

PART II
Chapter 6

**A Case Study
of Policy-related Transaction Costs
in Land Conservation Programmes
in the United States**

Executive Summary

The Conservation Reserve Program (CRP) has been the largest land retirement programme, and the largest US conservation programme of any kind. CRP is a voluntary programme that offers annual rental payments, incentive payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland.

As of June 2004, there were 34.8 million acres enrolled in CRP, with 2.8 million of those acres in partial-field enrolments under the continuous signup, Conservation Reserve Enhancement Program (CREP), and the Farmable Wetland Program (FWP). More than 660 000 contracts were in force with more than 390 000 farmers covering this acreage. The annual rental cost was almost USD 1.7 billion, and the average rental cost per acre was USD 48. About 60% of CRP acreage was planted to grasses, 16% to trees or woody vegetation for wildlife, and 5% was dedicated to wetland restoration. The programme is authorized at 39.7 million acres for enrolments under 10-15 year contracts through 2007. The current CRP program targets land retirement to increase the cost-effectiveness of the programme, and adjusts the payment to closely match the market value.

Responsibility for implementing CRP is shared by two of the US Department of Agriculture's largest agencies. Educating and providing technical assistance to farmers rests with USDA's Natural Resources Conservation Service (NRCS), while financial assistance paid to farmers is administered through USDA's Farm Service Agency (FSA). Other USDA, Federal, State and local government agencies have also played roles in developing and implementing conservation programmes, but their participation is usually short-lived *ad hoc* a minor financial commitment, and not easily captured in agency budget accounts.

The primary form of technical assistance provided in CRP is preparation of the conservation plan for CRP acres. An approved conservation plan is required before a CRP contract can be approved. Before approving CRP contracts, the FSA County Committee reviews and approves the plan to ensure that the plan meets all requirements. FSA has responsibility for issuing and implementing the contract for financial assistance, and making payment. The approved conservation plan obligates CRP participants to establish and maintain approved practices. NRCS has responsibility for monitoring and enforcing technical aspects of the plan's cover and practice establishment and maintenance, while FSA ensures that other contract terms continue in force.

Overall, the costs to the government of implementing the CRP are relatively low, running from 3% of expenditures in initial years and 1% in succeeding years for NRCS technical assistance, and about 4% of expenditures for FSA administrative support costs. This amounts to about USD 60 per acre enrolled in initial years of a ten-year enrolment period, and about USD 20 per acre in succeeding years. These costs are less than comparable costs for the Wetland Reserve Program, and much less for working land programmes such as Environmental Quality Improvement Program (EQIP) and its predecessor programmes. The absolute size of rental payments in CRP dwarfs transaction costs in ways that cost-share funds under working lands programmes do not.

FSA administrative costs are highly correlated with programme characteristics, especially the cumulative acreage enrolled, with each additional acre increasing costs by USD 1.79. NRCS technical assistance costs are more variable, and are significantly correlated with acres idled or installed in a given year (adding USD 2.39 per acre) and cumulative acres enrolled (adding USD .30 with each additional acre) in each year. NRCS costs increased significantly between the first CRP signups and the second set after 1996. The signs and magnitudes of other correlates are interesting, but not statistically significant.

Conservation technical assistance overall has declined from peak levels in the mid-1970s, despite an increase in management-related practices. Congressional support for technical assistance may be dropping, as evidenced by issues related to the Section 11 cap on reimbursement, caps on technical assistance in the new Conservation Security Program (CSP), reliance on third-party technical assistance providers, and mandates for studying conservation planning reform.

Information technology, centralisation of functions, and other administrative improvements can reduce technical assistance and administrative transaction costs, and perhaps improve the ability to evaluate resource concerns and conservation plans to correct them, and has partly compensated for reduced technical assistance availability in recent years. In particular, FSA has invested in distributed, web-based signup processes and software that have substantially reduced the burden of signup on their local county offices. Continued decreases in technical assistance at the field level and reliance on online resources and information technology can and have made some cost reductions, but cannot indefinitely substitute for face-to-face, on-the-ground technical assistance provided by trained conservationists to producers. Technical assistance is not merely a policy-related transaction cost to be overcome, but part of the programme itself.

Acronyms for USDA conservation agencies and programmes

Acronym	Description
ACP	Agricultural Conservation Program (FSA)
ASCS	Agricultural Conservation and Stabilisation Service, now FSA
CCC	Commodity Credit Corporation
CD	Conservation District
CED	County Executive Director (FSA)
C.F.R.	Code of Federal Regulations
COC	County Committee (FSA)
CPA	Conservation Priority Area in CRP
CRBSCP	Colorado River Basin Salinity Control Program
CRP	Conservation Reserve Program (FSA)
CREP	Conservation Reserve Enhancement Program (FSA)
CSP	Conservation Security Program (CSP)
CTA	Conservation Technical Assistance Program (NRCS)
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorisation Amendments
DC	District Conservationist or Designated Conservationist
EBI	Environmental Benefits Index in CRP
ECP	Emergency Conservation Program (FSA)
EI	Erodibility Index

Acronyms for USDA conservation agencies and programmes (cont.)

Acronym	Description
EQIP	Environmental Quality Incentives Program (FSA)
EPA	Environmental Protection Agency
FACTA	Food, Agriculture, Conservation, and Trade Act of 1990
FAIR	Federal Agriculture Improvement and Reform Act of 1996
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIP	Forestry Incentives Program (FS)
FRPP	Farm and Ranchland Protection Program (NRCS)
FSA	Farm Service Agency
1985 FSA	Food Security Act of 1985
FS	US Forest Service in USDA
FSRI	Farm Security and Rural Investment Act of 2002
FWP	Farmable Wetlands Program (FSA)
FWS	US Fish and Wildlife Service in USDOI
GAO	General Accounting Office
GIS	Geographic information system
GPCP	Great Plains Conservation Program
GRP	Grassland Reserve Program (FSA)
HEL	Highly Erodible Land
MARR	Maximum Acceptable Rental Rate in CRP before 1990
NACD	National Association of Conservation Districts
NEPA	National Environmental Policy Act of 1970
NPPH	National Planning Procedures Handbook
NRCS	Natural Resources Conservation Service
OBPA	Office of Budget and Program Analysis
OECD	Organisation for Economic Cooperation and Development
PRTC	Policy-related transaction costs
RCWP	Rural Clean Water Program (NRCS)
SCS	Soil Conservation Service, now NRCS
SRR	Soil adjusted rental rate in CRP after 1990
T&E	Threatened and endangered species
TSP	Technical Service Provider provision
USDA	US Department of Agriculture
USDOI	US Department of the Interior
WBP	Water Bank Program
WHIP	Wildlife Habitat Incentives Program
WQIP	Water Quality Incentives Program
WRP	Wetland Reserve Program

6.1. Background

This case study examines the evolution of land conservation programmes in the United States and provides estimates of technical assistance expenditures and other implementation costs for the Conservation Reserve Program (CRP), the Wetland Reserve Program (WRP) and the Environmental Quality Improvement Program (EQIP) and their predecessors.

Policy-related transaction costs and technical assistance

This chapter is a case study of the US Conservation Reserve Program (CRP, see Appendix for Acronyms), in the context of programme delivery for other US Department of Agriculture (USDA) conservation programmes. The primary focus of the case study is on the levels of and trends in administrative and technical assistance costs incurred by USDA agencies implementing CRP and other conservation programmes. However, before launching into that examination, it is useful to consider how well these costs really fit the economist's concept of transaction costs, definition of PRTC's adopted in Chapter 1, and the extent to which they can even be logically separated from delivery of the programmes they are intended to implement.

Economists use the term "transaction costs" to mean many things, ranging from very specific kinds of charges associated with narrow market transaction in particular markets to very broad categories of expense associated with corporate structure and industrial organisation.¹ Chapter 1 is using the term in a narrower sense to encompass only administrative or implementation costs associated with a particular programme. Both of these senses, however, have a pejorative connotation that implies transaction costs are a kind of "friction" on the system that should be eliminated or minimised. The underlying question addressed in this topic shows that transaction costs are invariably considered as negative, since they are seen as offsetting economic benefits.

This attitude toward transaction costs, combined with an understandable reaction to bureaucratic excesses in some kinds of programmes, leads policy makers to prefer market-based policies whose efficiency seems to be determined by proportion of expenditures that can be directly paid to producers. In the case of agri-environmental programmes, not all costs of implementing the programme decrease cost-effectiveness, and some may be as valuable (or more valuable) than the financial assistance paid for the "practice". This should be clear if we enumerate the categories of PRTCs identified in Figure 1.1 of Chapter 1, which occur in the CRP program.

Initial and final costs

While a certain amount of agency staff time was expended in designing the modern CRP in 1985 (and redesigning it after the 1990, 1996 and 2002 Farm Bills), much of the effort was undertaken by a small number of policy specialists whose job is designing and providing input to such programmes, and is essentially a fixed (and sunk) cost, although the opportunity costs of research foregone by those specialists is a real, but small, cost. Many of the participants in the design process actively engaged in the trade-off between requiring more elaborate environmental and economic bid assessment and reducing administrative burdens on the agencies they represented in implementing it. Likewise, such *ex-post* evaluations of programme performance as have occurred are grist for the political process of comparing expenditures on one programme to another, on agri-

environmental programmes to other environmental policies, and on comparing agricultural programmes to other functions of government. These activities contribute to the overall efficiency of the governance process and are not fairly counted to just the programme itself. Only those expenditures within the primary agencies responsible for the programme are accounted for in this case study.

Implementation costs

Most of the administrative data on programme expenditures fits into this category, and it is reasonably comprehensive for the primary agencies involved in running CRP. Some of these steps (filling out forms, cutting checks, etc.) can and should be accomplished as efficiently as possible and share in benefits from centralisation and decentralisation in USDA-wide reorganisations accomplished in 1994 that consolidated such administrative functions across the entire department (GAO, 2000). For example, USDA's National Finance Center processes checks for CRP participants as only part of the complex of farm programme payments and financial transaction (payroll, personnel, etc.) for all USDA and many other Federal agencies. USDA's traditional decentralisation of field offices to the county level accomplishes administrative efficiencies because Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS) staffing for CRP is only part of a full slate of administrative and technical services provided for conservation and other farm programmes. Having county offices also reduces producers' transaction costs (travel, communication, information) that would be imposed by a more centralised staffing.

Technical assistance costs are a larger cost of implementing CRP that combines aspects of transaction costs with the substance of the programme itself. Identifying and targeting resources to be protected and developing the conservation cover plans needed to accomplish that protection are tasks that require trained resource professionals working in close concert with the producer on the land. While modern information technology can reap efficiency rewards in some cases, excessive reliance on information technology could result in poorly targeted and ill-planned land retirement.

Previous USDA land retirement programmes (the original CRP and Soil Bank) in the 1950s and 1960s were not targeted to specific agri-environmental resources (highly erodible land, wetlands, water quality, wildlife habitat), nor was conservation cover planning aimed at correcting or improving specific resource issues. While it is not possible to quantitatively compare the environmental impacts of current and earlier programmes because earlier programme impacts were not studied and because of systemic changes in agricultural production techniques and markets, it is generally believed that environmental benefits from current land retirement are far greater than in the past.

