

# WATER INFRASTRUCTURE & ECONOMIC DEVELOPMENT

## Executive Summary

Water is inextricably linked to the economy as it shapes the wellbeing and prosperity of communities. The true economic impact of water infrastructure is often obscured within health, social, and environmental outcomes, as well as its direct effects on businesses. Water is a core component of public capital investments and operational expenditures. The water industry also employs a sizable portion of the national workforce which means water is linked to local wages and spending patterns. While water sector jobs are more heavily concentrated in large metro areas, they are consistently 1 to 2% of the workforce in all regions across the country<sup>1</sup>.

The impact of water investment varies greatly by region, population density, and industry composition, but in general, sufficient, well-maintained water infrastructure can support sustainable economic development and boost the workforce over the long-term. Water infrastructure capital investments have a direct impact on water industry output and an indirect benefit to other industries in the economy as the labor force increases in the area<sup>2</sup>. Water infrastructure spending also provides indirect benefits to communities by attracting adjacent retail and service industries as well as supporting a healthy housing market<sup>3</sup>. Inversely, the failure to invest in water infrastructure can leave a community vulnerable to excessive damages from natural disasters and other shocks to the local economy that impact the tax base as well as discourage business investments.

The US water sector suffers from severe under-investment, which limits the economic potential of communities across the country. The heterogeneity of water based on location, quality, timing, and variability provides a clear case that water should be analyzed as more than a commodity in economic modeling<sup>4</sup>. The nexus between water and economic development highlights the impact of water infrastructure spending on the overall long-term prosperity of a community. The following literature review summarizes the current academic research on this connection and examines specifically how the deficit in US water infrastructure spending can have a material impact on sustainable economic growth.

## Key Findings

### Water and Industry

- Improves private industry performance and productivity
- Increased public investment in water is associated with an increase in private investment
- Increased investment in the water sector leads to industry wage growth for water and non-water intensive sectors over the long-term

Water is a key component to industry, impacting virtually all consumer products, which has extensive implications for the performance of the broader economy. Research from Alfredo M. Pereira in 2001 found that public water infrastructure spending had a large crowding-in effect on other public and private business spending<sup>5</sup>. The crowding-in effect occurs when “public capital compliments private capital in the production and distribution of private output” resulting in an increase in overall private output. A 2008 report using the Bureau of Economic Analysis input-output tool (RIMS II), found that “across the US as a whole, for each additional dollar’s worth of output of the water and sewer industry in a year, the dollar value of the increase in output that occurs in all industries is \$2.62 in the same year.”<sup>6</sup> The size of the returns vary by US region and also vary with time after the water projects are implemented.

### Water and Society

- Failing or inadequate water infrastructure results in poor water quality and risk of greater damage in the aftermath of severe storms
- Water infrastructure investments can make economies more resilient to shocks and downturns
- Poor water infrastructure investments exacerbate inequality

1 <https://www.waterrf.org/system/files/resource/2022-09/4751.pdf>

2 <https://doi.org/10.1177/109114210102900101>

3 <https://ageconsearch.umn.edu/record/289691>

4 <https://doi.org/10.1093/oxrep/grz035>

5 <https://doi.org/10.1177/109114210102900101>

6 [https://nacwa50report.org/Content/documents/G3\\_R8\\_LocalGovtInvtnMunicipalWaterandSewerInfrastructure-Krop-et-al-2008.pdf](https://nacwa50report.org/Content/documents/G3_R8_LocalGovtInvtnMunicipalWaterandSewerInfrastructure-Krop-et-al-2008.pdf)

Water infrastructure is the backbone of a thriving community and when it is in disarray, community growth can be severely stunted. Furthermore, environmental pollution and degradation of natural resources as the result of poor wastewater management can further inhibit economic growth in an area for the industries that depend on them. Community water systems that are ill-equipped to handle natural disasters are likely to suffer excessive loss to their economic activity as businesses face interruptions and residents incur additional repair costs. According to a 2019 report published by the National Academy of Sciences, Engineering, and Medicine, while urban flooding impacts a wide range of demographics, it is most harmful to low-income residents and minorities without the resources to recover from the damage and disruption<sup>1</sup>.

### Development Cycle of Water and Growth

- Public water investments lead to an increase in water sector output which increases public tax revenue
- Public water investments attract diverse adjacent local businesses making the economy more resilient to downturns
- Water infrastructure investment can strengthen a technical workforce
- Investing in water is an investment in anchor institutions and stable jobs

Having strong water infrastructure is appealing to outside companies looking to invest in new operations. While parts of the US face water stress and insecurity because of geography and climate conditions, business analysts suggest the Great Lakes region of the US appears to be emerging as a “Water Belt.”<sup>2</sup> Access to a sufficient supply of clean water has the potential to attract new business investment to a community and site selectors are paying attention to set their businesses up for success. Next, implementing water infrastructure projects is an investment in a sector with numerous employment opportunities. Water jobs encompass a broad set of people and skills. Investing in the water sector has been shown to lead to increases in the number of water jobs in a community, but also job growth outside the sector as other industries indirectly benefit from the investment.<sup>3</sup>

### Factors that Impact Size of Economic Returns

- Rural vs. urban community
- Availability of skilled labor or training opportunities
- Methods used to generate additional funding

In a study conducted by the USDA Economic Research Service, urban communities saw larger returns to water infrastructure investment than rural communities even when controlling for income, demographics, and employment rates.<sup>4</sup> Given the technical nature of certain water jobs and the years of on-the-job training involved, job growth is dependent on available labor and a technical workforce. This may be why urban communities see greater job growth as the result of comparable water projects. Additionally, communities may be deterred from applying to funding for large-scale projects because of limited capacity or uncertain capacity to manage an ongoing, highly technical project. The way a water project is funded equates to the costs that are passed down to customers which can impact local economic activity.

## Conclusion

Water infrastructure spending has a distributed effect among industries and households in a community with spillover effects on the wider regional economy. It improves productivity in businesses reliant on water and the water sector itself, which produces jobs and grows wages. The water infrastructure also has indirect benefits for adjacent businesses and environmental health that can fortify a community against economic downturns and unforeseen climate impacts. Investing to expand and conserve water supplies supports a healthy housing market and makes communities more resilient to future climate risks that could exacerbate water scarcity and disrupt economic activity. Furthermore, investing in water infrastructure is an investment in the water workforce which provides a stable career path with competitive wages, a boon for local economic development. The US spends roughly \$50 billion on water infrastructure annually but has failed to keep up with aging water systems and population trends. The new federal funding, including the Infrastructure Investment and Jobs Act and Inflation Reduction Act, will more than double this spending across years of new projects, which are vital for meeting future water needs.<sup>5</sup> Given the many ways that water touches peoples’ lives, investing in the infrastructure to properly manage this resource is a key to sustaining economic activity and community wellbeing.

1 <https://doi.org/10.17226/25381>

2 <https://siteselection.com/issues/2021/may/water-supply-could-this-be-the-dawn-of-the-water-belt.cfm>

3 <https://ageconsearch.umn.edu/record/289691>

4 <https://ageconsearch.umn.edu/record/289691>

5 <https://uswateralliance.org/news/president-biden-introduces-plan-111-billion-water-infrastructure-investment>