

**Agri-environmental Programs in the US and the EU: Lessons from  
Germany and New York State**

Christina v. Haaren  
Department of Environmental Planning, University of Hanover, Hanover, GERMANY

Nelson Bills  
Department of Applied Economics and Management, Cornell University, Ithaca New  
York, USA

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## **Abstract**

The purpose of this paper is to summarize the literature and the debate over agri-environmental program effectiveness in the European Union (EU) and the US, with emphasis on examples in the Northeastern US and Germany. A particular concern is arrangements for blending regulatory and compensatory incentives for providing environmental goods and services on farms and in rural communities. In the EU, and especially in Germany, a prevailing view is that current agri-environmental efforts are unsatisfactory in terms of effects on environment and cost-effectiveness. Future challenges include better targeting of agri-environmental payments and providing incentives for resource sustainability. In the U.S., efforts to achieve a balance between agriculture and environmental quality are longer lived and follow two distinct policy tracks: 1) soil erosion/water quality management and 2) farmland protection. Each policy track has its own constituency and each has a fairly exclusive list of policy tools. However, this fragmented policy environment tends to blur the broad view of the “multifunctional” landscape and the implications of farm and food production on landscape diversity, biological resources, wildlife habitat, and open space land interests. Suggestions for advancing the strategic interests of both countries in the arena of working landscape management, with particular emphasis on providing financial incentives for the provision of environmental goods and services are discussed.

**Key Words:** agri-environmental programs, multifunctional landscapes, New York State, Germany

## Introduction

The effectiveness of agri-environmental programs, policy interventions designed to improve environmental performance on farms and rural landscapes, is a continuing policy issue in all modern nations. However, it is especially difficult to accumulate inter-country comparisons and capitalize on experiences with policy implementation. The purpose of this paper is to summarize the literature and the debate over agri-environmental program effectiveness in the European Union (EU) and the US. Then, closer attention will be given to examples in the Northeastern US and Germany. A particular concern, especially in the context of evolving World Trade Organization (WTO) negotiations, are arrangements for blending regulatory and compensatory incentives for providing environmental goods and services on farms and in rural communities.

In the EU, and especially in Germany, a prevailing view is that current agri-environmental efforts are unsatisfactory in terms of effects on environment as well as in terms of cost-effectiveness. Considering future prospects for the EU subsidy system, solutions are needed to better target agri-environmental payments and to motivate farmers to promote sustainability. New approaches should include concepts that combine environmental planning, targeting agri-environmental programs (referred to throughout this paper as “AEM”), alternate models of remuneration, and advisory schemes that better integrate environmental services into the technical assistance provided farm operators.

In the U.S., efforts to improve environmental management on farms date to the 1930s and often mirror some of these same issues. In the years after World War II, American policy efforts have evolved into two distinct policy tracks: 1) soil erosion/water quality management and 2) farmland protection (maintenance of farmland in its current use). Although distinctions seem artificial (one always affects the other), separating agri-environmental discussions into these two dimensions has made an impact. Each policy track has developed its own constituency and programs that feature a fairly exclusive list of policy tools. Often missing in this fragmented policy environment, however, is the broad view of the rural, working or “multifunctional” landscape that considers the implications of farm and food production for landscape diversity, biological resources, wildlife habitat, and open space land interests. A further distraction is that many state

and local governments are aggressively promoting and funding agri-environmental programs. This layered approach—featuring federal, state, and local initiatives-- is often masked in international discussions because commentators almost invariably dwell on federal agri-environmental policies and even more narrowly on programs administered by the USDA.

The motivation for this paper is that broader comparisons of the American and German experience with agri-environmental programs are both timely and beneficial to the evolving policy debate in both countries. Landowners, local public officials, and environmental interests must somehow be involved in a deeper and overarching discussion on how to sustain the working rural landscape. One pathway is to capitalize on the added value associated with intercountry comparisons. We submit that such comparisons can enhance understanding of each system and promote fresh discussion of alternatives. The science surrounding improved environmental performance is far from settled and, therefore, there are many opportunities to learn more about good examples. Finally, the policy debate might be enhanced if policymakers learn more about situation in other countries and make some determination of program transferability. Finally, good environmental performance in the farm and food sector is an evolutionary process with plenty of room to celebrate solutions and reach for new milestones

The quest we are on presents formidable challenges. There is an enormous institutional overburden when discussion moves between countries and when some very arcane policies are vetted in detail. With these misgivings in mind, the first section of this paper will deal with an interpretation of the extensive international literature on the role of agriculture in working landscapes and identify potential or emergent interests in landscape management. The second section deals with a comprehensive picture of current public investments in landscape conservation in New York State, which mirrors many developments in the densely settled Northeastern US, and in Germany. In a concluding section, we discuss opportunities for advancing the strategic interests of both countries in the arena of working landscape management, with particular emphasis on providing financial incentives for the provision of environmental goods and services.

## Definitions and Performance Measures

There is general agreement that farm and food production yields many non-commodity outputs. Most agricultural commodities are traded in markets while most non-commodity outputs are provided by other means. The term “multifunctionality” has been coined to describe concerns about the provision of both commodity and non-commodity outputs. Nonmarket goods and services are now a prominent part of the debate on agricultural policy in rich nations and an integral part of international negotiations on reducing trade barriers for farm and food commodities. As Blandford and Boisvert (2004) point out, views on how to reconcile multifunctionality with freer international movements of agricultural commodities appear to divide along two relatively distinct lines. One can argue that without the continuation of current agricultural policies, freer trade will jeopardize the provision of public goods and positive externalities provided by agriculture. The opposing view is that such policies are primarily designed to protect agriculture from international competition, alter commodity prices, and perpetuate trade distortions.

In a separate paper, Blandford and Boisvert (2002), argue that the issues surrounding multifunctionality are too complex in their global, country-specific, and local dimensions to be resolved within the traditional domestic/international trade policy paradigm. In such a paradigm, welfare maximizing taxes and subsidies applied to the non-commodity outputs of agriculture would internalize their external benefits and costs. They conclude that, while forceful on conceptual grounds, attempts to measure such external benefits and costs are faced with obstacles that cannot be overcome empirically. Instead, a workable solution might be to specify conditions and actions that are likely to lead to an increase in the supply of desired non-commodity outputs or attributes, e.g., a set of production standards that will result in improved animal welfare or standards for the maintenance of areas of wildlife habitat. The cost-effectiveness of alternative combinations of regulation and monetary incentives to achieve an increase in the supply of such desired outputs could then be evaluated.

Following Batie and Horan (2002), these evaluations turn on several design issues, including:

- What is the objective of the program? Is the objective only the enhancement of environmental services or is farm income support and other program objectives also important? What are the inherent tradeoffs between income support and environmental objectives? What environmental services are to be the focus of the program? How are these services to be measured? Will there be different objectives for different regions or enterprises?
- Who should be paid? Who is eligible? Should payments go to areas of intensive agricultural production or to areas where the provision of the services affect many people and/or have significant environmental impacts? Should payments be targeted, and what selection criteria should be used? What land should be targeted: those with significant actual or significant potential environment problems? Or, should certain regions or types of crops be targeted?
- How much will farmers and/or landowners be paid? Will payments exceed producer costs? Will payments vary spatially? Will total payment amounts be limited?
- What should farmers and/or landowners be paid to do? Should payments be based on performance (e.g., on a set of criteria that combine several environmental services, perhaps based on an environmental impact index), on the adoption of specific management practices, or on a holistic farm conservation plan? What is the appropriate baseline from which to evaluate payments? Should payments be made only for improvements from the status quo, or for past stewardship? Will constraints be imposed on which lands are eligible for payments? How should compliance with program requirements be monitored and enforced?

