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Recent Land-Grant College Research on the Economics and Policy Aspects of Water Use

By Raleigh Barlowe

SCOPE OF REPORT

This report summarizes the current and recent research on the economics and policy aspects of water use at our land-grant institutions.

By way of delimiting the subject, consideration is given only to those research studies now under way or completed during the past ten years. Except for a few pertinent studies by U. S. Department of Agriculture personnel, no mention is made of the numerous economic studies and policy statements published by federal and state agencies. A considerable amount of fruitful research by agricultural and irrigation engineers, soil scientists, crop specialists, and others has also been ruled out because of its concern with technical rather than economic or policy considerations.

RESEARCH IN THE 31 EASTERN STATES

Only during the past few years has much attention been given to economic studies of water problems in our eastern states. This interest stems mostly from the expanded use of supplemental irrigation practices. In some cases it also reflects our growing concern over the increasing competition among agriculture, industry, and other users for our available supplies of water.

Supplemental Irrigation

Studies concerning the economic feasibility of supplemental irrigation and the costs and probable returns associated with this farm practice have been reported for Louisiana, Michigan, New York, and Pennsylvania. A report of a Wisconsin study is now in process. Similar studies are under way in Arkansas, Delaware, Georgia, Indiana, Iowa, and Maryland.

Examples:

Cornell A.E.S. Bul. 862. Hampton, Murphy, and Hoff, Potato Irrigation: Costs and Practices in Suffolk County, New York, 1946.

Cornell Dept. of Agr. Economics A.E. 851. Kerr, Irrigation in Upstate New York.

Louisiana A.E.S. Mimeo. Cir. 179. Wiegmann, General Crop Irrigation in Louisiana.

Pennsylvania A.E.S. Bul. 562. Barr and Thomas, Irrigation on Pennsylvania Farms.

Water Rights

Experiment station personnel have worked on the problem of irrigation water rights in Delaware, Illinois, Indiana, Louisiana, Maryland, Michigan, Mississippi, Pennsylvania, and Wisconsin. Subcommittees have been set up in both the Southeastern and the Southwestern Land Tenure Committees to consider this question.

Official study committees have also been set up in Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, North Carolina, Ohio, South Carolina, and Tennessee to examine the water rights problem and make legislative recommendations.

Drainage and Flood Control

Examples:

Arkansas A.E.S. Bul. 476. Harrison and Kollmorgen, Drainage Reclamations in the Bartholomew-Boeuf-Tensas Basin of Arkansas and Louisiana.

Maryland. Current project. Effect of Drainage Upon Crop Yields, Farming Practices, and Land Utilization.

Missouri A.E.S. Res. Bul. 564. Kiehl, Effects of Flood Control Reservoirs on Agricultural Production. Missouri also has a study of some economic problems associated with the operation of the Wappapello Reservoir and a project on "Economic Problems of Drainage Below the Wappapello Dam on the St. Francis River."

Florida has some research concerning the flood control, water storage, salt water control, recreation, and wildlife aspects of the Central and South Florida Flood Control District.

Small Watersheds

Illinois and Wisconsin have research projects dealing with the economics of small watershed developments.

RESEARCH IN THE 17 WESTERN STATES

Irrigation is an old problem throughout most of the West. Many western states have long records of technical and economical research

on water problems. Considerable new research has been started during recent years. Some of this research has been stimulated by new reclamation project proposals and some by the spread of new ideas.

Some of the most significant new research has come from the Northern Great Plains states, where several Missouri Valley projects have been proposed and undertaken. The research in this area has also been both stimulated and coordinated by the Great Plains Council.

Farther west, the Western Agricultural Economics Research Council has sponsored some western regional research. It also has conducted several stimulating discussions of "Water Resources and Economic Development of the West." The published proceedings of three of these meetings deal with: (1) research needs and problems, (2) institutions and policies, and (3) benefit-cost analysis.

The research dealing with the economics and policy of water use in the western states can be classified as follows:

General Inventories

Descriptive reports outlining the physical features of selected areas, the amount of irrigation development, and other comparable items have been published for many areas.

Examples:

Nevada A.E.S. Bul. 183. Hardman and Mason, Irrigated Lands of Nevada.

Texas A.E.S. Misc. Publ. 59. Hughes and Motheral, Irrigated Agriculture in Texas.

Utah A.E.S. Spec. Report 1. Thomas *et al.*, The Colorado River and Utah's Agriculture.

U.S.D.A. Misc. Publ. 670. Irrigation Agriculture in the West.

Farm Management Studies

Numerous studies have been made of farm organization under irrigation and of the effect of irrigation upon particular crops and enterprises.

Examples:

Montana A.E.S. Mimeo Cir. 67. Jensen, Economics of Pasture Irrigation on Irrigated Farms.

