

## *Economic Impact of Water-Based Recreation*

DANIEL D. BADGER

*Department of Agricultural Economics, Oklahoma State University  
Stillwater, Oklahoma 74074*

This paper reports the results of recent studies to: (1) analyze the economic impact of water-based recreation (in terms of income, output, and employment) on regional economies, (2) estimate impacts on land values, and (3) analyze a few of the noneconomic or externality-type effects of water-based recreation. Finally, I would like to suggest some alternative research approaches that would provide information needed by policy makers and resource planners in developing new water-based recreational facilities and in improving the management policies of existing facilities to provide a higher level esthetic experience for more people.

The creation of new man-made reservoirs and the development of recreational facilities win new converts to water-based outdoor recreational activities and stimulate additional use by 'preconditioned users.' Fishermen, boaters, and water skiers move quickly onto reservoirs as they are completed and have increased the use of water-based recreational facilities tremendously.

Recreation is now recognized as a legitimate purpose or output of water resource development projects. It is no longer a 'tagalong' thrown in 'just for good measure' in developing man-made lakes. However, the greatly increased use of recreational activities at our man-made lakes has burgeoned greatly only in recent years. The advent of more leisure time, higher levels of incomes, more and better highways, and more private transportation allows greater fulfillment of the desire of people to recreate and/or relax in a water surrounding.

Many of us, as construction agency planners, government policy makers, and university researchers, have not aided in making this transition to true multiple-purpose development. We have not seriously considered how recreation 'relates' as one of many purposes. In general, dams have not been located to maximize

economic, social, and esthetic benefits to the public from the resulting recreational use; i.e., this output is still considered a by-product of development for other purposes.

### MEASURING ECONOMIC IMPACT

Two generally accepted techniques have been used to estimate outdoor recreation benefits and/or the economic impact of outdoor recreation in a regional economy. The first technique relates to the various methods used in recent years by economists to estimate demand curves for selected recreational activities [Clawson, 1959; Knetsch, 1964b; McNeely, 1968; McNeely and Badger, 1968; Merewitz, 1964; Wennergren, 1965]. By the use of such estimates and attendance patterns, recreationists' expenditures can be totaled to provide some indication of the 'value' of outdoor recreation. However, such demand measurements do not consider all the aggregate or macro effects of water-based recreation.

The second technique is based on the multiplier approach to determine the direct, indirect, and induced effects of outdoor recreational expenditures. By developing a recreational sector for an input-output model, we can trace the effects of such expenditures on other sectors of a regional or national economy and can derive multipliers for calculating the income, output, and employment effects of outdoor recreation. This technique requires detailed planning data for the different sectors of the economy. It has limitations, such as an assumed level of technology and linearity or constant relationships among sectors. However, it is a valuable technique in analyzing economic impacts.

Some input-output studies in other regions will be summarized in this paper. However, I will focus primarily on a recent input-output study of our Oklahoma water-based recreational laboratory.

## INPUT-OUTPUT AND RELATED ANALYSES

Several recent input-output studies have focused on the economic impact in a region due to the development of water-based outdoor recreational facilities. A Cornell University evaluation of the recreational impact of a small Corps of Engineer reservoir (485 ha) concluded:

the introduction of reservoir recreation has been a mild and seasonal stimulant to economic growth. Any problems or costs such as traffic congestion, vandalism, noise, etc., were minor and primarily on hot weekends. Overall, the introduction of the lake and accompanying recreational facilities has been an asset to the rural residential environment. It is likely that the reservoir recreational investment will help attract new residents in the future.

*Hinman* [1969, p. 63]

An earlier Oklahoma study concluded:

The local gross income per dollar of direct and total recreational income is much smaller than for agriculture. That is, there is only \$1.17 in gross income to the economy per dollar of direct recreational receipts, and \$1.13 per dollar of total receipts . . . Thus, there is a smaller multiplier effect (a greater amount of leakage) associated with recreational income than that associated with agricultural receipts.

*Jansma and Back* [1964, p. 14]

There have been dramatic increases in certain types of businesses as a result of the availability of water-based recreational activities. Sales of all types of pleasure boats, particularly the outboard types used for fishing and water-skiing, have increased tremendously. For example, in 1968 an estimated 36,554 boats less than 4.88 meters in length, 6655 boats between 4.88 and 7.62 meters, and 1211 boats longer than 7.62 meters were moored on the 26 Tennessee Valley Authority lakes. These boats had an estimated value of over \$55 million. In addition, over 3000 houseboats valued at almost \$10 million were in use on those lakes.

