Evolution of U.S. Drainage Policy from Development to Preservation

Farm Drainage in the United States: History, Status, and Prospects. *Edited by George A Pavelis MP-1455 U S Department of Agriculture, Economic Research Service, 1987, 170 pp , $9 (paper)*

Reviewed by Leon E. Danielson

The subject of land drainage has intrigued American farmers, agricultural researchers, and extension specialists since the early days of our country's settlement Tales of horses wading through water "to their girth," of swarms of mosquitoes, and diseases such as malaria suggest the difficulties swamplands presented as the frontier moved westward Drainage transformed this land into highly productive cropland Today, drainage principles and practices often bear little resemblance to those of earlier days, and water management techniques and principles have become increasingly sophisticated

A major portion of the book is devoted to tracing the evolution of these technological improvements, and it makes for interesting reading Each article is an invited paper by an author known and respected in the field of drainage and water management Six articles focus primarily on the technical aspects of drainage Two major types of technical progress are identified (1) changes in materials and installation methods, and (2) changes in the design of water management systems through use of computer simulation and design procedures These studies will be of interest primarily to technically oriented readers, although only one of them requires considerable mathematical expertise

As an addition to natural resources literature, the book's major contribution is its review of drainage policy and the transition from the "development ethos" characterizing U S policies for about 200 years after settlement to a policy embracing an "environmental ethic "

Observers of U S land and water policy might be tempted to consider four events or conditions in the mid-eighties as initiating the change in policy and the decline in the economic incentives to clear and drain wetlands (1) passage of the swampbuster provisions of the 1985 Food Security Act, (2) the 1986 Tax Reform Act (new rules for taxing capital gains and expensing land development costs), (3) the high cost of farm commodity surpluses, and (4) an increased resolve to deal with high national budget deficits However, Pavelis traces the beginnings of the "environmental ethic" back to the fifties Financial assistance from the Agricultural Stabilization and Conservation Service under the Agricultural Conservation Program and technical assistance from the Soil Conservation Service were curtailed beginning in 1956 in cases where new land was brought into production Other policies later played a major role the National Environmental Policy Act of 1969, the Clean Water Act as amended in 1977, and President Carter's Executive Order on protection of wetlands (no 11990 in 1977) Thus, these four events and conditions in the eighties actually completed a change in policy begun three decades earlier

The authors also discuss policies that were important during the "development ethos" era I found the concept of drainage at the "extensive" versus "intensive" margins useful in categorizing the effects of policies during the two eras In the development era, policies expanded farmland at the extensive margin by bringing new lands into production That is, they contributed to the dynamic process whereby lands move out of forest land or wetlands and into agriculture Today, and in the future so long as drainage policies embrace the environmental ethic, policies will stimulate drainage at the "intensive margin," but will not stimulate expansion at the extensive margin In this case, drainage will increase the intensity of farming by increasing production and net return on existing farms without converting land from other uses Although some other industries such as forestry may not be limited to the intensive margin, the concept is useful in speculating about the level and the effects of drainage in the future

Two articles, one by Fausey, Doering and Palmer, the other by Thomas, deal with assessing values associated with drainage Topics range from traditional pro-drainage values (for example, public health and control of water-borne disease, salt removal, increased trafficability and timeliness in working the land) to public environmental values associated with preservation of wetlands (for example, fish and wildlife habitat, groundwater recharge, and nutrient retention) The articles on values are important because they recognize progress in accepting and bringing into the open the need for poli-

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cies balancing public environmental costs with private benefits of drainage Readers interested in the natural values of wetlands should consult other sources such as ecological texts for an indepth treatment of the topic

Pavelis estimates the value of drainage by comparing land values in "highly drained counties" with those in counties classified as "less highly drained " The analysis suffers, however, because the data are not detailed enough to allow adjusting for other factors and conditions affecting land value that vary among counties or tracts A far more detailed database is needed to estimate causal relationships between drainage and land values The Swader and Pavelis article also contains information on wetland value, especially that related to natural values of wetlands as providers of waterfowl habitat The information about values is good, but it suffers from being scattered

The final major topic addressed might be labeled drainage data, trends, and expectations for the future Pavelis, Daugherty, and Lewis, and Swader and Pavelis present useful national and State data on several topics surface and subsurface acreage drained, land uses, drainage improvement investments, drainage and irrigation needs from the 1982 National Resources Inventory, value of production on irrigated lands, farmland values, and waterfowl values The authors evaluate the adequacy of drainage information and add a cautionary note because comparable data seldom exist between studies done for different purposes or in different years I found three errors in the data presented, and readers might want to look closely at the numbers

Although the U S Department of Agriculture has often been criticized by environmental groups for its pro-agriculture stance in the past, the book documents just how far Federal policymaking has come in trying to reflect the public's interest in balancing agricultural development values and environmental values Van Schilfgaarde writes that he expects this balance to continue and that improved policies in the future will enhance agricultural production and promote environmental values However, history has shown that the winds of change often come swiftly It is easy to imagine events (for example, a major drought in the United States or elsewhere) that could again swing the pendulum toward pro-development forces Conversely, rapid technological gains in the future could further relieve the "pressures to produce" on America's farmland and thereby reinforce policy trends of the past 30 years As Smith and Massey note, higher productivity from agricultural research and development facilitates the protection of environmentally sensitive lands by making their productive capacities less essential Under such conditions, preservation of these lands is less controversial

The book provides an interesting overview of the history of drainage and makes valuable suggestions for developing better policies to balance private and public wetland values We may indeed be seeing the end of the era of strong USDA support for drainage activities, which may or may not lead to longrun changes in drainage activities and the preservation of wetlands New policies are needed that provide economic returns to private landowners for maintaining wetlands in their natural state for the public's benefit Improved methods of estimating the public values provided by wetlands may be required Finally, new information collection schemes must be designed to provide accurate data so we can determine whether trends in wetland loss are changing

The papers include (1) "A Framework for Future Farm Drainage Policy The Environmental and Economic Setting" by Stephen C Smith and Dean T Massey, (2) "A History of Drainage and Drainage Methods" by Keith H Beauchamp, (3) "Advances in Drainage Technology 1955–85" by James L Fouss and Ronald C Reeve, (4) "Purposes and Benefits of Drainage" by N R Fausey, E J Doering, and M L Palmer, (5) "Preserving Environmental Values" by Carl H Thomas, (6) "Principles of Drainage" by R Wayne Skaggs, (7) "Drainage System Elements" by Walter J Ochs, Richard D Wenberg, and Gordon W Stroup, (8) "Planning Farm and Project Drainage" by Thomas C G Hodges and Douglas A Christensen, (9) "Drainage for Irrigation Managing Soil Salinity and Drain-Water Quality" by Glenn J Hoffman and Jan van Schilfgaarde, (10) "Drainage Institutions" by Carmen Sandretto, (11) "Economic Survey of Farm Drainage" by George A Pavelis, (12) "Drainage Potential and Information Needs" by Arthur B Daugherty and Douglas G Lewis, (13) "Drainage Challenges and Opportunities" by Fred Swader and George A Pavelis

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