# PUBLIC CONSERVATION POLICY AND AGRICULTURAL SUSTAINABILITY

# VEŘEJNÁ KONZERVAČNÍ POLITIKA A UDRŽITELNOST ZEMĚDĚLSTVÍ

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**Abstract:**
A host of research studies produced within the United States (US) strongly indicate that public conservation policy is essential to achieve long-term sustainability in production agriculture. It has been demonstrated repeatedly that a large percentage of land owner-operators will not adopt and use conservation production systems without some form of economic incentive or disincentive created by public policy. Research evidence also strongly suggests that US public conservation policies emphasizing incentive approaches have not been successful in resolving environmental degradation associated with production agriculture. It is argued that more emphasis should be placed on coercive policy initiatives to achieve national conservation goals.

**Keywords:**
Conservation, agriculture, public policy, incentives, disincentives

**Anotace:**
Velké množství výzkumných studií produkované Spojenými Státy (USA) jasně ukazuje, že k dosažení dlouhodobé stability v zemědělské výrobě je nezbytná veřejná konzervační politika. Opakovaně bylo dokazováno, že velké procento vlastníků-operátorů půdy konzervační výrobní systém nepřijmou a nebudou ho využívat bez určitých forem ekonomických podnětů nebo brzdících prostředků vytvořených veřejnou politikou. Fakta výzkumu také výrazně upozorňují na to, že konzervační politika USA zdůrazňující stimulové přístupy při řešení zhoršování životního prostředí spojeného se zemědělskou výrobou nebyla úspěšná. Otázkou je, zda by měl být kladen větší důraz na donucovací politické stimuly k dosažení národních konzervačních cílů.

**Klíčová slova:**
Ochrana, zemědělství, veřejná politika, podněty, brzdící prostředky

## INTRODUCTION

Protection of soil resources is essential to the long-term sustainability of food and fiber production within all societies. Without fertile soil, societies are not able to produce sufficient food and fiber to feed, clothe and house resident populations. The socio-economic viability of societies is significantly dependent on abundant and fertile agricultural land resources.

Unfortunately agricultural land has been degraded by soil erosion for decades in all societies. While soil erosion is a naturally occurring phenomenon, cultivation of land for agricultural purposes significantly increases the magnitude of displaced topsoil. As the magnitude of soil erosion increases, the quality of land resources concomitantly decreases.

Soil erosion generates both on-site and off-site environmental damages. Primary on-site

damages associated with soil erosion are as follows: loss of long-term fertility of agricultural land, loss of water retention capability of land resources, loss of the aesthetic quality of land resources, and a decline in economic value of land resources.

Some of the major off-site damages associated with soil erosion of agricultural lands are as follows: degradation of surface and subsurface water resources used for residential and industrial purposes, sedimentation of water ways and reservoirs, degradation of fish and wildlife habitat, reduction of the aesthetic quality of land and water resources for recreation and other nonfarm activities, sedimentation of transportation systems and roadside ditches, and reduction of non-farm land values. Each of these off-site damages can adversely affect the economic viability of farm businesses and can retard socio-economic growth of the society. Off-site damages from soil erosion necessitate the allocation of significant economic and human resources to mitigate the adverse consequences of the erosion. If limited investment resources are used to mitigate off-site damages of soil erosion, such resources cannot be employed to address other societal issues such as funding of regional and/or national development programs, investment in research and development to create new technologies to improve productivity within various sectors of the economy, investment in social services and public infrastructures, investment in conservation programs to maintain and/or improve environmental quality, and investment in other activities that a society can implement to improve the quality of life for its citizens.

Examination of the on-site and off-site damages associated with erosion of agricultural land clearly reveals that it is in the best socio-economic interest of society and individual land owner-operators to be concerned about soil erosion of farm land and to implement conservation programs to reduce or eliminate the problem. While many people within societies are very concerned about the consequences of the use of inappropriate farm production systems, individual land owner-operators and many policy makers are reluctant to adopt and/or implement conservation policies and programs that will significantly reduce the incidence of soil erosion. The primary barriers to adoption and use of conservation production systems in agriculture within the US are basically the economic costs of reducing erosion and the political costs associated with the development and implementation of effective conservation initiatives.

