an often-externalized cost back into a commodity system. Another case — a program funded by New York City residents to improve land management practices in upstate New York — uses the power of governments to pay for good stewardship of land. The third case examines Switzerland's reform of agricultural subsidies by paying farmers for serving that society's goals for clean water, biodiversity, and healthy rural communities. All of these cases remind us that it is entirely possible to re-shape commodity systems to serve goals that stretch far beyond productivity.

Incorporating Environmental Costs — Iowa Groundwater Protection Act

In the Corn Belt region of the United States commodity agriculture pushes up against the limits of ecosystems to absorb agricultural chemicals. This is seen, in particular, in the pollution of groundwater with nitrates and herbicides and in the pollution of the Mississippi River and Gulf of Mexico with fertilizer run-off.

In 1987 the state of Iowa responded to this situation with the passage of the Groundwater Protection Act. This legislation established fees that are paid by pesticide manufacturers who wish to register products for use in Iowa and dealers who wish to sell in Iowa. In addition, taxes are charged on fertilizer use — per ton of nitrogen, for example. This fertilizer tax is one kind of direct feedback to the farmer — the more nitrogen



is used, the more tax is paid.⁴⁸

As shown in Figure 3-16 the amount of nitrogen fertilizer used per acre in Iowa has dropped compared to the period just before the passage of the legislation, and is lower than nearby states in the Corn Belt.

The nitrogen tax itself is relatively small — around seventy-five cents per ton of nitrogen fertilizer.⁴⁹ But, because the funds raised are applied to training, research, and technical assistance to reduce fertilizer use, the program does seem to have helped counteract the tendency of commodity systems continually increase the use of productivity boosting inputs.

Figure 3-17 shows a systems diagram of the waste generation trap of commodity systems, modified with a program like the Iowa Groundwater Protection Act. With this modification to the system, the core driver that would tend to over-produce wastes is counterbalanced by the tax and associated education and technical assistance programs aimed at reducing fertilizer use.

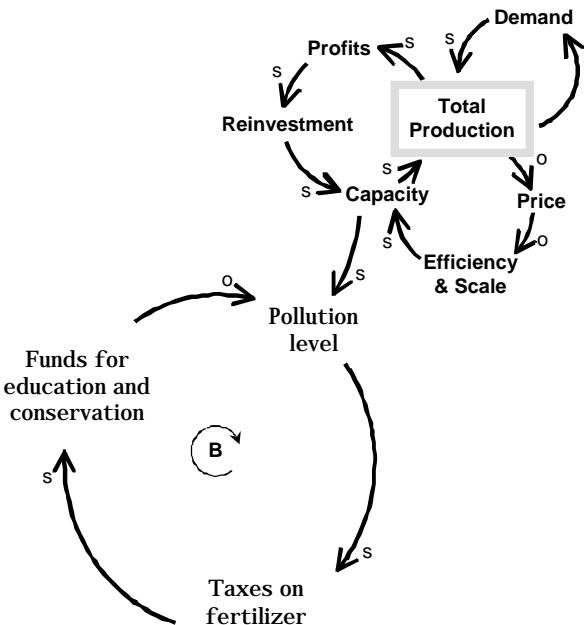
Figure 3-17 shows that the Iowa nitrogen tax program does not change the structure of the core driver itself. The underlying incentives to maximize production and minimize costs are still present. With fertilizer prices of close to two-hundred dollars per ton, a seventy-five cents per ton tax is unlikely to change many decisions based on profit, making the tax a weak balancing tool. The program is pushing against the momentum of the system primarily through education, rather than economics.

Water Quality Stewardship Payments — New York City and The Catskills

The pollution generated by commodity systems that have grown beyond the capacity of their environment to absorb wastes can impact populations far beyond the producing area. Water pollution, as it flows downstream, can affect many people and many ecosystems. Those affected often feel powerless to change upstream behavior. But, the mere fact that there are so many downstream recipients of pollution has the potential for collective coordinated action.

That was the case when New York City needed to ensure a clean drinking water supply. The event that triggered action was when an outside authority (the EPA), wielding a very big stick

FIGURE 3-17 Addressing the Pollution Trap with Taxes



This diagram is adapted from Figure 2-8. The *Production growth drivers* lead to more *Pollution level*, but that level doesn't affect the *Production growth drivers*. It can spark *Taxes on fertilizer* and generate *Funds for education and conservation programs*, thus decreasing *Pollution level*

(the Surface Water Treatment Rule), threatened to make the city build expensive drinking water filtration plants. The goal was to filter out pollution generated by farming activities upstream of the city's reservoirs. However, the filtration plants would have had very large on-going operations and maintenance costs.

