

Small Water Systems

This project provides a guideline for a holistic “best-practice” approach to effectively developing & maintaining a small water system utility. The development and sustainment of water utility plants are broken into the major streams leading to success; government regulations, R&D of technologies, stakeholder management, business case economics, and ongoing operations. The current state baseline of each supporting stream is identified, analyzed, and a future “best practice is proposed. A number of governmental agencies, NGOs and private commercial/industrial facilitators that seek for proper technologies, make funding available, introduce the innovations to users (municipalities and industries), and facilitate testing and pilot runs are identified through the paper. It was determined that North American governments are reducing their oversight and regulation over expensive and time consuming approvals for innovative water system technologies. They are creating new channel of innovation and funding to accelerate innovation in the clean water sector. All of the current efforts in accelerating innovation in small water systems were confined into first world companies. However, opportunities were identified for rapid scale-up across the world. Water Opportunities Acts in Canada and USEPA programs in the US were identified as the pioneers in these regards. Although there are some risks associated with innovation and the shift to smaller-scale systems, the benefits to the community and improved environmental impacts could be significant. Based on the findings, the stakeholder analysis led to a general consensus implying that to succeed with a small water system in a developed nation is to “Regionalize” or force communities to develop “Cooperative Infrastructures” in order to benefit from economy of scale. It was also found that training and education of water system personnel is an existing challenge; a challenge which is shared with developing nations. Two implementation methods for developing nations are to encourage “Pro-poor Policies” with top-down approaches or to focus first on the end-user by providing low-tech filtration devices. Economic practises & ongoing operations were also analyzed and determined to be an important factor affecting the success of small water system developments. Current practices rely heavily on governments and NGO’s for investment and ongoing subsidy. Facilities are built in large excess capacity, and are operated with an ad-hoc approach. It was determined that a modular approach should be taken to constructing water utilities in attempts to improve capacity utilization, and reduce upfront investment. This approach would also seem more appealing for private investment into the sector allowing for more competitive and effective management of water utilities. Ongoing operations should utilize operational best practices including Lean, Six-Sigma, and Project Management techniques to maximize ROI and EBITA. In 2009, it was estimated that \$36B must be spent each year for the next 10 years to meet the U.N. Millennium Development Goal of providing potable water to the global population not currently served. It is imperative that solutions are developed to accommodate the basic human need of water, globally.