

# THE CENTRAL ARIZONA PROJECT

## *Arizona's Continued Agricultural Production Depends upon an Ample Supply and New Sources of Irrigation Water*

*EDITOR'S NOTE: Last fall Dean Harold E. Myers was asked to appear, with other prominent Arizona governmental, business and agricultural leaders, before a U. S. Senate subcommittee which was studying Senate Bill 1658, a bill to authorize the Central Arizona Authority.*

*Much of that statement — in fact, all of it — is of vital interest to all Arizonans. We take pleasure in presenting it here. We are happy, too, to give credit to Dr. J. S. Hillman and his fellow agricultural economists who selected and assembled material on which this statement is based.*

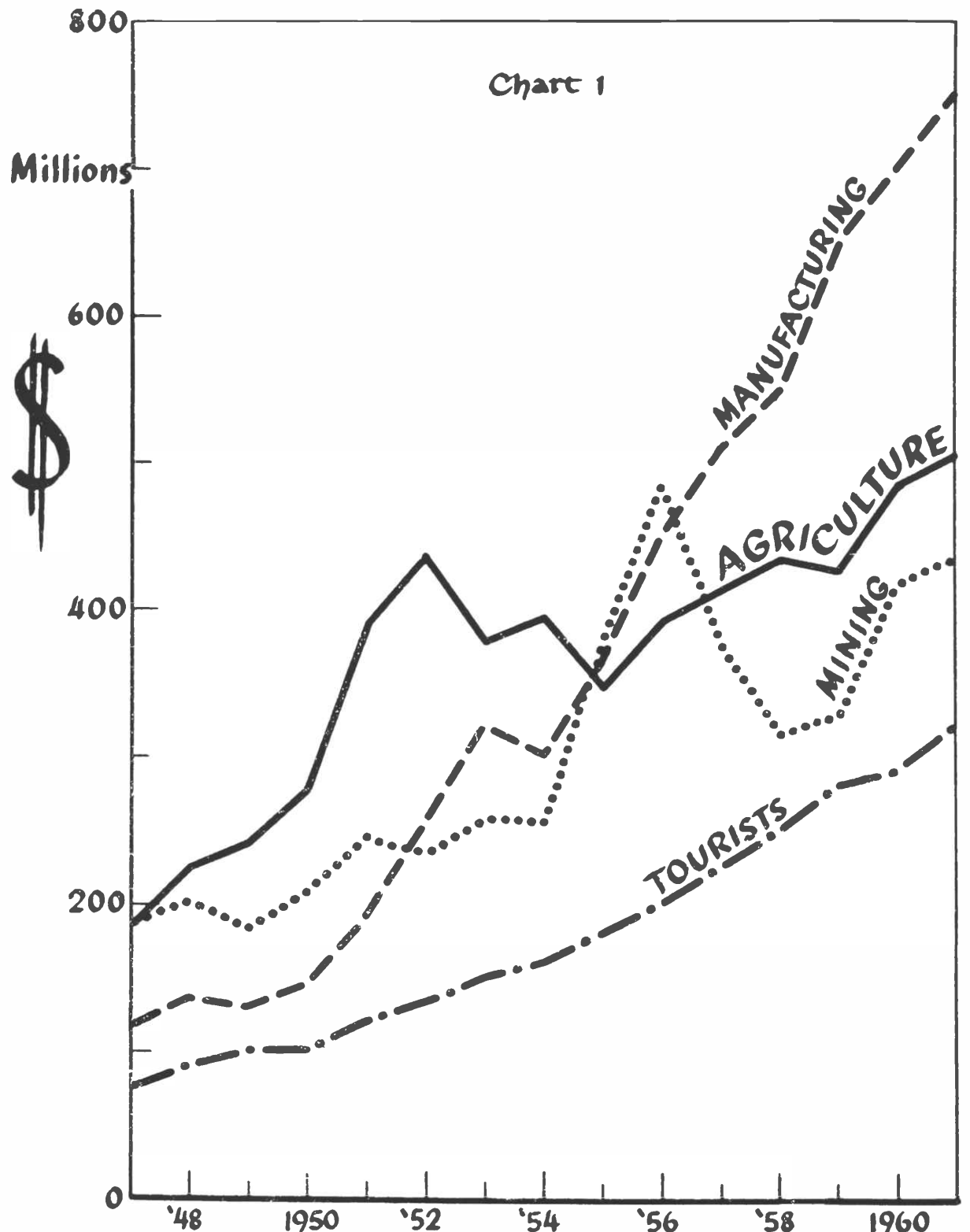
Agriculture is a major factor in Arizona's economy. About one-fourth of all people employed in Arizona are engaged in agriculture directly or in industries and services dependent upon agriculture.