## **Agri-Environmental Policies in the EU, Germany and the US**

Agriculture in the European Union (EU) features a common agricultural policy (CAP) for member countries. The CAP was initiated in 1957 to integrate markets across the boundaries of member countries, to secure income for farmers and the supply of farm products to the population and arrange for common financing of farm subsidies. Subsidy arrangements have included agricultural price supports, direct payments to farmers, supply controls, and border measures.

The EU instituted several major policy reforms in the early 1990s that included the introduction of green or AEM payments into the CAP. More recent reforms, in 2000 and 2003, initiated the decoupling of farm subsidies from commodity production and placed additional emphasis on environmental concerns. Farmers now must more fully comply with environmental regulations, along with allied provisions for improving animal welfare, food safety, and food quality, as a precondition for receiving direct subsidy under the CAP. These latest reforms, along with requiring compliance with more exacting environmental standards, also represent some devolution of farm policy. Each member state now receives more discretion over the timing and implementation of agri-environmental programs (Gunderson et al, 2004).

The 2003 provisions for decoupled payments are generally referred to as single farm payments (SFP). The EU-15 member States opted for different models in distributing the SFP but most are based on past payment history for each farmer and landowner; the new EU accession states do not have that history and introduced flat rate payments. Germany chose a hybrid model which gradually changes into regionally differentiated flat rate payments by 2013. And, land eligible for support in Germany but not farmed, i.e., arable land set-aside from active farm use, must be maintained in good agricultural condition as a precondition for subsidy support.

Also noteworthy in the recent reforms is a marked shift in the way rural development initiatives are treated. The recent CAP reforms established two “pillars” or program pathways in the budget: Pillar I for market and price support policies and Pillar II for rural development policies. Rural development, in EU parlance, will embody increased attention to production of environmental goods and services by incentivizing

the use of agri-environmental practices. And, using a concept called “modulation”, member states have obligations to transfer SFP subsidy funds from Pillar I into Pillar II: SFP payments greater than 5,000 euros (about \$6,500) are reduced by 5 percent, while farmers whose SFP is less than 5,000 euros are not penalized. The budget funds saved through modulation are transferred to the Pillar II rural development fund. At least 80 percent of the funds from the penalties will remain in the country where the SFPs were reduced and are to be used for rural development purposes. The Member States can voluntarily increase the share of modulation.

### Design of agri-environmental measures in the EU and Germany

As noted above, EU farmers can now voluntarily participate in agri-environment programs within the framework of the Second Pillar of the CAP. Embedded in such programs is the fundamental concept of the relationship between agri-environment measures (AEM) or good farming practice. Agri-environment measures are conceptualized in Europe as environmental services beyond a baseline of good farming practice (GFP). GFP is generally understood to be a set of mandatory, threshold level of environmental obligations for the farm operator. These GFP are defined by basic environmental standards established by European or national legislation. Further, it is prescribed that national law can define more ambitious rules for GFP than the EU. Every farmer has to comply with these obligations without financial compensation- a consequence of the polluter pays principle embedded in the Environmental Treaty of the EU. In addition to compulsory use of GFP, farmers who receive direct payments from the First Pillar of the CAP will be subject to "cross compliance" (CC) obligations under the 2003 CAP reforms. Cross compliance requirements define what are called “Good Agricultural and Environmental Conditions” (GACE, 2002; and IEEP, 2007).

The implications of the new cross compliance obligations are not clear. Good farming practices have been a feature of EU regulations for some years and member states have applied various additional national regulations from time to time. The issue becomes whether enforcement will improve by coupling GFP with the possibility of withdrawing payments in the case of non-compliance. However enforcement is limited to 1% of the farms because of running costs and, if non-compliance is identified, the consequences are usually not severe for first offenders.

A selection of standards required by Cross Compliance (GACE, 2002) is shown in Figure 1. It can be seen that cross compliance is not solely confined to environmental requirements, but also contains regulations intended to keep land in “good farming condition”. This somewhat opaque requirement is a consequence of the rather diffuse concept of “multifunctionality “of the EU.

On German farms, the introduction of cross compliance imposed some more exacting environmental regulations than existed before 2003. For the first time, compliance extended to the protection of selected landscape features and the conservation of grassland. Previously, under the German Federal Nature Protection Law, landscape features were covered only by a general clause and plowing of grassland was allowed excepting for only a few conditions. Now – on farms which receive direct payments – plowing of grassland is restricted and grassland eligible for direct payments has to be maintained by mulching or mowing.

#### Agri-Environment Measures in the Second Pillar of the CAP

The Second Pillar of the CAP stresses rural development and has numerous implications for agri-environmental programs (European Commission 2005). Major thrusts under this pillar will include programs that support improving the competitiveness of the agricultural and forestry sector (Axis 1), the environment and the countryside (Axis 2), the quality of life in rural areas and diversification of the rural economy (Axis 3) and cross sectoral bottom up projects and initiatives integrating the goals of the other Axis (Axis 4 or LEADER). While provisions for “environment” are the most important for financing AEMs, it is also expected that other programs rationalized in terms of business structure, quality of life, and diversification will also offer possibilities for co-financing environmentally relevant measures. On the other hand, the other axes may also support measures which are at cross purposes with environmental goals (like building agricultural infrastructure, dykes or preventing land abandonment in areas where nature conservation would wish for more succession). However, it seems clear that net gains have been made in policy design under the 2003 reforms. Environmental concerns are more clearly separated from other rural development issues and prospects for moving funds in that direction are improved.

Despite this optimism, the funding situation is extremely fluid in the EU at present as member states implement the reforms and match EU funding with co-financing decisions. Some indication of the similarities and differences across the EU can be obtained from the AEM portfolio of the member States (Figure 2). Noteworthy is the emphasis given to AEMs characterized as biodiversity measures. These measures are rated in meta evaluations as especially effective in serving also other natural resources and may be considered as multifunctional (Société Oréade-Brèche 2005).

A clear emphasis in all EU member states is working land programs, while set aside has been not very well accepted by AEM by member states and/ or farmers. However, between 10 and 15% of the arable land in active crop rotation has to be taken out of production as part of EU market policies. There is tension around this measure at present because of the increased interest in producing dedicated energy crops. The preference for working land programs may be partly but not completely explained by environmental factors. Biodiversity and recreation in Europe depend much more on extensively farmed land than in the US. On the other hand, also in areas where nature conservation interests would wish for more “wilderness”, farmers are not inclined to opt for set aside programs.