Until land owner-operators adopt and use conservation production systems at the farm level, it will be impossible to achieve national environmental quality goals. The purpose of this paper is to examine the evolution of soil and water conservation policies within the US in the context of how conservation policies motivate land owner-operators to address environmental problems created by technology-intensive farming systems. It is argued that soil and water protection policies were effective in reducing on-site and off-site damages in the initial stages of policy implementation within the US, however, it is also posited that contemporary soil and water conservation efforts will probably not achieve national environmental goals. It is argued that significant shifts in conservation policy will have to be made, if soil erosion associated with production agriculture is to be substantially reduced in the future.

**Evolution of Soil Conservation Policies in the US**

Degradation of soil and water resources is not a recently emerging environmental issue within the US. A number of enlightened citizens raised concerns about poor agricultural practices that contributed to significant erosion of farm land during the Colonial settlement of North America ( Betts, 1944; Napier, 1999; Napier and Napier, 2000; Napier et al., 2004; Rasmussen, 1982). Unfortunately there were no policy instruments available at the time to compel land owner-operators to adopt and use conservation production systems. The only means available to influence the behavior of land owner-operators was the provision of information and indirect social pressure. Neither of these approaches was very successful for motivating land owner-operators to change farm production systems. When agricultural land became so degraded from

erosion that crops could no longer be profitably produced, crop land was abandoned and land never farmed before was cleared and farmed using the same degrading production systems. This system of degradation was continued until free lands were no long available for exploitation (Napier et al., 2004 ).

With the closing of the frontier in 1890s, land owner-operators became somewhat more concerned about on-site damages from erosion, however, they ignored off-site damages (Napier, 1994). Land owner-operators continued to farm land without consideration of the environmental consequences of their actions in terms of the future productivity of the land. They also ignored the rights of future generations to have the opportunity to produce food and fiber on the land they farmed. Such an orientation continued until the 1930s Dust Bowl when topsoil was displaced by wind erosion at such high rates that future productivity of land resources was severely threatened. Millions of hectares of farm land within the High Plains and Midwestern states were so severely degraded during this time period that a large percentage of the eroded crop land will never be reclaimed for agricultural purposes (Napier et al., 2004). Thousands of land owner-operators lost their farms because they could not produce sufficient food and fiber to pay farm mortgages assumed during the early years of the Great Depression (late 1920s).

Economic depravation associated with the Great Depression combined with environmental degradation generated by the dust storms of the 1930s drastically changed attitudes and perceptions of US land owner-operators about soil conservation. Farmers became very concerned about soil erosion and became highly motivated to adopt and use any production practice they could afford that had the potential to reduce the loss of soil productivity. Farmers recognized that conservation of soil resources was essential to prevent loss of their livelihood

Given the severe loss of future agricultural productivity of land resources and the emergence of a new poverty class created by the dust storms, the US Congress was motivated to act and authorized the formation of the Soil Erosion Service (SES) in 1933 (Napier, 1999). The impact of the SES was inconsequential to terms of resolving soil and water conservation in the US because it was quickly replaced by the Soil Conservation Service (SCS) via the Soil Conservation Act of 1935. The SES legislation remains significant because it was the first act of Congress to recognize the need for public policy to address degradation of land and water resources associated with agricultural soil erosion (Napier et al., 2004).

The Soil Conservation Act of 1935 authorized the SCS to provide conservation information and technical assistance to farmers so that land owner-operators could implement conservation production systems on their farms. The Act was amended in 1936 so that the SCS could provide economic incentives to land owner-operators to aid in the implementation of conservation programs at the farm level. It was quickly recognized that land owner-operators could not implement soil and water protection systems without financial support from the government. With the introduction of economic incentives, many land owner-operators who could not afford to purchase required inputs to adopt conservation production systems were motivated to implement conservation production systems on their land.

The incorporation of economic incentives into early conservation programs established a precedent in US conservation policies that has been continued to the present. It was quickly recognized that land owner-operators would not adopt and use conservation production systems unless society was willing to assume a major portion of the economic risks associated with the shift in production systems.

Another extremely important precedent was established by the conservation policies introduced during the 1930s. All conservation policies established at this time period emphasized voluntary participation in conservation programs. Policy makers were strongly influenced by the belief that land owners possessed almost absolute rights to land resources. Consequently policy makers were reluctant to use any policy instrument that would infringe on the rights of land

owners to make decisions about the use and abuse of land resources they controlled. Subsequently this policy approach resulted in representatives of society being unable to force land abusers who failed to participate in conservation efforts to do so. If a land owner decided that he/she did not wish to participate in conservation programs even though he/she was degrading land resources they managed, nothing could be done to prevent the land owner from further degradation of land and water resources they controlled.