Arizona agriculture is predominantly based on the irrigation of desert valleys. At the beginning of the century less than 200,000 acres were irrigated, most of which were irrigated by diverting surface water from streams. Beginning about 1920, the groundwater used for irrigation purposes became an important factor and, except for Yuma County and the San Carlos irrigation project, additional irrigation water since that era has come from pumping. The greatest acreage ever irrigated in the state was in 1953 when 1,300,000 acres were irrigated. Acreage has declined since that time. The approximate reduction of 150,000 acres has been largely concentrated in Pinal and Maricopa Counties.

Historically, the economy of Arizona has been heavily dependent on income and raw materials produced in the agricultural sector. Arizona

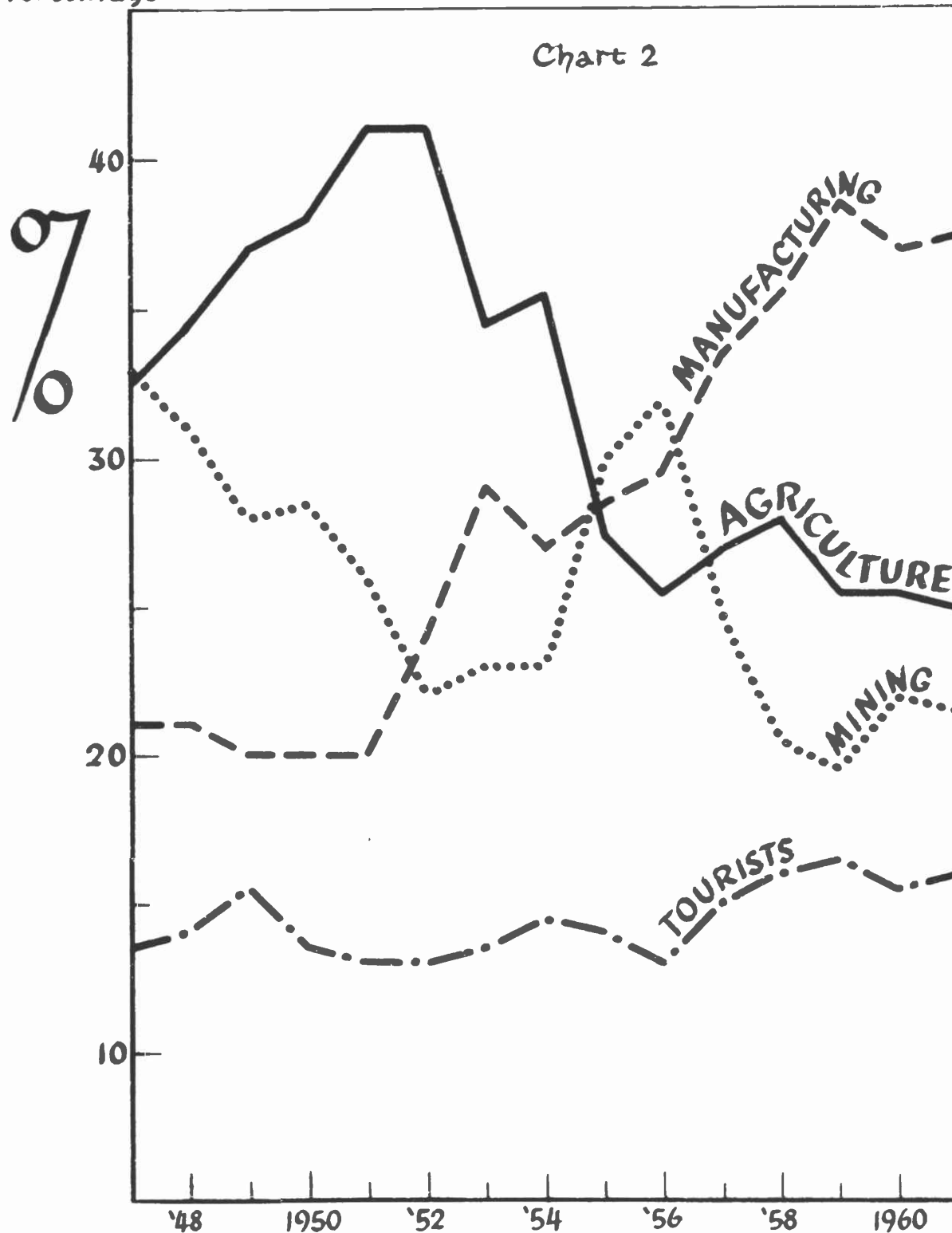
farms produced crops valued at over \$325 million in 1962. Another \$226 million of livestock and livestock products was produced. Gross value of agricultural production in Arizona compares favorably with income produced in other sectors of Arizona's economy. The accompanying charts show that agriculture since World War II has varied between 25 and 41 percent of total state income, while  
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## Major Sources of Arizona Income