Due to the federal structure of Germany, planning, implementation and control of agri-environment measures are ultimately the responsibility of the Federal States. The States also have to seek approval and co-financing directly by the EU for their program portfolio. This portfolio includes measures which are identical in all states but, in addition, each State is pursuing additional programs. At the national level, the Federal Ministry of Agriculture develops only basic AEMs, primarily aimed at improving farming techniques; these programs offer flat rate payment without taking into account the site specific conservation issues that have to be integrated into the state programs. The Federal Government is helping to co-finance these AEMs by topping off the funding each state gets from the EU. This is why most German states assign the bigger part of their AEM-budgets to these federal designed measures: it reduces their exposure to environmental support in the state budget. An unfavorable side effect is that environmental funding is poorly targeted and not necessarily directed to areas with particular environmental needs.

Technical assistance to farmers in order to support the selection and execution of AEM would be crucial for the ecological effectiveness of AEM. Up to now, EU schemes have not offered financial support for single, farm oriented consultancies and as a result, German states did not implement this service (ART 2005: 126). However, in the new budget period starting 2008, farm consultancy can be supported financially from the Second Pillar of the CAP. It is expected that many states will implement this measure. This offers the chance of better targeting the measures on farm scale and also will pave the way for more result oriented measures.

### Contrasts with the US

US agri-environmental policy has its origins in the Great Depression and the attendant farm crisis of the 1930's. Congressional action in 1936, The Soil Conservation and Domestic Allotment Act, provided for the protection of land resources against soil erosion and for other purposes; those "other purposes" included the transfer of revenue to American farmers (USDA, 1984). Over the years, in successive rounds of legislative debate and reform, the U.S. Congress has perpetuated the dichotomy of supporting farm income and instituting programs that protect natural resources. However, public concern began to grow in the late 1970s and early 1980's about the sometimes deleterious nature of intensive agricultural production. The 1985 Farm Bill was the first federal legislation to feature a specific title devoted to conservation issues; this legislation made provisions for greatly accelerated conservation effort in the US. For the first time, the Congress called for conservation cross-compliance, making adequate control of soil erosion on highly erodible land a precondition for access to major USDA farm program benefits. In addition, such program benefits were denied to farmers who converted fragile grasslands to rotation agriculture (sodbusting) or installed drainage works that permit crop production on wetlands (swampbusting). In addition, the Congress returned to the idea of a major cropland set-aside program and instituted the Conservation Reserve Program (CRP). The CRP echoed experimentation with a Soil Bank in the 1950s and 1960s. The Soil Bank set aside nearly 29 million acres (11.7 million ha) under long-term contracts for conservation purposes (USDA, 1984). The CRP repeated this history but administration with vastly improved provisions for targeting land resources that are especially vulnerable to excessive soil erosion from rainfall or wind.

While the 1985 federal legislation ushered in a new era of agri-environmental policy initiatives, the Congress has revisited this legislation at the five year intervals over the past two decades to tweak program administration and to recalibrate AEM funding. At present, USDA-administered agri-environmental programs can be divided into three distinct categories: conservation compliance mechanisms, and compensatory programs centered either on land retirement or providing incentives for improved conservation management on working (actively farmed) land (Cattaneo et al, 2005). More than 60% of direct USDA program payments target specific environmental concerns-principally highly erodible cropland, restorable farmed wetlands or prime farmland (Claassen et al, 2004). In addition, the targeting and outcome orientation of the US programs is supported by a clear goal setting, which facilitates monitoring and by mechanisms for an allocation of the measures to sites that constitute the best value for money based on an indices for measuring environmental benefits. A summary of federal AEM payment programs is shown in Figure 3.

Additionally, U.S. Congress commits significant resources to producer education and technical assistance to farmers and landowners. Most of this education and technical assistance is delivered to rural communities through a nationwide system of local soil and water conservation districts. These districts usually follow the political boundaries of more than 3,100 counties across the US. State and local governments also appropriate funds to support the efforts of soil and water conservation districts, and district staff often deals with broader community problems associated with land and water management for conservation purposes.

An interesting question of particular relevance to US-EU comparisons relates to the matter of conservation compliance. As noted above, American farmers and landowners farmers can only remain eligible for farm program benefits when they comply with certain environmental practices (Claassen et al, 2004). Conservation Compliance provisions administered by the USDA require those who farm highly erodible lands to implement conservation plans to reduce soil erosion. The Sodbuster provision requires producers to apply strict conservation systems to any new highly erodible lands that they bring into production. The swampbuster provision excludes

farmers from farm program payments if they drain wetlands in order to bring land into agricultural production.

Compliance with environmental standards is not completely within the purview of USDA programs. Regulatory requirements are also used as agri-environmental policy tools by other federal agencies... The Environmental Protection Agency (EPA) carries out the most prominent regulatory actions to manage water quality... The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act, focuses on reducing the water quality impact of both point and nonpoint sources of pollution. In the early 1990s, in the aftermath of litigation in federal courts over discharges of livestock wastes into navigable waters, the focus of the Clean Water Act has turned to non-point sources, including runoff from agricultural operations (Claassen, 2001). The EPA began aggressive efforts to work with individual states and craft regulatory measures that would control agricultural point source pollution from confined animal feedlot operations (CAFO). As of 2001, over 6,000 livestock operations were large enough to be classified as CAFOs under the Clean Water Act (Claassen, 2001). This designation requires CAFOs to manage both crop and animal enterprises to eliminate discharges of manure and nutrients to surface waters. Details of CAFO regulation varies from state to state, but in New York, a precondition for operating a large CAFO is the preparation of a whole farm nutrient management plan by a state-certified nutrient management planner; New York nutrient management plans for livestock and poultry operations are very comprehensive and extend to manure management, balancing nutrient applications on cropland, and installation of facilities to control discharges of waste water from livestock and feed handling facilities (New York State Department Of Environmental Conservation, 2004). Producers must update this plan annually to obtain a permit renewal

In addition, the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 is a federally mandated program requiring specific measures to deal with agricultural non-point source pollution in order to restore and protect coastal waters. The program requires each of the twenty-nine states with approved coastal zone management plans to utilize voluntary incentives to encourage farmers to adopt measures that control non-point source pollution. If voluntary measures fail, however, then states must enforce adoption (Claassen, 2001). The Endangered Species Act of 1973 was enacted to

conserve endangered or threatened species and their ecosystems. Under this law, farmers are prohibited from “taking” a member of a species determined to be endangered or extinct. And in some cases, habitat destruction, cropping practices or the use of certain pesticides can be prohibited. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947 regulates the use farm chemicals. Certain chemicals can be banned if they pose unacceptable risks to human health or the environment (Claassen, 2001).

## **Payments to agriculture in US and EU**

In this section, we turn our attention to estimates of direct financial support to farmers and landowners in the US and the EU. These comparisons are provisional and subject to much interpretation. One problem is fashioning accurate in-country comparisons; this issue is complicated by the layering of environmental subsidies among levels of government. The second problem is that the funding situation is extremely fluid at present. In the US, the Congress is now deliberating over revisions to federal farm legislation. At this writing, while the US House of Representatives has passed a version of the 2007 Farm Bill, the ultimate legislative outcome is as uncertain until the US Senate acts and a congressional conference committee completes its work for signature by the President. Major provisions of the federal farm legislation will expire at the end of calendar 2007. Reauthorization is expected by most observers, although current provisions could conceivably be extended into 2008 as that debate enters its final stages. In the EU, the funding situation is also rapidly evolving because member states are grappling with major structural adjustments and support for farming. The fiscal implications of those adjustments simply are not clear at this time.

