

Green Payment Program Design: A Matter of Perspective

While analysis of existing commodity program and conservation payments suggests the potential for tradeoffs between income support and conservation objectives, some features of existing conservation programs make it difficult to reach strong conclusions based on this experience alone. For example, current conservation program funding emphasizes land retirement, while a green payments program would likely focus on encouraging conservation practices on working land. To gain additional insight, we analyze a number of hypothetical green payment program designs.

“Program design” refers to the details of a program: who is eligible, what action or activity producers could be paid for (e.g., conservation treatments), and how much they would receive for specific actions. While all green payment program designs would seek to support farm income and improve environmental performance, one could approach design decisions from a number of perspectives. To identify potential tradeoffs between income support to current recipients and environmental gain, we analyze some “polar” cases—program designs that originate from decidedly different perspectives. On the one hand, policymakers could start from a primarily environmental point of view, establishing a set of environmental payments that are large enough to leverage environmental gain and provide income support. These are *Environmental Performance* scenarios. On the other hand, policymakers could focus on the recipients of current commodity program payments, making these payments “greener” through the addition of environmental requirements, similar to (but going beyond) existing conservation compliance, sodbuster, and swampbuster requirements. (Sodbuster and swampbuster are designed to discourage producers from bringing additional highly erodible land and wetland, respectively, into crop production.) These are *Environmental Compliance* scenarios.

Some key details of program design are common to all four outlined scenarios. First, all scenarios assume that farmers are offered 5-year contracts and “program payments” are generally represented as the sum of all payments over the 5-year period. Second, because income support is a primary objective, we assume that a green payment program would be run as an entitlement, in keeping with existing farm commodity programs. Under an entitlement (like existing commodity programs), the Government is obliged to enroll producers who apply for the program and qualify for benefits. Program spending depends, in part, on the level of producer participation. In contrast, existing conservation programs are limited by an annual budget or acreage cap that limits the number of producers and acres that can be enrolled. In our green payment scenarios, the Government would establish rules governing eligibility and the calculation of payments, but the exact level of program payments for any specific scenario is determined by the number of farms that participate, the number of acres they choose to enroll, and the conservation treatments they apply.

In the *Environmental Performance* scenarios, farmers and ranchers are offered the opportunity to (voluntarily) produce environmental “goods” for a “price” established by the Government. Environmental goods could include

clean water or wildlife habitat that farmers and ranchers produce by applying conservation treatments. For example, they could help produce clean water by controlling runoff of sediment, nutrients, and/or pesticides from agricultural land. See table 1 for a full listing of the resource concerns that could be addressed in our green payment scenarios and the conservation treatments that might be used to address them.

In keeping with existing conservation programs, producers are allowed to determine (within guidelines) which land and conservation treatments they will offer for green payment program participation. All cropland and grazing land could be eligible for program enrollment, so long as the proposed conservation treatment would address a specific resource concern present on or associated with the tract being offered. The payment a producer could receive for taking these actions would be roughly proportional to his or her probable contribution to the production of environmental goods. Our analysis uses an environmental index, similar to the Environmental Benefits Index (EBI) used in the CRP, to quantify a producer’s environmental performance and estimate the gain in environmental performance from any given conservation treatment (see box, “The Environmental Index,” and appendix 1 for full details). Specific scenarios include:

- **Improved Performance.** Payments would be based on expected environmental gain, as measured by our environmental index. Producers would receive payments based on the application of *additional* conservation treatments that yield a *gain* in environmental performance. The payment made to a producer would equal the change in the producer’s environmental index score (no matter what his or her starting point), multiplied by a payment rate per index point determined by the Government and announced to producers as part of the program signup notice.

Table 1
Linking resource concerns, land use, physical effects, and treatments

Resource concern	Physical effect	Land use	Treatment
Air quality	Wind erosion	Cropland ¹	Wind erosion control
Surface-water quality	Water erosion	Cropland	Water erosion control
	Nitrogen runoff	Cropland	Nutrient management
	Phosphorus runoff	Cropland	Nutrient management
	Nutrient runoff and riparian erosion	Grazing land	Nutrient management and riparian erosion control
	Pesticide runoff	Cropland	Pest management
Groundwater quality	Nitrogen leaching	Cropland	Nutrient management
	Pesticide leaching	Cropland	Pest management
Soil productivity	Wind erosion	Cropland	Wind erosion control
	Water erosion	Cropland	Water erosion control
Grazing land health	Grazing land health	Grazing land	Grazing land health
Wildlife	Wildlife habitat loss or degradation	Cropland	Habitat restoration or enhancement
		Grazing land	Habitat restoration or enhancement

¹Irrigated and nonirrigated cropland are combined here but are treated separately in our analysis.

Source: USDA, Economic Research Service.