The Tennessee Valley Authority estimated that the total value of both public and private recreational facilities and improvements at these 26 lakes was almost \$287,000,000 in 1969, more than a 100% increase from the \$121,000,000 of 1960.

However, from a regional standpoint the point of purchase for each of these boats and for other

recreational equipment is needed to determine the value of such imports to the regional economies where the lakes are located. Some studies have concluded that much of the impact on employment, output, and incomes is lost to the rural local area economies, since many of the boats are manufactured and sold in urban centers [*Badger*, 1970a]. On the other hand, from a national standpoint the water-based recreational activity provided by our man-made lakes has created new markets, new jobs, and some distribution of income effects.

Economic benefits from water-based outdoor recreation are generally widely scattered. Owing to imports of both capital and consumption goods into the rural area, a high percent of the recreationists' expenditures in the area may flow back out of the local economy. Also many of the items used in recreation are purchased outside the area and are thus imported into the local areas for use by the recreationists.

Often not only capital but also personnel are imported into the area to manage the recreational complex. It is difficult to convince policy planners that individuals lacking capital, managerial skills and experience, and/or successful farming experience are unlikely to be able to develop and manage a recreational enterprise successfully. Certainly, some job opportunities are available when recreational facilities are developed on and around our man-made lakes. However, most of these jobs are seasonal in nature, and the wages paid for them may not be high by the standards of today.

## WATER-BASED RECREATION IN OKLAHOMA

The 50 states now have thousands of hectares of recreational areas and many excellent facilities in conjunction with large-scale federally financed water development projects. For example, Lake Texoma in south central Oklahoma and north central Texas with 37,650 ha of surface area and Lake Eufaula in eastern Oklahoma with around 42,900 ha of surface area are two examples of large water-based recreational complexes. Around these lakes are many public and private recreational sites. In Oklahoma, only 2 (Alabaster Caverns and Red Rock Canyon) of our 22 state parks and recreational areas are not associated with or built on a natural or man-made lake. Adding to our water-based recreational orientation are the many excellent recreational facilities on 27 Corps of Engineer

and Bureau of Reclamation reservoirs already constructed or under construction.

Better roads, more cars, and more leisure time for Oklahomans and out of staters have helped increase attendance at the 60 public recreational areas in Oklahoma, which are primarily water based. Attendance at Oklahoma's public recreational facilities increased from 25 million visits in 1963 to 42 million visits in 1969. Much of this increased recreational use has been on and around the four new Corps of Engineer reservoirs completed since 1963 and two new Bureau of Reclamation reservoirs completed since 1965. Better measurement techniques may account for some of this rapid increase, but it is readily apparent that recreational use of existing and newly opened water-based facilities continues to increase rapidly.

#### INPUT-OUTPUT ANALYSIS IN SOUTHEASTERN OKLAHOMA

In many recent efforts, either the geographic area studied has been very small or the data have been aggregated to such an extent that the effects of specific types of recreation are not known. We have recently completed a study, using input-output analysis, to measure the economic impact of water and related land-based recreational facilities on the regional economy of southeastern Oklahoma.

The current economic base of the region relies heavily on the livestock industry, mining, and a limited variety of manufacturing activities. However, Arrowhead State Park, Robber's Cave State Park, Lake Wister State Park, and Beavers Bend State Park are all located within the region. Three of these state parks are adjacent to large man-made reservoirs. In addition, five new reservoirs are currently under construction, and two others are authorized for future construction. These bodies of water promise to add to the potential for outdoor recreation development in the region.

Building on an earlier Oklahoma State University study using a 16-sector input-output model for the Kiamichi district in southeastern Oklahoma, we attempted to measure the economic impact of outdoor recreation in this part of the Ozark region (an area of depressed or low per capita income and high unemployment). We developed building block data for a seven-county area and derived the recreation multipliers in Table 1.

TABLE 1. Values and Rankings of Recreation Multipliers for Water-Based Recreation Impact, Southeastern Oklahoma

Recreation Multiplier	With Households Exogenous	With Households Endogenous
Output	1.18 (ranks 5th)	2.20 (ranks 13th)
Income	1.07 (ranks 14th)	1.77 (ranks 5th)
Employment	1.10 (ranks 13th)	1.59 (ranks 17th)

The input-output model for the seven-county region had 17 sectors. Thus the rankings of the recreation multipliers are based on the 17-sector economy.