### US agri-environmental expenditures

With these reservations in mind, we first turn our attention to the US situation. We pursue the argument that, beyond the uncertainty over program direction at federal level, the funding picture is distorted if sub-national program efforts are ignored. Limiting attention to high-profile programs administered by the USDA misses the vast amount of discretion over agri-environmental issues devolved to state governments and,

in some very noteworthy cases, to thousands of local governmental units across the US. Further, third party non-governmental conservation organizations, regional land trusts and conservancies in particular, are also making increasingly important inroads into US agri-environmental efforts.

To achieve a broader and hence more useful policy context, we assembled EU and US farm subsidy data and arranged comparisons in an area basis for a single currency in calendar 2004 or 2006<sup>1</sup>. Results are shown in Figure 4. Using total USDA direct payments (across-the-board and inclusive of AEM payments) and total cropland or arable land area, on average the overall federal subsidy is €105 per hectare, compared to an approximately comparable estimate of €633 and €538 for all member states, on average, in the EU-15 and Germany, respectively. These comparisons are arbitrary because of exchange rates but also because of the metric used to account for spatial and production differences between the EU and the US. With respect to land area, one could argue that agricultural subsidies should be more appropriately weighted by all area utilized for farming, rather than area classified as arable cropland. In the EU, such assessments are for utilized agricultural area (UAA), comprised of land in crop rotation, permanent grassland, and permanent crops. A comparable area measure for the US would be total cropland and pasture, as reported by the USDA (Lubowski, et al, 2006).

As Figure 4 shows, these alternate area weights can make a profound difference in the numbers and the impressions conveyed on both absolute and relative amounts of subsidy. The perceived gap between support in Europe and the US widens substantially when a more inclusive definition of agricultural area is used. Because of wide spatial interstate differences in area classified as pasture and range in the US- the extensive margin for farm and ranch use- one gets alternate impressions of USDA program support. Because Northeast states like New York have relatively little pasture area remaining in farm statistics, federal subsidy is estimated at €46 per hectare, a value directly comparable to the coterminous US at €45 per ha, where extensive territory is classified as pasture and range in the American West.. Weighting support by cropland area alone brings federal support for New York State to an estimated at €60 per ha or some 40% below the overall US average.

This discrepancy on a cropland area basis reflects the preferential dimensions of US farm policy. Income support is concentrated in 10 major program crops.<sup>2</sup> New York State is among several others that produce relatively few of these supported commodities. In addition, outlays for AEM in the US tend to pool in localities where farms receive relatively high commodity payments, thus further exacerbating state-to-state and region-to-region differences in levels of federal support.

Another way to make intercountry comparisons is to arrange farm subsidy data against gross farm receipts, measured in producer prices; these comparisons are also on display in Figure 4 and show that, in the US, total federal farm subsidy amounts to 10% of the gross value of farm marketings. The comparable value for New York State is less than 5%. Comparable values for the EU in Germany are in the 16 to 17% range (Figure 4). While substantially higher than the US average, such percentages are not unheard of in the US. Earlier this decade, levels of direct federal support for farmers and landowners some states ranged up to one third of gross value of farm marketings (Bills et al, 2006).

According to the most recent USDA data (USDA, 2007a), annual direct subsidies for conservation purposes are presently about €2.7 billion. These outlays are dominated by rental and cost sharing payments for long-term land retirement under the Conservation Reserve Program (CRP)—see Figure 5. Treasury costs for the CRP are in the vicinity of €1.5 billion each year with little trend because enrollment is capped and aggregate annual rental payments are flat. Rental payments are relatively stable because; enrollment bids landowners submit for land entering and leaving the CRP tend to converge over time in any one locality. Also, annual rental payment amounts are not adjusted for inflation during the life of any one rental contract. The 2002 Farm Bill extended CRP enrollment authority through 2007 and increased the enrollment cap to 39.2 million acres (15.9 million ha). As of December 2006, CRP enrollment totaled 36.1 million acres (14.6 million ha). CRP rental ontracts expiring in 2007 cover 16 million

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<sup>1</sup> EU data are for calendar 2006 and US data are for calendar 2004.

<sup>2</sup> Major program crops under federal farm legislation are wheat, corn, barley, oats, cotton, rice, soybeans, tobacco, peanuts, and sugar. An additional 13 commodities receive limited federal support, largely through nonrecourse commodity loans.

acres (6.5 million ha); over the 2007-2010 period, contracts involving 28 million acres (11.3 ha) will lapse, unless the Congress authorizes re-enrollments.

The Wetlands Reserve Program (WRP) pays landowners to retire cropland from agricultural production if those lands are restored to wetlands and protected with a long-term or permanent easement that precludes resumption of cropping or other higher income uses. Landowners receive fair market value for the farm income forgone with wetland restoration and are provided with cost-share assistance to cover their restoration expenses. The 2002 Farm Bill increased the WRP enrollment cap to 2.275 million acres (0.92 million ha).

The Environmental Quality Incentives Program (EQIP) continues the USDA legacy, dating to the 1930s, of providing financial assistance (usually cost sharing on installation and management of AEMs) and technical assistance to landowners that face resource management challenges that impact soil, water and related natural resources. The scope of this program is broad and directs funds to conservation treatment of cropland, pasture/grazing lands, wetlands, and wildlife habitat management. This program is also a major source of funding for nutrient management and control of livestock and poultry wastes. EQIP was reauthorized by the 2002 Farm Bill through 2007.

The Wildlife Habitat Incentives Program (WHIP) is a voluntary program that provides cost-sharing for landowners to apply an array of wildlife practices to develop habitat that will support upland wildlife, wetland wildlife, threatened and endangered species, fisheries, and other types of wildlife. The Farm Bill authorized this program through 2007.

The Conservation Security Program (CSP) was first authorized by the 2002 Farm Bill and provides financial and technical assistance on agricultural working lands to support ongoing conservation stewardship. The program provides payments to farmers who maintain and enhance the condition of natural resources. During the first year of enrollment in 2004, the Department signed 2,200 long-term CSP contracts in 18 priority watersheds or catchments. By the end of 2007, the USDA expects nearly 19,000 farmers and ranchers participate in the program. The near-term fate of the CSP is

uncertain. The 2007 farm bill recently drafted by the US House of Representatives (2007) would suspend implementation the CSP until 2013. More insight into this program's direction will come from the markup of legislation in the U.S. Senate and eventual conference negotiations before asking for the President's signature.

The Farm and Ranch Lands Protection Program (FRPP) shares the costs of acquiring development rights, conservation easements, or other interests to limit conversion of agricultural lands to non-agricultural uses. FRPP acquires perpetual conservation easements by providing matching funds of no more than 50 percent of the purchase price for the acquired easements. The Farm Bill authorized this program through 2007.

The 2002 Farm Bill authorized the Grassland Reserve Program (GRP) to assist landowners in restoring and protecting grassland by enrolling up to 2 million acres under easement or long-term rental agreements. The program participant also enrolls in a restoration agreement to restore the functions and values of the grassland. The program was initiated in 2003 and reached its total funding cap in 2005.

