

Economic Impact of the Irrigation Equipment and Services Industry

Executive Summary

For:



By



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This effort estimates the current size of the irrigation industry in terms of annual sales of equipment and related services. This estimate also provides an independent update and comparison to a similar study conducted in 2010.

Though simple, the question of magnitude is important but not easily answered due to the diversity of functions served by the industry, the guarded nature of data held by the private firms characterizing a major portion of equipment manufacturing, and the lack of a systematic data collection method that might characterize a single purpose industry. However, in practical terms, the size of the industry influences its ability to affect future policy and regulation.

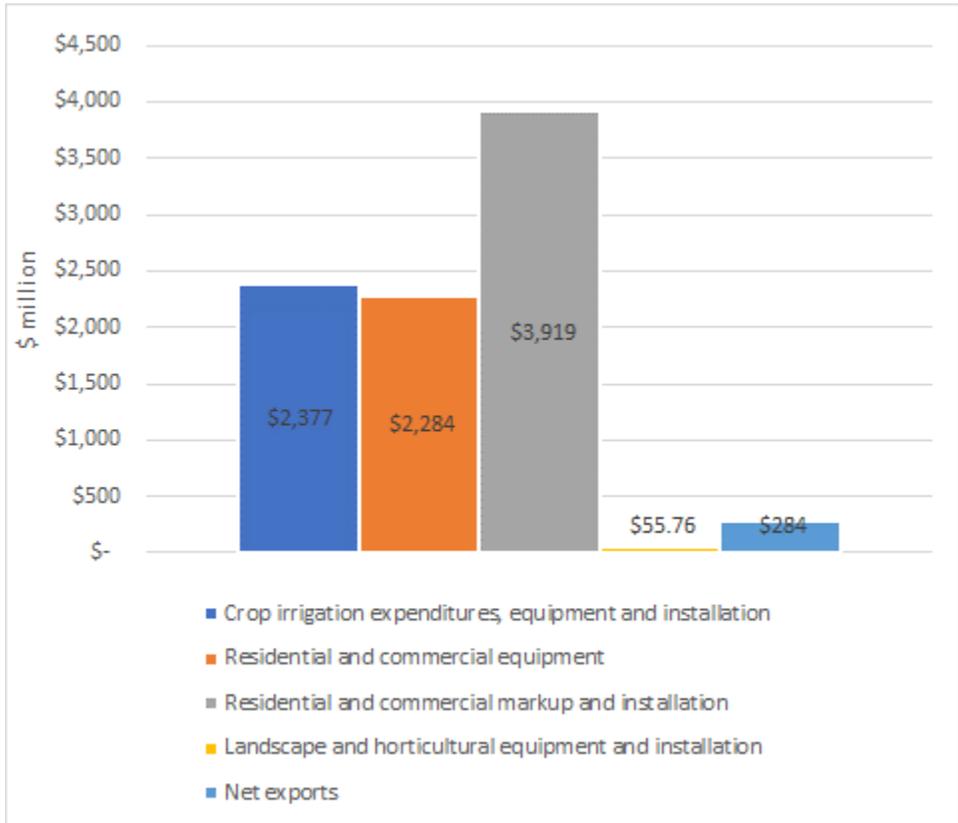
More importantly, the irrigation industry serves functions critically important to the U.S. economy – irrigated crops, landscaping, and horticulture. Serving these functions will become increasingly important given irrigation’s critical role in mitigating climate change. At a macro level, these functions are driven by different economic factors and, as a result, the combination provides market diversity and reduced volatility compared to dependence on a single economic driver. In agriculture, commodity prices account for most growth and variability in crop irrigation equipment sales over time, although local conditions and changing weather patterns play roles at a regional level. In contrast, single-family housing starts are the main macro driver for landscape equipment sales and services. Commodity prices slowly increase over time, but in cycles, while single-family housing starts have steadily increased over time, with the exception of the 2007-2009 Great Recession, but quickly rebounded.

In response to limited industry-specific macro data, a bottom-up approach was used for each function, or sector. This consisted of aggregating estimated expenditures over the area irrigated. Expenditures estimated on a per acre, or square foot basis, included irrigation system investment, operation and maintenance, periodic replacement, upgrades, and the expansion of the irrigated area. When summed over all irrigated acres in the U.S., these expenditure estimates provide a reasonable and defensible estimate of the magnitude of the industry’s annual expenditures on equipment and services. However, it should be noted that estimated expenditures per acre, and in some cases the number of acres themselves, were dependent upon assumptions rather than empirical data.

