

Economics of Droughts

Agricultural land in every region of the world is subject to periodic fluctuation of rainfall. In certain regions, periods of low rainfall can be characterized by conditions of drought. Under drought conditions, the annual supply of rain water is not sufficient to meet water demand and water stocks held either in reservoirs or in groundwater must be tapped.

The Agricultural Response to Drought:

- (1) Fallowing of low-quality land.
- (2) Increase in adoption of modern irrigation technologies such as sprinkler and drip.
- (3) Increase in acreage of water-saving crops (such as vegetables, wheat, and nuts).
- (4) Increase in reliance on ground water as an alternative to surface water.

Northern California has much more water availability than Southern California, given the distribution of rainfall across the state, and the location of reservoirs. Water is transported from Northern California to Southern California primarily through Central Valley Project (CVP) canals. The distribution of water in California lends econometricians an interesting opportunity to compare the impact of drought between the two regions. We might expect to see a smaller response to the drought in Northern California than in Southern California embodied in:

- The number of wells drilled to access groundwater
- The sale of electric pumps to access groundwater reserves
- The use of modern irrigation technology
- The choice of non-water-intensive crops.
- The use of satellite weather information systems such as California Integrated Management and Information Service (CIMIS)

Figure 16.1: Water in Reservoirs and Wells Drilled During the 1987-1992 California Drought

