Sandstone Creek: The Effect of Upstream Flood Prevention on Local Land Use

CHESTER WEEMS, Louisiana Polytechnic Institute, Ruston

Just where to start with the history of the Sandstone Creek Watershed is somewhat difficult, as there is a choice of dates. One possibility would be with the passage of the Flood Control Act of 1944, for this set in motion the machinery to experiment with the somewhat controversial concept of upstream flood prevention.[1] The idea was to apply the principles of "little dams" and land treatment measures to 11 river watersheds in the United States. One of these watersheds was the Washita, which for the most part is in Oklahoma. Sandstone Creek was the first of the subwatersheds on the Washita to be completed, with work beginning in 1950 and ending in 1953.[2]

The Sandstone Creek watershed is a boot-shaped region of 68,770 acres, or roughly 107 square miles.[3] It is located in extreme western Oklahoma, mainly in the southeast section of Roger Mills County, but with an overlap into adjacent Beckham County of about 30 square miles. The main stream, Sandstone Creek, flows generally eastward, then northeastward, until finally it empties into the Washita River after covering a distance of approximately 16 miles. At the western extremity and highest point of the waterahed, the elevation is almost 2,400 ft; some 643

ft lower, at an elevation of 1,757 ft, the creek empties into the Washita. The headwater tributaries of the creek form small, shallow channels; but, in its lower course Sandstone Creek flows in a deep channel along a flood plain nearly a mile in width, across which it once meandered, often changing channels completely.

There are several topics that can be explored concerning the project—for example, the development of the project itself; the land treatment measures; or perhaps present farming operations in the watershed. Another possibility, of course, is the land use changes, if any, under the conservation program, which is the major topic of this paper.

Research for this paper, which is part of a larger study, was done in the spring and early summer of 1966. It is hoped that the 13-year period will be enough so that the upstream flood control idea can be evaluated, at least in terms of this particular watershed.

Land-use changes in the Sandstone Creek watershed since the completion of the flood control project are of several types, but they are not necessarily those that were anticipated in some of the early evaluation reports. The major concern in those reports was with the 4,700 acres of bottomland, whereas the "hilly upland" areas, considered as only suited for grass, received less attention. Surprisingly, however, the greater changes have taken place on the upland, especially on the rolling sandy plains in the west and on the southeastern terrace deposits. Neither of these two was particularly suited to cultivation, for they eroded quite easily and suffered from wind erosion. Much of this upland area had at one time been cultivated, and when the project began an estimated 15% of the upland, or about 10,495 acres, was being cultivated. The remaining 52,805 acres was mostly in grass. Since completion of the project there have been some further changes, prompted by economic necessity.

Farm units continue to get larger, fewer people are growing cotton, and more emphasis is being placed on crops that will supplement the cattle industry, which seems to afford the largest, or at least the most reliable, return in relation to labor and other costs. Increased emphasis on cattle means reseeding the pastures to improved grasses, or raising hay crops or feed grains. An increasing amount of land in the watershed, particularly on the uplands, is being designated for one of the "soil bank" programs, which again removes land from cultivation or, in some instances, from any productive use. Several farmers, especially in the west and southeast, who formerly grew cotton have now gone into the dairy business.

The narrow bottomlands in the upper watershed, that are associated more with the ranch country than they are with lower Sandstone, also show a slight change. Productive acreage has increased since some fields, previously abandoned because of periodic flooding, are now used. There has also been some further clearing of land. Shallow creeks that once meandered across the fertile bottoms are now confined to relatively straight and much deeper channels, thus reducing danger to the new bottomland fields. One new field that was cleared along Currant Creek, a tributary to Sandstone, is less productive than anticipated because of places having a higher than expected percentage of sterile sand.