Nebraska A.E.S. Bul. 404. Thorfinnson, Epp, and Pine, Systems of Farming in Irrigation Districts in the Republican River Valley.

Nebraska. Current project. Economics of Alternative Cropping Systems, Livestock Systems, and Farm Size in the Sandy Irrigated Areas of the North Platte River Valley.

Nevada. Current project. Improved Irrigation Practices for Meadows.

Washington A.E.S. Cir. 239. Brough and Walker, Crop and Livestock Production Possibilities, Columbia Basin Project, Washington.

Evaluation of Proposed Developments and Their Potentialities

Considerable attention has been given in the Missouri Valley to the over-all economic justification of new projects and to their potentialities for the residents of these states.

Examples:

California. Current project. The Economics of Public Resource Development with Particular Reference to Federal Multiple-Purpose Projects.

Montana. Current project. Economic Problems of Irrigation Development and Income Potentialities of Farming in Areas to Be Irrigated.

Montana. Current project. Nature and Extent of Benefits of Irrigation Development.

University of North Dakota Economic Study 2. Kelley, Irrigation in North Dakota: The Potential Economic Impact of the Program Proposed by the Bureau of Reclamation.

South Dakota A.E.S. Bul. 410. Kristjanson, Development of Irrigated Farms on the Mirage Flats Project.

South Dakota A.E.S. Cir. 110. Nervik, Kristjanson, Schutz, and Stangeland, Economics of Federal Irrigation Projects in the Missouri Basin.

Utah A.E.S. Spec. Report 7. Fuhriman, Blanch, and Stewart, Economic Analysis of Agricultural Potentials of Weber Basin Reclamation Project.

Washington bulletin in process. Income-Earning Potentials of the Various Land Types of the Columbia Basin.

Adjustment and Transition Problems

With the coming of irrigation to the Missouri Valley, considerable attention has been given to the adjustment and transition problems that arise as farmers shift from dryland farming to the use of irrigation.

Examples:

U.S.D.A. Mimeo. Publ. Thompson and Berger, From Dryland Farming to Irrigation (Tri-county areas, Nebraska).

Nebraska. Study by Gertel, Thomas, Thorfinnson, and Ottoson now in process. Adjustments to Irrigation in the Middle Loup Area.

North Dakota A.E.S. Bul. 385. Helfinstine and Schaffner, Irrigation and Dryland Farming Can Work Together on the Cannonball River.

North Dakota. Study by Schaffner now in process. Costs and Transition Problems in Shifting from Dryland Farming to Use of Irrigation.

Efficiency of Water Use

With the general shortage of irrigation water relative to the total area upon which additional water could be used to advantage, several states have emphasized the need for more information on the general efficiency of alternative types of water use. From a management standpoint, consideration is also being given to the various ways in which farmers use water and to their practices in integrating irrigated lands with nonirrigated lands.

Examples:

Colorado, Montana, Nevada, Utah, Washington, and Wyoming. Cooperative western regional project. Economics of Alternative Methods of Water Application.

Montana A.E.S. Bul. 464. Ward and Kelso, Irrigation Farmers Reach out into the Dry Land.

Montana. Current study. Effects of Cost Structure on the Method of Application and the Quantity of Irrigation Water Used by Montana Farmers.

Nebraska. Current project. Costs of Distribution of Irrigation Water by Different Methods.

U.S.D.A. Mimeo. Publ. Greenshields and Voelker, Integration of Irrigated and Dry-Land Farming in the North Platte Valley in 1946.

Settler Progress and Welfare

The success of any irrigation project depends upon the farmers who settle on the land. Several research studies have been concerned with the problem of settler progress and welfare.

Examples:

Montana A.E.S. Bul. 476. Stewart and Myrick, Control and Use of Resources in the Development of Irrigated Farms.

Montana Mimeo. Publ. Stucky, Settlement and Repayment Policies on Irrigation Projects.

Nebraska. Current project. Low Income Problems in Scottsbluff Irrigation District.

North Dakota A.E.S. Bul. 369. Voelker, Settlers' Progress on Two North Dakota Irrigation Projects.

Washington A.E.S. Cir. 173. Steinmueller, Financing Your New Irrigated Farm.

Washington. Current project. Settlement Progress Under New Irrigation Development in the Columbia Basin.

Wyoming A.E.S. Bul. 323. Tompkin, Brock, and Petzoldt, Riverton-Shoshone Settlers, an Economic Study.

Institutional Aspects

Research studies have dealt with a variety of institutional factors and problems. Some of these are concerned with organization and administration. Some are concerned with financing and the allocation and reimbursement of project costs on multipurpose developments. In the Missouri Valley states, attention has also been given to public land purchase, settler relocation, and other problems that arise with the development of flood control measures and irrigation reservoirs.

