



DESIGNING PRO-POOR REWARDS FOR ECOSYSTEM SERVICES: LESSONS FROM THE UNITED STATES?

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The United States has experimented with its version of rewards for ecosystem services for close to 80 years. In general, market forces are used to reward land users for protecting the environment. This LTC Brief examines the US experience and investigates if the lessons can be adapted to tenure regimes in the developing world.



Pro-poor in the US context

PRO-POOR REWARDS for ecosystem services has emerged as a relatively new idea in international aid. Yet, the core concept of rewarding land users for sustainable resource behavior is long standing in the United States. Through the 20th century it has been applied to many types of natural resource and ecological systems.

In the United States the rationale for pro-poor rewards has most often emerged when there is a group of landowners that, broadly speaking, is denoted as “land rich and cash poor.” People in this group tend to be landowners who hold title to land but do not have significant income, either from the land itself or from other, non-land, sources. The rationale for the programs that have been developed has been, again broadly speaking, to intervene in normal market processes. The landowners receive market signals, which, if they respond rationally, will lead them to engage in natural resource and ecosystem management practices that are non-optimal from a social perspective, though they appear optimal from an individual landowner-user perspective.

This mismatch between individual and social outcomes with regard to resource use is one version of Hardin’s “Tragedy of the Commons” (1968), where “normal” market processes (reflecting demographic, technological and economic changes) often result in situations where land prices escalate, sometimes sharply, encouraging landowners to allow land to move into alternative uses. The change in the land use often threatens ecological stability and ecosystem service provision.

So, in the US context these programs have *not* been directed at the poorest of the poor, nor have they been directed at users who seek access to communal, tribal or common resources. Rather, the US experience primarily reflects concern with landowners who hold title to land and for whom land represents a significant (often the most significant) economic asset. When these conditions exist, and markets present the opportunity to “cash out,” many landowners do so. The focus of most ecosystem reward programs throughout the 20th century and into the 21st century is to seek to break, through policy intervention, this economic incentive for land use change.



Combating ecological disaster

During the urban economic boom of the 1920s, America's rural areas experienced a serious economic downturn. American agriculture still had its 19th century form of smallholdings and small-scale producers, but mechanization and industrialization changed the economics of production. As farm prices dropped, owners and users worked as hard as they could to squeeze out as much profit as possible. This stressed the ecosystem, which became evident to all of America during the 1930s dust bowl (information on the dust bowl can be found at http://en.wikipedia.org/wiki/Dust_bowl).

A national level response to this ecological disaster was the formation of the national Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service. Starting with an experiment in southwestern Wisconsin's Coon Valley, an hilly area of thin soils highly prone to erosion, natural resource scientists experimented with how to get farmers and farmland owners to more sustainably manage their land. The experiment became a national program in 1933.

The decline of the dust bowl as an ecological phenomenon, the advent of World War II, and the subsequent post-war economic boom turned America's attention away from resource management, though work with the establishment SCS districts and assistance to individual landowners continues to the present.

Beginning in the late 1950s, the focus of rewards for ecosystem services shifted to the consequences of urban sprawl and specifically the "protection" of agricultural land.

Beginning on the east and west coasts, land economists and agricultural scientists became concerned with the rapid transformation of productive agricultural land through peri-urban land subdivision.

Often the precise characteristics that made land good for food production were also those that made it attractive for land subdivision—land

that was relatively flat, well drained, with ready access to transportation corridors, etc. Scientists' concerns were of two types—whether the conversion of agricultural land was in and of itself a wise thing relative to food production, and the impact of land conversion on ecosystem factors such as ground water recharge, wildlife habitats, and air and water pollution.

The earlier SCS programs focused on a farm-by-farm approach to stem soil erosion and promote resource sustainability. The new approaches were based on broad changes to state law, which enabled local, sub-state governments to offer individual landowners opportunities for more resource sustainable behavior.