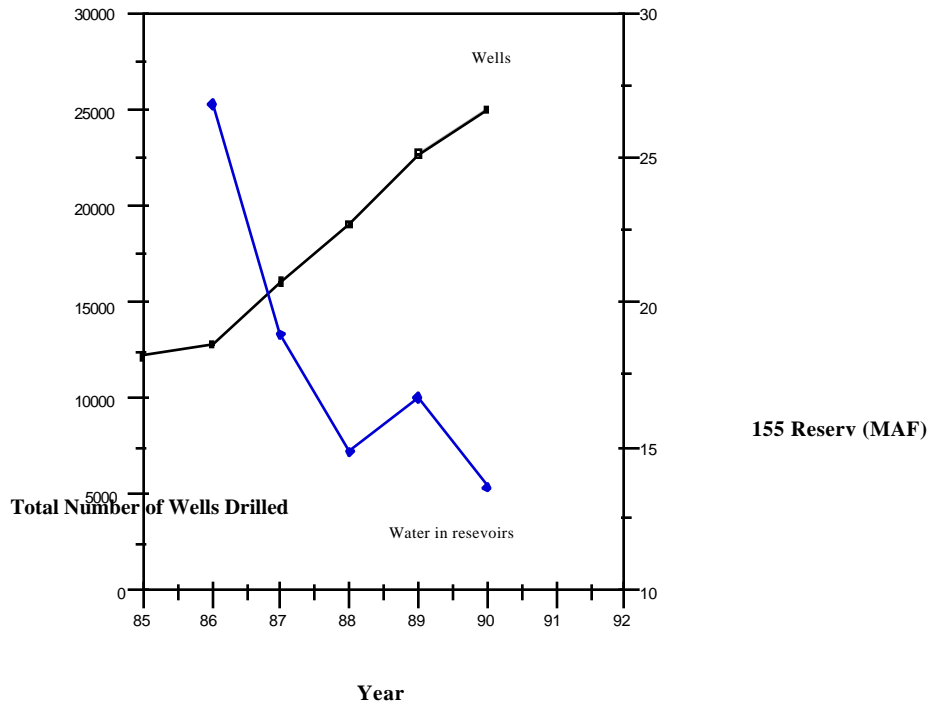


Figure 16.2: Adjusted Average Index for Sale of Pumps 1987-1991

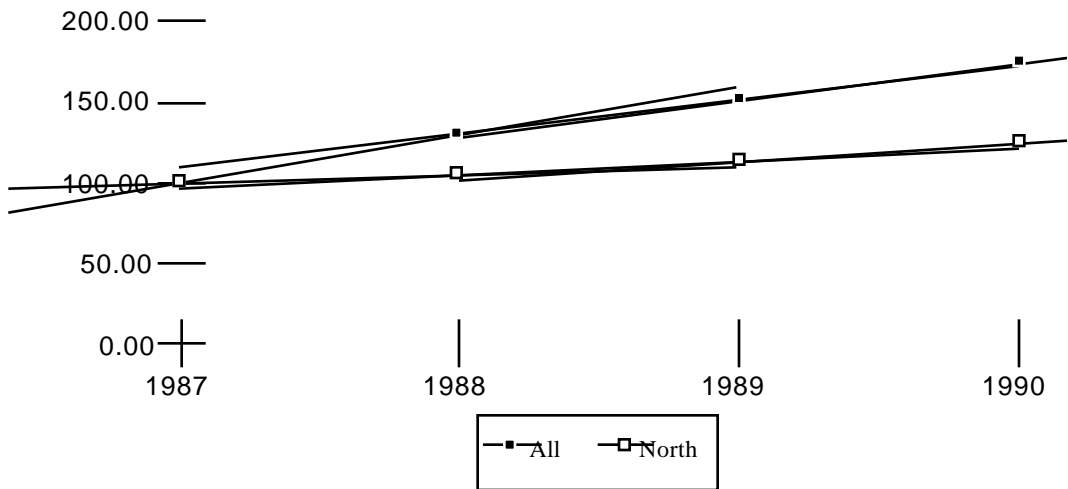


Figure 16.3

Relationships between water level in reservoirs and number of all wells drilled

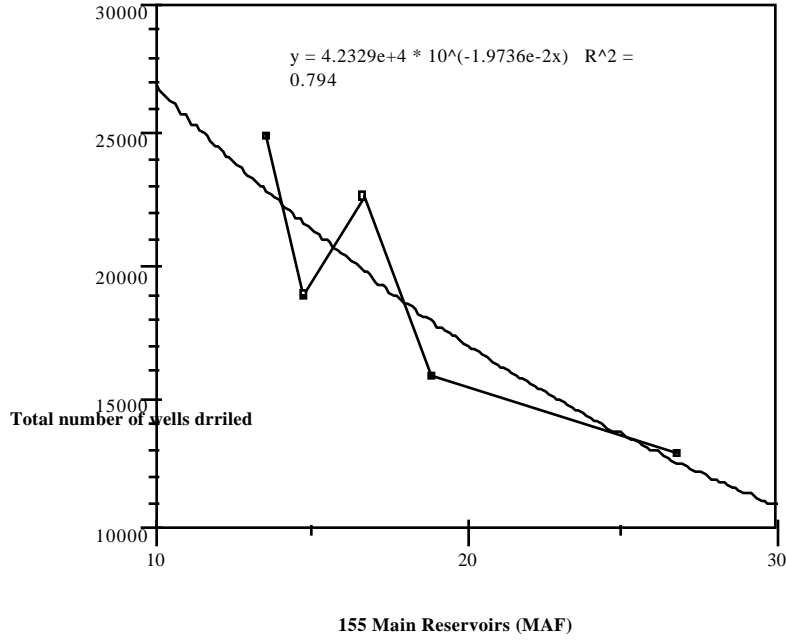


Figure 16.4
Relationship between water stock in CVP and SWP projects and irrigation wells