Participation costs

There is little data on the costs producers incurred in enrolling land in CRP, with the exception of some small-scale surveys of producer satisfaction with the signup process. While it is certainly desirable to minimise the administrative burden of applying for and enrolling in the programme, it can be argued that the time producers spend working with resource specialists on technical assistance in selecting parcels to enrol and developing conservation cover plans has value above its necessity for implementing the programme. Indeed, another long-standing NRCS conservation program, the Conservation Technical Assistance (CTA) program provides nothing but staff time to interact with producers, and much of the State-Federal Cooperative Extension effort in conservation is similarly devoted

to working one-on-one with producers. While efficiencies should be sought in delivering this part of the programme, the goal should be to enrich the time spent in targeting and planning, not eliminating it.

Plan of the chapter

The balance of this chapter covers the following areas:

- A brief description of the CRP program.
- The evolution from whole-farm conservation planning to programme-based technical assistance.
- The evolution of the interagency roles of FSA and NRCS in administering CRP and other conservation programmes.
- The differentiation between costs of developing and administering programmes such as CRP, technical assistance to producers for applying for the programme, and technical assistance in applying conservation on the ground once an application is approved.
- The interplay between open enrolment, complex evaluation of applications, and cost-effectiveness in administering CRP.
- Comparing and contrasting technical assistance expenditures for annual rental programmes like CRP, long-term easement programmes like WRP, and conservation on working lands like the former ACP and current EQIP programmes.
- Trends in the willingness to fund technical assistance (*versus* rental payments, cost-share, etc.) when the trend in conservation is toward more and more “management” practices that require even more technical assistance.

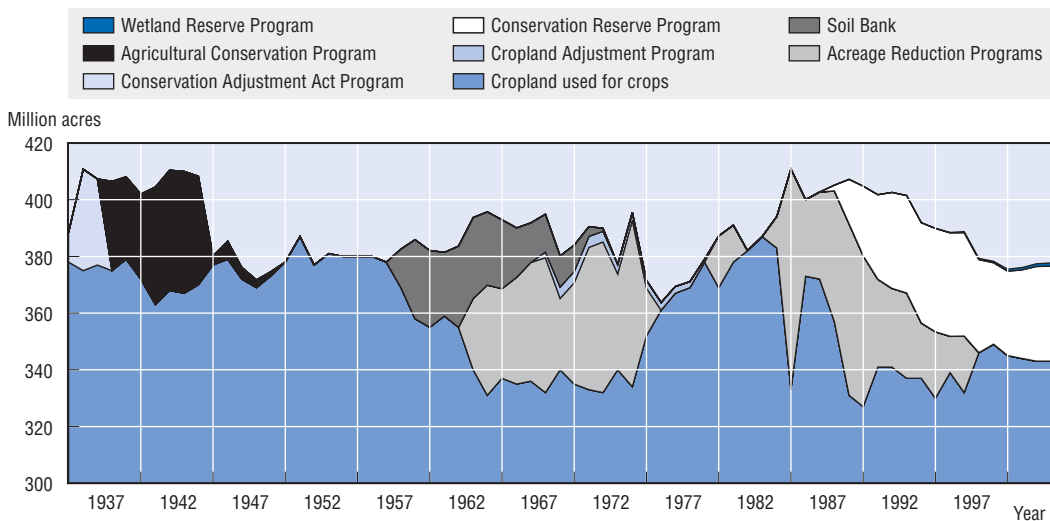
The analysis is conducted using budget data on administrative support, technical assistance, cost-sharing, and rental payments for CRP and other USDA conservation programmes from 1983 to 2002 (USDA, OBPA, 2002). A longer time series on conservation expenditures from 1936 to 1999 is also used to illustrate longer-term trends in technical *versus* financial assistance.

6.2. The Conservation Reserve Program

Land retirement has been a common agricultural policy tool in the United States since the 1930s, when dual concerns over low farm income and resource problems, such as soil erosion, flooding, and drought, were both addressed by reducing cultivated acreage. The United States has periodically instituted programmes to idle cropped acreage, with peak enrolments varying inversely with net farm income. Historically, these programmes have been instituted when agricultural prices were low, and acreage came out of enrolment when prices recovered. Land retirement programmes in the US (including annual set-asides) averaged 31 million acres between 1933 and 2001, (8% of cropland used for crops; Figure 6.1). Land retirement ranged as high as 78 million acres (20%) in 1983. In only 10 years (1948-55 and 1980-81) was no cropland retired in such programmes.

CRP has been the largest land retirement programme throughout this period, and the largest US conservation programme of any kind. CRP is a voluntary programme that offers annual rental payments, incentive payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland. One potential difference between the United States and many other countries is that in the United States, private landowners have almost no limitations on how they can use their land for agricultural or

Figure 6.1. History of US land retirement programmes, 1933-2001



Source: Heimlich (2002).

forestry purposes. There are no national laws, and only a few State or local regulations that significantly restrict landowners' use of their land (Taylor, 2001). Consequently, any attempt to influence land use or adoption of conservation practices has to rely on direct voluntary incentives, or indirect incentives provided through other voluntary programmes.

As of June 2004, there were 34.8 million acres enrolled in CRP, with 2.8 million of those acres in partial-field enrolments under the continuous signup, Conservation Reserve Enhancement Program (CREP), and the Farmable Wetland Program (FWP) (USDA-FSA, 2004). More than 660 000 contracts were in force with more than 390 000 farmers covering this acreage. The annual rental cost was almost USD 1.7 billion, and the average rental cost per acre was USD 48. About 60% of CRP acreage was planted to grasses, 16% to trees or woody vegetation for wildlife, and 5% was dedicated to wetland restoration. The programme is authorized at 39.7 million acres for enrolments under 10-15-year contracts through 2007. The current CRP program targets land retirement to increase the cost-effectiveness of the programme, and adjusts the payment to closely match the market value.

Targeting

In the 1930s, when land retirement was first tried as a policy instrument, little attention was paid to specific criteria for identifying which land to retire. Quantitative tools developed for conservation planning at the farm level were extended to conservation policy planning at the regional and National level during debates about the 1985 omnibus farm legislation. A kind of "triage" was performed on the Nation's cropland (Bills and Heimlich, 1984). Land that would not result in high erosion rates even if farmed intensively was deemed "nonerodible". Land on which erosion rates could be successfully controlled through the use of conservation tillage and other practices, while remaining in crop production, was classed as "moderately erodible". "Highly erodible land (HEL)" was defined as land that, even if farmed under the most rigorous conservation practices, would still produce unacceptable rates of soil erosion.

CRP, enacted in the 1985 Food Security Act (FSA), adopted this targeting scheme, restricting enrolment to highly erodible cropland. A goal of enrolling 45 million acres of the

142 million acres of HEL by 1990 was included in the legislation. Of 36.4 million acres enrolled between 1986 and 1993, 8% were eroding at more than 40 tonnes per acre per year (TAY), and 83% were eroding at greater than 10 TAY (Osborn *et al.*, 1995). Later analysis showed that more than half of the land enrolled was HEL, resulting in savings of 281 million tonnes of soil per year (USDA-SCS, 1994). Average erosion rates on HEL land were reduced from 8.6 to 0.6 TAY for water-caused erosion, and from 10.7 to 1.3 TAY for wind erosion. In total, CRP enrolment reduced total erosion by 12%, accounting for 38% of erosion reductions between 1982 and 1992. Of 1.2 billion tonnes of sheet and rill and wind erosion reduced between 1982 and 1997, on net from all sources, 406 million tonnes (34%) was due to CRP (Claassen *et al.*, 2001).

The focus on HEL land implicitly recognized that soil erosion reduction was the primary environmental objective of the programme and enrolled land with the greatest inherent capacity to produce erosion. By 1990, however, it became clear that soil erosion itself was not as important a goal as had been previously thought. In particular, physical and economic studies of the effects of observed rates of erosion on crop productivity showed that onsite impacts paled in comparison with the impact of erosion and sedimentation on water quality, fish and wildlife habitat, and public services such as dams, ditches, and canals (Crosson and Stout, 1983; Larson *et al.*, 1983; Clark *et al.*, 1985; Ribaud, 1986; AAEA, 1986). These findings sparked growing interest in conservation policies that would mitigate the offsite impacts of erosion, and related nutrient and pesticide runoff (Ogg *et al.*, 1989). In addition, the importance of land retirement for creating and improving wildlife habitat associated with farmland, and the social and economic benefits people derived from these changes, prompted greater attention to these impacts (Berner, 1989; CAST, 1990; Allen, 1994). Finally, rebounding commodity prices blunted the desire to meet the 45 million acre enrolment goal, resulting in a 36 million acre enrolment cap in the 1990 FACTA act. Enrolling the “best” acres (those with the highest environmental benefits per dollar spent) with the remaining acreage became more important than enrolling as many acres as possible.

As a result of these three factors, following the 1990 Farm Bill USDA was encouraged by Congress to enrol lands in CRP that achieved the greatest environmental benefits for each dollar spent. In order to meet the multiple environmental objectives and to increase the cost-effectiveness of the programme, USDA developed and instituted an Environmental Benefits Index (EBI) designed to proxy for the range of environmental benefits being sought (USDA-FSA, 1997). The EBI was evaluated for every parcel of land offered, and included terms for:

- improvements in surface water quality;
- improvements in groundwater quality;
- maintenance of soil productivity;
- assistance to producers with potential problems implementing conservation compliance plans;
- acreage planted to trees;
- acreage within identified critical water quality problem areas; and
- acreage within conservation priority areas designated by Congress.

A national cost-effective ranking based on the EBI score and offered rental rate was constructed for each sign-up. Bids with the highest ratios were accepted until the acreage

enrolment objectives for the signup were met. Analysis indicated that the post-1990 bid acceptance processes were targeting more expensive land in the Corn Belt and Northeast, with higher water-caused (sheet and rill) erosion rates, impacting water quality problems. The EBI has been updated several times, with the latest version for the 26th signup at USDA-FSA (2003).

A more formal validation of the new procedures was accomplished in an *ex post* evaluation of signups 1-12 and the new procedures (Feather *et al.*, 1999). They found that EBI criteria increased freshwater-based recreation and wildlife-viewing benefits, and decreased pheasant-hunting benefits compared with CRP acreage accepted prior to 1992. Based on this partial accounting of benefits, the new procedures increased the benefits USD 370 million per year.

In 1996, when the 10-year contracts originally made in 1986 started to expire, CRP was reauthorized, and use of the EBI to ensure cost-effective enrolment was confirmed.

Getting the rent right

Compensating the farm operator for the opportunity cost of not using the land in crop production is the economic basis for all US land retirement programmes. Without such compensation, and in the absence of any regulations against using this land for crop production, it is impossible to get farm operators in any numbers to offer land for enrolment. Despite this simple criterion for payment, determining the correct compensation for individual parcels is a difficult task for an operational programme covering millions of acres. In well-functioning, competitive markets, annual rents for agricultural land are theoretically equivalent to the annual returns from agricultural production, and hence equal the opportunity cost of using the land. This is not always the case, as discussed below.