Over the last 50 years, the approach pioneered in the area of agricultural land protection has been expanded to a wide range of natural resources and ecosystem services including wetlands, forest lands, riparian buffer strips, and wildlife habitat. In all of these situations the rationale is the same. The owner has land whose ecological management yields broad social value.

The "poor" owner, however, is often in a situation where his or her ownership of the land is a principal economic asset. Changing market conditions, often related to peri-urban or rural growth, create a situation where the owner's rational behavior is to sell the land for the highest price offered by the market. This price, though, is not for the land in its ecosystem state—as agricultural land, forest land or wetland. Instead it is for the transformation of the land use to a more intensive, urban style use. The net result of a set of owners acting rationally is the destruction of the ecosystem service.

Therefore, policy alternatives developed over the last 50 years have all striven to intervene in this process, by making the market price less attractive to the owner, or by providing compensation to the owner, so that the owner has no need to take the market's offer price.

Policy approaches

Attempts in the United States to provide pro-poor rewards for ecosystem services are shaped by several unique factors. Among these are (1) a strong cultural and historical tradition that promotes and respects private property, (2) a relatively weak legacy of government intervention with private property rights, and (3) a system of governmental planning and policy implementation oriented towards devolution and action by local government.

Within this context, pro-poor policies are generally of two types: taxation programs and land rights compensation programs. These are generally carried out by either government itself or in collaboration with NGOs.

Taxation programs

Landowners in the United States are required to pay taxes on the land they own. In most states the tax is required to reflect the land's full, real market value. This means that land used and valued for its ecosystem services will carry a relatively small tax burden. Yet as peri-urban and rural growth cause land value to escalate, the tax burden on the land also rises, reflective of the rising market value.

Landowners are presented with a quandary. Market signals, as translated into tax rates, tell them that their land is more valuable. In order to pay the increased taxes due on the land they either have to increase the land's productivity or find alternative means of paying the tax. These leads to a condition commonly known as "being taxed out of use," where the taxes owed on land exceed the land's ability to generate the tax revenue when the land is used for productive or ecosystem service purposes.

The design of taxation programs assumes that owners would prefer to pay fewer taxes and that if they could pay fewer taxes the signal they receive to encourage a change in land use would be lessened. These programs thus offer to reduce the normal amount of property taxation owed in exchange for preferred

landowner behavior with regard to the resource. For example, an owner of agricultural land will receive a reduction in taxes in exchange for an agreement to not fragment the land and to continue in agricultural production.

Generally these programs are implemented through individual contracts between government and a landowner, though the terms of the contract (the amount of reduction, the period of reduction, etc.) are set by state law. The length of the contract period, though, can be an element of negotiation, though it is generally five to ten years.

In implementing these programs, governments have several options for how to reduce land taxes, though all achieve roughly the same outcome. The valuation of the land can be reduced, the valuation rate applied to the land for taxation can be reduced, or the actual amount of tax owed per year can be specified. The net result of most programs is to reduce the annual taxation burden on the landowner by 50-100%.

Landowners have been very receptive to these types of reward programs. They provide relief from market pressure for land use change. In addition, they allow owners to continue in their current use of land. Importantly, these program do not prevent future land use change after the contract expires.

Governments also have been receptive to this approach, though for different reasons. As designed and implemented, they delay land fragmentation, which delays demand for infrastructure investment and expansion related to new urban-style growth.

In one form or another these programs have existed for nearly 50 years. First developed for agricultural land protection, they now cover a broad range of ecosystem services. For one form or another of natural resource they are authorized by every state in the United States.

Do they work? Yes and no. Yes, owners participate in these programs, often in large

numbers. Owners especially appreciate the individual nature of contract negotiations, which allow the generalities of the program to be shaped to individual circumstances. And yes, these programs *delay* land fragmentation and conversion.

Yet these programs do not prevent land conversion. What they do is postpone the timing of land conversion. Where market conditions cause land prices to rise, rising tax burdens are a factor for landowners. Yet, for poor landowners, owners for whom land is a principal economic asset, the price offered by the market for land conversion eventually outweighs the enticement offered by tax savings.