Total Irrigation Industry Impact

For the year 2020, it was estimated that direct expenditures on irrigation equipment and services was approximately \$8.92 billion, allocated across spending categories as shown in Figure ES-1. Expenditures for equipment across the industry appear to be about the same for crop irrigation (\$2.4 billion) as it is for landscape irrigation (\$2.3 billion), which includes residential and commercial uses. However, considering the mark-up occurring between the manufacturer and the end-user, and significant installation costs relative to the value of the equipment, the landscape sector accounts for an additional \$3.9 billion in annual expenditures. Including net exports increases the annual expenditure estimate to \$8.92 billion.

Figure ES-1. Estimated Direct Expenditures for Irrigation Equipment and Services for 2020, Totaling \$8.92 Billion



These direct expenditures are then used as the basis for an economic multiplier analysis which estimates the indirect and induced impacts of these expenditures on a range of parameters, most notably gross economic output and employment (Figure ES-2). These are the beneficial indirect impacts to input suppliers, such as parts and transportation providers, resulting from increased spending on irrigation equipment, plus the induced spending at the household level by their employees' households.

Figure ES-2. Total Economic Impact of Expenditures for Irrigation Equipment and Services (million)

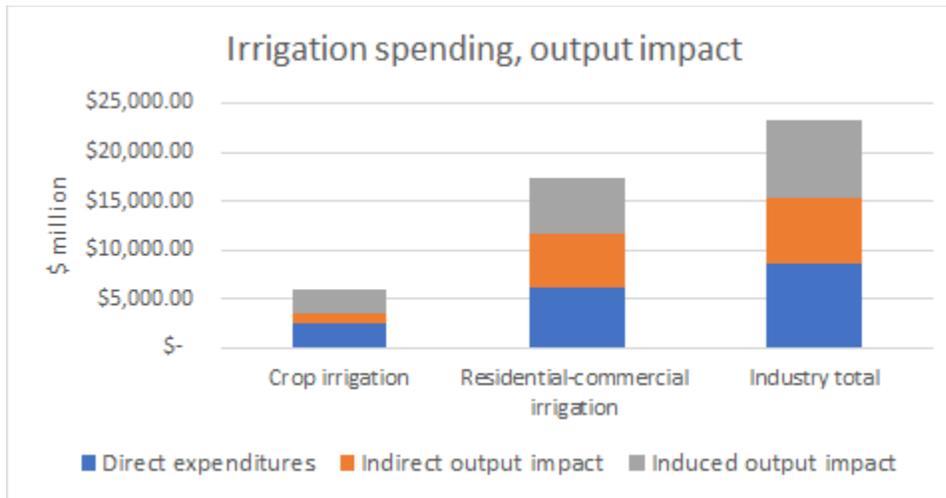
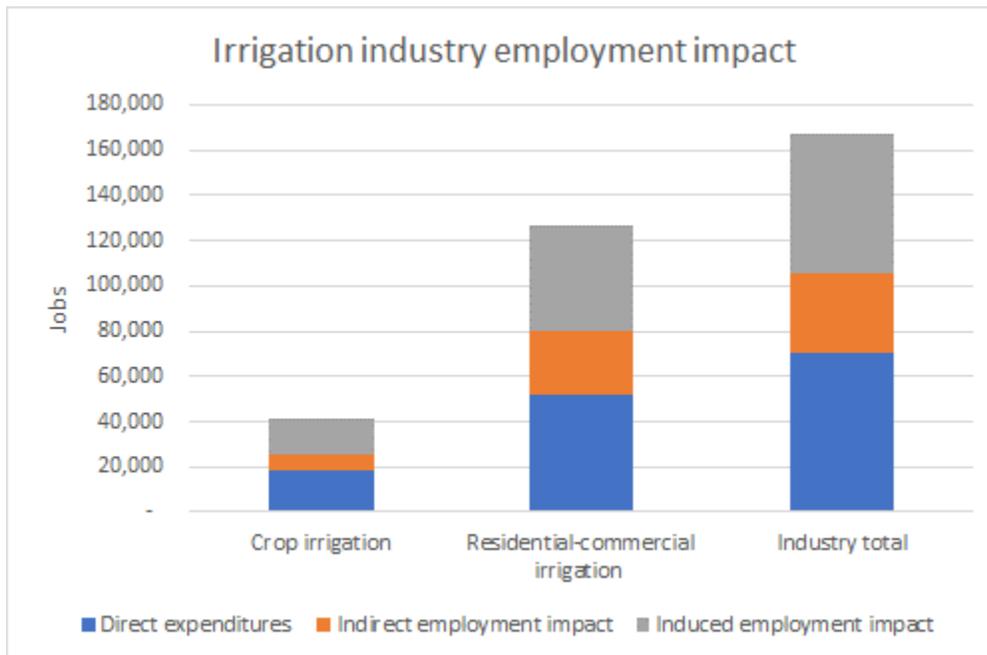