Given the reluctance of policy makers to challenge the rights of land owners to use and abuse land resources in any manner deemed appropriate by the land operator, little changed over the next 30 years in terms of soil and water conservation programs and policies. Public conservation policy relied on information, technical assistance, and small economic subsidies to motivate land owner-operators to adopt and use conservation production systems at the farm level.

Experiments with farm commodity support programs during the mid-1950s added a new dimension to conservation policy and programs within the US. Set-aside programs were introduced on a large-term basis. The Soil Bank Program came into being in 1956 and remained a major policy instrument until 1972. The Soil Bank was designed to retire crop land from agricultural production for 10 years. While the Soil Bank was primarily designed as an agricultural commodity price support program, it was marketed on the basis of its environmental benefits. Farmers received economic payments from the federal government to retire crop land from production. Unfortunately no provision was made to "target"funding to highly erodible crop land which resulted in much of the Soil Bank funding being applied to non-erodible crop land. This policy substantially reduced the potential environmental benefits of the program. While considerable environmental benefits were achieved via the Soil Bank, a significant opportunity to further reduce soil erosion in the US was lost. Of even more environmental significance was the fact that much of the land enrolled in the Soil Bank was returned to crop production after the program ceased to exist using the same degrading production systems employed prior to enrollment in the program. The outcome of this action was loss of most of the environmental benefits achieved when the land was retired for the 10 year period.

A number of researchers began to raise questions about the return to investment in soil and water conservation in the 1970s and 1980s. Significant research evidence began to accumulate that demonstrated most contemporary conservation policy approaches were not successful in reducing soil erosion and degradation of water quality to levels defined as being acceptable to society (Halcrow et al., 1982; Lovejoy and Napier, 1986; Napier, 1987; Napier et al., 1983; Napier et al., 1984; Napier et al., 1986; Swanson et al., 1986 ). Factors assumed to be significant for motivating land owner-operators to adopt and use soil conservation production systems were shown not to be useful for that purpose. Conservation policy initiatives designed to influence these types of variables were shown to have little impact on conservation adoption behaviors. Such research indicated that policy instruments being employed were not very useful for motivating farmers to adopt and use conservation production systems at the farm level. After billions of US dollars and millions of human work years had been allocated to soil and water conservation efforts, many of the environmental problems identified in the 1930s remained problematic.

As the evidence began to build that existing conservation policy approaches were not accomplishing environmental goals, political pressure began to increase for the creation of new policy approaches. The outcome of the political process was the Conservation Title of 1985 (Napier, 1990).

The Conservation Title of 1985 introduced a new era of conservation policy in the US. The basic policy change of the new legislation was the assumption of specific property rights by the government. For the first time in US History, society redefined property rights to give

representatives of society the right to impose constraints on individual land owner-operator behaviors. The legislation basically established behavioral expectations of land owners in terms of abuse of land resources. Farmers were no longer free to use land resources in any manner they deemed appropriate. Sensitive land and water resources were for the first time protected from abuse by owners.

Unfortunately the more coercive elements of the original legislation were effectively circumvented by individual land owner-operators and were later modified extensively to return more decision making power to land owners. However, a precedent was established that gave society the right to intervene into individual land owner decision making to protect the environment. Such policy action was extremely important for future conservation policy initiatives even though command and control approaches have not been implemented very extensively to date.

While Conservation Title programs during the last 20 years have not achieved many of the original environmental goals established by their creators, they have significantly reduced soil erosion in the US. Millions of hectares of highly erodible crop land have been retired from crop production for 10 year periods. Wetlands and grasslands have been protected and wildlife habitat has been enhanced. Stream corridors have been forested or have been covered by vegetation. Water quality has been maintained or improved within many waterways within the US. While it is highly likely that greater environmental benefits could have been achieved by using other policy approaches (Napier, 1990), it must be acknowledged that Conservation Title programs did improve environmental quality within the US.