Arranging these federal AEM subsidies on a per ha cropland basis is instructive—see Figure 6. Glancing back to 1996, for the coterminous US, federal outlays for AEM have ranged from 7 to 10 euro per ha. Comparable values for New York State are in the 2-3 euro per cropland ha. This more than three-fold difference between the US and New York State, while just one of 48 state-level experiences with federal support for AEM, begins to illustrate the fundamentals. There are very wide swings in the amount of federal AEM dollars available from state to state. One overriding factor is that AEM subsidies are dominated by voluntary land retirement programs—principally the CRP. More than 20 years experience with this program has shown that program participation tends to pool in territory where farmers and farmland owners are also garnering highly preferential income support for a small collection of federal program crops.

Looking beyond the USDA program efforts, state and local support for AEM measures is thought to be significant, but not widely discussed. A portion of state and local funding is directed to assist with water quality improvement but no comprehensive

information on funding from these sources is available. A great deal is known, however, about state efforts to protect farmland from conversion to develop uses. This funding stream is monitored, most prominently, by the American Farmland Trust (AFT, 2007a; AFT, 2007b). Along with direct money outlays, which provide financial assistance by topping up federal program support (through the Farm and Ranchland Protection Program-FRPP-mentioned above), state legislatures in all 50 states have passed legislation that alter arrangements for collecting an annual, ad valorem tax on real estate (Freedgood, 1997). These laws generate agri-environmental benefits through local tax expenditures. Tax expenditures are the property tax revenues foregone due to tax preferences for farmland owners. These tax preferences are usually arranged through tax levies on farm use rather than full market property values; the legislative intent is to reduce property tax expenses and encourage maintenance of farmland in its current use (Tremblay et al, 1987). Reliable, comprehensive estimates of tax expenditures for agri-environmental measures are not available (Bills, 2007) but previous work comparing outlays for agri-environmental programs in New York State and England showed that tax expenditures can dramatically alter comparative AEM relationships in sections of the US where local governments are heavily dependent on local property tax levies to fund public services (Bills and Gross, 2005). However, recent economic research and literature in the U.S. fails to acknowledge the influence tax expenditures wield on AEM funding (see for example, Batie 2003; Blandford and Boisvert, 2002; Dobbs, 2002; Dobbs and Pretty, 2001; Dobbs and Pretty, 2004; Hellerstein et. al., 2002; Hollis and Fulton, 2002; Libby, 2000).

Calculations for aggregate New York State federal and state subsidy, inclusive of tax expenditure estimates, are presented in Figure 7. This estimate goes across the board and includes federal support for both AEM and direct payments for all other farm programs. Similarly, State funding for both water quality and farmland protection measures is included in the estimate. While references to such state and local program support are sometimes ignored in debates over international trade relationships and in WTO negotiations, results presented here for New York suggest that state and local efforts can be an instrumental component of the agri-environmental management regime in the US. Consideration of state contributions in New York State boosted average public subsidy from €60 to €88 per hectare of cropland in New York State 2004 (Figure 7). Time series calculations show that state contributions are increasing systematically in

current terms, with support nearly doubling over the nine year interval 1996-2004. The increase is attributable both to higher state appropriations but also to steady increases in the value of benefits generated through property tax expenditures.

### Expenditures in the EU and Germany

The design of the programs of the Second Pillar is only one indicator of the effectiveness and efficiency of pursuing environmental objectives by the EU and its Member States. At least as important for judging the priority policy gives to environmental goals are AEM expenditures in comparison to the market and production subsidies received by farmers in the EU under Pillar I. The CAP budget has been rising steadily in over the years but has been capped as a consequence of the EU enlargement from 15 to 27 Member States. For the upcoming budget period, 2007-2013, of the fixed budget amount is 371 billion €. For 2007, € 52,441 million have been dedicated to Natural Resources with the biggest part reserved for agriculture.

The task here is to put these expected in outlays in perspective for the EU and for Germany, using the best available data. Unfortunately, data available are confined at this time to values for EU-27. This broadens the discussion to include nations just now ascending to EU membership and distracts from comments made above using the EU-15 as reference point. With these reservations in mind, the EU planned outlays for the CAP in 2007 is shown in Figure 8. Total subsidy is expected to approach €36.9 billion this year with 70% and 19%, respectively, allocated to the newly crafted single farm payment (SFP) and rural development.

Within the broad rural development category is an understory of programs, some of which focus on agri-environmental management (AEM). To illustrate, we weight these expected outlays by total utilized agricultural area (UAA) as shown in Figure 9. A further distinction is made between expected outlays for AEM and other categories of rural development assistance. Following this data protocol, the single farm payment, on average for all EU-27 member countries, is expected to average €228 per UAA. In contrast, AEM payments are pegged at €14/ha UAA while other rural development support is estimated at €47/ha UAA. This brings total support to €289, on average, for every utilized agricultural hectare. It should be noted that these estimates are materially

less than the values reported for EU-15 in Figure 4. Part of that discrepancy is due to the reporting year (the previously discussed EU-15 estimates were for 2006 instead of 2007) while most the remainder probably relates to averaging outlays across 27 rather than 15 member states.

Figure 9 displays companion data for Germany. Single farm payments are pegged at €338 per ha of utilized agricultural area, an amount well above the EU-27 average of €228. Expected expenditures for AEM are more in line with the EU average at €17 per ha. Other rural development payments amount to €53 per ha, bringing expected total assistance to German farmers to an estimated at €406 for every hectare of cropland, pasture and grassland.

The emphasis placed on AEM measures in Germany will be somewhat different than other EU member states. In some cases, the first Pillar-single farm payments-will receive greater emphasis (Osterburg et al. 2007). Programs in Austria, Portugal and Finland future a distinct emphasis on the Second Pillar compared to the share of payments farmers receive from the First Pillar. In contrast, farmers in France, UK, Denmark and the Netherlands receive, by far, most of their support payments from the First Pillar. This picture will change slightly as member states increase shares or for the Second Pillar by modulation, which moves the Second Pillar above the compulsory share of 5%. Funding available for the Second Pillar also varies substantially in absolute terms. For example, in Austria about 160 €/ha UAA is available while in the UK less than 20€ can be paid per ha UAA. The EU average is at about 61 €/ha UAA. Finally, an increasingly critical source of country to country variation stems from the growing presence of national and regional contributions to top off EU funding.

## **Discussion**

Our assessment of agri- environment payments in Europe and Germany suggests that, in general, only a small and shrinking share of CAP payments in the EU are dedicated to AEMs, but there is much variation among member nations. Most of this variability can be explained by differences in the ability and willingness of member states to co-finance the EU payments. Rising world market prices for food and dedicated energy crops will probably attenuate this problem and

accelerate the conflict between AEM payments and support for production of cash crops (European Commission 2007b). The amount of money necessary to finance common conservation objectives and obligations of the member states will likely exceed the budget share these states have earmarked for that purpose up to now. Either a more robust modulation or a rearrangement of budget between the first and second pillars of the CAP will be needed to solve this problem.

In addition, the targeting of these payments to environmentally sensitive or especially valuable sites is left to the discretion of the member states. A direct consequence is that funding is very diverse and in many member states, like Germany, only to a very small degree decided based on exacting requirements for environmental protection. Such funding for environmental goods and services was a major thrust of this paper but the comparisons we are able to make are far from satisfying. Clearly, more can be done to smooth and rectify the comparative data. We suggest that such steps are probably worth taking as the international discussion over improved environmental management for farm and food production widens and deepens. To date, too little of that discussion is data driven and, as a result, policymakers cannot benefit from the insights that can come from both qualitative and quantitative assessments of program direction in various nations.