Figure ES-2 shows that the annual \$8.92 billion dollar industry-wide direct impact, plus its indirect and induced impacts, totals nearly \$23.3 billion per year.

Translating these output impacts to jobs results in Figure ES-3 which shows the corresponding employment impacts resulting from spending on irrigation equipment and services. A direct impact of over 70,000 industry-wide jobs results in a total impact of over 167,000 jobs when these secondary impacts are included.

Figure ES-3. Total Employment Impact of Expenditures on Irrigation Equipment and Services (jobs)



The 2020 analysis shows that the industry grew at a compound annual rate of about 2 percent per year (Table ES-1). The crop irrigation and commercial irrigation sectors appear to have grown the most rapidly and offset the estimated decline in the golf industry.¹ Indirect and induced impacts to output and employment increased at a similar rate (Table ES-2).

Table ES-1. Comparison of 2010 and 2020 Estimates of Direct Industry Impacts (million)

	2010 estimate	2020 estimate	growth
Crop irrigation	\$ 1,324	\$ 2,377	6.03%
Landscape and hort.crop irrigation	NA	\$ 56	
Residential	\$ 2,819	\$ 3,315	1.63%
Commercial	\$ 1,344	\$ 2,236	5.22%
Golf	\$ 1,604	\$ 653	-8.59%
Net exports	NA	\$ 284	
	\$ 7,091	\$ 8,920	2.32%

Table ES-2. Comparison of Total Economic Impact of the Irrigation Industry, 2010 and 2020

	2010 estimate		2020 estimate	
	Direct impact	Total impact	Direct impact	Total impact
Output (million)	\$ 7,091	\$ 19,205	\$ 8,920	\$ 23,262
Employment (jobs)	66,000	149,900	70,323	167,578

Industry Specific Trends

Commodity prices are a driving factor supporting irrigation equipment demand and sufficient data was available to examine changes in expenditures relative to commodity prices. This “elasticity of demand” with respect to price was used to estimate future expenditures for crop irrigation equipment and services based on estimates of future commodity prices. Figure ES-4 illustrates this relationship using the price of corn as a proxy for commodity prices.

In contrast to crops, expenditures in the residential and commercial sectors are driven by new single-family housing starts, which serve as a proxy for overall economic conditions. Due to insufficient data, a statistical relationship between residential-commercial sales available was not developed, although Figure ES-5 shows how these variables moved together over time over the previous two decades.

¹ A portion of the estimated decline in the golf industry may be due to different methodologies between 2010 and 2020.

Figure ES-4. Expenditures for Crop Irrigation Equipment and Installation and Commodity Prices