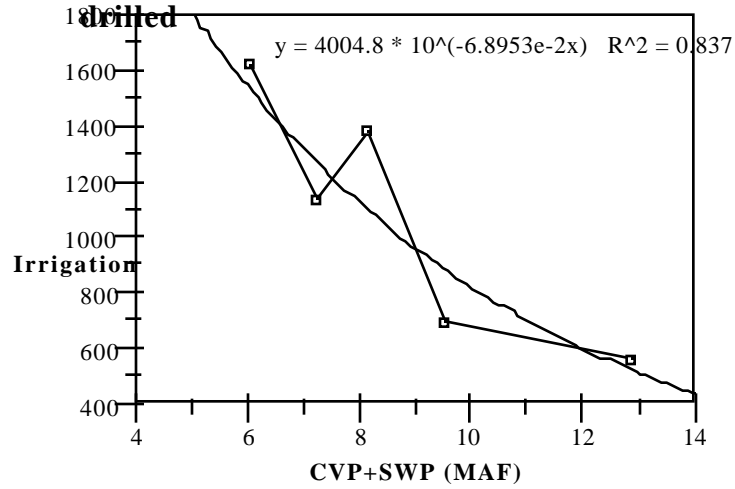


Figure 1: Use of Drip Irrigation in Selected Regions, 1987-1991

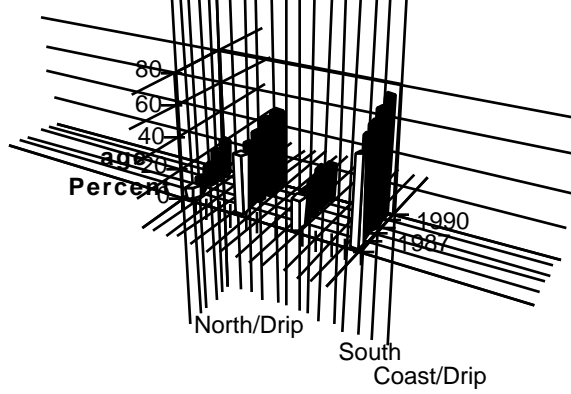


Figure 2: Use of Drip Irrigation on Selected Crops, 1987-1991

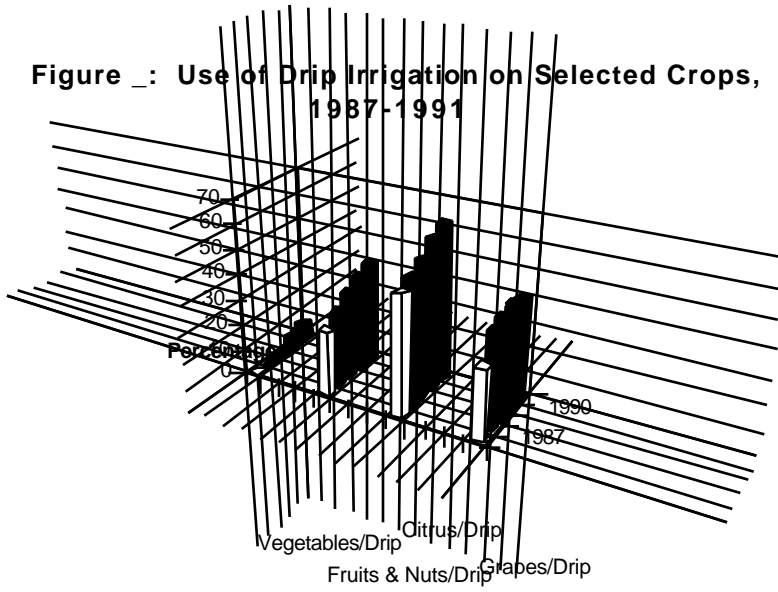


Figure _: Use of Furrow and Sprinkler Irrigation in Selected Regions, 1987-1991