The comparisons and contrasts arranged here do showcase substantive differences in the funding levels for AEM and add perspective on just how those outlays relate to total public financial support for agriculture in the EU and the US. Secondly, this paper highlights evolving policy concerns about targeting of AEM measures and their efficacy in meeting public program goals and objectives. We want to emphasize that this issue will likely become more attenuated over time as more responsibility for AEM programs is devolved to EU member states.

The overall paradigm for farm support is moving in the same general direction in the EU and in the US, with more emphasis on environmental goods and services and a greater inclination to target priority natural resources issues. However, in the US, commodity and farm income from is still tied to production of a handful of program crops. Steps to uncouple that support and materially reorder assistance to farmers and landowners are debated but initial indications are that legislative action anticipated in the

next few months will not lead to such a major change in federal policy direction. In the EU, decoupled farm or area based payments were implemented in 2003.

Our analysis graphically illustrates that, on average, total US federal farm subsidies are lower on an area basis by orders of magnitude compared to the EU. The picture is far less clear, however, when comparisons move to AEM and a more nuanced view of public support that acknowledges layered efforts by different units of government. The mainstream American literature and policy debate is quite disappointing in this regard. Discussion too often begins and ends with federal farm policy. Overlooked in these instances are the substantial investments some state and local governments make to assist farmers and landowners with AEM measures to control pollution and improve water quality. Greater sums are spent on farmland protection measures and these investments are sometimes swept into the discussion of AEM financing and sometimes they are not. Regardless, comprehensive and comparable data on the state and local assistance for water quality management on US farms are not known to exist in the US.

Looking at high profile USDA conservation programs, direct support to US farmers and landowners has been in the range of €7-10 per ha cropland in recent years. In comparison, for the last budget period, EU expenditures for AEM are more than €16 per ha of utilized agricultural area. To begin to advance a more incisive discussion of funding, we exploited data generated for New York State and initiated a more comprehensive comparison with expenditures in Germany. Even with all funds considered, public subsidy for New York farmers and farmland owners is exceedingly low compared to the EU and indeed Germany. New York State produces few federal program crops and thus receives relatively low income support payments. On the conservation front, federal funds are limited in New York because few New York landowners opt for the USDA's expensive land retirement programs, the CRP in particular. But, on the other hand, state outlays are enormously important and full consideration of state support, in 2004, boosted total subsidy per ha cropland from €60 to €88. Comparisons with Germany are mixed. As expected, overall public support for German agriculture is higher than that for New York State by orders of magnitude. For 2007, overall support is estimated at €408 per ha UAA. Of this amount in Germany, €17 is identified as AEM expenditures. This means that AEM support New York State, when

state and federal funds are considered together, is roughly comparable. That is, in 2004, after taking direct cash subsidy and tax expenditures into account, state support alone in New York was €28 per ha cropland; federal AEM support brought that total to €31. Weighting these expenditures with a measure similar to Germany's utilized Agricultural area (UAA) would bring New York State outlays into the vicinity of those reported for Germany. The amount of money spent on AEM in New York State may come as a surprise to those Europeans who perceive AEM support in the EU to be on the cutting edge. However, we recognize that better evidence is required, along with a more thoughtful analysis of the demographic, social, and structural subtleties between countries.

Environmental concerns were integrated into US farm policy several generations before such changes took place in the EU. However, in the US, the range of addressed environmental issues was rather narrow for several decades with an emphasis on soil erosion and land retirement. Today, US programs have broader focus but do not directly address landscape amenities and biodiversity. In sharp contrast, in the EU a high number of AEMs aim at improving or maintaining nature and landscape. Moreover, another striking difference between EU and US programs is the amount of effort put into targeting. For Europeans, targeting efforts in the USDA are a hallmark of American AEM programs along with implementation of bidding systems, in some cases, to help guide allocation of public funds. In contrast, evaluations of the EU and German programs show that most contracts and (substantiated for Germany) finances go to spatially untargeted measures. We estimate that about 20 percent of the AEM expenditures in Germany are targeted to priority sites using appropriate environmental information for landscape planning. However, even in the case of spatially targeted programs, the uptake and efficiency is hampered by flat rate payments, which are too low for some difficult sites and too high for others.

In the US, as well as in the EU and the German federal system, a considerable and growing amount of discretion over agri-environment programs is given to the states. However in the case of the US, this diversity largely expresses itself in additional financial contribution by the states to a federal core which is designed and promulgated at the federal level. A noteworthy exception is state initiatives to alter state property tax laws to afford farmers and farmland owners relief from the local property tax. It can be

shown that the resulting tax expenditures materially affect the level of AEM benefits in American states that are heavily dependent on the local property tax to fund public goods and services. Property tax considerations appear to be a far lesser importance in the EU. And, additionally, the AEM framework supplied by the EU is interpreted differently by the member states. One obvious effect of this policy is the lack of transparent data in the EU, while in the US, at least at national and state level, concise data on direct federal support is now readily accessible. Another effect, exemplified by the situation in Germany, is the disconnect between expenditure on AEM on one hand and environmental problem density/priorities on the other. This disconnect will take on considerable importance if EU priority areas cannot be safeguarded and managed properly in member states which are relatively poor or do not emphasize environment in their rural development programs.

AEM payments have to be ultimately judged in the context of the complete toolbox used to solve agri-environmental problems, as the different tools may substitute each other. A distinct difference in that respect between US and EU is that good farming practice and other legal obligations, arguably, address a much broader range of environmental issues in the EU compared to cross compliance measures now in play in the US. The EU obligations refer to all utilized agricultural areas (UAA) and in general the enforcement mechanism is centered on conservation compliance with the good farming practice rules. The scope of conservation compliance, instituted in the US more than 20 years ago, is more problematic. Farm legislation in the mid-1980s mandated conservation compliance on actively cropped land designated as being highly susceptible to soil erosion from rain or wind. Acceptable levels of erosion control, however, are not mandated but instead represent a precondition for receiving federal program support. Crop area falling under conservation compliance is only a fraction of the total, because much American cropland erodes at or below accepted erosion tolerances under current management. And, since not all farmers and all farmland owners have substantial access to federal program support, it is not always clear that denial of such benefits is a sufficient incentive to always deter less than satisfactory land stewardship. Conservation compliance provisions extend to fragile grasslands conversion and wetlands conversion, but again, compliance is voluntary.

Turning to broader land-use concerns, conversion of farmland to developed uses is a policy issue of some import in the US and the EU. Along with tax expenditures, the centerpiece of farmland protection effort in the US is arranging funding to acquire farmland development rights from farmers and other farmland owners. These payments to US farmers and landowners for development rights have no parallel in the EU AEM system, with member nations choosing zoning and other mechanisms to elevate control of these property rights to the national level.