Land rights compensation programs

Taxation approaches to rewards for ecosystem services can be understood as providing temporary solutions. As concerns for ecosystem management grew in the latter part of the 20th century, activists in the United States focused on developing approaches that would provide more permanent solutions, whereby the landowners of ecosystem service land would not be able to disrupt the ecosystem service. These solutions focus on compensating landowners for a permanent change to their land use options and building on the core concept of land as a bundle of property rights.

In the United States landownership is operationalized as ownership of a bundle of rights. These rights refer to the physical character of the land—the air right, the soil right, the water right, the mineral right—and social relationships relative to the land—the right to use, the right to control access, the right to transfer (through sale, lease, or gift). Fee simple ownership of land is ownership of all of these rights. For the purposes of ecosystem services management some of the key rights in this bundle are the rights to change land use by the owner and the owner's right to transfer to another who can choose to change land use. A key element of this core concept is the ability to separate one or more

rights (for example, the mineral right or the water right) from the other rights in the bundle. In the literature, the particular right(s) related to land use change are often referred to as “the development right.” Two policy approaches that utilize this core concept and have been widely discussed are transfer of development rights and purchase of development rights.

Transfer of development rights (TDR). TDRs were “invented” in the early 1970s, originally as an approach to protect historic buildings in dense urban areas. The problem that prompted their invention is analogous to that faced by ecosystem areas, which is why the approach quickly expanded to such areas. Historic buildings have broad social value, but to the owner, a rational response is to destroy the building so as to capture market values for the land in more intensive urban use.

In the United States this market demand is often supported by public land regulation, which, because of cultural values, does not allow the public to require the owner to keep the building in its relatively low-density use. Thus the problem: a mismatch between individual and social logic over land use. The solution? To use the core concept of ownership as a bundle of rights where individual rights can be separated from the bundle in an attempt to address the needs of both the owner and society.

How?

Two land use districts are created, a sending district and a receiving district. In the sending district land use is strongly restricted, via public regulation, to that use that serves public purposes—for example, wetlands, wildlife habitat, old growth forest, and unique ecological sites. Owners of these lands are issued TDR credits that, based on some schema, represent a difference between the land use they would have been allowed to engage in prior to the TDR program and the land use they are allowed to engage in now. For simplicity purposes let us say that landowners received one TDR credit per hectare owned.

In the receiving zone landowners are also subject to land regulation. The regulation provides these owners with the option to develop (intensify) land use at two levels, with or without the acquisition of a TDR credit. The expectation, though, is that if these are properly designed and properly responsive to market conditions, owners in the receiving district will want to acquire TDR credits because it will allow them to engage in more intensive, and thus more profitable, land use-development activity. Again, for simplicity purposes, let us say that an owner of a one hectare parcel of land in a receiving district can develop without a TDR credit at a density of two units per hectare, or with TDR credits at a density of up to eight units per hectare.

Thus, the logic goes, the ecosystem service provided by the land is now permanently available, because the right to change land use is no longer within the owner's bundle of rights, even if the owner transfers the property to another. Also, the compensation provided to the owner in the sending district has come from a private party, not from government. So government has achieved a broad public purpose without substantial governmental expenditure. And, government has achieved its purposes of efficient infrastructure and development through the design of the receiving district and the intensification of land use in that district.

Though owners do not like the level of strong public regulation that is at the base of TDR programs, if owners in the sending district receive strong levels of compensation for their development right, and they can continue owning and using their land, they tend to be satisfied. The funds they receive can be used to invest in the land itself, or for other personal purposes. Landowners in receiving districts can be more skeptical. If public regulation allows them to develop land at two levels (one with and one without TDR), why can't they just develop land at the higher level? And why do they have to provide for a public good, through compensating landowners in the sending district?