For employment multipliers developed by using regional employment-output ratios (households being endogenous to give the induced effects of local household expenditures), recreation ranks last of the 17 sectors, but only 6 other sectors have a significantly greater impact than recreation does. They are food manufacturing, apparel manufacturing, lumber manufacturing, personal services, repair services, and professional services.

We concluded that increased expenditures in the outdoor recreation sector will have a favorable effect on regional income, particularly when direct, indirect, and induced effects are considered. However, the employment multipliers calculated by using regional employment-output ratios indicate that development of the recreation sector will do little to alleviate the regional unemployment problem [Mapp and Badger, 1970].

We recognize that use of our water-based recreational facilities is seasonal in nature; many activities associated with outdoor recreation do not provide year-round employment. Thus public expenditures to attract manufacturing sector activities will do more to relieve unemployment than public expenditures to develop water-based recreational facilities in southeast Oklahoma.

However, when recessions, such as the one in 1970, occur, these small manufacturing industries in rural areas can be hurt badly, the only employment base of the local area being disrupted. On the other hand, there is some evidence that recreation, measured by visitor days, continues to increase even in recession or 'economic slowdown' years, such as 1958, 1960, 1967, and 1970.

Despite the high leakage due to imports of goods and services into our rural areas for purchase and consumption by recreationists, water-based recreation does have a favorable impact on these local economies. Schmedemann and McNeely [1967] indicated that recreational users

may sometimes be a deterrent or have a negative impact on local areas because of wear and tear on roads, public utilities, schools, hospitals, and other community service institutions. There are some situations in which tourists or recreational users have done more economic harm than good to a community. Obviously, repair costs resulting from vandalism to signs and buildings and clean-up costs due to littering are some of these economic losses.

However, in the cases in Oklahoma with which I am familiar, federal construction of large multiple-purpose reservoirs has meant better state or federally financed access roads to the recreational areas, higher tax revenues from increased property values, and high-priced land around the water-based recreational area that is being sold not only for cabins and other private uses but also for recreation-related businesses, such as bait and tackle shops, restaurants, cafes, boat storage facilities, and so on.

#### IMPACT OF WATER-BASED RECREATION ON LAND VALUES

Construction of a reservoir and the subsequent public and private development of water-based recreational activities stimulate increased activity in property exchanges (transactions) of nearby land. Some recent studies have analyzed the impact of reservoir development on land use change and land values [Prebble, 1969; Waldrop and Badger, 1966; Epp, 1970; Romm, 1969; David and Lord, 1969].

Land use shifts from nonproject to project oriented uses, property values change, and some land owners gain economically. However, other land owners who are forced to sell their land for construction of the reservoir, do not obtain large economic gains.

*Prebble* [1969]

*Knetsch* [1964a], in a study of land value changes near Tennessee Valley Authority reservoirs, concluded that

the increased sales prices of land established in the real estate market reflect values due entirely to location on or near reservoir projects. These increased prices represent the capitalization of values derived from such locational advantage.

Results of a similar study of property transfers near a 910-ha water-based state park in Pennsylvania indicated

that public investment in water based recreational areas can significantly influence the value of rural property . . . The park has a significant impact on the structure of the land market surrounding the park.

*Schutjer and Hallberg* [1968, p. 582]

Still another study has concluded that increases in recreational uses of our man-made lakes 'should accelerate the current economic impact on land values, particularly if the administering agency can maintain or improve the quality of recreational opportunity' [Milliken and Mew, 1969, p. 99]. Although that analysis was based on a study of three small Bureau of Reclamation reservoirs in Colorado, similar conclusions have been reached on the basis of studies of larger man-made reservoirs [Morgan, 1970] and smaller multiple-purpose upstream detention structures developed in coordination with municipalities [McNeely, 1968].

When land is acquired for reservoir construction or any other public development project (highways, urban renewal, military bases, and so on), initial concern and criticism relates to the adverse effect such a shift of property from private to public control will have on the tax base of local governments and school districts. Because of the concern and criticism, construction agencies and public management agencies have established policies of school district subsidies and/or reimbursement of part of the revenues collected (for grazing and recreational use, for example) to local governments. Some school districts are provided with new buildings in a new location by the construction agency involved.