In theory, auctions could promote efficiency in running such a programme (Dicks, 1985; Ervin and Mill, 1985). Government and the farm operator could engage in bid/acceptance behavior that would let farmers offer land at a bid price, and government accept those bids it desired. In fact, an experimental bid programme was conducted in 1958, but not continued (Christensen and Aines, 1962, p. 45). When the modern CRP was authorized in 1985, such a bid/acceptance process was implemented. However, the 45 million-acre goal effectively precluded auctions because it was impossible to enrol that much acreage in a short period. Multiple enrolment periods and the obvious pressure government officials were under to enrol as much land as quickly as possible opened opportunities to “game” any bidding system in favor of the landowner. Unprepared to negotiate bids with landowners, USDA officials sought guidance for Maximum Acceptable Rental Rates (MARR) based on county average rents that rapidly evolved into an offer system set at the MARR.

By 1990, the failure of the bid system and problems with the MARR became obvious. A soil-adjusted rental rate system was proposed that captured the essential elements of the distribution of soil productivity (Reichelderfer and Boggess, 1988; Barbarika *et al.*, 1994). Average county rents are adjusted up and down in relation to the ratio of the parcel soil productivity to average productivity in the county. For example, a parcel with soil that is 20% more productive than the “average” soil in the county would get 1.2 times the average county rent. This system adjusts the compensation paid to the single factor most likely to affect the opportunity cost of operating land, relative crop productivity.

Continuous signup

Another innovation in the 1996 Farm Bill was to allow partial field enrolment of land with certain high priority conservation practices, such as filter strips and riparian buffers, at any time during the year without competition. In addition to annual soil rental payment and cost-share assistance, many practices are eligible for additional annual and one-time up-front financial incentives. A related State-Federal cooperative programme called the Conservation Reserve Enhancement Program (CREP) focused continuous signup on locally-identified projects designed to address specific environmental objectives through targeted CRP enrolments. Sign-up is held on a continuous basis, but general sign-up practices may be included in addition to those under the regular continuous signup, and additional financial incentives are generally provided. There were 29 agreements in effect in 25 states as of 2004.

CRP, and land retirement programmes in general, have evolved from simple beginnings in the 1930s as new objectives and new administrative procedures were developed. The transaction cost data for the programme reflect these changes, especially in years initiating new 10-year contract periods. The analysis attempts to separate out these changes, to some degree.

Evolving from whole-farm planning to programme-based technical assistance

Prior to the 1985 Food Security Act, which established the Conservation Reserve Program and conservation compliance requirements, USDA's NRCS² relied on a whole-farm conservation planning process that identified all resource concerns on the farm.

“Conservation districts and SCS had championed the complete farm conservation plan approach [...] Most districts assigned priority to farmers who were interested in more than single-practice assistance” (Cohee, 1986, p. 95).

With limited cost-share funding (ACP was limited to USD 3 500 per farm per year), some elements of the plan might never be implemented. Many farmers surveyed in a conservation planning study said “SCS personnel often recommended practices that were too elaborate, not cost-effective, or too expensive, even with cost-sharing” (Nielson, 1986, p. 76). SCS tended to work with farmers who had been co-operators in the past, not necessarily those with the most critical conservation problems. District conservationists often found it difficult to interest new farmers in becoming co-operators because there were few financial incentives to do conservation planning and implementation.

Passage of the CRP and conservation compliance provisions created a demand pressure for conservation planning that nearly overwhelmed SCS in 1986. Even as the programme was being legislated, congressional staff worried that expanding eligibility on top of other changes in conservation programme changes “might overload the system” (Gray, 1986, p. 31). One observer noted “implementation of [CRP] will require substantial reallocation of staff time and expenditures by a variety of federal, state, and local government agencies [...] The opportunity costs of these reallocations will not be recognised until other programmes have been neglected” (Ervin and Blase, 1986, p. 80). Assisting landowners in determining whether land met the eligibility criteria for the nearly 101 million acres of HEL cropland and developing conservation cover plans for CRP after acceptance on more than 8 million acres signed up in 1986 alone caused SCS to re-evaluate its planning processes.

However, a survey of USDA county conservation officials found that only 10-12% of respondents thought scheduling or obtaining technical assistance was a problem limiting farmers' enrolment in CRP (Nowak and Schnepf, 1989, Table 7). The need for more

personnel at the local level to implement the programme was mentioned more than any other consideration, however, by one of every five respondents who commented. Respondents also reported greater local interagency cooperation in implementing the programmes, and that level increased with increasing erosion rates and percentage of land with highly erodible soils. Local conservationists assessed farmers' paperwork burden in applying for CRP as an important barrier in 18-19% of responses. ASCS county officials and county Extension agents cited this as a barrier about twice as often as SCS District conservationists (Nowak and Schnepf, 1989, Table 7). These pressures on local staff have grown, with district and area conservationists recording increased scores toward "burnout" later in the Food Security Act implementation schedule (Barlow, 1989).

The pressure of limited time frames for both CRP eligibility assessment and conservation cover planning, and planning for conservation compliance led SCS to consider some radical changes to their traditional one-on-one, whole-farm conservation planning process. Conservationists narrowed their focus from all resource concerns on the farm to what farmers wanted to do (or had to do) with HEL cropland. Table 6.1 presents the findings of a 1989 SCS survey of alternative planning techniques.

Table 6.1. **Cost of conservation plans by planning process**

Planning process	Source of assistance	Districts	Number of plans	Acres planned	Cost per plan	Cost per acre		
						Average	Minimum	Maximum
		Number	Number	Acres	USD	USD per acre planned		
One-on-one	Contractor	2	1 668	697 150	91.10	0.22	0.18	0.23
One-on-one	SCS sole source	5	4 694	912 968	182.87	0.94	0.76	2.56
One-on-one	SCS in lead role	10	10 075	1 548 917	154.99	1.01	0.38	3.62
Group	SCS sole source	1	307	19 700	73.09	1.14	n.a.	n.a.
Combination	SCS in lead role	11	19 259	2 807 413	197.21	1.35	0.20	4.01

n.a.: not available; SCS: Soil Conservation Service.
Source: Robertson, et al. (1989).

However, the complexity of soils, landscapes, and practices probably overwhelmed any differences in cost because of the planning process itself. The authors pointed out that group processes would be more effective when soil types, cropping patterns, and conservation needs were similar, such as when planning similar cover types for similar highly erodible soils in a relatively homogeneous area. Other agency officials involved in conservation planning also found that group planning processes could meet conservation planning needs within the limited time frames, if proper materials and background were prepared in advance (Farnsworth and Braden, 1988; Farnsworth et al, 1988). Adoption of office automation and Geographical Information Systems (GIS) technology to facilitate the planning process added its own stresses to local planners who were not "computer literate" (Ventura and Giampetroni, 1992).

The agency began to realize that the narrow focus on planning for erosion control on highly erodible land in CRP implementation failed to capitalize on potential opportunities to plan for water quality, wildlife habitat, and other resource concerns which moved to higher priority as the 1996 Farm Bill was being considered (Bridge, 1993). New programmes established in the 1996 FAIR Act, along with reauthorisation of CRP put even more money, and therefore more pressure, on the conservation establishment to eschew whole-farm

planning in favor of planning just enough to get the farmer's application for one of many programmes (CRP, EQIP, WHIP, FRPP, etc.) completed. Each of these programmes has their own requirements for planning and applications, so the local conservationist's time is even more fragmented than ever before.

6.3. Interagency roles in the Conservation Reserve Program

There has been a long-standing division of labor within USDA in implementing agricultural conservation programmes. Responsibility for educating and providing technical assistance to farmers rests with NRCS, while financial assistance paid to farmers was administered through FSA. These are the agencies with principal responsibilities and funding for conservation programmes directed toward production agriculture. Other USDA, Federal, State and local government agencies have also played roles in developing and implementing conservation programmes, but their participation is usually short-lived, *ad hoc*, a minor financial commitment, and not easily captured in agency budget accounts.

In CRP, NRCS responsibilities include certifying that land offered meets eligibility requirements for soil erodibility and other criteria, assisting with quantification of the EBI, working with the producer to develop a conservation cover plan for the land, providing technical assistance and oversight in establishing the conservation cover, and monitoring that cover is successfully established and maintained. Thus, much of the technical assistance provided by NRCS occurs at the beginning of the contract, tapering off rapidly once conservation cover is successfully established. NRCS staff handling CRP do so on a periodic basis, and then move on to other programmes and responsibilities. On the other hand, FSA responsibilities include verifying that the producer is financially eligible to participate, assisting the producer in submitting a signup application, submitting the EBI score, notifying successful applicants and finalizing the contract, administering payment, and verifying that contracts remain eligible for payment. These responsibilities continue at a fairly high level over the life of the contract. While some FSA staff in county offices may be drafted to work on CRP general signups during short periods (which is probably not captured in reported FSA expenditure data), many are assigned full time to service CRP. Specific roles in CRP at the State and local office level are detailed in Table 6.2.

NRCS technical assistance prior to acceptance thus focuses on the CRP-2 form (see Figure 6.2), certifying the eligibility of the land, the suitability of the proposed conservation cover practices, and the soil type (to which the soil rental rate is tied). FSA administrative support focuses on the CRP-1 form, which establishes the soil rental rate and certifies that crop insurance requirements are met.

FSA, primarily in the Washington office, runs the CRP bid acceptance process, which is largely invisible to the producer or landowner. Once a bid is accepted, administrative support and technical assistance again devolve to the local conservation district office at the county level. The producer is notified and NRCS (sometimes with USDA-Forest Service or USDO-I-Fish and Wildlife Service assistance) helps develop a conservation plan of operation to install the conservation cover practices. FSA approves the plan of operation and, as it is implemented, issues CRP-1 contracts covering the various practices and ensuring processing for payment of cost-share and rental payments. NRCS district conservationists continue to follow establishment and maintenance of conservation cover on an as-needed basis throughout the life of the contract.