## Percentage Comparison of Arizona Income Sources

Percentage



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manufacturing, mining and tourists, average about 30 percent. In spite of recent rapid increases in manufacturing, agriculture has managed to hold its own since 1955. If water supplies had been available in recent years in the same magnitude of early postwar years, agricultural income might have been even greater.

In addition to the value of crops produced, worth noting is the wide variety of crops grown on Arizona farms, including citrus, grapes, lettuce, melons, a wide variety of other vegetables and specialty crops, in-

cluding commercial rose production. The national supply of some horticultural products such as lettuce and melons is heavily dependent on Arizona production during certain seasons.

### Need for Additional Water

An increased pumping lift, coupled with other factors, is resulting in a continued reduction of land irrigated in Arizona. Pinal County, an area largely dependent on pumping, decreased from 315,000 irrigated acres in 1952 to 258,000 irrigated acres in 1962, and a more dramatic drop is in prospect unless a supplemental water supply is found. A severe economic loss results when land, prepared for

crop production through irrigation, goes out of production. The high level of investment in land preparation, wells, equipment and other resources required for development may be of little value.

The importance of agriculture and the resultant loss, should agriculture decline decidedly, can be adduced from facts published recently by a California growers organization. Using their information, and recognizing the similarity between the two agricultures, it appears that for every 100 employed in agriculture another 250 or more are employed in closely related industries such as processing, packaging, transporting, storing and selling. Farming in itself accounts directly for about 30,000 jobs in Arizona. This becomes of much greater importance — something close to 100,000 jobs — when such multiplier effects are taken into consideration. This was about one-fourth of all people employed in Arizona in 1960.

### Losses Due to Uncertainty

A good example of losses which plague agriculture because of water uncertainty is the San Carlos Irrigation Project located in eastern Pinal County. Less than half of the developed area of this project, which comprises 100,000 acres, can be planted to crops in any given year due to the shortage of water.

Compounding the San Carlos problem is the fact that the flow from the Gila and San Pedro is so erratic that farmers cannot make efficient use of the water which is available. Farmers don't know at planting time how much water will be available. Hence, not only is water inefficiently used but so are other resources, due to economic uncertainty. Supplemental water from the Colorado River could contribute considerably to farm income by providing a certain amount of stability. But the need for this stability **should not be interpreted as a request for water to develop new land for irrigation, since there is to be no new irrigated land under the proposed project.**

Stability alone is an important fact to be desired in agriculture. A recent study by the Department of Agricultural Economics, The University of Arizona, points out the effects of this unstable water situation on the farmer decision-making process in the San Carlos Project area. This study shows that the low probability of having sufficient water during the latter

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part of the growing season has restricted farmers from planting the crops which would yield the highest returns. A supplemental, stable water supply would not only stabilize the agriculture of the San Carlos area but also would assist in stabilizing the community and State.

### Value of Groundwater

Arizona produces crops on about 800,000 acres of land by using irrigation water pumped from underground. In 1962 the value of crops produced on this acreage was \$220 million. The \$220 million received currently for the crops produced on these 800,000 acres will continue annually so long as groundwater is available to be pumped at economical costs, assuming no changes in price relations, technology, and irrigation practices. We estimate that on the average, over the pump water areas in the state, the water table is falling about 6½ feet per year and will reach the limit of economic pumping in about 24 years, assuming no change in technology or price structure.

If these \$220 million per year could be received indefinitely because the water table could be prevented from receding, these dollars would continue to flow indefinitely through the Arizona economy, continuing to generate incomes to the state's economy. However, if the agriculture dependent on groundwater for its irrigation disap-

pears after 24 years, then, beyond that time, these \$220 million will no longer be available to perform their service of generating income in the State's economy.

### Would Be Huge Loss

How much will this damage the state economically? Let's put it this way —

\$220 million annually in perpetuity at 5% discount is worth \$4,400 million today.

\$220 million annually for only 24 years, again at 5% discount, is worth \$3,036 million today.

