

Scenario Planning: Making Strategic Decisions in Uncertain Times

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Tim has over 15 years of experience managing and implementing projects related to water supply, water quality, strategic planning, and regulatory compliance. He received his bachelor's degree from the University of Illinois and is scheduled to receive a master of engineering degree from the University of Arizona in December. Tim is currently a project manager with HDR Engineering and is a member of HDR's Water Supply Practice Group. Prior to joining HDR, Tim spent five years in the mining industry and nine years in the public sector as a program manager and water resources planner. Tim has long been an active member of the AZ Water Association and currently serves on the Board of Trustees of the Arizona Section of the WaterReuse Association. Tim's presentation focuses on managing critical uncertainties in water resources planning through the use of the Scenario Planning technique.



After growing at unprecedented rates, many communities in the arid West need to rethink some of their most basic planning assumptions—assumptions about what the future may look like. Similarly, water professionals and decision makers in the arid West are now facing water-resource and supply challenges that were not envisioned a decade ago, including the uncertainties associated with global climate change. Scenario Planning is a technique that can assist water planners in managing uncertainty.

Based on a recent article by the speakers (Marra and Thomure, 2009), this presentation provided an overview of Scenario Planning as a potential tool to utilize for water resources planning. This presentation gave two water planning examples with significant uncertainties, although there are hundreds that could be brought into the conversation. Scenario Planning was defined, the process was reviewed, and the tangible outcomes were described. Quite often, one of the concerns expressed by people being exposed to Scenario Planning for the first time is: “That’s great,

however, you invest a lot of time to complete the process, but what is the outcome on the back end? What is the project or what is the path forward?” In the case of Tucson Water’s long-range water plan (2004), the utility found it to be a very useful tool with some very tangible outcomes.

Water resources plans are developed by a myriad of agencies including the US army corps of engineers, state water planning agencies, and local municipalities. Other entities also engage in water planning efforts, such as the National Park Service. Regardless of the type of planning organization or its geographic location, the over-arching planning goal is sustainability. Simply put, sustainability is meeting the needs of today without compromising the ability to meet the needs of the future generations. But, how do we plan for a sustainable future in the face of significant uncertainty?

Examples of Planning Uncertainty

Climate change is obviously getting a lot of attention in the media. There is also a significant

amount of ongoing climate research and many projections of future conditions. However, we don't have all the answers and we don't know what the end points are going to be. We can collect data and observe trends, but we do not have a crystal ball with accurate predictions of future conditions. As water planners, we need to be aware that conditions are changing and that the range of climatic variability is growing. Rather than trying to decide which projection of future conditions is "right", knowing full well that whatever one we choose will most likely be wrong, we may be better served to plan for a range of possible future climatic conditions.

The future of effluent reuse is another water resource planning element with significant uncertainty. Many communities have developed reclaimed water systems to recycle municipal wastewater for turf irrigation or industrial uses. Over time, effluent reuse is expected to grow as other traditional water resources become exhausted. Water planners in many parts of the world have begun looking at the future (indirect or direct) potable use of effluent. There is no uncertainty that the technologies exist to safely recycle effluent into potable water. However, public acceptance of the potable reuse of effluent is highly uncertain and is likely to be decided on a community-by-community basis. Water planners need to consider the ramifications if their particular community embraces or rejects potable effluent reuse.

Scenario Planning: Envisioning Multiple Futures

To better prepare for a sustainable water future, water professionals are becoming increasingly aware of Scenario Planning as a tool to help manage uncertainty in turbulent times (Means et al, 2005). The method has been around for decades but became popular in the 1990s after Schwartz (1991) published *The Art of the Long View*. A more formal and in-depth presentation is provided by Van der Heijden (2005) in *Scenarios: The Art of Strategic Conversation*. According to Van der Heijden (2005), Scenario Planning assumes that the future is not predictable but it is nonetheless possible to come up with possible causal reasons why things happen the way they do. By analyzing the driving forces that motivate current events and extrapolating relevant trends into the future, one can strategically define a credible range of possible futures or scenarios. He notes that there is no one best answer

but the Scenario Planning process can provide a means to developing a flexible strategic position from which to respond to change and irreducible uncertainty.

First Steps: Issues and Drivers

The first step is to identify one or more pivotal issues in order to prepare for a significant decision. For some utilities, the critical issue might be the increasing vulnerability of currently available water resources and how best to ensure supply reliability in future years. For others, it might be whether to prepare customers for the eventual indirect potable reuse of effluent and if so, when and how. Identifying the central issue can be accomplished through a brainstorming session involving a diverse group of staff members with the active involvement or tacit support of decision makers. The group should be prepared to enter into a vigorous vetting process – discussions can become contentious if there are strong opinions to work through. The objective is to arrive at consensus agreement on the central issue in order to move forward. In a subsequent session, the group generates a list of the driving forces that could have bearing on the central issue. Once the list is established, the driving forces are ranked to identify those considered extremely important and highly uncertain. These become the "critical uncertainties" in the next phase.

Scenario Definition: Critical Uncertainties and Stories of the Future

In subsequent meetings, the group determines which of these driving forces will be used to frame the scenario matrix. The matrix framework is constructed by placing the identified critical uncertainties on its defining axes. The boundaries of each future are thus defined by the polar extremes of the critical uncertainties. The planning group subsequently develops a sufficiently complete description of each unique future to give it substance—to make it real. This step is one of creativity and imagination. The participants should identify the potential issues that must be managed or overcome given the uncertainties involved. Each end-member future essentially becomes a different story or scenario. To develop a more flexible, multidimensional view of the future, each story/ scenario is considered equally likely to occur.

Tangible Results: Pathways and Common Elements

The end-member future scenarios collectively establish a range of future possibilities. The group plots an independent pathway, a sequence of projects and programs, to realize each unique future based upon its specific characteristics and issues. Despite differences among the developed pathways, similarities and overlaps will occur; this commonality indicates which projects and programs would be most viable over time.

Summary

Instead of emphasizing what is known and predictable, Scenario Planning focuses on the critical uncertainties specific to a given major issue. Multiple scenarios are developed, each based on a unique combination of the identified critical uncertainties. The aim is not to capture every possible future but only those that can serve as end members which can define a credible range of future possibility. Each of those end-member futures are considered equally likely to occur to protect against perceptual bias and blind spots. By identifying and sequencing all the projects and initiatives that would be needed to realize each future scenario, a common implementation pathway can be developed. If all the individual pathways are stacked on top of each other, many projects and initiatives overlap in time—these are the common elements. The overall purpose of this approach is to identify the common elements that can strategically place an organization in a highly flexible, adaptable position when change occurs.

References

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