However, there is research evidence that the increased values of nearby private lands favorably impacted by the reservoir more than offset the loss of tax revenues in a fairly short period of time [Bates, 1969]. A recent study concluded:

In the areas studied, the appreciation in value of surrounding areas occurred very rapidly. In twelve of the fifteen development areas, the total value of taxable real estate remaining was higher the year after acquisition began than it was the previous year.

*Epp* [1970, p. 18]

Obviously, when land values increase, tax values increase, and the resulting higher tax revenues to local governments should assist many local areas greatly in their efforts to provide good quality services and to remain or to become

viable economic areas. Often much of the land around our reservoirs is still in an undeveloped state. As new access roads are built and more recreational sites are added, the net impact will be for more nearby land transactions, and the upward trend in land values will continue.

The major difficulty in making general assessments about tax revenues is that school districts and other public services are generally funded on county or sometimes township boundaries. If by chance most of the land acquired for the reservoir is in one political boundary and the economic activity (including land transactions) from recreational developments occurs in other political districts, inequities may occur as a result of the water-based recreational impact.

#### IMPACT ON ENVIRONMENTAL QUALITY AND OTHER EXTERNALITY CONSIDERATIONS

The general philosophy of the construction agencies is that water projects should be developed to accommodate large numbers of users. However, *Lawyer* [1970, p. 8] points out that

facilities and lands must be developed only to a degree consistent with the reasonable estimate of project carrying capacity . . . . We recognize, therefore, that to sustain the quality of the recreation experience at our projects, some restrictions on total amounts of development and the numbers participating in given activities at any one place or any one time will be necessary.

The qualitative experiences received by recreationists at a man-made lake may be either beneficially or adversely affected depending on the use patterns, timing of visit, and so on. As more people use a given site past some critical use point of daily visitations, the esthetic experience declines.

*Clawson* [1963] summarized some of the outdoor recreational trends on federal reservoirs and indicated some of the recreational policy problems that must be faced in relation to water management. In discussing the cost of waste disposal programs as related to the quality of water needed for recreation, he makes the point that 'aesthetic considerations may be as important as economic ones.' That statement was made in 1963, but in view of recent national policies [*U.S. Congress*, 1962], as indicated by the establishment of the Environmental Protection Agency and the Environmental Quality Council and by

the *Water Resources Council's* [1969] proposed objectives of water resource development, esthetic considerations or quality of life considerations may be assuming a higher level of importance!

#### PUBLIC POLICY PERSPECTIVES AND SOME ALTERNATIVE RESEARCH STRATEGIES

The Outdoor Recreation Resources Review Commission reports recognized the importance of increasing public expenditures for development and operation of outdoor recreational facilities in connection with water resource development. Whether 'supply creates its own demand' is a moot point in this context. Our citizens have increased use of water-based recreational facilities in recent years. What once was considered to be an 'extra dividend' of water resource development is now considered to be equal to other purposes for which the public receives or obtains economic and esthetic benefits [*Kerr*, 1960].

Little or no thought was given initially to the depreciation of recreational sites and surrounding areas due to overuse or congestion, to the seasonality effects on both transportation facilities and business interests in surrounding communities, or to the ability of the community to provide such services. Research is certainly needed in these fields.

Similarly, too little effort has been devoted to the type of research needed to determine which groups of people are absorbing the costs and which groups are gaining the social and economic benefits. The operation and maintenance costs of such outdoor recreational facilities are becoming a much more significant expense to the public agencies providing them. Many equity and efficiency arguments over who benefits and who pays for the operation and maintenance of these recreational activities remain unanswered.

Probably most, if not all, public recreational facilities should be put on a self-sustaining basis through the imposition of user fees [*Badger*, 1965]. Others have come to the same conclusion on the basis of these and other reasons:

If there are no externalities resulting from public investments in outdoor recreation facilities, then it follows that efficiency is attained when users bear the marginal costs which are incurred. Without charges to consumers, there is little incentive for them to make efficient use of recreation resources. The public provision of outdoor recreation

in water projects is not done without cost and beneficiaries are clearly identifiable.

*Knetsch [1964b]*

Although the user or admission fees charged by federal or state agencies were once considered 'verboden' for public use areas, they are generally accepted now by most of the public. Extension (by the 1970 Congress) of the Golden Eagle Passport Program until December 31, 1971, at an annual permit fee of \$10.00 will allow additional revenues for use in the provisions of the Land and Water Conservation Fund Act [U.S. Congress, 1965].