The Environmental Index

To base payments on environmental performance, some method of measuring performance is needed. Environmental indexes are used widely in conservation programs to gauge the potential environmental gain from the application of conservation treatments. Indexes combine data on a number of environmental dimensions into a single number. In several USDA programs, including the Conservation Reserve Program (CRP) and the Environmental Quality Incentives Program (EQIP), program managers use indexes to rank contracts for program enrollment. For a limited number of resource concerns, the Conservation Security Program also offers payments that vary according to improvement in the value of indexes believed to reflect environmental performance. In our model of green payments, we develop an overall index of environmental performance and use it to specify environmental performance-based payments.

Our index is similar to the Environmental Benefits Index (EBI) used to rank contract offers in the CRP general signup:

- Roughly one-third of points are for soil erosion on cropland. Points are given for potential of erosion control to reduce dust (improve air quality), preserve soil productivity, and reduce sediment loads to water.
- Another third are for other water quality-related treatments, including nutrient management and pest management on cropland, nutrient management and riparian erosion on grazing land, and grazing land health.
- Remaining points are for wildlife habitat enhancement (on cropland and grazing land).

The share of possible points assigned to a specific farm depends on the intensity of the physical effects (e.g., soil erosion or nutrient runoff) and the potential damage to soil, water quality, or other resources. For example, if soil erosion due to water (tons per acre per year) is estimated to be high on a field located in an area where water-quality damage per ton of soil erosion is also estimated to be high, a large share of potential points would be assigned for the index subcomponent that accounts for sediment damage to water quality. A complete description of the index can be found in appendix 1.

- **Good Performance.** Payments would be based on environmental *performance*. Once producers reach a predetermined level of environmental performance—which we refer to as an environmental hurdle—they are eligible for payments. Producers do not necessarily need to apply new conservation treatments—they can qualify for payments even if environmental performance was achieved before the establishment of the green payment program. The hurdle rate is set by region so that about half of all agricultural land in each region qualifies for payments without additional conservation effort.² Producers who have already surpassed the hurdle can also increase payments by further improving environmental performance (undertaking additional conservation treatments). For an individual producer, payment would be equal to the difference between his or her index score and the environmental hurdle, multiplied by the payment

²The hurdle rate could have been calculated at other geographic scales. For a comparison of basic results using regional and national hurdle rates, see Appendix 5: Sensitivity Analysis.

rate per index point. That is, the payment equals the payment rate times the difference between the index score and the hurdle rate, if the index score is greater than the hurdle rate. If the index score is less than the hurdle rate, the payment is zero.

In the *Environmental Compliance* scenarios, existing farm commodity payments are used to leverage additional conservation effort and improve environmental performance. Existing compliance requirements for wetland conservation and soil conservation on highly erodible cropland (HEL), in force since 1985, would remain unchanged, while new compliance requirements would be added. New compliance requirements would include reducing soil erosion to the soil loss tolerance (“T” level) on non-HEL cropland, as well as nutrient management and pest management on cropland.³ Specific scenarios include:

- **Extended Compliance.** Continued eligibility for commodity program payments would be contingent on addressing all existing and new compliance requirements, regardless of cost. Producers who do not meet all applicable requirements would become ineligible for commodity program payments, and the income support they provide, on all the land they farm.
- **Modified Compliance.** Producers could opt out of some of the new requirements if they accept a reduced payment. Producers who address no additional requirements would still receive 20 percent of the maximum payments they would be eligible for. Producers who address all additional requirements would receive 100 percent of their potential payment. For producers who opt out of some, but not all additional requirements, payment reduction would be commensurate with the environmental gain forgone, as measured by our environmental index.

³Note that grazing land cannot be enrolled and that wildlife habitat resource concerns cannot be addressed through compliance scenarios.

Table 2
Summary of scenarios for green payment analysis

Scenario type	Scenario	Eligible farms/land	Payment “trigger” (action/condition)	Payments
Environmental Performance	1. Improved Performance	All cropland and grazing land; farms that include either cropland or grazing land	Any additional treatment appropriate to the farm	Based on environmental gain, as measured by the <i>change</i> in environmental index score
	2. Good Performance		Environmental performance exceeds a predetermined “hurdle” rate	Based on environmental performance, as measured by environmental index, relative to the hurdle rate
Environmental Compliance	3. Extended Compliance	Cropland on farms that receive income support	Meet existing compliance requirements and control soil erosion on all land, manage nutrients; pests	Similar to existing direct payments; producers must meet all conservation treatment requirements to maintain eligibility
	4. Modified Compliance		Meet existing compliance requirements and control soil erosion on all land, manage nutrients; pests	Producers can opt out of some conservation treatment requirements for a reduction in payments, commensurate with reduction in environmental performance, as measured by environmental index

Source: USDA, Economic Research Service.