Rather than solve the problem with downstream filtration technology, New York City decided in 1990 to try influencing upstream behavior. After a long period of negotiations (150 sessions over one and a half years) the Environmental Protection Agency, the state, the city, the upstate communities, and environmental groups agreed upon a plan to protect the entire watershed.⁵⁰

The lesson here is to invite everyone to the table — and keep everyone at the table, which was no easy task. In a sense, we were lucky. With a \$4 to \$6 billion filtration-plant pricetag hanging over the city's head, there was a great incentive to tough out the negotiations. The difficult lesson for all the parties has been learning to live with compromises. It's a lesson we are still learning

— EPA Assistant Regional Administrator William J. Muszyski, 2000.⁵¹

The Watershed Agricultural Council is the non-profit organization (funded primarily by the New York City Department of Environmental Protection) that develops the policies and procedures that protect the watershed from agricultural pollutants. Through the Council, New York City pays the full costs of changes made by farmers who adopt Best Management Practices. In exchange, farmers sign Whole Farm Plan contracts guaranteeing they will stick with the management practices. The program is designed to do no harm to farming in upstate New York.

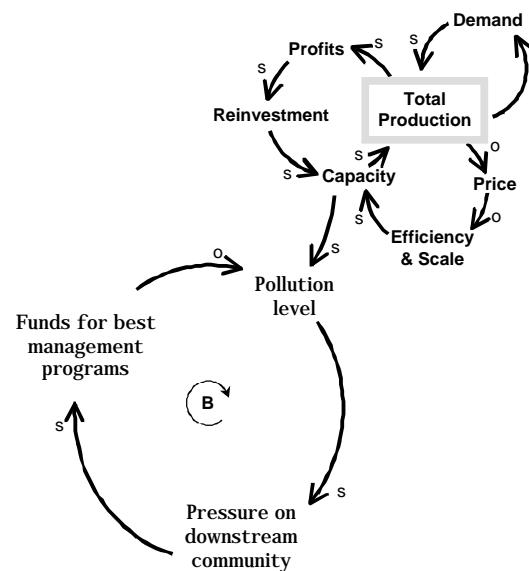
It is the Task Force's and New York City's intention that not one farm will be put out of business by this program. While actively participating in the development and implementation of their Whole Farm Plans, farmers will not have to pay for the planning, implementation, maintenance or operation of Best Management Practices recommended to meet the water quality objectives of New York City's outlined in the Whole Farm Plan

— The Brown Book, December 1991⁵²

More than ninety percent of the farms in the target watersheds participate in the program⁵³, ensuring high water quality for the residents of New York City. This creative solution was less expensive for the taxpayers of New York City than construction and maintenance of water filtration facilities.

In this example the citizens of the New York City (via the city government) pay the upstate farmers for careful stewardship of the watershed. The arrangement recognizes that water flowing

FIGURE 3-18 Addressing the Pollution Trap with Best Management Practices



Similar to previous diagrams, the *Pollution level* can build *Pressure on the downstream community* and *Funds for best management programs*, which can reduce *Pollution level*.

into New York City is as much a product of upstate agriculture as grain and milk. The Watershed Agricultural Council program changes the incentives experienced by farmers in the region, counteracting the pressures that would ordinarily have them spend as little as possible on management practices in order to minimize costs and maximize yields.

Figure 3-18 shows that, from a systems perspective, this approach is fairly similar to the Iowa groundwater example. As wastes from commodity production begin to affect surrounding communities, resources are allocated towards better management practices. This can be a better solution for all concerned, since the downstream communities solve the problem for less cost, and the commodity producers are able to afford producing their crops in a more sustainable fashion.

FOR MORE INFORMATION ABOUT THE PARTNERSHIP BETWEEN
UPSTATE AGRICULTURE AND THE NEW YORK CITY
Watershed Agricultural Council
<http://www.nycwatershed.org/>

Direct Payments for Social and Environmental Benefits — Swiss Agricultural Policy

The Iowa groundwater program and the New York City watershed program both compensate for the fact that the incentives in commodity production lead producers to put pressure on ecosystems in order to lower costs and raise production. Through taxes, training, or payments to offset the costs of better production techniques, governments can help shift commodity systems to less damaging methods of production.