Examples:

Arizona A.E.S. Bul. 237. Rehnberg, Irrigation Ditch Management on Arizona Irrigated Farms.

Kansas A.E.S. Cir. 293. Reducing Adverse Effects of Reservoirs.

Montana. Current study. Institutional Structure in Water Resources Development.

South Dakota A.E.S. Bul. 432. Kristjanson, TVA Land Acquisition Experience Applied to Dams in the Missouri Basin.

U.S.D.A. Cir. 934. Hutchins, Selby, and Voelker, Irrigation Enterprise Organizations.

Leasing Arrangements

Special studies have been made in some areas to develop better lease proposals for irrigated farms.

Examples:

Colorado Agr. Ext. Service Bul. 431-A. Crecink and Bice, Making a Lease for an Irrigated Farm.

Nebraska A.E.S. Cir. 24. Adapting a Lease to Irrigation Farming.

Texas Prog. Report 1434. Adkins and Parker, Farm Leases on Irrigated Farms on the High Plains of Texas.

Washington (cooperative with Bureau of Reclamation and Farmers Home Administration). Farm Leasing Under Irrigation, with Special Reference to Columbia Basin Conditions.

Economics of Sprinkler Irrigation

Sprinkler irrigation has become important in many parts of the West as well as the East. Studies have accordingly been made of the costs and returns and general economic potentialities of this farming practice.

Examples:

Idaho A.E.S. Bul. 286. Jensen and Bevan, Costs of Sprinkler Irrigation on Idaho Farms.

Kansas. Current study. Investments, Operating Costs, and Expected Returns from Sprinkler Irrigation.

Montana A.E.S. Bul. 483. Mason, Sprinkler Irrigation in Montana.

Oregon A.E.S. Bul. 532. Becker, Sprinkler Irrigation Costs and Practices.

South Dakota A.E.S. Cir. 95. Wiersma, ABC's of Sprinkler Irrigation.

Texas. Current project. Economic Investigation of Supplemental Irrigation in Selected Humid Areas of Texas.

Washington A.E.S. Cir. 251. Walker and Pauls, Comparison of Sprinkler and Surface Irrigation Methods.

Washington Mimeo. Publ. Cagle, Economics of Farm Irrigation in Western Washington (part of project on Input Requirements for Sprinkler Irrigation).

Watershed Studies

Several states have indicated an interest in the economics of small watersheds.

Examples:

Montana. Current study. Small Water Project Development as Carried on by the Montana Water Conservation Board.

Kansas. Current studies of three small watershed areas.

Nebraska. Current study. Types of District Organizations Needed for Successful Watersheds.

Nevada. Current study of Winnemucca community watershed.

Western regional proposal (not approved as yet) for research. Adaptability of the Small Watersheds Program to the Western United States.

Ground Waters

Many areas pump most of their irrigation water. The problems associated with ground water use often parallel those associated with surface water use. Considerable attention has been given to these problems in the southwestern states.

Examples:

Arizona A.E.S. Bul. 246. Rehnberg, Cost of Pumping Irrigation Water, Pinal County.

California. Current project. Economic and Social Aspects of Utilizing Ground Water in California.

New Mexico A.E.S. Bul. 383. Stephens, Cost of Pumping Irrigation Water, Lea County, 1952.

New Mexico. Current project. Pump Irrigation Economics.

Oklahoma. Current project. Economic Study of Subsurface Water Resources and Development for Irrigation on Oklahoma Farms.

Texas A.E.S. Bul. 745. Magee, McArthur, Bonnen, and Hughes, Cost of Water for Irrigation on the High Plains.

Texas A.E.S. Bul. 756. Bonnen, McArthur, Magee, and Hughes. Use of Irrigation Water on the High Plains.

Texas A.E.S. Bul. 763. Magee, Bonnen, McArthur, and Hughes. Production Practices for Irrigated Crops on the High Plains.

Texas. Current project. Economic Study of Water Use and Related Management Problems in the High Plains.

Western regional proposal (not approved as yet). Criteria for Economic Analysis of Ground Water Development.

Water Rights

Water rights has long been a problem of major concern in the West. Wells Hutchins of the U. S. Department of Agriculture is now revising his earlier publication on "Selected Problems in the Law of Water Rights in the West." In addition to his legal research, several water rights studies are now contemplated or under way in the various states.

Examples:

Western regional proposal (to be undertaken next year if adequate funds are available). Comparative Economic Analysis of Laws and Related Institutions Affecting Ground-Water Use in the Various Western States.

Water rights studies comparable to those made in many eastern states have been made in North Dakota and South Dakota. A similar study is now under way in Kansas.

PART III

Economic Growth and Stability