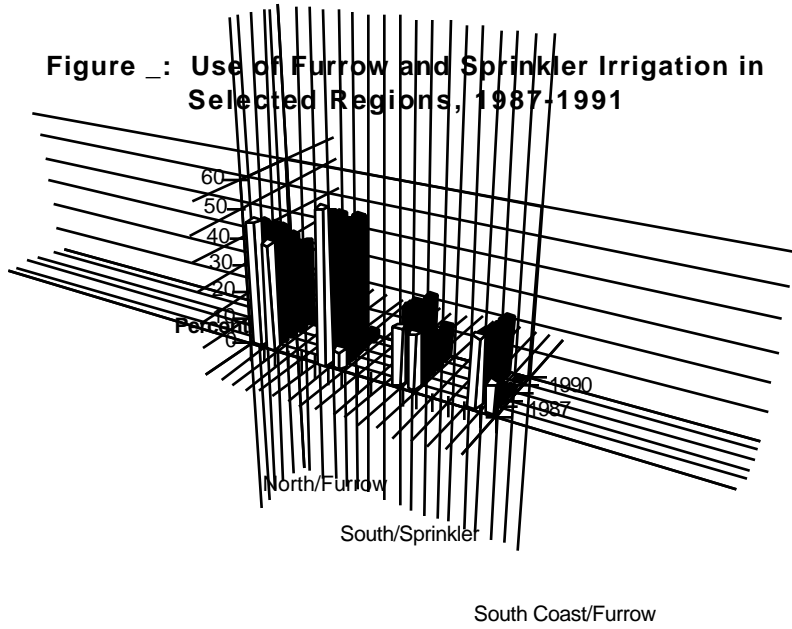


Figure _: Use of Furrow and Sprinkler Irrigation on Selected Crops, 1987-1991

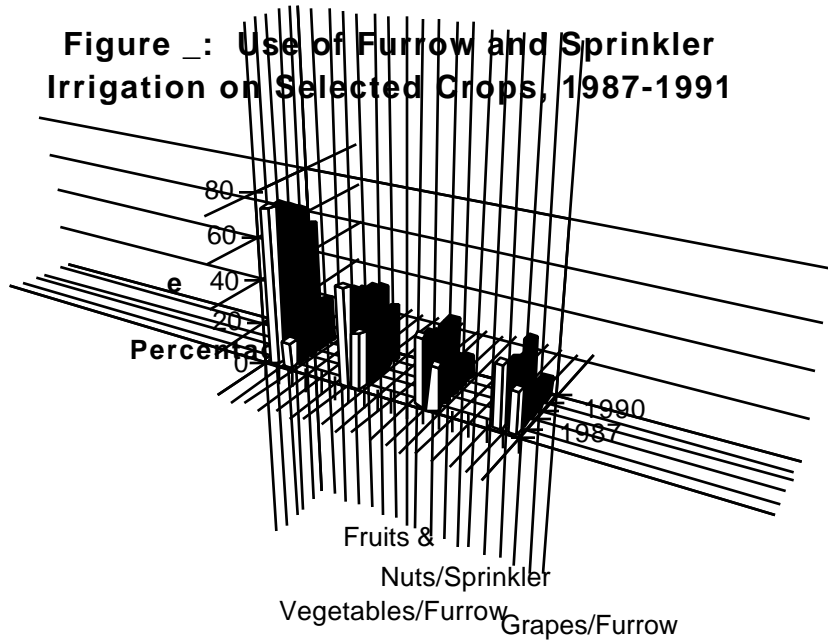


Figure 16.9
Adjusted Index of Automated Irrigation Equipment 1987-1991

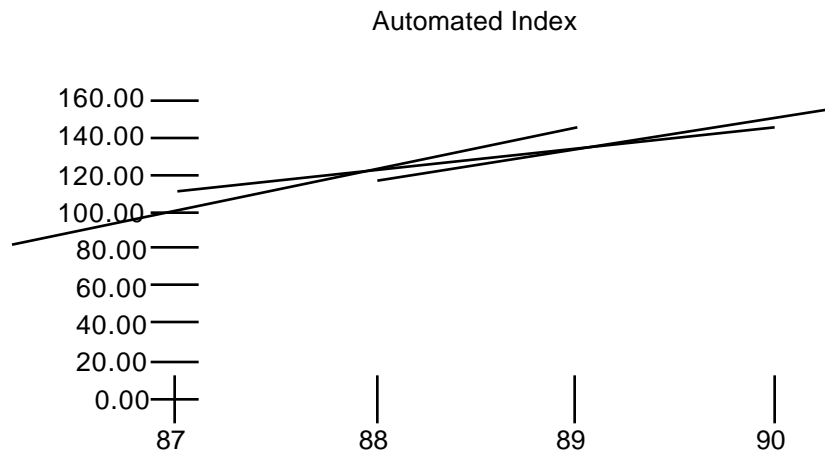


Figure 16.10
Increase in CIMIS Users during the 1987-1992 Drought