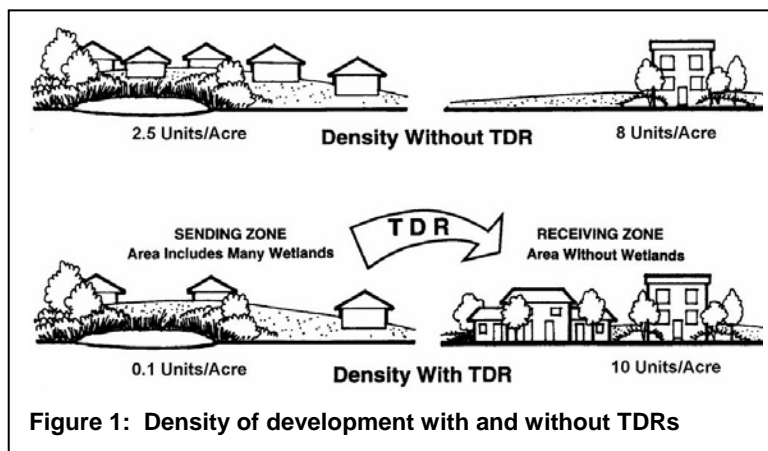


Figure 1: Density of development with and without TDRs

Owners of land in the receiving district thus have an incentive to acquire TDR credits. The expectation is that these owners will approach owners in the sending districts and negotiate with them to acquire TDR credits.

If a transfer does occur several things happen. The owner of land in the sending district from which a TDR credit has been acquired receives compensation for the value of the TDR credit. How much? Whatever the two negotiating owners agree upon. Once the transfer occurs, the sending district owner's bundle of rights has been permanently altered. The right to "development" is no longer within the bundle.

For TDR to work it requires a very specific relationship of supply and demand. Ideally, it requires a relatively small supply of TDR credits (a small sending area) and a relatively high demand for them (a large receiving area). This creates conditions where owners in sending districts are essentially guaranteed a purchaser and a strong purchase price. In practice, many TDR studies result in the opposite—a large sending area (a large supply of TDR credits) and a small receiving area. Why? Because it is easy to identify the ecosystem that should be protected and managed, and to overdesignate it. Conversely, it is can be difficult to develop public consensus about the location and size of receiving areas.

Purchase of development rights (PDR). In part because of the inability to more widely implement TDR as an approach for ecosystem protection, the approach of PDR was introduced in the 1980s.

PDR too is based on the concept of land as a bundle of rights, where rights can be separated from the bundle. Its purpose is to provide the owner of critical ecosystem land with compensation for permanently altering the bundle of rights for the land, so the land will be permanently available for ecosystem services. PDR also identifies the land it is concerned with through designation of a sending district. Owners in this district are subject to strict public regulation over their land, regulation that is compatible with the goals of protecting and enhancing ecosystem services.

With PDR there is only one district, a sending district. There is no attempt to design supply and demand, and thus create an artificial private sector market for land rights. There is also no attempt to fund land protection through the private sector. Instead, with PDR the public itself provides compensation to owners in the sending district for the value of their publicly designated and created PDRs. Depending on market conditions, a publicly purchased PDR costs between 50-95% of the land's full market value.

Given this cost, what are the advantages of a PDR over a TDR? The program is easier to explain to policymakers and citizens than TDR, it is less complicated to operate, and it has more certainty for owners in the sending district. In general owners do not like the level of strong public regulation that is at the base of PDR, but they do like the strong levels of compensation for their development right, the fact that a buyer is assured, and the fact that they get to continue owning and using their land.

The key to the success of PDR is sufficient funding. In reality this restricts PDR to

governments wealthy enough to generate the funds for the program. In part because of this limitation, NGOs in the United States have become very active in PDR programs. Private sector land trusts raise the funds privately for the purchase of development rights. Sometimes these funds are provided to government. More usually, though, the NGOs themselves engage in the negotiation and purchase of the development right, and then the ownership and management of it.