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Figure 1: Selected standards of the German Advisory Council on the Environment

<b>Standard</b>	<b>explanation</b>
<i>Compliance with EU legislation</i>	The requirements of the habitats and Bird Directive, the ground water and pesticide directive, sludge directive and the nitrate directive as well as regulations about food and animal feed, registering of animals, animal protection must be followed.
<i>Minimum soil cover</i>	Between 1 December and 15 February at least 40% of the total arable area of a holding must either be covered/seeded with plants or the farmer will not be allowed to plough the remaining area. The farmer could also fulfill the measure if he or she does not plant winter crops so long as they do not plough up 40% of the harvested area before 15 February.
<i>Retain terraces</i>	
<i>crop rotations</i>	Establish a crop rotation of at least 3 kinds of arable crops, each with at least a 15 % share of the total arable land. All cereals count as one kind of arable crop, as do summer and winter crops of the same type. Permanent and multi-annual crops cannot be counted as an element of the required crop rotation.
<i>Measurement of soil organic matter Control of soil erosion</i>	Evaluate the humus balance of the soil every year. On average over a 3 year period, the humus balance cannot fall below a threshold value of minus 75kg of humus carbon material per hectare per year. If the humus balance falls below this level, advice must be taken. Alternatively, farmers can examine the organic composition with the help of scientific soil tests, which must be done at least once every six years. At the same time, and continuing until 2009, all areas will be assessed to determine their real and potential risk to soil erosion. A regionalised map graded according to erosion risk will be developed. In turn, more strategic measures and concrete controls will be implemented to tackle any problems from 2009.
<i>Burning of stubble prohibited</i>	
<i>Minimum Level of Maintenance</i>	All arable land subject to obligatory or voluntary set-aside must be greened or maintained as self-seeding. All set aside arable land or permanent grassland must be cut and distributed evenly across the whole area once a year, or be mown every two years and the cuttings then removed or be mown at least every two years if the mowed material is removed. Mowing after July 15 <sup>th</sup> to protect young animals. Furthermore, each regional government can implement additional measures for special nature conservation and environmental protection reasons for permanent grassland.
<i>Protection of landscape features</i>	It will be forbidden to remove the following landscape features: a) Hedges that run for a length of at least 20m. b) Tree rows that contain at least five trees and run for a minimum length of 50m. c) Field woods that range in size from 100m <sup>2</sup> to 2000m <sup>2</sup> . d) Wetland habitats up to a maximum size of 2000m <sup>2</sup> (in Germany also protected by the German Federal Nature Conservation Act). It is stressed that the farmer has no responsibility to take care of any of the above mentioned landscape features; such management may be paid by the Agri-Environment schemes.
<i>Permanent pasture</i>	Farmers may reduce permanent pasture by up to 5% (regional or farm level). If more pasture is converted e.g. into arable land, the government is obliged to introduce corrective measures. At 10% reduction the farmer has to compensate for the lost grassland

Source: European Commission 2005: COUNCIL REGULATION (EC) No /2005; IEEP 2005

Figure 2: Share of different types and objectives of agri-environment measures in the Member states of EU 15 (2000-2005)

<b>Objectives and examples of AEM</b>	<b>Number of AEM</b>	<b>%</b>
<b>Water</b> : e.g. reduction of fertiliser and pesticide, reversal of drainage	597	32
<b>Soil</b> : e.g. erosion control, maintenance of organic matter	308	16
<b>Biodiversity</b> : e.g. habitat conservation, landscape structures, habitat networks, conversion of arable land into grassland, species conservation, cultivation of areas where extensive agriculture is retreating	754	40
<b>Others</b> : e.g. organic agriculture, rural landscapes	224	12

Source: Société Oréade-Brèche 2005 (summarised)

Figure 3. Agri-environmental Payment Programs in the US

Land Retirement Programs

- **Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP):** Annual payments and cost-sharing to establish long-term, resource-conserving cover, usually grass or trees, on environmentally sensitive land.
- **Wetlands Reserve Program (WRP):** Cost-sharing and/or longterm or permanent easements for restoration of wetlands on agricultural land.

Working-Land Payment Programs

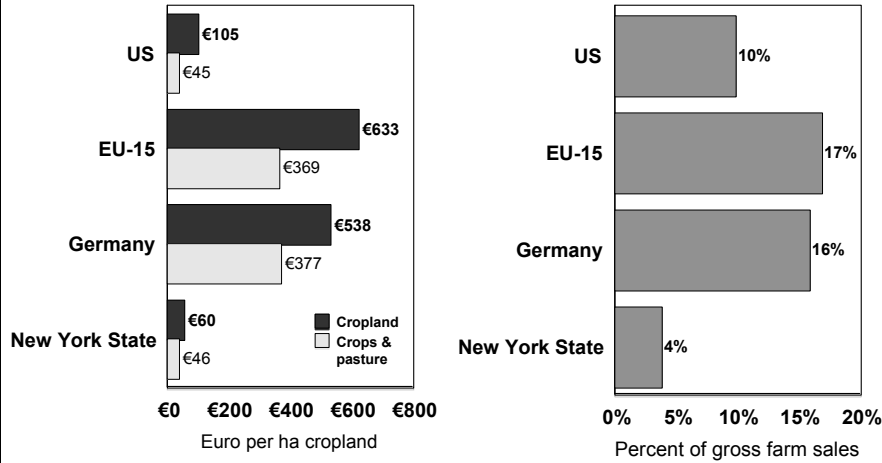
- **Environmental Quality Incentives Program (EQIP):** Technical assistance and cost-sharing or incentive payments to assist livestock and crop producers with conservation and environmental improvements on working lands.
- **Conservation Reserve Program (CRP) Continuous Signup:** Cost-sharing and annual payments to producers who establish “buffer” practices such as riparian buffers, filter strips, grassed waterways, and contour grass strips to intercept sediment and nutrients before they leave the field.
- **Wildlife Habitat Incentives Program (WHIP)** provides cost-sharing to landowners and producers to develop and improve wildlife habitat.
- **Conservation Security Program (CSP)** will reward demonstrated land stewards for implementing appropriate land-based practices on working lands that address one or more resources of concern, such as soil, water, or wildlife habitat.

Agricultural Land Preservation Programs

- **Farm and Ranch Lands Protection Program (FRPP):** Funds to State, tribal, or local governments and private organizations to help purchase development rights and keep productive farmland in agricultural use.
- **Grassland Reserve Program (GRP):** Long-term contracts and easements limiting use to haying and grazing activities while restoring/maintaining native grass and shrub species.

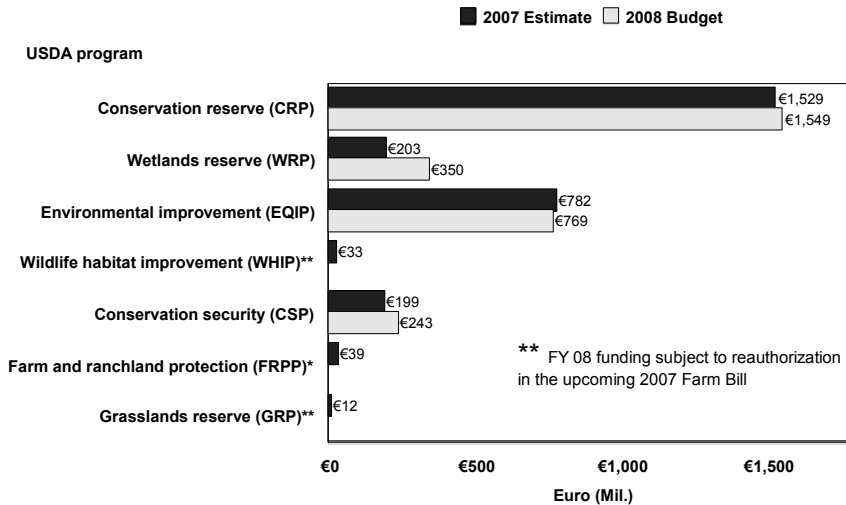
Source: Adopted from Cattaneo, et al.