The environmental benefits associated with the Conservation Title have not been achieved without significant economic cost. Conservation programs authorized and funded via the Conservation Titles in the last four Farm Bills have cost US taxpayers billions of dollars each year in economic rents. In addition to the costs associated with retiring crop land, millions of human work days have been allocated to implement the programs. The Natural Resources Conservation Service of the United State Department of Agriculture (formerly the SCS) employs thousands of professionals to implement and administrate various conservation initiatives within the US. In addition to federal programs, individual states and many private conservation groups fund extensive programs at the local and state levels. All of these efforts consume billions of dollars of economic resources each year. Further reduction of soil erosion rates within the US will require even larger expenditures per hectare because the inexpensive and easily achieved soil savings have already been accomplished

**Future Soil and Water Conservation Policies in the US**

Identification of future trends in any significant policy arena is problematic and the validity of predictions is predicated on assumptions made about future societal situations in which the policy decisions will be made. Predictions made in this paper about the future direction of conservation policies in the US are based on the following assumptions: 1) public policy makers will remain reluctant to imposed command and control approaches on land owner-operators within the US; 2) economic resources will be available to provide financial subsidies of sufficient magnitude to motivate land owner operators to participate in incentive-based conservation programs; 3) social movements will not emerge that encourage the use of command and control policy approaches to reduce environmental degradation associated with agricultural production; 4) food and fiber stocks will not become so scarce that government incentives will be applied to increase food and fiber production on marginal and highly erodible farm land; 5) technological innovations will not be introduced that will eliminate the need for erosion control measures; and 6) commodity prices will not become so high that land owner-operators will be motivated to employ production systems to maximize output at any environmental cost.

Given these assumptions, it is highly likely that near-term soil and water conservation policies within the US will remain voluntary and incentive-driven as they are at present. It is highly unlikely that command and control approaches will become the norm for agricultural conservation policy even though there are elements of command and control within the most recent Clean Water Act. The political cost associated with advancing a command and control approach is much too high for policy makers within the US at the present time. While the number of people engaged in agriculturally related occupations is very small numerically in the US, the political power possessed by agricultural interests far exceeds the number of people directly associated with food and fiber production, processing and marketing. Farm interest groups have made it clear that command and control approaches will be vigorously opposed and policy makers are very sensitive to the expressed opinion of farm lobby groups.

Command and control approaches will probably be used more extensively in the future for control of specific environmental pollutants. The Clean Water Act has targeted animal waste for command and control efforts in recent months. It is highly likely that other agricultural pollutants will be approached in the same manner in the future. A prime candidate for future command and control approaches are large, technology-intensive farming operations in the urban fringe. It is high likely that farm operations adjacent to suburban housing will be subject to severe restrictions relative to the types of farm production system that will be permitted to be used. Should conservation funding be substantially reduced at the federal level to the point that economic subsidies must be curtailed or eliminated, it is highly likely that command and control approaches will be employed. The issue is not whether nor not environmental quality will be maintained but rather how it will be maintained. It is widely recognized that command and control approaches can be effectively used to reduce pollution because that was the means used to control point pollution in the US. Since economic resources presently exist to subsidize land owner-operators to adopt and use conservation production systems, such an approach is preferred because it is much more socially acceptable to agricultural interest groups.

## Policy Lessons Learned from the US Experience

A number of useful observations about conservation policy making can be derived from the US experience. Several are listed below:

1. Any society that wishes to employ public policy approaches to reduce soil erosion from agricultural land must be willing to allocate huge financial resources and extensive human capital to accomplish national environmental objectives.
2. Multiple implementation approaches should be incorporated into any national comprehensive conservation policy so that command and control approaches can be employed in addition to incentive approaches.
3. Soil and water conservation policy should target highly erodible lands and environmentally sensitive areas for priority in terms of program efforts to maximize environmental benefits per unit cost.
4. Soil and water conservation policy should demand that program participants continue to use conservation production systems after program involvement has ceased.
5. Soil and water conservation policy should strive to achieve permanent resolution of site-specific erosion problems rather than use of temporary set-aside approaches.
6. Soil and water conservation policy should be consistent over time and be complementary with other public policies, especially national agricultural policy.

One of the most important issues that must be addressed when societies are in the process of developing comprehensive national soil and water conservation policy is what is the purpose of the policies being created. If the policies are to be created to protect soil and water resources from degradation and for use by future generations, then policies can be created to achieve that policy objective. If the purpose of the policy is to achieve an income transfer to the farm sector, then policy can be created to accomplish that goal. There a multitude of other goals that can be accomplished, if policy is developed for a specific purpose. Unfortunately many of the goals are mutually exclusive in that one can be accomplished but at a cost of the others. Society must decide what the policy goal is to be and seek to maximize the benefits per unit cost. One of the major problems with past and present conservation policies and programs in the US is that policy makers have attempted to accomplish multiple objectives with a single policy and have not been effective in accomplishing that goal. Until soil and water conservation policies in the US are created and implemented with environmental goals as the primary reason for their existence, it is highly likely that future soil and water conservation policies and programs will continue to fall short of achieving national environmental goals.

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