The difference between \$4,400 million and \$3,036 million is \$1,364 million. This means that, as of today, the economy of the state of Arizona stands to take a loss of \$1,364 million if some means is not found to prevent the ultimate and inevitable disappearance of that part of its agriculture now dependent on pumped water. This estimated loss of \$1,364 million is far in excess of the estimated construction cost of the Central Arizona Project.

This is the *minimum* loss to the state if the decline in the water table is not arrested. This loss takes only partial cognizance of the loss of other incomes generated in the state through the multiple respending of this agricultural income. Data do not reveal how big this multiplier effect

may be; but if it is, as is often suggested, as much as four times the *net* value added in crop agriculture, then the present value of the total loss to the Arizona economy brought about by the continued decline in the groundwater level, may be as much as \$2,828 million.

The total estimated loss of the crop producing capacity, plus the assumed multiplier effect of the lost crop income, becomes a calculated \$4,192 million, more than four times the estimated cost of the Central Arizona Project.

The University of Arizona's Department of Agricultural Economics estimates that there are about 43,000 jobs dependent on agriculture. These are jobs supplying inputs for Arizona agriculture. These are the "pull" effects. The "push" effects of agriculture on jobs in the state, or those in transportation, processing and other sectors, are probably equally as important, which approximates the 100,000-jobs figure mentioned earlier.

The above analysis does not take into consideration the tremendous direct loss of investment in land and improvements which occurs when land goes out of production completely. The salvage value of water, in terms of investments saved, adds to the economic necessity for supplementing pump water in central Arizona with other supplies.

(Million Dollars)

| Year           | Agriculture |         | Manufacturing |         | Mining |         | Tourist |         | Total Amount |
|----------------|-------------|---------|---------------|---------|--------|---------|---------|---------|--------------|
|                | Amount      | Percent | Amount        | Percent | Amount | Percent | Amount  | Percent |              |
| 1947           | 182.8       | 32.59   | 117.0         | 20.86   | 186.1  | 33.18   | 75.0    | 13.37   | 560.9        |
| 1948           | 223.0       | 34.34   | 136.0         | 20.94   | 200.4  | 30.86   | 90.0    | 13.86   | 649.4        |
| 1949           | 240.0       | 36.86   | 130.0         | 19.97   | 181.1  | 27.81   | 100.0   | 15.36   | 651.1        |
| 1950           | 278.0       | 38.06   | 145.0         | 19.85   | 207.4  | 28.40   | 100.0   | 13.69   | 730.4        |
| 1951           | 388.0       | 41.19   | 190.0         | 20.17   | 243.9  | 25.89   | 120.0   | 12.75   | 941.9        |
| 1952           | 433.4       | 41.08   | 255.0         | 24.17   | 231.7  | 21.96   | 135.0   | 12.79   | 1,055.1      |
| 1953           | 379.0       | 34.28   | 320.0         | 28.94   | 256.6  | 23.21   | 150.0   | 13.57   | 1,105.6      |
| 1954           | 393.0       | 35.48   | 300.0         | 27.09   | 254.5  | 22.98   | 160.0   | 14.45   | 1,107.5      |
| 1955           | 347.0       | 27.32   | 365.0         | 28.73   | 378.3  | 29.78   | 180.0   | 14.17   | 1,270.3      |
| 1956           | 392.0       | 25.67   | 450.0         | 29.47   | 485.0  | 31.76   | 200.0   | 13.10   | 1,527.0      |
| 1957           | 411.5       | 27.09   | 510.0         | 33.57   | 372.6  | 24.53   | 225.0   | 14.81   | 1,519.1      |
| 1958           | 433.5       | 28.00   | 550.0         | 35.53   | 314.5  | 20.32   | 250.0   | 16.15   | 1,548.0      |
| 1959           | 426.9       | 25.35   | 650.0         | 38.60   | 326.9  | 19.42   | 280.0   | 16.63   | 1,683.8      |
| 1960           | 485.2       | 25.66   | 700.0         | 37.02   | 415.8  | 21.99   | 290.0   | 15.33   | 1,891.0      |
| 1961           | 503.5       | 25.09   | 750.0         | 37.37   | 433.4  | 21.60   | 320.0   | 15.94   | 2,006.9      |
| Annual Average | 367.8       | 30.23   | 371.2         | 30.51   | 299.2  | 24.60   | 178.3   | 14.66   | 1,216.5      |

Sum of income from the four major sources. This is not to imply that this is the total gross income of the state.