



Quality of Drinking Water Services May be Constrained by Labor Markets

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When it comes to the provision of public services, an organization's performance depends on the availability any number of financial and environmental resources. When these resources are abundant, organizations may have an easier time supplying quality public services to citizens. When they are not, organizations struggle. In the same way, performance may be constrained by the financial and environmental resources available to it, organizations may be constrained by the workforce talent available in their labor market.

Economists have long recognized the important role that labor markets have played in the success of firms. Firms with access to high quality educated labor tend to grow faster and survive longer than those in areas with less educated labor available in the market. This is especially true of firms that deal with highly technical issues. The dependence of firms on labor market talent explains why firms, and especially those in more technical fields, tend to locate in areas with a highly educated labor force. Unlike most private firms, however, public organizations cannot choose their location based on the quality of the labor market. Faced with a shortage of highly educated workers, a local government responsible for providing a public service cannot relocate to an area where skilled labor is more plentiful. The quality of public services may be constrained by the labor market resources available to the organizations responsible for providing them.

Water Services and Labor Markets

One crucial area where access to educated labor may make a great deal of difference in the quality of public service delivery is in drinking water. Water utilities are faced with fairly complex tasks. The treatment and monitoring of water involves a great deal of technical acumen. Although no formal level of education is required for water treatment operations, the job requires a certain understanding of chemistry and mathematics.

Utilities in areas without a high level of skilled workers in the labor force may struggle to find workers who are capable of learning the skills necessary for managing the day to day operations of a utility. This may especially be the case with smaller utilities, who do not have the resources to attract outside talent. One of the main goals of utilities is compliance with the United States Safe Drinking Water Act. Meeting the regulatory requirements means applying technologies in an appropriate manner and keeping pollutants below certain levels, both of which may be difficult if educated labor is not available.

In recent work, my co-authors and I have explored the issue of Safe Drinking Water Act compliance and labor market education. We have looked at how labor market education, measured as percentage of the metropolitan area or county with a bachelor's degree, impacts compliance. We find that local government utilities in areas with highly educated labor are far less likely to commit violations than those who are located

in less education rich markets. Importantly, we find that education matters most when utilities are large enough to take advantage of the labor market. Even when surrounded by educated labor, small utilities may struggle to attract quality labor given the relative lack of resources. Our statistical approach was supplemented with field visits at two smaller utilities in a rural area that lacked a labor pool with a high degree of education. As expected, the managers at both utilities expressed that finding individuals qualified to be utility operators was a constant difficulty. Even when applicants had good work ethics and physical abilities, they would often not be able to meet the mathematical requirements to be a utility operator. Given our statistical analysis, it is likely that utilities across the country are struggling with the same kind of workforce issues as the two we visited.

Solving the Labor Problem

This is a problem that will only continue to grow as water infrastructure ages. There are some potential policy options to deal with this, but each comes with major tradeoffs:

Cross training — One of the two utilities we visited overcame the limits of its labor market options by cross training employees to perform multiple duties within the organization. Employees received training in all phases of water and wastewater treatment, and would work towards certification across multiple areas. This allowed for employees to cover for other or supplement existing staff in short-term situations. Cross training is only likely to be effective when employees are at the utility long enough to train them, however, and may be limited by state licensing requirements.

Privatization — Recent research has found that private utilities may have some advantages when it comes to compliance with the Safe Drinking Water Act. Especially when part of larger corporations, they may have the resources and networks to overcome local labor market shortages and recruit strong talent anywhere. Privatizing water utilities, however, would mean severing control over service delivery from local control, meaning there are potential democratic costs to privatization that would need to be seriously considered.

Consolidation — Another option is to consolidate rural water delivery into special districts. Special district water utilities are government organizations that are solely responsible for water services. Consolidating local government utilities into a regional single purpose government could potentially create economies of scale that could allow for more resources to be put towards recruitment of qualified labor. Special districts are sometimes criticized for being less visible and responsive than other governments, however, so this may too come with tradeoffs with respect to local democracy.

Formal and Informal Regionalization — A fourth possibility would be to create formal and informal regional networks dealing with workforce issues. For example, Baywork is an organization in the San Francisco Bay area that helps create a reliable workforce for water and wastewater treatment in the area through a partnership with regional utilities. Similar organizations could create workforce networks to help overcome labor market gaps. This would require collaboration between utilities that may require some outside resources to facilitate.

Read more in Manuel Teodoro and David Switzer, "**Drinking from the Talent Pool: A Resource Endowment Theory of Human Capital and Agency Performance**," *Public Administration Review* 76, no. 4 (2016), and David Switzer, Manuel P. Teodoro, and Stuart Karaski "**The Human Capital Resource**

Challenge: Recognizing and Overcoming Small Utility Workforce Obstacles," *Journal of the American Water Works Association* 108, no. 8 (2016): E416-E424.