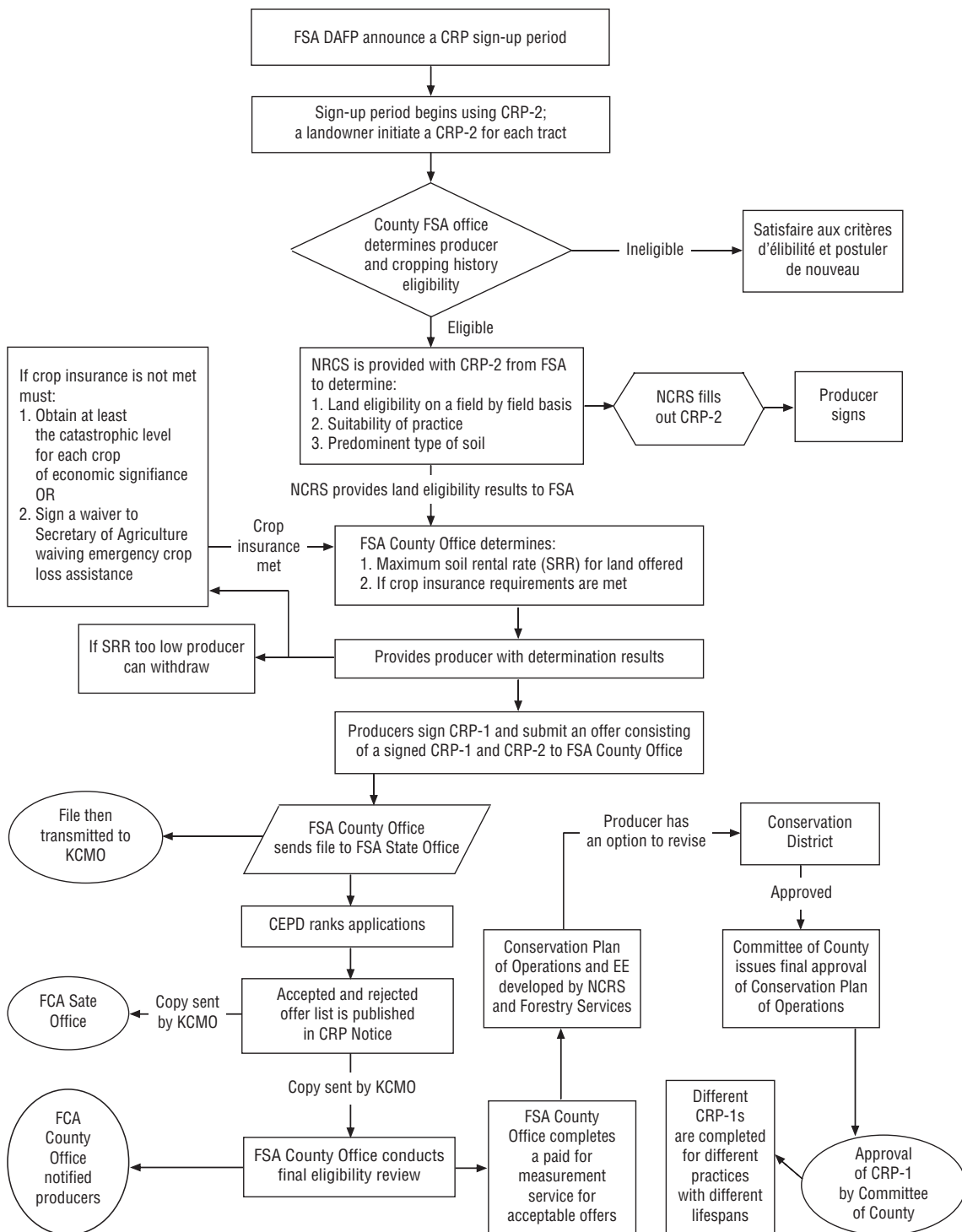
A detailed listing of roles for each major agency is contained in Table 6.2.

Table 6.2. **Roles of FSA, NRCS and FS county officials in Conservation Reserve Program administration and technical assistance**

Official or designee	Role
FSA District Director	Reviews and approves CRP-1s for USDA and related county level employees Ensures that an environmental evaluation (EE) has been completed for each CRP contract and all necessary consultations are complete
FSA County Executive Director (CED)	Computes cost-share and rental payments Manages day-to-day activities of field service centres and employees
County Office of the FSA	Calculates Maximum Annual Rental Rate (MARR) Determines producer and cropping history eligibility Determines if crop insurance requirements are met Completes "paid-for" measurement Reviews 25% enrolment limit for County Ensures CRP and AMTA contract acreage does not exceed agricultural use acreage on farm Determines reductions in quotas and allotments Makes the rental, cost-share (C/S), SIP, and PIP payments
County Committee (COC)	Approves eligible cropland acres and conservation plans Can delegate some of its authority to CED (<i>e.g.</i> eligible cropland acres and approval of conservation plans) Approves CRP-1 except for USDA, FSA, Conservation District, and Headquarters' office employees and members Determines violations of CRP-1s Provides written approval to landowners, at the end of the easement, to have the easement removed from title Approves share agreements of owner/operator Can provide certain ownership eligibility waivers Determines compliance with landlord/tenant provisions on participation Provides guidance to county office, determines producer, land and practice eligibility for CCRP Ensures conservation plan for CCRP includes maintenance practices Approves final conservation plan and CRP-1 for CCRP After concurring with the state FSA committee, they can decide to hold continuous sign-up only if 25% county limit is not reached or can ask for a waiver from the state FSA committee Determines if the annual payment limit of USD 50 000 is exceeded and then reduces payment Authorizes most cost-share agreements Can establish cost-share rates if authorised by state FSA committee and with NRCS concurrence
District Conservationist-NRCS Field Office	Represents NRCS with FSA, COC, State Forestry and State wildlife agencies, Conservation Districts Coordinates tree planting with State Forestry Determines practice suitability, need, and feasibility of practice and predominant soil types for determining land eligibility
Conservation District	Approves tree planting plan Provides letter of recommendation to COC to exceed 25% enrolment, if need be Approves conservation plans
NRCS	Participates in state level technical determinations and policy reviews Determines EBI scores for factors #1 through #6 and fills in on CRP-2 Assist county offices in identifying soil types Develops conservation plan and cost-share agreement with FS if applicable Completes site specific EE Performs annual status review Obtains conservation district approval of conservation plans
Forest Service (FS)	Develops tree planting plans Provides technical assistance for tree planting practices Monitors and certifies practice compliance Develops stewardship plans for converted CRP land

Source: Table 3.2-1, USDA, FSA Conservation Reserve Program, Final Programmatic Environmental Impact Statement.

Figure 6.2. **Diagram of general CRP contract process**



KMCO: Kansas City Management Office.

Source: USDA, FSA, Conservation Reserve Program, Final Programmatic Environmental Impact Statement.

Conservation planning

The primary form of technical assistance provided in CRP is preparation of the conservation plan for CRP acres. An approved conservation plan is required before a CRP contract can be approved. The plan is a record of supporting information and decisions for the treatment of the CRP parcel. Prior to the 1985 FSA Act, conservation plans were often comprehensive, covering the entire farm operation. For CRP (and many other financial assistance programmes passed since 1985), a programme conservation plan only needs to contain information related specifically to the CRP parcel.

The participants involved in the development of the CRP conservation plan include NRCS District Conservationist, State forester (if trees are involved), FWS or State wildlife planner (if habitat is involved) and FSA's county committee. NRCS is ultimately responsible for the technical leadership for planning and implementation, adherence to NRCS policy in the National Planning and Procedures Handbook (NPPH) about compliance with the US National Environmental Policy Act (NEPA), and technical concurrence on the conservation plans and any revisions. However, FSA is the lead agency with ultimate responsibility for NEPA compliance. NRCS would complete the Environmental Evaluation for any potential threatened and endangered (T&E) species issues under the Endangered Species Act in conjunction with required field visits. FSA then ensures that necessary consultations are carried out. Ultimate approval depends on whether the approved conservation plan:

- contains all the practices necessary for the successful establishment and maintenance of the vegetative cover on all of the acres offered for CRP;
- is technically adequate for achieving CRP objectives;
- adheres to NRCS policy about NEPA compliance;
- is reviewed and approved by the NRCS Conservation District (the district may assist the producer in planning and implementing conservation management systems); and
- ensures that CRP cover will not be disturbed during the primary nesting season, as determined by State Technical Committee.

Before approving CRP contracts, the FSA County Committee reviews and approves the plan to ensure that the plan:

- has been signed and agreed to by all signatories to the CRP contract, NRCS, and the Conservation District;
- includes all of the eligible acres offered for CRP;
- includes required maintenance for weed, insect, and pest control for the life of the CRP contract;
- includes only practices requested for the CRP contract;
- includes C/S for eligible practices only;
- includes application rates, such as the amount of seed, lime, fertiliser, that are consistent with practice specifications; and
- meets the objective of the conservation priority area (CPA), if enrolled in one.

The approved conservation plan obligates CRP participants to establish and maintain approved practices that:

- where appropriate, plant perennial seeding and planting mixes that achieve the highest environmental benefits for each CRP practice;
- where practical, use State-certified seed for CRP (common seeds, especially natives, may be used when certified seed is not available);
- where appropriate, avoid the use of single, introduced species;
- use native legumes, forbs, shrubs, and plant mixes; and
- ensure that the approved seeding mix does not include weed species, including noxious weeds.

The most important aspect of a CRP conservation plan is that it outlines the necessary maintenance practices for the successful establishment and maintenance of the approved practices included in the CRP contract, regardless of the applicant's eligibility for cost-share funds.

US Fish and Wildlife Service, Partners for Fish and Wildlife Program

Fish and Wildlife Service biologists provide biological expertise on habitat management, restoration and individual species needs on lands enrolled in the CRP, EQIP, WHIP and a variety of similar conservation programmes. Since 1992, the Partners Program has helped NRCS and landowners choose sites for the WRP, craft restoration plans, and participate in decisions on land use activities inside the WRP easement area.

In recent years (2001-04), about USD 1.2 million per year in FWS technical assistance has been provided to CRP applicants and contract holders (Naley, 2004). This figure was likely larger in start-up years when many more acres and contracts were being applied for and conservation cover established.

6.4. CRP technical assistance and support costs

Because responsibility for CRP is split between FSA and NRCS (and to a limited extent USDA's Forest Service), USDA transaction costs must include both NRCS and FS technical assistance costs and FSA administrative support costs. Costs are estimated using aggregate budget data. The limitations of such data are explained in Box 6.1. Since the USDA budget detail does not break out FSA conservation support by programme, the total is apportioned by the relative expenditures on the CRP (by far the largest), ACP, Emergency Conservation Program (ECP), and Rural Clean Water Program (RCWP) in each year. The resulting amounts, expressed as a percentage of rental and cost-share payments for cover establishment, are shown in Figure 6.3.

Both NRCS/FS and FSA had substantial start-up costs (87% for NRCS/FS and 23% for FSA) reflected in the amount of technical assistance and support expenditures per dollar of payments in 1986, the first year CRP was operated. However, FSA support expenditures settled down to a steady 3-4% of payments, while NRCS/FS technical assistance costs were far more variable, ranging from 0.4 to 4% of payments. This reflects the steady nature of administrative support provided by FSA for contracts, and the episodic nature of technical assistance effort required to plan for and implement cover establishment for land entering CRP at different times. Technical assistance costs receded as enrolment proceeded, fully enrolling the 36 million acres allotted to the programme. After CRP was reauthorised in the

Box 6.1. A note on data quality

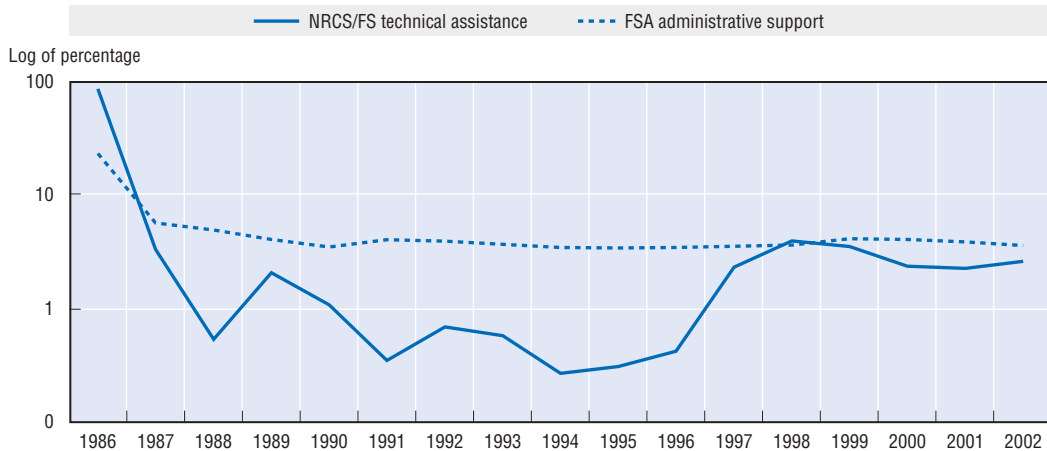
The data used in this analysis is aggregate budget data reported through the US Department of Agriculture. Any such administrative data has a host of problems associated with budget processes and administrative accounting rules. In addition to the usual problems, the data on NRCS technical assistance costs for CRP suffer from two additional problems.