Farther downstream, on lower Sandstone, a much closer record of land use has been compiled, for here were expected the big changes. Most of the farmers interviewed along lower Sandstone, however, had the impression that there had been little change in their patterns of land utilization. The majority were planting the same crops in the same fields as always, the only differences being that now they get a crop every year. Records show, however, that there has been a small, gradual change, both in crops and crop emphasis. For instance, cultivated land occupied

67% of the flood plain in 1950, the year work began on the structures (Table I).[4] Since then there has been a gradual increase in cultivated land, with a corresponding decrease in pasture. Specifically, the year

TABLE I. GENERAL FLOOD PLAIN USE ON THE SANDSTONE CREEK WATERSHED*

(Percentage of Flood Plain Occupied)

	1950	1955	1957	1958	1959	1962
Cultivation	67	69	69	70	69	75
Pasture	—	29	29	28	28	23
Miscellaneous	—	2	2	3	3	2

1962 showed 75% of the bottomland cultivated and 23% in pasture. Moreover, the record of crop emphasis as shown by Table II does indicate some changes: wheat, which occupied 40% of the flood plain in 1951, occupied only 33% in the average year between 1957 and 1962; small grains, which increased in the years between 1951 and 1957, have since held fairly steady.[4] A more impressive increase has been registered in the acreage of both alfalfa and cotton, with alfalfa becoming the number two crop, second only to wheat. The increase in cotton acreage, although not as large as expected, is attributed in part to the transfer of allotments from the adjacent hillsides to the bottomlands. Corn and broomcorn have been completely eliminated, but sorghums have increased in importance, partially because of irrigation. Land in pasture has decreased 10% since 1951.

Perhaps if the water rights problem did not exist, there would continue to be a slight increase in alfalfa acreage. The writer gained the impression that the resident farmers, most of whom are in their fifties, think that alfalfa requires too much work. Of course, the acreage of any of the main crops could be influenced at any time by new government programs. For example, during some years in the early 60s, when the wheat price was relatively low, some farmers considered quitting wheat altogether. The bumper crop of 1965 and the higher prices in 1966, however, have led the farmers to delay such action. Land in pasture could increase somewhat in the future if the practice of seeding Midland Bermuda becomes widespread. This has been done on some former wheat ground and is being considered by several other farmers. More production of this grass could enhance cattle raising along lower Sandstone Creek.

There is one other effect of the upstream flood prevention program that should be noted, although it is more of an abstract nature. This is the effect that the mere presence of the program has on the landowners in terms of making them realize how important conservation is. Most of the people interviewed did have an understanding of conservation practices and at least to a degree let this influence the utilization of their land. Perhaps this is the greatest effect of all.

TABLE II. FLOOD PLAIN USE BY CROPS ON THE SANDSTONE CREEK WATERSHED*

(Percentage of Flood Plain Occupied)

	1951	1957	1958	1959	1962
Wheat	40	32	32	32	33
Small grains	2	4	6	6	6
Alfalfa	12	17	14	14	17
Cotton	5	9	11	11	14
Corn	3	0	0	0	0
Broomcorn	1	0	0	0	0
Sorghum	2	2	2	2	5
Meadows	0	5	5	4	0
Pasture	33	29	28	28	23
Miscellaneous	2	2	2	3	2

*Compiled from *Evaluation Studies, Sandstone Creek Watershed* 1958-1962

FOOTNOTES

[1]Staub, Charles. *Little Dams Stop Big Floods.* Reprinted from The Farm, Vol. 13, Autumn, 1968, by the U.S. Department of Agriculture, Soil Conservation Service, Fort Worth, Texas.

[2]Kautz, Harold M. The Story of Sandstone Creek Watershed. In: *Water, The Yearbook of Agriculture 1955.* U.S. Department of Agriculture. Washington: U.S. Government Printing Office, 1955, p. 214.

[3]*Evaluation Studies, Sandstone Creek Watershed.* Stillwater, Oklahoma: U.S. Department of Agriculture, Soil Conservation Service, January, 1958, p. 2.

[4]*Evaluation Studies, Sandstone Creek Watershed.* Stillwater, Oklahoma: U.S. Department of Agriculture, Soil Conservation Service, 1958-1962.