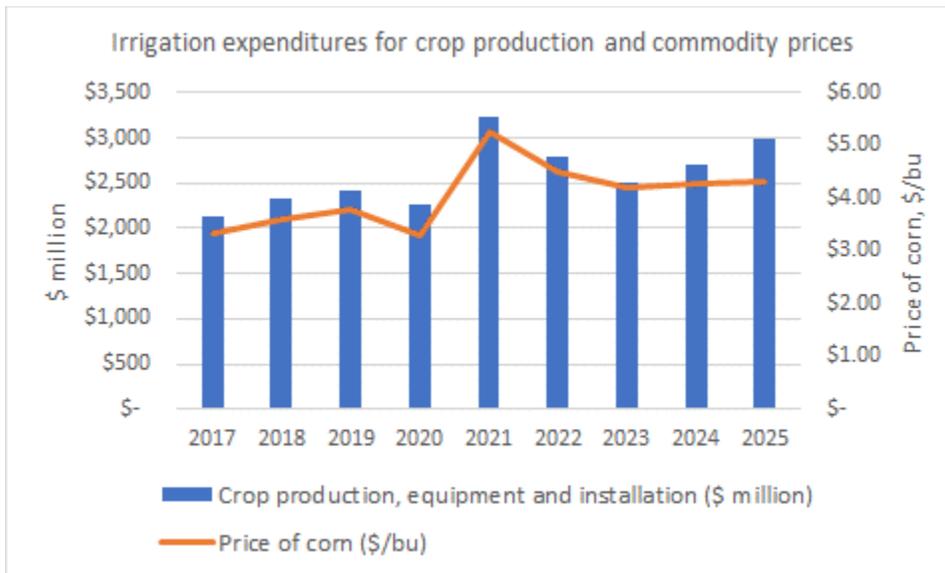
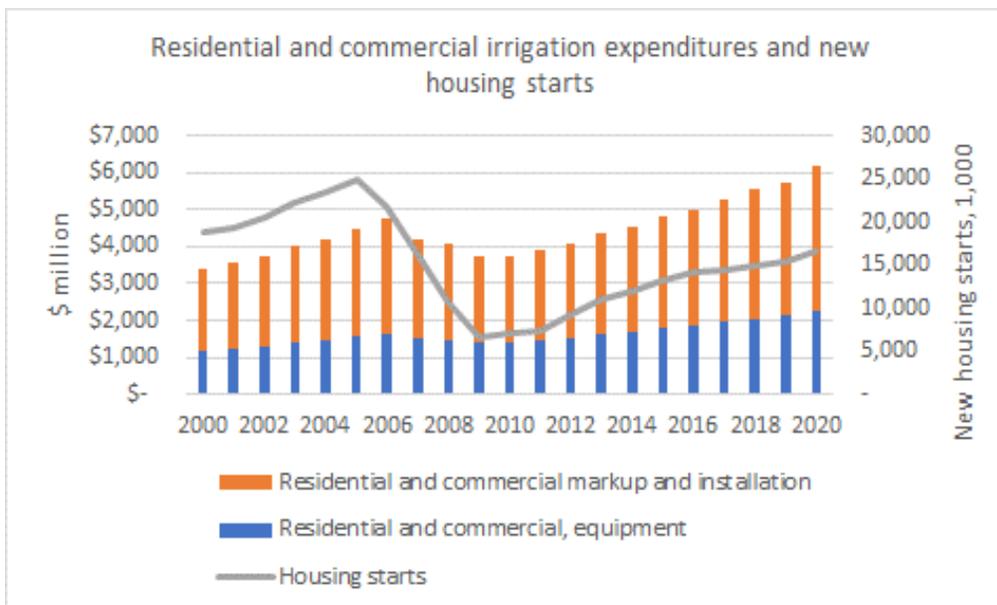


Figure ES-5. Residential-Commercial Expenditures and New Housing Starts



Conclusions/ Summary/ Lessons Learned

Understanding the size and growth trajectories of the irrigation industry is beneficial for everyone influenced by the industry. It also helps key players in the business to plan and prepare for the expected (e.g., cyclical recessions) and unexpected (e.g., public health crisis) events. For example, conducting the

study amid the COVID-19 pandemic has shown that the irrigation industry benefited from disposable income that households saved from foregone spending on entertainment like traveling, movies, and restaurants.

Taking into account predicted climate change impacts, it is expected that the demand for water-conserving technology will continue to be incentivized by regulations and policies and will continue to grow. Increasingly variable water supply availability will likely impact decisions about adopting water-conserving technology for crop producers, housing developers, as well as at household and consumer levels.

Commodity prices are expected to continue being the driving indicator of the crop irrigating sector growth. Admittedly, this correspondence is more direct in those regions where only a few major crops are being produced (e.g., in Mississippi River and Missouri River basins). However, some areas (e.g., California) would benefit from a smaller scale regional analysis to better understand the specific driving trends and predictions of the irrigation industry expenditures on the crop growing sector.

More data from the irrigation industry representing the residential and commercial sector is encouraged to be made publicly available (e.g., in the form of the NAICS code). This would significantly advance the understanding of the size and the trends of the irrigation industry's expenditures in that sector. However, until that is the case, single-family housing starts, and anecdotal evidence will continue being the primary source explaining the trajectories of the residential and commercial irrigation sector expenditures.

Looking forward, more frequent (i.e., five-year increment) estimations of the irrigation industry's expenditures would be beneficial, especially if more data becomes available.



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