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Upstream Watershed Activities in Iowa and Our Environment

WILSON T. MOON¹

Abstract. Watershed activities in Iowa have had considerable impact on the welfare and environment of our people. Reductions in floodwater, sediment, and erosion damages to lands have been the principal benefits. Preservation and enhancement of the environment is recognized as a by-product for better living for both rural and urban residents.

The Flood Control Act of June 22, 1936, a Congressional appropriation in 1953 of 5 million dollars for Pilot Watershed Projects, and the Watershed Protection and Flood Prevention Act of 1954 (Public Law 566) have been the principal means of initiating watershed projects in Iowa during the past 25 years. The Little Sioux Watershed Project in northwest Iowa was developed under the Flood Control Act of 1936. Three pilot projects were completed, and 35 watershed projects have been authorized for construction under Public Law 566.

Watershed activities in Iowa have had considerable impact on the welfare and environment of many of our people. Reductions in damages from floods and sediment and reduction in erosion damage to land have been the principal benefits. However, preservation and enhancement of the environment is being recognized as a by-product for better living for many Iowa rural and urban residents.

The watershed concept of planning for the development and preservation of soil and water resources in Iowa began a quarter of a century ago. It began with the Little Sioux Flood Prevention Program and has evolved to the far-reaching Watershed Protection and Flood Prevention Projects of Public Law 566. The technical aspects of watershed planning have received the attention of a large number of people in many fields. The criteria needed for planning and the methods used in evaluating the benefits of watershed programs have thus been developed.

During this period, major attention has been given by the United States Congress and by the State Legislature to promote watershed activities for the health and general welfare of the people. Federal and State legislation concerning authorization, enabling acts, and appropriations have been enacted that were not in existence prior to the early 40's. These laws are largely responsible for the many watershed activities that have taken place since then.

The Legislative Acts have placed the initiative for watershed development with local people. Thereby, the local residents in a watershed and the local units of government such as Soil Conserva-

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tion Districts, counties, towns, drainage districts, must determine that watershed problems exist which require their organized attention. On the basis of the local administration of a program for planning, construction, and operation and maintenance of watershed improvements, a great deal of aid is provided from Federal funds for technical assistance and for construction of improvements that provide group benefits in 1) flood prevention, 2) water management for agricultural use such as drainage, irrigation or livestock, 3) municipal and industrial water supply, and 4) recreation and fish and wildlife developments.

EARLY FLOOD CONTROL ACTIVITIES

The Federal Flood Control Act of June 22, 1936, was the first major authorizing Act to provide for studies and action programs in the upstream portions of major watersheds. The Act set forth responsibilities for the U. S. Army Corps of Engineers and for the U. S. Department of Agriculture in making such studies and for prosecuting the programs. In general, the Corps was made responsible for the larger downstream measures in River Basins and the Department of Agriculture for measures in the upstream portions or tributaries and for treatment of watershed lands. The Department of Agriculture assigned its responsibilities in national forests to the Forest Service, and in the primary agricultural regions, including Iowa, to the Soil Conservation Service.

Based on that authorizing Act, Congress appropriated funds for such studies in 11 watersheds in the United States, including the Little Sioux River Watershed in northwest Iowa and southwestern Minnesota. The upstream flood prevention program recommended in a survey report for the Little Sioux River Watershed by the Soil Conservation Service was authorized for construction by Congress in 1944. Appropriations have been provided by Congress since 1945 to install those upstream flood prevention improvements.

The improvements being installed in the Little Sioux River Watershed are for the purpose of protecting watershed lands from gully and sheet erosion, for reduction of flood damages in the tributary valleys, for reduction of flood run-off from the watershed lands, for reduction of sediment damages to downstream channels and lands, and for the enhancement of crop production on the lands in the watersheds.

The flood prevention watershed treatments consist of two general types of work: 1) Land treatment practices, and 2) Structural measures.