**Figure 4. Estimated federal direct farm payments for the US and New York State (2004) with comparisons for the EU-15 and Germany (2006)**



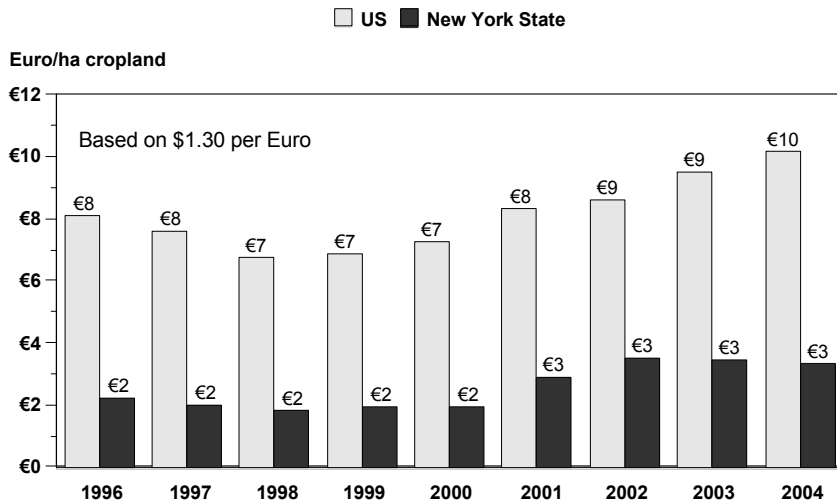
Source: Eurostat, 2007 and USDA-ERS, 2007

**Figure 5: Federal direct payments for AEM programs administered by the USDA**



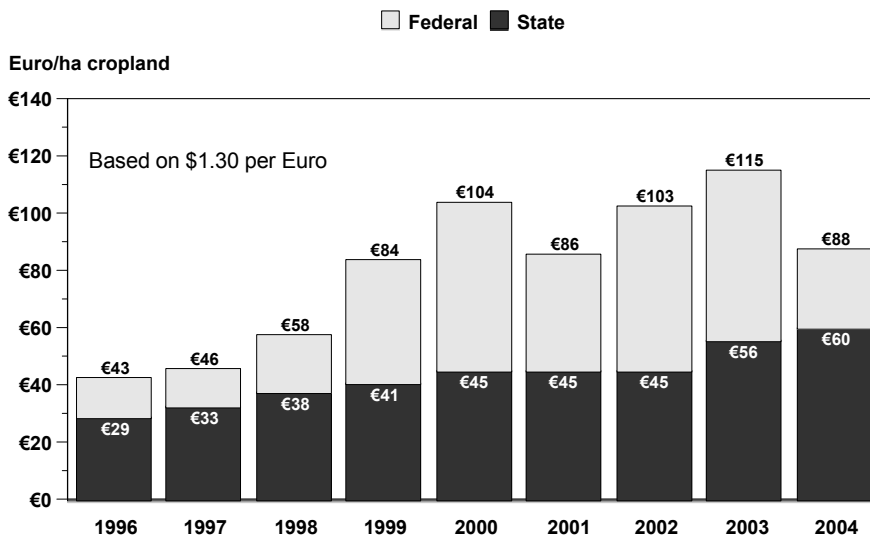
Source: USDA, Office of Budget and Policy Analysis

**Figure 6. Direct federal AEM payments for the US and New York State, 1996-2004**



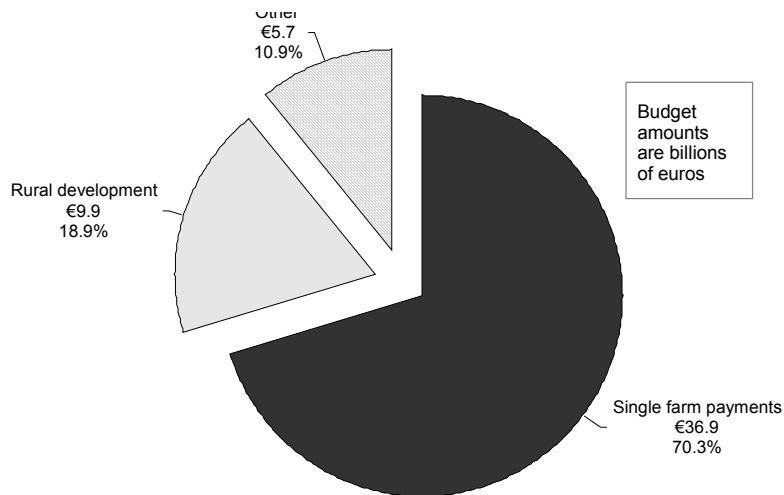
Source: USDA-ERS (2007a)

**Figure 7. Estimated federal and state subsidies for farming, New York State, 1996-2004**



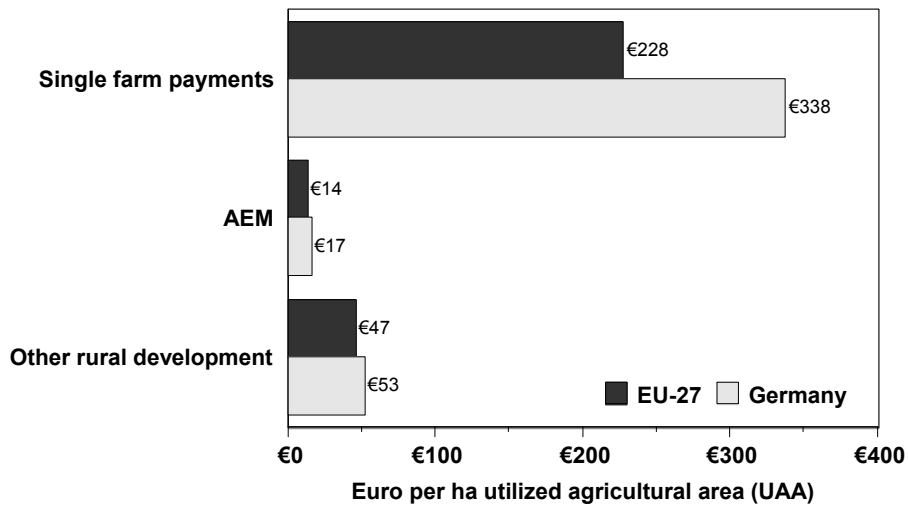
Source: USDA-ERS (2007a) and Bills et al (2005)

**Figure 8: EU common agricultural policy (CAP) budget for EU 27, 2007**



Source: von Harren and von Ruschkowski (in preparation); data: European Commission (2007)

**Figure 9: Agricultural payments by purpose, Germany and average for EU-27, 2007**



Source: von Harren and von Ruschkowski (in preparation); data: EU Commission (2007); Eurostat (2007); BMELV (2007)