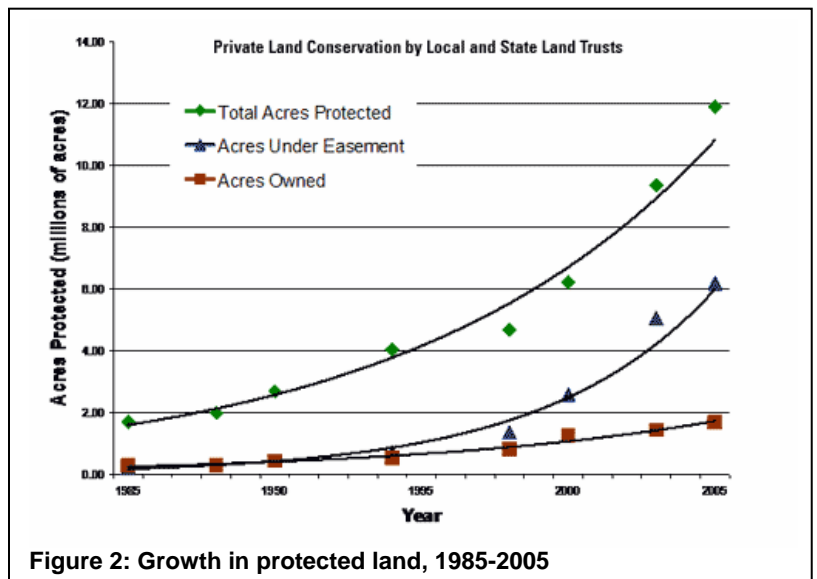


Figure 2: Growth in protected land, 1985-2005

Will It Work Elsewhere?

The United States has experimented with its version of pro-poor rewards for ecosystem services for close to 80 years. Prompting these programs, in general, is the pull of market forces, which entices landowners to consider converting land from a state that favors ecosystem services to a state where the ecosystem will be disserved. Therefore, the US experiments have been prompted by an interest in blunting “natural” market forces that cause a rise in land prices or a decision to engage in destructive land use behavior.

The programs most responsive in terms of drawing in pro-poor participants have tended to be those that:

- are designed to allow for substantial individual interaction and negotiation with the landowner
- provide short-term rewards to the landowner, without restricting long-term options
- partner financial rewards with technical assistance in land management.

The programs most effective at actually protecting ecosystem services have tended to be those that:

- are based in a strong system of public regulation
- combine this regulation with a process (TDR or PDR) that permanently alters the composition of the owners property rights bundle through removing their so-called development right, and providing the owner with compensation for this removal
- provide a public enforcement mechanism for the regulation and the rights removal.

The situation of the United States seems far removed from many of the contexts within which pro-poor rewards for ecosystem services is being experimented. The United States has:

- high levels of private landownership
- low levels of communal, tribal and common tenure
- a well developed and generally well respected (by its citizens) system of law and law enforcement
- relatively high levels of public sector administrative transparency
- a robust private sector market system
- high levels of income
- relatively high standard of living
- a strong system and network of NGOs
- little explicit tribal-ethnic strife.

Yet, there are elements of the US experience worth noting as developing countries move forward with these programs.

- The need for these programs comes about because of a disruption of prior land tenure

relationships that sustained ecosystem services.

- Programs to which landowners are receptive are those tailored to the individual's circumstances (land and life), and include financial assistance, technical assistance, and do not require long-term commitments from the individual.
- These programs have not secured ecosystem services for the long term, but rather postpone the timing of land tenure change.
- Programs that do secure ecosystem services in the long-term are expensive, require the permanent acquisition of land rights, are set with a system of strong public regulation, and seem most feasible within a system of law and enforcement that recognizes and manages those rights.

As countries without the economic and social “advantages” of the United States look at pro-poor approaches for the long-term securing of ecosystem services, these lessons show what can (and can not) be accomplished under such a regime and system.