Land treatment practices such as contouring, terracing, grassed waterways, conservation crop rotations, pasture improvement, forest and wildlife habitat improvement, etc., are installed on the farm

lands to reduce sheet erosion and water run-off and increase production from the land. They are installed by farmers themselves with technical assistance provided to them by the Soil Conservation Service through individual Soil Conservation Districts. Other agencies have also provided assistance such as the State Conservation Commission and the U. S. Forest Service. Farmers receive cost-sharing assistance for many of these practices under the Agricultural Conservation Program (ACP) usually to about 40% to 60% of their cost.

The flood prevention "structural measures" are installed in locally organized sub-watershed areas. These structural measures are various types of stabilizing structures and waterway channels in the deeply gullied areas to prevent land damage and sediment production from gully erosion. Where such needed treatments cannot be accomplished by individual farmers, joint action may be required by groups of farmers working together. Floodwater retarding and sediment storage structures and floodway channels are installed in the sub-watershed tributaries to contain and prevent flood and sediment damages to the bottomland areas and channels.

Lands and rights-of-way and operation and maintenance for the structural measures are provided by local residents through the Soil Conservation Districts and county units of government. Construction costs are borne by Federal funds appropriated annually by Congress.

The program is coordinated and carried forward under the direction of the "Little Sioux Works Committee" comprised of representatives from each of the 12 concerned Soil Conservation Districts located in the Iowa portion of the Little Sioux Watershed. The policies and priorities of sub-watershed work in each of the Districts are set forth by this committee. It receives assistance and advice in its deliberations from many Federal and State agencies and Iowa State University.

Projects have been completed in 74 sub-watersheds, and are underway in an additional six. Priorities and planning assistance for structural measures have been extended to 10 sub-watersheds where farmers have made good progress in the installation of land treatment measures. In total, it is estimated that about 40% of the land treatment and structural measures in the Little Sioux River Watershed have now been completed.

PILOT WATERSHED PROGRAM

In 1953, Congress appropriated 5 million dollars under authority of the Soil Conservation Act of 1935 to start an upstream pilot watershed program on a nation-wide basis. Of the 58 pilot projects

in 32 states, three were located in Iowa:

Mule Creek, 8,013 acres in Mills County;

Honey Creek, 9,120 acres in Lucas County; and

Floyd River Tributaries consisting of Upper Plymouth Creek, 8,700 acres in Plymouth County, and Nassau Creek, 5,840 acres in Sioux County.

Surveys of problems and needs were made by the Soil Conservation Service and plans and programs were adopted by the local people with the Soil Conservation Districts serving as sponsors. Measures similar to those previously described in sub-watersheds of the Little Sioux River were planned. The structural measures were completed in these "pilot watersheds" in 1958.

PRESENT WATERSHED LEGISLATION

Congress enacted the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress) in 1954. This Act established a national policy for work on watersheds of less than 250,000 acres and for water-retarding structures of under 12,500 acre-feet of flood storage and under 25,000 acre-feet of total water storage for all purposes. It assigned administration of the program to the Secretary of Agriculture. The Act, as amended, provides that Federal funds pay for planning and construction costs of flood prevention improvements, but that local sponsors provide for administration costs and lands, easements and rights-of-way, and for the operation and maintenance of improvements that are installed. It provides for cost-sharing in consideration of the direct and secondary benefits of measures for agricultural water management such as irrigation and drainage. It provides for the incorporation into plans of municipal and industrial water supplies with an equitable savings in costs to be shared by all parties. It provides for the enhancement of fish and wildlife and for recreation by a sharing of costs on a 50-50 basis for improvements included for those purposes.