First, district conservationists in the field are under severe pressure to both balance the demands from producers and clients and also account for their time within the funding codes available to them in the accounting system. Incentives are on the side of making sure that both clients and accounts are balanced on paper, whether they are in fact or not. Consequently, some work reported as “CRP technical assistance” may not be, and *vice versa*.

Second, NRCS performs CRP technical assistance under reimbursement from FSA rather than through direct appropriation. There is an understandable bureaucratic tendency to attempt reimbursement for as much as work as possible, perhaps covering other work not strictly relating to CRP. In addition, the controversy over the Section 11 CCC funding cap may have limited the amount of reimbursement NRCS sought. The net effect of potential over- and under-reporting of CRP technical assistance costs is impossible to determine from these data.

Despite these flaws, these data are the official budget costs reported by USDA and the only practicable source for estimating transaction costs at the national level.

Figure 6.3. **Conservation Reserve Program: Technical assistance and support as a per cent of cost-share and rental payments**

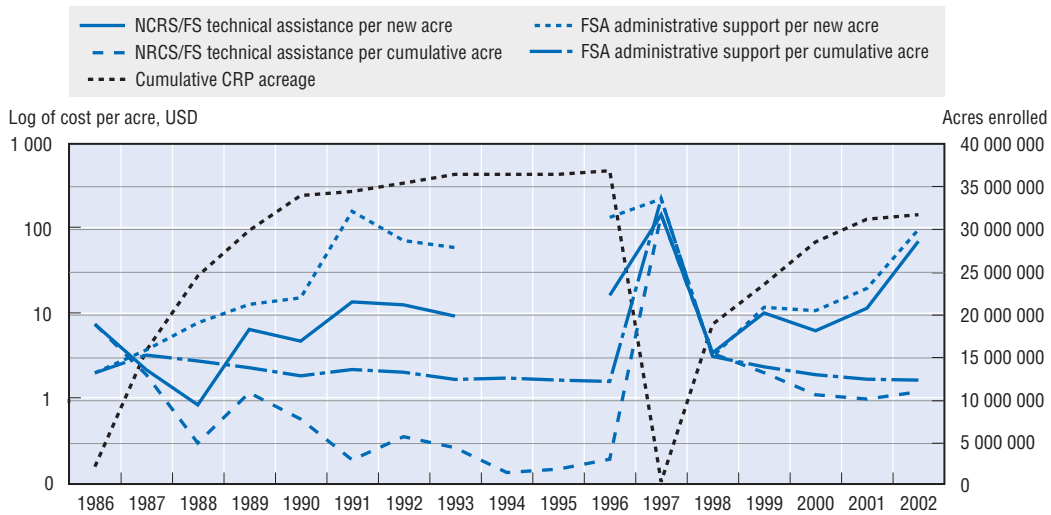


Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

1996 FAIR Act and previously enrolled acreage came out of contract and was resubmitted, NRCS/FS technical assistance costs rose again. The addition of CREP and institutionalisation of the continuous CRP signup provided a steadier, ongoing technical assistance demand reflected in the higher level of continuing assistance after 1996.

A better metric for transaction costs than dollar expenditures is costs per enrolled acre and cumulative enrolled acre (Figure 6.4). Because FSA administrative support extends to both newly enrolled and continuing acres, the costs per newly enrolled acre climb steadily (no acres were enrolled in 1994 and 1995), while costs per cumulative acre flatten out and

Figure 6.4. **Conservation Reserve Program: Transaction costs per new and cumulative acre enrolled**



Source: USDA, OBPA and Ralph E. Heimlich, *Agricultural Conservation Economics*

then recede. Costs per newly enrolled acre are less than proportional to enrolment after the initial burst, probably because personnel learn their roles and become more efficient in delivering the programme for additional acres. Participants also may learn, after repeated attempts to enrol, requiring less administrative and technical help.

Technical assistance for signup and cover establishment by NRCS and FS follows a similar pattern of rise as signups increase, with declines in cost per cumulative acre enrolled, but with more variation. Because technical assistance needs fall off after the first few years of a contract, expenditures per cumulative acre fall off more dramatically than for FSA administrative support.

Major bursts of administrative and technical assistance activity occurred in 1986, when the programme was being developed and deployed, and again in 1997. Both FSA and NRCS/FS expenses expanded in 1996-97 when the second round of enrolments was being prepared after CRP was reauthorized in the 1996 FAIR Act, and when the largest amount of acreage from contracts expiring and being re-enrolled was processed for retirement beginning in 1998. Once again, costs per cumulative acre fall off, with technical assistance costs dropping faster than administrative support.

As time series of transaction costs for CRP are available, it is possible to decompose how various factors affect transaction costs. A simple linear regression equation relating transaction costs to summary characteristics for the year in which the signup occurred is revealing. In order to account for the differences between administrative support and technical assistance, separate estimations were made for each.

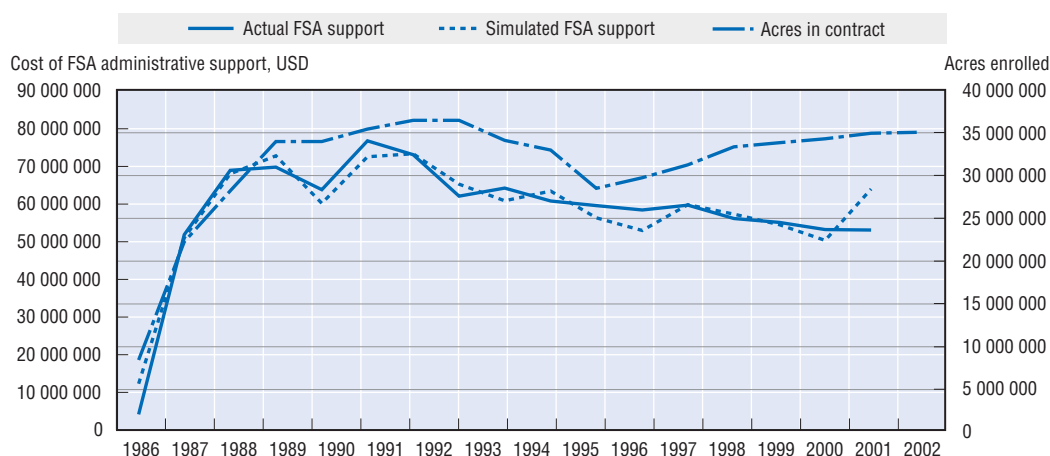
The equation for FSA administrative support (Table 6.3) is highly predictive, explaining nearly 80% (adjusted $R^2 = 0.776$) of the variation in costs over the 17 years estimated, with a significant value for the F test. Four variables are statistically significant in the equation. Cumulative acreage enrolled has the most significance, which is consistent with the idea that administrative support is spread across all the acres in the programme, not just those newly enrolled (Figure 6.5). The coefficients are interpreted as marginal costs, so each acre added to the programme is estimated to account for USD 1.79 in FSA administrative

Table 6.3. **Regression equation of Conservation Reserve Program FSA administrative support expenditures, 1986-2002**

Regression statistics					
Multiple R	0.961				
R Square	0.923				
Adjusted R Square	0.776				
Standard Error	5 496 547				
Observations	17				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	7	4.E + 15	5.E + 14	17	0
Residual	10	3.E + 14	3.E + 13		
Total	17	4.E + 15			
	Coefficients	Standard error	t Stat	P-value	Lower 95%
Acres newly enrolled	-6.56	2.16	***(3.03)	0.01	(11.37)
Acres idled/installed	-0.20	0.45	(0.43)	0.67	(1.21)
Reenrolled acres	0.68	0.64	1.08	0.31	(0.73)
Continuous acres	-3.83	9.17	(0.42)	0.69	(24.25)
Cumulative acres enrolled	1.79	0.08	***22.62	0.00	1.62
Number of contracts enrolled	798.35	238.32	***3.35	0.01	267.33
Post1996 dummy	-41 196 527	10 543 697	***(3.91)	0.00	(64 689 352)

*** significant at the 95% confidence level.

Source: Ralph E. Heimlich, Agricultural Conservation Economics.

Figure 6.5. **Conservation Reserve Program: Actual and simulated FSA administrative support costs**

Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

support costs. The number of contracts enrolled is significant, each additional contract adding USD 798 to costs. This probably reflects some economies of scale in preparing for signups, and some efficiency from “learning-by-doing” as more contracts are handled. The acres enrolled in each signup is significant, with each additional acre lowering costs by USD 6.56. This is logical considering that larger contracts spread the costs of contract administration over more acres and reduce the total number of contracts that must be administered. Finally, a dummy variable accounting for the difference between the

1985-95 programme and the 1996-2002 programme is statistically significant, shifting FSA support costs down by USD 41.2 million per year. This may reflect a reduced burden on the FSA field staff because of streamlining the bid selection process, standardising the rental rates, and automating much of the sign-up paperwork through web-based applications.

Other coefficients, although not statistically significant, are interesting for the direction and magnitude of their estimated effect on administrative support costs. Each acre idled subtracts USD 0.20, presumably because of the effect of spreading fixed costs over more acres. In later signups (after 1996), land previously enrolled in CRP could be re-enrolled. These are estimated to add USD 0.68 per re-enrolled acre. Land brought into the programme under the continuous signup process incurs considerably less administrative costs than land enrolled in the general signup. These are estimated to subtract USD 3.83 from administrative support costs per acre enrolled in the continuous programme. Note that this only pertains to administrative transaction costs: rental and cost-share payments for continuous acres are often higher than for general signup acreage.

There is considerably more variation in NRCS/FS technical assistance costs, and because they are generally incurred in the first contract years, different variables are expected to explain that variation (Table 6.4). Only about half of the variance in the data is explained by the regression (adjusted $R^2 = 0.472$), and the regression F test is not as significant as the FSA cost equation. As expected, cumulative acres enrolled is not as significant a variable in this equation as for FSA costs, and the coefficient on cumulative acres is much smaller, adding only USD 0.30 per acre enrolled. Significant explanatory variables for technical assistance costs are the number of acres idled or for which cover

Table 6.4. **Regression equation of Conservation Reserve Program NRCS/FS technical assistance expenditures, 1986-2002**

Regression statistics					
Multiple R	0.856				
R Square	0.732				
Adjusted R Square	0.472				
Standard Error	11 432 253				
Observations	17				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	7	4.E + 15	5.E + 14	4	0
Residual	10	1.E + 15	1.E + 14		
Total	17	5.E + 15			
	Coefficients	Standard error	Stat	P-value	Lower 95%
Acres newly enrolled	1.40	4.50	0.31	0.76	(8.62)
Acres idled/installed	2.39	0.94	***2.54	0.03	0.29
Reenrolled acres	-0.51	1.32	(0.39)	0.71	(3.46)
Continuous acres	-3.63	19.07	(0.19)	0.85	(46.11)
Cumulative acres enrolled	0.30	0.16	**1.84	0.10	(0.06)
Number of contracts enrolled	-220.82	495.69	(0.45)	0.67	(1 325.28)
Post 1996 dummy	31 894 665	21 929 806	*1.45	0.18	(16 967 998)

* significant at the 80% confidence level.