This approach can be taken one step further — beyond offsetting the costs of better practices, citizens and their governments can pay producers for environmental and social benefits. Given that, in many countries, agricultural production is already heavily subsidized, this is often a matter of shifting public investment in natural resource producing communities from commodity production to stewardship.

One country that has made such a switch is Switzerland. In 1993, economic support of agriculture was reallocated so that "the state remunerates the provision of public good for which there is social demand but no market and special ecological services with direct payments."⁵⁴ The payments are given to farmers contingent on compliance with ecological requirements, including nutrient management, diversified crop rotations, a share of land in ecological compensation areas (semi-natural zones such as meadows and hedges), and ground cover in winter.⁵⁵ As a result in 1998 about 88% of Swiss agricultural land was farmed according to these requirements.

By linking economic support to sustainable practices, the government is able to interject additional goals into the commodity systems. On the farms supported by these programs, producing the most for the least cost is only one of several goals. Good land stewardship becomes an additional goal.

Subsidy reforms were initially made when Swiss agriculture was protected from the pressure of global markets. However, as Europe becomes more unified and as the pace of globalization increases, this level of protection has begun to change.

After agriculture was made much more ecological in a first reform phase (1993-1998), the emphasis now is on increasing competitiveness. Today agriculture still enjoys certain protective measures imposed at the Swiss borders, including the EU countries. With increasing mobility and in view of international agreements, this protection will be eroded. Under these circumstances prices and costs must be reduced if market shares are going to be maintained.

— Eduard Hofer, 2000⁵⁶

In 1999, Swiss agricultural policy began to focus on abolishing all price and market guarantees. And so, with less protection from low-priced agricultural commodities from other regions and with less support of prices, Swiss agriculture seems poised to enter into the typical commodity dynamics of overproduction and falling prices.

Since direct payments for ecological practices do not interfere with the core drivers that create increasing production and falling prices, it seems quite likely that farm incomes in Switzerland will begin to erode, requiring more and more support to keep farmers on the land.

As was the case of for some of the examples of certification, direct payments alone may not be enough for a successful escape from all of the traps of commodity systems. Without measures to keep production within the limits of demand, the spiral of falling incomes seems all-too-likely to undermine the very innovative government investment in public goals.

FOR MORE INFORMATION ABOUT REFORMS IN SWISS AGRICULTURE

Swiss Federal Office for Agriculture
<http://www.blw.admin.ch/e/index.htm>

Government Mediated Interventions — Summary

From taxing pollutants to rewarding good stewardship government programs can influence commodity systems.

1. CITIZENS CAN USE THE POWER OF GOVERNMENT TO TAX AND REWARD SPECIFIC PRACTICES THAT REFLECT MULTIPLE GOALS FOR COMMODITY SYSTEMS.

Governments can reshape commodity systems by taxing practices that place burdens on communities or ecosystems and by paying commodity producers for the ecosystem and social benefits of particular production practices.

By paying for what it values — clean water, biodiversity, small farms — society can shift the goals of commodity systems to include more than just high productivity and low costs.

2. TAXING INPUTS TO A COMMODITY SYSTEM CAN SUPPORT WASTE AND POLLUTION REDUCTION PROGRAMS.

Investments in education and assistance can be supported by taxes on the polluting substances and can help moderate the traps of commodity systems. However, the impact may be limited if Production Growth Drivers are still in place.

3. EVEN AS GOVERNMENTS INTRODUCE PAYMENTS FOR “SOCIAL GOODS” AND TAXES ON “BADS”, PRODUCTION GROWTH DRIVERS OF COMMODITY SYSTEM BEHAVIOR CAN REMAIN IN PLACE.

Paying farmers for good practices without any mechanism for the control of production runs the risk that prices and incomes will fall lower and lower, and farmers will require more and more government payments to maintain the same income level. If maintaining producer incomes is an explicit goal of such programs, measures to limit supply and break the over-production cycle will be needed.

Paying for good stewardship while leaving the Production Growth Drivers unrestrained is unlikely to be a long-term solution. While it will quite likely establish better environmental practices, pressures from the influx of cheaper commodities produced where standards are not as high will probably put pressure on prices and thus incomes. If the society also has the goal of maintaining many small producers, some system to restrain overproduction and competition from global markets will be required.