The Iowa State Legislature, during these 24 years, has enacted important legislation and appropriations dealing with watershed work. The Legislature provided enabling legislation for use of local units of government in the construction and operation and maintenance of watershed projects. These Acts provide for: 1) the formulation of Conservancy Districts with authority to raise monies by assessments proportioned to benefits, 2) raising needed funds for operation and maintenance by means of a real property tax on the agricultural base in the county not exceeding one-quarter mill, with authority for the county to accomplish the maintenance work, and 3) the formulation of a sub-district of the Soil Conservation District with authority to tax its lands not in excess of four mills, or to assess costs based upon benefits received.

The State Legislature has provided appropriations for the use of the State Soil Conservation Committee and the Soil Conservation Districts for administration of their responsibilities in the watershed program. Annual appropriations in the amount of \$50,000 per year beginning July 1, 1959, have been provided by the State for giving assistance to the Soil Conservation Service in watershed planning.

Work plans for construction of improvements have been authorized in 35 watersheds under Public Law 566. Five of these have been completed. The development of plans on an additional 10 watersheds has been authorized and plans are in various stages of completion. Applications for assistance have been approved by the State Soil Conservation Committee for an additional 27 watersheds. Records indicate that organization for anticipated watershed activities is proceeding in an additional 64 watersheds.

ENVIRONMENTAL CHANGES

How have the watershed activities affected the environment? Perhaps a few specific examples can illustrate this best.

Lum Hollow Watershed. In the Little Sioux River Watershed in western Iowa, an upstream watershed known as Lum Hollow was in serious trouble 10 years ago. Tremendous gullies, 30 to 45 feet deep and up to 100 to 200 feet wide, were advancing up into the main valley and many of the tributary waterways. Gully erosion was so severe that it dissected fields and farms, making many lands inaccessible. Studies indicated that 34 acres were going out of farm use each year in this 6,400-acre watershed. Many of the road culverts and bridges and roadways were also being engulfed by the canyon sized gullies.

Erosion of the farm fields on hillside cultivated areas was serious. The soils in the watershed are a deep loessial deposit or wind blown material up to 50, and in places, 100 feet in depth. This great depth of very erosive soil was then the stage setting for a very unstable community, both in the earning of a living from the production of the land, and in the beauty, the tranquility, or the durability, if you will, of a farming area or scene with its mixture of fields, pastures, woods, and wildlife areas.

The great amounts of soil loosened by erosion were transported out of the Lum Hollow Watershed. Much of it was then deposited as sediment downstream in Wolf Creek which serves as its outlet to the Little Sioux River. A Drainage District was formed there years ago to clean out these sediment deposits with drag lines, sometimes working the year around. The great and growing spoil banks on each side of the creek are mute evidence of the despoiling of

the countryside that had taken place. The remedial plan that was installed in the watershed was extensive, and, by the way, expensive.

Basic farm conservation plans were developed on 84% of the farms in the watershed to provide for treatment of the land in accordance with its capability. Farmers then set about to use conservation crop rotations on their fields, contour farm the land, construct grassed waterways, and install a great number of protective cropland terraces. This was all for the purpose of reducing erosion on the farm fields to tolerable limits of soil loss. Satisfactory treatments now exist on 78% of the area.

Surveys were made of the gully problems in the watershed. A treatment plan was then developed to stabilize the water course system. This included both an engineering study and an economic study to determine that the project would be economically justified over an evaluation period of 50 years.

Twenty-two gully stabilization structures were installed at a cost of \$390,000. The planning and construction costs of these were paid from Federal funds under the Little Sioux Flood Prevention authority. Two such stabilizing structures on roads were installed by the county, using county road funds. All land rights were provided by local people. All future operation and maintenance including inspections, repair work, and other costs are being provided from a county-wide "maintenance fund" for that purpose, which is paid into by the benefited farmers in accordance with voluntary enforceable contracts.

The achievements in the Lum Hollow Watershed have stabilized that farming environment. The people there are tremendously proud of their accomplishment. You can well imagine the relief from worry by residents that took place when the project was completed and stability and conservation became the outlook for the future.