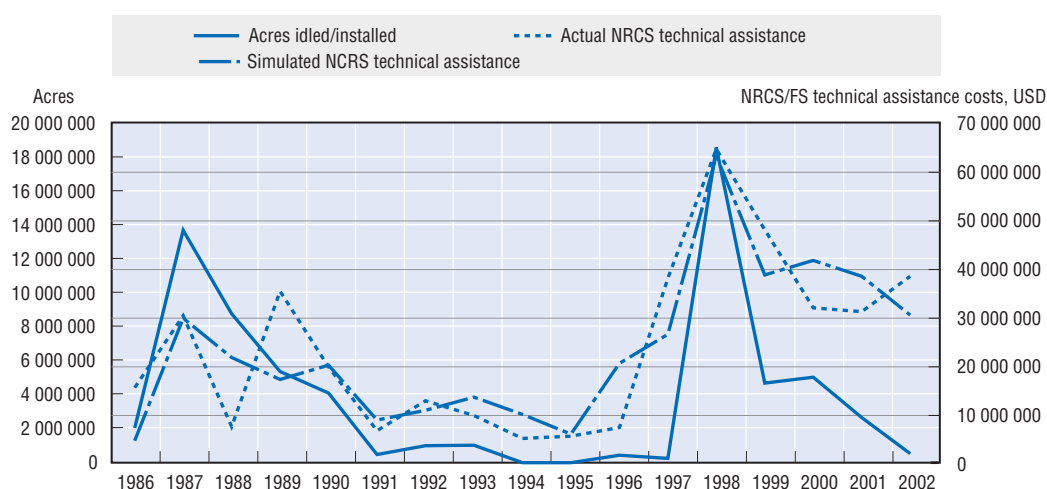
** significant at the 90% level.

*** significant at the 95% level.

Source: Ralph E. Heimlich, Agricultural Conservation Economics.

was installed in each year number of acres enrolled in each year (not cumulative), and the dummy for post-1996 enrolment. Not surprisingly, each additional acre idled/installed adds USD 2.39 (Figure 6.6). The post-1996 dummy variable indicates that NRCS technical assistance costs shifted up by USD 31.9 million per year after 1996. This may be explained by the additional complexity involved in evaluating the EBI, which was initiated in 1991, but wasn't used on a large acreage until after the 1996 CRP reauthorisation. The increase may also reflect the more complex technical assistance for additional environmental issues dealt with by the programme, such as wildlife habitat and water quality issues, compared with technical assistance for soil erosion on HEL in earlier signups.

Figure 6.6. **Conservation Reserve Program:
Actual and simulated NRCS/FS technical assistance expenditures**



Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

Although not statistically significant, the coefficients on remaining variables are interesting in sign and magnitude. Reenrolled acres reduce technical assistance costs by USD 0.51 per acre. Acres enrolled in the continuous signup reduce technical assistance costs by USD 3.63 per acre, perhaps because these primarily focused on riparian buffer practices.

Technical assistance in initial and succeeding years

Evidence from expenditure data shows that there are substantial transaction costs in developing and rolling out conservation programmes in their initial years, relative to ongoing costs once programmes are established (Table 6.5). CRP's initial years were 1986, when the first enrolments in the programme were made, and 1997, when the first contracts under the programme reauthorized after the 1996 FAIR Act were enrolled. NRCS technical assistance costs averaged USD 0.03 per dollar of expenditures (3%) in the initial period, but only USD 0.01 per dollar (1%) in succeeding years. FSA administrative support costs were essentially equal per dollar of expenditure in both periods. Another measure is the cost per acre enrolled, which was USD 23.21 per acre for NRCS technical assistance in the initial years, and dropped to only USD 5.33 per acre enrolled in succeeding years. FSA administrative costs per acre enrolled also dropped, from USD 27.11 per acre to only USD 13.97 per acre.

Table 6.5. Technical assistance and administrative support in initial and succeeding years of US conservation programmes, 1983-2002 (USD)

		Conservation Reserve Program (CRP)	Wetland Reserve Program (WRP)	Environmental Quality Improvement Program (EQIP) and predecessors
	Initial year(s)	1986, 1997	1993	1995-96
Initial year(s), million 1996 constant dollars	NRCS technical assistance	53.4	5.3	194.3
	FSA administrative support	62.4	n.a.	10.7
Succeeding year(s), million 1996 constant dollars	NRCS technical assistance	353.2	85.5	1 476.5
	FSA administrative support	925.3	n.a.	168.5
Per dollar of expenditure, initial year(s), dollars per 1996 constant dollar	NRCS technical assistance	0.03	1.11	0.62
	FSA administrative support	0.04	n.a.	0.03
Per dollar of expenditure, succeeding year(s), dollars per 1996 constant dollar	NRCS technical assistance	0.01	0.09	0.37
	FSA administrative support	0.04	n.a.	0.04
Per acre enrolled, initial year(s), 1996 constant dollars per acre	NRCS technical assistance	23.21	106.93	n.a.
	FSA administrative support	27.11	n.a.	n.a.
Per acre enrolled, succeeding year(s), 1996 constant dollars per acre	NRCS technical assistance	5.33	93.38	n.a.
	FSA administrative support	13.97	n.a.	n.a.

n.a.: not available.

Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

The publicly available administrative cost data used in this analysis do not discriminate between establishment costs, which might be considered an investment that should be amortized over the 10-year life of the CRP program, and ongoing costs associated with simply implementing the programme over its life span. While major programme design and redesign activities were undertaken in 1986 when modern CRP was first authorized, and again in 1996-97 when the programme was reauthorized, these were not the only times the programme was changed. For example, the EBI and soil-adjusted rental rates were developed after the 1990 FACT Act redirected the programme toward a broader array of environmental objectives, but these were mostly experiments used to meet the remaining 1.4 million acres under the 36.4 million acres enrolment cap. These methods were re-evaluated and refined after the 1996 FAIR Act reauthorized CRP for another set of 10-year enrolments and subsequently used to reenrol more than 22 million acres in 1997-98. There are other, more minor programme changes and administrative modifications made with every sign-up.

The contrast between establishment and ongoing costs is more marked for WRP (Table 6.5). NRCS technical assistance costs were more than USD 1.11 per dollar of expenditures in the initial year of the programme, and USD 106.93 per acre enrolled. After establishment, costs dropped to only USD 0.09 per dollar of expenditure (9%), and USD 93.38 per acre enrolled. WRP costs are considerable because of the need to establish a legal easement on the area to be restored as wetland, *versus* a simple contract between the producer and the government in other programmes. EQIP passed in the 1996 FAIR Act, consolidated several previous cost-share programmes, including the long-standing Agricultural Conservation Program (ACP), run by FSA, and the Great Plains Conservation Program (GPCP) and Colorado Salinity Control Programs, run by NRCS. The Forestry Incentives Program (FIP) was moved from NRCS to the Forest Service in 1996. Comparing technical assistance and administrative costs before and after the 1995-96 transition period

shows that NRCS technical assistance costs dropped from USD 0.62 per dollar expended as EQIP was being established to the pre- and post-establishment average of USD 0.37 per dollar spent. FSA administrative costs remained constant at about USD 0.04 per dollar.

Comparing average annual costs for the first CRP program (1985-95) to those of the second programme (1996-2002) shows that NRCS technical assistance costs increased dramatically, while FSA administrative support costs fell (Table 6.6). NRCS costs increased 150%, from about USD 15 million per year to USD 36 million per year. Meanwhile, FSA costs dropped 6%. Overall costs increased 25%.

Table 6.6. Differences in average annual agency transaction costs, first and second CRP (USD)

	NRCS Technical assistance costs per year	FSA administrative support costs per year	Total agency transaction costs per year
First CRP (1986-96)	14 760 049	59 364 895	74 124 945
Second CRP (1996-2002)	36 996 689	56 289 935	93 286 624

Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

There are probably at least five influences at work in these figures. First, use of the EBI in bid assessment and standardised soil-adjusted rental rates may have increased assessment costs for NRCS, but decreased costs for FSA. Even though these changes were first introduced in 1991, they were not applied to significant acreages until CRP was reauthorised in 1996 and the first set of contract began to expire. Second, the broader range of environmental issues dealt with after 1990, and particularly after 1996, probably required more technical assistance effort for NRCS in planning and implementing CRP cover practices. Third, NRCS may have become increasingly careful in accounting for technical assistance on CRP after 1996 because of the increasingly competitive demands on staff resources with the increase in conservation programme funding (but not staffing) in the 1996 FAIR Act. The continuous signup and CREP were implemented after 1996, which engendered a set of different technical and administrative efforts. Finally, FSA increasingly turned to web-based and GIS-enabled administrative tools for managing the CRP signups after 1996, which could have produced some savings.

Complex evaluation, open enrolment and cost-effectiveness

Superficially, the administrative and technical costs associated with the continuous and CREP enrolments might be thought to be lower than the work required to apply and evaluate the EBI under the general CRP signup. There is no direct data on transaction costs for the different enrolment methods, but the regression analysis of expenditures provides some limited support for this idea.

For FSA administrative support costs, land brought into the programme under the continuous signup process incurs considerably less administrative costs than land enrolled in the general signup. These are estimated to subtract USD 3.83 from administrative support costs per acre enrolled in the continuous programme, although the coefficients are not statistically significant (Table 6.3). NRCS and FS technical assistance costs for acres enrolled in the continuous signup are estimated to be USD 3.63 per acre less than for the general signup. Again, this coefficient is not statistically significant. Note that these estimates only pertain to administrative and technical assistance transaction costs: rental

and cost-share payments for continuous acres are often higher than for general signup acreage. Average CRP rents in the general signup are USD 44 per acre, while they average USD 89 for continuous signup and USD 121 per acre for CREP (USDA, FSA, 2004).

While the riparian buffers, filter strips, and vegetative corridors accepted in continuous and CREP enrolments provide important environmental benefits for water quality improvement and wildlife habitat, it is not feasible to evaluate them against larger parcels accepted in the general signup. The smaller acreage involved means that fixed administrative and technical costs are amortised over fewer acres per contract, and the transaction costs for producers to enrol these smaller acreages are also larger. This is one reason that rental rates for these enrolments, as well as signing incentive payments and practice incentive payments, were raised to provide sufficient incentives to landowners. Despite these higher incentives, enrolment in continuous and CREP has lagged expectations. As of January 2004, only 555 626 CREP acres were enrolled of the 1.5 million acres allocated to State programmes (USDA, FSA, 2004b).

Continuous and CREP enrolment are complements to the larger whole-field enrolment of the general signup. While it may be useful to consider additional forms of continuous signup for other high-priority environmental practices on a partial-field, or even a whole-field, basis, it would not be cost-effective to replace the general signup with complete reliance on open enrolment.