Implications

Even those sympathetic to payments for ecosystem services raise concerns about its utility and long term functionality (and related pro-poor rewards) in protecting ecosystems. A selected set of key issues and what the US experience suggests about them include the following.

Conditionality enforcement

Programs established on the basis of agreements between governments or NGOs and landowners, or NGOs and local governments, have to be enforceable. This requires that landowners fully understand and respect contract relationships. The US experience suggests that while these general conditions are met, a lack of continual local enforcement leads to a deterioration of the integrity of programs designed to protect ecosystem services. This appears to be true no

matter whether the originator of the program is the national government, state government, local government or an NGO.

Enforcement mechanisms are a crucial part of any program. In some US states if a conservation easement is not regularly certified as in compliance, such as on a once a year basis, the landowner can void the easement and the ecosystem service agreement associated with it. A study of one of the 1950s pioneering programs in the use of conservation easements demonstrated their deterioration because of a lack of enforcement, and subsequent owners (including second generation owners) lack of understanding of the easement's meanings, intent and obligations.

Public vs. private origination

Who should be responsible for ecosystem service protection? Private, incentive-based conservation protects vital habitat in the United States, but these areas are ultimately dwarfed by size and function of public lands. Voluntary, incentive-based conservation is a vital supplement to public measures. For certain services this supplement is essential, but ultimately public land designated for conservation is legally a more permanent basis for ecosystem service management.

There is also the question of the appropriate role for national or international NGOs. This is not a wholly developing country discussion. Within the United States, concern has arisen about privatization of public functions. When conservation NGOs drive the ecosystem services agenda, they focus on issues of most import to them. Yet these goals can conflict with the broader public policies of local and state governments. US NGOs, such as The Nature Conservancy, have begun to have more open conflict with state and local governments.

Private and public equity

When pro-poor rewards are provided to landowners—either through direct payment or the foregoing of obligations (i.e., taxes)—the

owner gains, society at large may gain, but the most proximate of governments may lose.

In the United States there has been increasing conflict over the fact that promotion of both public and private ecosystem service approaches incurs a foregone opportunity cost to local government. If land is protected, it cannot be developed. If it cannot be developed, it cannot be valued for higher purposes, and potentially generate more tax revenues. If tax revenues do not come from the protected land, but the revenues are necessary for the provision of services, then the ecosystem service program shifts the tax burden to others.

Even when there is strong consensus that protection of ecosystem services is “good,” the shifted burden may still be perceived as “bad.” Ecosystem service protection is rarely a win-win situation for all parties involved. Instead it results in a complex set of winners and losers. Increasingly in the United States, the losers are forcing a more explicit discussion about the relative costs and benefits of particular ecosystem service approaches.

Viability of alternate land tenure systems

Private property is the dominant tenure form in the United States and most developed countries, yet it is only one of many forms in developing countries. There currently is a global debate about encouraging the promulgation of private property; this debate originates in classical political philosophy and political economy, and in contemporary advocacy.

Many of the proposals for pro-poor rewards for ecosystem services work best in a socio-legal environment of well-defined property rights, rights that may be held by individuals (private property rights) or by groups (such as tribal communities). What is gained by explicit property rights system (an ability to contract and enforce), also can lead to losses. These losses are not shared equally, but tend to fall disproportionately on vulnerable populations, for example women.

Further reading

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- Molotch, Harvey. 1976. "The City as a Growth Machine: Toward a Political Economy of Place." *American Journal of Sociology* 82(2): 309-22. (Ground-breaking article that seeks to understand and explain how it is that local governments in the United States are compelled to grow, economically and thus physically, even when a local political constituency would support sustainable land and economic management.)
- Ohm, Brian W. 2000. "The Purchase of Scenic Easements and Wisconsin's Great River Road." *Journal of the American Planning Association* 66(2): 177-88. (Detailed study of an early use of conservation easements by a public agency, focusing on whether and how easements do (or do not) ensure perpetuity in land use.)



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