Walter's Creek Watershed. Another example is a project presently being installed under the Public Law 566 Authority, known as the Watershed Protection and Flood Prevention Act. This is the Walter's Creek Watershed just north of Corning in Adams County.

Here, some of the same erosion problems exist as I described in the Lum Hollow Watershed, but not as severe since gullies are not quite so deep and the hillside soils not quite so erosive. However, to provide for stability, similar treatments, though less costly, are required.

The valley of Walter's Creek has an additional problem, and that is flooding. The stream floods the valley lands on an average of once every 2 years. The valley is not a very pretty site after these floods. Crops are laid down or damaged from silt and water; debris is piled up at bridges or in fields; some are washed out;

wildlife nesting is destroyed; weed seeds are distributed; drainage ditches are filled with sediment; the list can be made longer and longer.

The town of Corning is a growing community and needs a more substantial surface water supply. The present artificial Lake Binder is inadequate for an ample supply during years of low rainfall. No expansion in use by growth and by industry can be tolerated.

There is a real need for water-based recreation facilities in this general area. Adequate water-based recreation facilities are too far away for use by the local people.

In 1965 a watershed work plan was developed and agreed upon by the sponsoring organizations consisting of the Adams County Soil Conservation District, the Adams County Conservation Board, the Adams County Board of Supervisors, the State Conservation Commission, the Corning Water Works Board of Trustees, and the City of Corning. The work plan provides for 37 gully stabilization structures, two floodwater retarding structures and one multiple purpose structure for floodwater protection, for municipal water supply, and for a recreational development. The latter includes water and land and basic recreation facilities for use as a recreation area somewhat similar to the many uses found in our state parks.

Again, the farmers are well along with the development of basic farm conservation plans and getting the conservation treatments installed on the land.

The grade stabilization structures are about 45% complete. Land appraisals for buying the lands (about 1,940 acres) for the multiple purpose structure have been completed. Options can soon be negotiated by the State Conservation Commission for land acquisition.

Plans are being developed in a priority sequence guided by the sponsors to complete the project during the next three or four years.

The environmental effects of this project will be several. The stabilizing effects on the farming scene—crops, pastures, woods, wildlife—will be the same as for the Lum Hollow Watershed.

The removal of the flood hazard on the valley lands will make for a scenic and beautiful little valley of productive farm lands, intermingled with wooded and brushy covered areas for use of bird and animal life that is quite bountiful in the area.

The City of Corning, population 2,041, will be assured of an adequate municipal and industrial water supply storage to be incorporated into the multiple purpose structure. This will give the city a dependable water supply for existing industries and for encouragement of new industries to locate in this community. This will help prevent the outmigration from rural areas to the larger urban areas.

Recreational activities that will be available to the community are fishing, swimming, boating, camping, picnicking, hunting, and the like. The number of persons utilizing these facilities has been estimated to be 90,000 annually.

DISCUSSION

Since the inception of the small watershed program in the early 40s, many areas of Iowa have benefited from the installation of these projects.

Federal assistance in these programs consist of funds to provide technical assistance and for installation of structural measures.

One of the great needs of our times is the need to establish a reasonably stable relationship between man and his environment, not a stagnant situation but an equilibrium which permits continuous healthy progress and full protection of the natural resources. These natural resources include soil, water, woods and wildlife. In trying to improve and develop these natural resources into a dynamic and yet permanently productive relationship with our land uses, we need to make basic protection measures, usually of an engineering nature. Sometimes construction measures will eliminate or change some of the existing vegetation, both herbaceous and woody. However, as the project develops, if it has been thoughtfully designed with regard to all natural resources, the natural resources all across the board including wildlife should be benefited and a more lasting, stable and desirable relationship between man, wildlife and environment should be established.

The benefits from these project programs have had a beneficial effect on the economy of the community through reduction of floodwater and erosion damages. These benefits also have improved the quality of our environment by making the community not only a safer place to live but also improving the aesthetic quality of the land.

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