6.5. Transaction costs for different kinds of conservation programmes

There are many ways to help farmers adopt conservation and environmental practices. A taxonomy of conservation approaches shows a continuum from the regulatory (rarely used in the US), through voluntary participation in response to financial incentives, to what is essentially moral suasion facilitated by education and technical assistance (Table 6.7). Transaction costs for these different approaches are quite different because the role of technical assistance varies from nearly absent (regulatory approaches) to dominant (programmes providing only technical assistance and education). For those programmes providing financial assistance for conservation, transaction costs for land retirement and cost-sharing/incentive programmes differ because of the timing, duration, and relative cost of technical assistance.

Technical assistance for cost-sharing and incentive programmes typically occurs in the same year in which the expenditure is made, and most installations are completed within a year or two. There is typically little need for follow-up technical assistance after the installation is complete. Technical assistance may be a much larger percentage of total costs, especially for practices that primarily affect how agricultural resources are managed, versus actual investments in machinery, structures, or materials. By contrast, technical assistance needs for land retirement occur in the first year or two to get conservation cover established, but payments go on for a period of years. Technical assistance is usually a much smaller percentage of total costs because rental and easement payments on land are typically quite large, and cover establishment costs are usually modest.

In either case, there may be extraordinary costs associated with developing a programme when it is first implemented and when it is being terminated. Development costs include working out technical standards, forms, staff training, reporting forms, procedures and data protocols, and financial accounting systems. Termination costs include finishing outstanding projects, resolving payment issues, finalising records and accounts, and transitioning staff to new duties.

Table 6.7. **Matrix of agricultural conservation/environmental problems, policy instruments, and federal programmes**

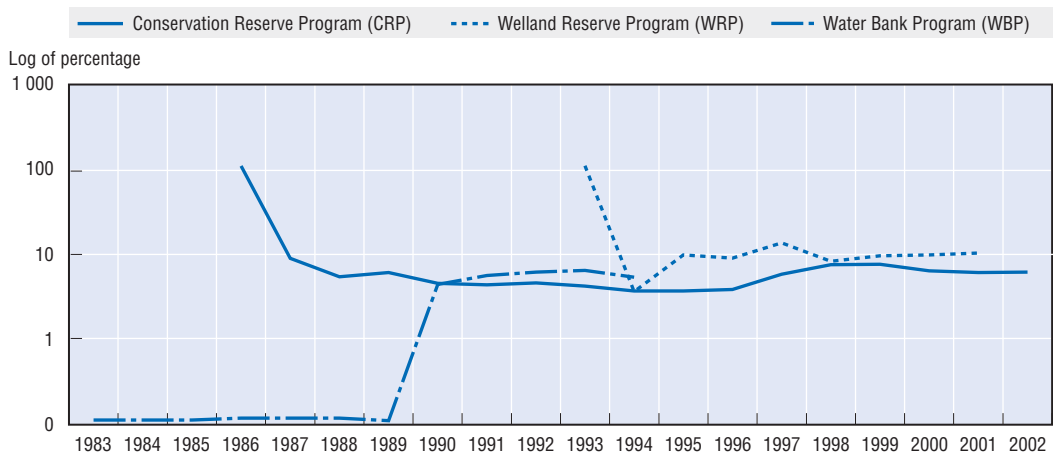
Conservation/environmental problems	Involuntary participation		Voluntary participation				Facilitative
	Regulation	Conservation compliance	Land retirement	Cost sharing	Incentive payments	Trading/banking/bonding	
Erosion: soil productivity loss		Sodbuster/compliance (1985)	Soil Bank (1956) CRP (1985)	ACP (1936)			CTA (1936)
Erosion: sedimentation	CZARA (1990)	Sodbuster/compliance (1990)	CRP (1990)	ACP (1936) EQIP (1996)	WQIP (1990) EQIP (1996)		CTA (1936)
Erosion: airborne dust		Sodbuster/compliance (1990)	CRP (1996)	ACP (1936) EQIP (1996)	ACP (1936) EQIP (1996)		CTA (1936)
Wetlands loss	CWA Section 404 (1972)	Swampbuster (1985)	Water Bank (1970) CRP (1988) WRP (1990) EWRP (1993)			Mitigation banking (1995)	
Water quality: impairment from nutrients	CZARA (1990)		CRP (1996)	EQIP (1996)	WQIP (1990) EQIP (1996)	CWA (1990)	CTA (1936)
Water quality: impairment from pesticides	FIFRA (1947) CZARA (1990)		CRP (1996)	EQIP (1996)	WQIP (1990) EQIP (1996)		CTA (1936)
Wildlife habitat loss	ESA (1973)		CRP (1996)	WHIP (1996)			

Acronyms: ACP – Agricultural Conservation Program. CRP – Conservation Reserve Program. CTA – Conservation Technical Assistance. CWA – Clean Water Act. CZARA – Coastal Zone Act Reauthorisation Amendments. EQIP – Environmental Quality Improvement Program. ESA – Endangered Species Act. EWRP – Emergency Wetland Reserve Program. FIFRA – Federal Insecticide, Fungicide and Rodenticide Act. WHIP – Wildlife Habitat Incentives Program. WQIP – Water Quality Improvement Program. WRP – Wetland Reserve Program.

Source: Heimlich and Claassen (1998), p. 98.

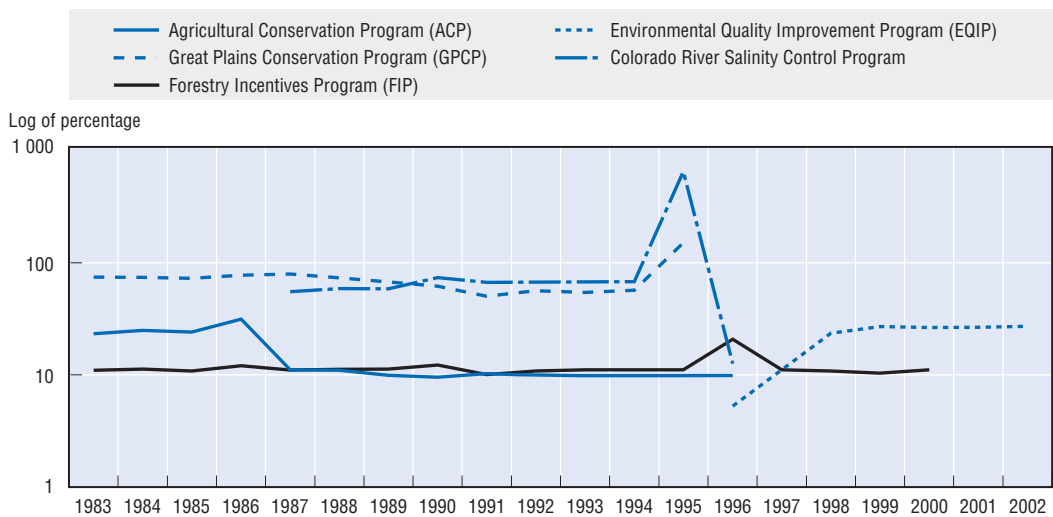
Figures 6.7 and 6.8 compare historical technical assistance costs for US land retirement and cost-sharing programmes between 1983 and 2002. Technical assistance costs for land retirement programmes in the US have typically run at 5 to 10% of expenditures for rental/easement and cover establishment cost-sharing. However, there were large start-up costs (110%) in the first year of both the CRP and WRP programs. The Water Bank (WBP) was an older land retirement programme started in the 1950s that paid farmers to retain shallow wetlands and buffers in farming areas. Water Bank was merged with WRP after the 1990 FACTA Act, so the abrupt change in technical assistance percentage (from 0.1% to 4.5%) is more likely due to a change in accounting for technical assistance than any actual change in the amount of assistance provided. There may have been some additional transaction costs as existing Water Bank agreements were converted to easements under WRP.

Figure 6.7. Land retirement programmes: Technical assistance as a per cent of cost-share and rental/easement expenditures



Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

Figure 6.8. Cost-share programmes: Technical assistance as a per cent of cost-share expenditures



Source: USDA, OBPA and Ralph E. Heimlich, Agricultural Conservation Economics.

Both GPCP and the CRBSCP had much higher technical assistance costs than the other cost-share programmes and than land retirement programmes, ranging from 55 to 80% of cost-share expenditures. This is less inefficiency than design, since these programmes focused more on conservation management changes and less on capital investments or “hardware” expenditures.

Much of the technical assistance work supporting ACP was probably funded under the NRCS CTA budget, which focused on continuing planning with long-term relationships (see whole farm planning discussion). The abrupt change in the ACP technical assistance percentage (from 31 to 11%) after the 1985 Farm Act probably reflects administrative accounting decisions rather than real changes in technical assistance available to producers, particularly since the CTA budget increased substantially at this time (from USD 410 to USD 458 million). The surges in technical assistance percentage for GPCP, CRBSCP, and FIP in 1996 reflect shut-down and transitional expenditures of consolidating those programmes and developing EQIP, which ramped up from 1996 to 1998, then settled in at 26-27%, a mid-point between the percentages of its predecessors.

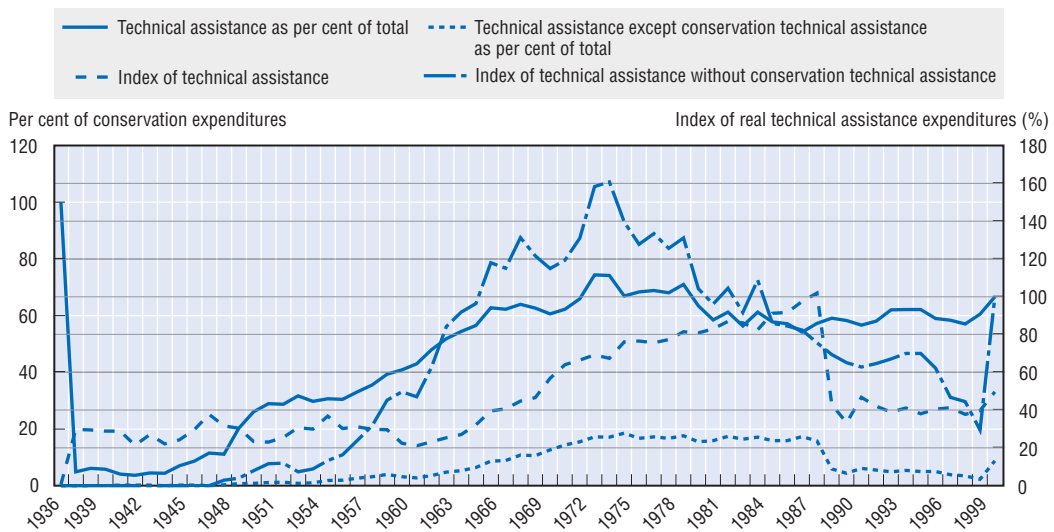
While there is substantial variation as programmes are developed, change and are phased out, and much room for arbitrary caps on administrative costs, a valid conclusion from these data is that transaction costs associated with land retirement programmes are substantially lower than for cost-share programmes. Technical assistance costs for land retirement rarely exceed 10% of rental and cost-share expenses, while those for cost-share programmes routinely exceed 10%. This could be expected since land retirement is considerably less complex than changing the way a farmer practices agricultural production, and since rental expenditures are considerably higher than the costs of conservation practices.