Certainly, Congress and the Office of Management and Budget will have pressures for increased funding to continue developing water-based outdoor recreational facilities. Additional policy planning is needed to determine just what percent of our national budget can (and/or should) be devoted to the development of additional water-based outdoor recreational complexes, to the improvement of existing facilities, and to the insatiable operation and maintenance needs of all our public facilities.

The rationale and basic framework have been provided for some type of rationing system in the use of our water-based recreational facilities. Research is needed to determine how best to establish such a management policy to provide higher quality recreational experiences at reasonable prices. The majority of those who recreate at our man-made lakes have the buying power to pay for their recreational experience. Most recreationists would be willing to pay a small cost if they were assured a higher quality esthetic experience from their visit.

Thus I see the need for more sophisticated research on ramifications of admission or user fee policies (perhaps even a multiple-price policy based on day of week, holidays, working days, or season of year) as a must for planning future recreational developments. We certainly do not have all the answers on demand for recreation activities.

Accurate estimates of both present and future consumer demand are needed to prevent surpluses of some types of [water] recreational developments and deficits of others.

*Schmedemann [1966]*

I visualize at least three different research areas relating to the interrelationships of water-based

recreational facilities, the use of these facilities by man, and the resulting economic impact.

The first research area is the development of more sophisticated techniques for measuring demand for and economic impact of selected water and related land-based recreational activities. This would involve interviewing present users and potential users, obtaining actual receipts and expenditures at and near the complex, and then performing a statistical demand analysis [McNeely and Badger, 1967, 1968] and an input-output analysis [Mapp and Badger, 1970].

A second research area would be a socio-economic analysis of the economic management problems and potentials of water-based recreational complexes that would include an analysis of the economic and legal implications of charging user fees for selected recreational use [Badger, 1965; Badger et al., 1966, 1970; Heard and Badger, 1967].

A third research area would be the development of ways to measure the environmental externalities associated with the various multiple uses of land and water as they involve water-based recreational activities [Badger, 1970b]. What are the third-party effects or social costs and benefits involved in the different water-based recreational activities? How might we improve the quality of the experiences from use of the man-made lake for outdoor recreational activities?

Not all the qualitative experiences relating to recreational use of the reservoir facilities and/or activities can be quantified or even catalogued in a qualitative scale of values. One study stated: 'The long-term benefits to society as a whole may well be measured in terms of the physical and mental well-being of the populace' [Milliken and Mew, 1969, p. 109]. The difficult part is attempting to measure 'well-being.'

New guidelines from the Water Resources Council indicate four national objectives for water resource development: national income, regional development, environmental enhancement, and the well-being of the people. Recreational development, as one of the many purposes of water resource projects, provides both market-valued and nonmarket-valued benefits to each of the four national objectives. Possibly, some adverse effects may enter into environmental enhancement and the well-being of the people. Further analyses of water-based recreational activities on existing and authorized

man-made reservoirs are needed to determine the nature and size of these effects. Also additional research should indicate what complementary or related developments are needed to achieve the greatest possible increases in the economic growth of the region where most of these water-based recreational facilities are located.

#### SUMMARY AND CONCLUSIONS

Increased recreational use on and around our man-made lakes is projected over the next 30 years on the basis of all known trends relative to the preferences of our citizens and income and spending patterns. New technological developments and mass production techniques using new materials, such as fiber glass, will continue to stimulate sales of pleasure boats, fishing rods, and water skis. Boats in particular have been brought within the spending power range of millions of Americans.

The recreating public, no matter where their homes are, receive leisure time qualitative benefits from the use of water-based recreational developments. Public expenditures for state and federal recreational developments on our man-made lakes have resulted in economic benefits as well as social and esthetic benefits for many of our citizens. Land values have been favorably affected, although some private property owners have gained no real benefits from the development of man-made lakes. In some cases, adverse environmental effects have been noted. Such social diseconomies or adverse externalities may increase if we do not reinforce our efforts toward proper management of our recreational facilities to prevent overcrowding and the resulting physical deterioration of the site.

Research is needed on how to measure some of these externalities as well as on how to develop improved techniques for measuring economic impacts and better methods for measuring both potential and actual demand for selected types of water-based recreational activities. More effective planning for location of recreational facilities on a geographic or regional basis and for specific site location of these facilities in a given area will be possible only with more investments in basic and applied socioeconomic research.

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