6.6. Trends in technical assistance funding

Technical assistance used to be a more important part of conservation expenditures than it is today. Congress increased conservation expenditures in the 1996 and 2002 omnibus farm legislation, but did not maintain the proportion of those expenditures earmarked for helping farmers use the increased funding effectively to solve conservation problems. Although technical assistance was nearly all the help farmers got for conservation in the 1930s, financial assistance, rental payments, cost-sharing and other forms of assistance grew rapidly (Figure 6.9). When conservation operations funded under what is now known as CTA are included, technical assistance grew to a peak of nearly 70% by 1987. Technical assistance associated with specific programmes grew to about 17% and remained there from 1972 to 1987, when unprecedented CRP expenditure rental levels dwarfed technical assistance funding.

However, the decline in technical assistance is more than just an artefact of the relative size of conservation expenditures. When viewed as an index of 1999 levels (in constant 1996 dollars), the peak in technical assistance can be seen to have occurred in 1973, long before CRP. The decline without CTA expenditures is particularly marked, falling to only 30% of 1999 levels in 1998.

This decline is understated because it accompanies a trend away from traditional “bricks and mortar” structural practices such as check dams, terraces, and other built infrastructure. Conservation has been moving toward more “management” practices that involve changing the way farming is done that should require even more technical assistance time with farmers.

Figure 6.9. **Technical assistance as a per cent of conservation expenditures 1937-99**

Source: USDA, ERS AREI Chapter 6.1 and Ralph E. Heimlich, *Agricultural Conservation Economics*.

Four provisions in the 2002 FSRI Act highlight congressional technical assistance funding: the Section 11 funding limitation, limits on technical assistance for the Conservation Security Program (CSP), passage of the Technical Service Provider (TSP) option, and reform of conservation planning. In 2002, the Federal Office of Management and Budget issued its A-70 regulations and both the Executive and Legislative Branches began turning serious attention to reducing the public costs of doing government business. Thus, the FSRI Act reflects trends outside of agriculture toward reducing government expenditures and increasing efficiency.

Section 11 cap

Just as funding for CRP rental and cost-share payments, funding for NRCS technical assistance for CRP is done under the Commodity Credit Corporation (CCC) authorisation, rather than through direct appropriations. CCC is a federal corporation that is located within the USDA and managed by a Board of Directors under the supervision of the Secretary of Agriculture. CCC is empowered to obtain funds through borrowing, as well as through direct appropriations from Congress. Section 11 of the CCC Charter Act authorizes the CCC to allot or transfer “to any bureau, office, administration or other agency of the Department of Agriculture [...] any of the funds available to [the CCC] for administrative expenses”, 15 USC. § 714i. Originally founded to fund commodity programmes, which often involved receipts for sales of surplus commodities, CCC has been increasingly tapped for other kinds of programmes, especially conservation programmes, since the 1996 Farm Bill.

A provision intended to limit unauthorized use of CCC funding authority for data processing and information technology purchases put a binding limit on reimbursable agreements between Federal agencies that may have unintentionally limited use of CCC funds by NRCS for technical assistance to the total amount of the allotments and transfers in fiscal year 1995, or about USD 56 million. Section 161, H.R. 2854, P.L. 104-127.

USDA was forced to pay for some CRP technical assistance out of funds appropriated for the CTA program for ongoing conservation operations outside the farm bill

programmes. Various legislative fixes for the Section 11 cap failed to pass, causing a bureaucratic disagreement about where CRP technical assistance should be funded until S.2856 was finally approved on 7 December 2004.

Partly in response to limits on NRCS funding for CRP technical assistance, FSA implemented a number of administrative measures to improve programme delivery while reducing administrative delivery costs. For example, during CRP general signup 26, FSA developed a new software tool to automate evaluations using the EBI and to provide GIS support in many counties. Over the last year, this GIS tool greatly reduced the time required for farmers to submit offers, saved farmers USD 160 000 in participation expenses, and helped FSA reduce administrative costs for CRP by over USD 7 million (Little testimony, May 2004).

Limit on CSP technical assistance

In a new conservation programme authorized in the 2002 Farm Bill, the CSP, technical assistance was limited to 15% of funds expended in each fiscal year. Senator Harkin, the programme's sponsor, in responding to delays in implementing the new programme said that the cap on technical assistance should not impede implementation because technical assistance will require a much lower percentage of total CSP funds since CSP emphasizes maintaining less expensive, already existing practices and precludes very expensive manure transport and storage practices with high technical assistance costs (Harkin, 2004).

This observation fails to account for several aspects of modern conservation programmes. A large part of technical assistance costs are spent on simply ensuring that producers are eligible for the programme. Assisting farmers navigate the increasingly complex requirements of recent conservation programmes takes considerable time, technical investigation, and face-to-face interaction with producers. Second, the number of applicants is often large relative to the number ultimately enrolled in the programme. Thus, a portion of technical assistance monies are expended on would-be applicants who are not ultimately successful and do not end up applying conservation practices. Third, modern conservation requires use of "management" practices that require considerable interaction with a conservation professional to assist the producer develop a nutrient management plan, select less environmentally damaging pesticides that are equally effective in controlling pest pressures, or assess range or pasture degradation and devise restoration strategies. Much of the older engineering assistance is actually encompassed in the cost-share financial assistance because it is done by commercial firms that implement the structures or construction embodied in those practices.

Initial implementation of CSP in July 2004 relied heavily on an online self-assessment filled out by the producer, reviewed by NRCS technical service providers, but with limited on-farm evaluation and planning (USDA, NRCS, 2004). NRCS Chief Bruce Knight is initially highly encouraged by this approach, and sees it as a model for future programme delivery (Rainford, 2004). While this use of information technology may constitute an increase in efficiency over paper forms and face-to-face interviews, it heavily substitutes untrained producer input for on-the-ground assessment by trained conservation professionals that may prove counterproductive in the longer term.

Third-party technical assistance

The 2002 FSRI Act also established a private-sector alternative to government provided technical assistance in the form of third-party technical service providers (Section 2701, FSRI Act of 2002, amending Section 1242 of the FSA Act of 1985; Federal Register Vol. 67,

No. 225, Thursday, 21 November 2002, 70119:70133). The Senate version of the legislation required USDA to establish provisions for increased technical assistance by non-federal providers, including certification of providers and cooperative agreements with state, local and nongovernmental groups to provide technical assistance. Congress recognized that, while USDA had been the primary provider of technical assistance to conservation programme participants, it would be difficult to meet the increased demand for technical services under the increased financial assistance over the life of the farm bill. The potential volume of many new, as well as returning, USDA conservation programme participants would overwhelm the assistance available through existing USDA resources, but Congress was reluctant to increase governmental staff levels. To meet this demand, Congress encouraged assistance from third-party providers, combining both the private and public sectors to provide technical assistance for USDA conservation programmes.

The Managers intended that third-party vendors accepting federal technical assistance payments follow all the applicable Federal laws and accept the appropriate liability for the adequacy of their plans, practice designs, and implementation procedures, and to comply with all appropriate privacy and confidentiality requirements. Putting these burdens, long shouldered by government technical assistance providers, on TSPs may make it less likely that private-sector providers can operate more efficiently than government providers.

Conservation planning reform

A provision of the 2002 FSRI Act also expressed dissatisfaction with the fragmented nature of conservation planning and technical assistance provision by calling on USDA to develop a plan to coordinate land retirement and agricultural working land conservation planning to eliminate redundancy, streamline programme delivery, and improve services provided to agricultural producers, including re-evaluation of the provision of technical assistance. A report is required by the end of 2005 to present a plan to integrate conservation planning programmes and the means to implement the plan.

These four provisions show different aspects of Congressional efforts to provide for conservation technical assistance. Technical assistance in planning and evaluating applicants for limited conservation assistance is necessary for cost-effective implementation. While technical assistance has some elements of a policy-related transaction cost that programme managers should strive to minimize, it is also an essential component in selecting the best applicants to receive conservation assistance, and helping those applicants develop and implement new ways of farming that will help conserve their resources and the environment.

6.7. Conclusions

Overall, the costs to the government of implementing the Conservation Reserve Program are relatively low, running from 3% of expenditures in initial years and 1% in succeeding years for NRCS technical assistance, and about 4% of expenditures for FSA administrative support costs. This amounts to about USD 60 per acre enrolled in initial years of a 10-year enrolment period, and about USD 20 per acre in succeeding years. These costs are less than comparable costs for the Wetland Reserve Program, and much less for working land programmes such as EQIP and its predecessor programmes. The absolute size of rental payments in CRP dwarfs transaction costs in ways that cost-share funds under working lands programmes do not.

FSA administrative costs are highly correlated with programme characteristics, especially the cumulative acreage enrolled, with each additional acre increasing costs by USD 1.79. NRCS technical assistance costs are more variable, and are significantly correlated with acres idled or installed in a given year (adding USD 2.39 per acre) and cumulative acres enrolled (adding USD 0.30 with each additional acre) in each year. NRCS costs increased significantly between the first CRP signups and the second set after 1996. The signs and magnitudes of other correlates are interesting, but not statistically significant.

Conservation technical assistance overall has declined from peak levels in the mid-1970s, despite an increase in management-related practices. Congressional support for technical assistance may be dropping, as evidenced by issues related to the Section 11 cap on reimbursement, caps on technical assistance in the new CSP, reliance on third-party technical assistance providers, and mandates for studying conservation planning reform.

Information technology, centralisation of functions, and other administrative improvements can reduce technical assistance and administrative transaction costs, and improve the ability to evaluate resource concerns and conservation plans to correct them, and has partly compensated for reduced technical assistance funding available in recent years. However, continued decreases in technical assistance at the field level and reliance on online resources and information technology cannot indefinitely substitute for face-to-face, on-the-ground technical assistance provided by trained conservationists to producers interested in learning about and applying improved methods. Technical assistance is not merely a cost or friction to be overcome for more efficient programme implementation, but part of the programme itself.

Notes

1. For example, in the context of stock markets, transaction costs include the time, effort, and money necessary, including such things as commission fees and the cost of physically moving the asset from seller to buyer. Transaction costs should also include the bid/ask spread as well as price impact costs (for example a large sell order could lower the price). See www.marketvolume.com/glossary/t0282.asp
2. Prior to the 1994 USDA reorganisation, NRCS was known as the Soil Conservation Service (SCS) and FSA was the Agricultural Conservation and Stabilization Service (ASCS). These names dated from the agencies' establishment in the 1930's.

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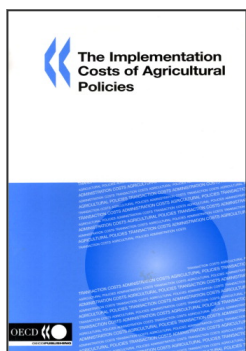
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From:
The Implementation Costs of Agricultural Policies

Access the complete publication at:
<https://doi.org/10.1787/9789264024540-en>

Please cite this chapter as:

OECD (2007), "A Case Study of Policy-related Transaction Costs in Land Conservation Programmes in the United States", in *The Implementation Costs of Agricultural Policies*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264024540-8-en>

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