An Introduction to Economic Frameworks for Consumer Decision Making Related to Water-Linked Health and Wellness

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ABSTRACT

Across the globe there is increased awareness, and in some cases, concern that water is scarce and a vitally important resource. Sustainable water management is a major topic of concern for government (public) entities, private corporations, and societies as a whole. Water management is complicated by the multitude of necessary uses for water, including drinking water, irrigation and/or other agricultural uses, industrial uses, and various household uses, from bathing to cooking and cleaning. Furthermore, beyond availability of water for society, increased attention has been placed on the quality of water available; thus, it is a twofold problem of quantity available and the quality of that water that is available for use. Lack of water, either in quantity or in quality, can lead to decreased productivity by societies as increased attention it placed on obtaining adequate water supplies (and diverted from other endeavors) and water-related illness can further cripple development through rising health care costs and further loss of productivity. Well-defined property rights for water are necessary, together with effective management institutions, in order for private consumer/household decisions to result in increased social welfare where water is concerned.

Keywords: Consumer, decision making, economics, health, household, water.

1. WATER AND ITS MANAGEMENT AS A SCARCE AND VITAL RESOURCE

There is increasing awareness that water is a scarce and vitally important resource. According to the *OECD Environmental Outlook to 2030*, water scarcity will worsen because of unsustainable use and water management, as well as due to climatic change. Furthermore, the number of people living in areas under severe water stress is expected to increase to ~3.9 billion, an increase of 1 billion people (Organization for Economic Cooperation and Development, 2008). Economists, scientists, business leaders, and geo-political strategists are arguing, “water is the new oil” and urging that it is time to stop taking water, as a resource, for granted (Knowledge@Wharton, 2008). Recent events, such as sustained drought in key crop-producing areas of the United States in recent years, have put a spotlight on the importance of water in the United States. However, battles over water rights, ownership of water, and water conflicts have also been rising around the world. Furthermore, battles for water do not just take place across state and national borders, and corporate claims to water supplies and competition between public and private uses of water have become commonplace.

With increasing focus on water, water rights, and water availability, the allocation of water resources is a source of major debate. But, is all water equal? In countries such as India, access to safe drinking water can be limited or prohibitive in terms of time or cost to obtain it. Depending on the specific location, there may be water of varying levels of quality, technical availability, or time availability. In short, there may be water, but is the water of appropriate quality for its intended use (i.e., drinking versus irrigation) and at the required time? All water is not created equal in the marketplace. Thus, the battle over water may actually consist of multiple battles going on simultaneously; battles over drinking water versus battles over water suitable for industrial purposes, for example. Beyond the product itself, those demanding the product (water) or products (water of varying quality levels) are heterogeneous, as well. Individual households may have differences in preferences for ability to pay for and willingness to pay for water resources. Ability to obtain water is one part of the debate, but actual availability is another. Thus, a threefold problem exists (admittedly, this is a gross oversimplification): (1) availability, (2) allocation among competing uses, and (3) allocation among competing entities – people, businesses, nations – within each of those uses.

2. CRITICAL INFLUENCES ON WATER IN THE FUTURE

Approximately 1 billion people lack access to any type of improved source of water for drinking (World Health Organization, 2013). Four major trends have been highlighted as having critical influence on water markets moving forward: global population growth, infrastructure, standards for water quality, and climate change (Wild, Francke, Menzli, & Schon, 2007). Global population growth and demographic changes are influencing demand for safe water through the sheer increase in total population, the movement into urban centers, and the general increase in standards of living in countries with very large populations,

namely India and China (Wild et al., 2007). Lack of infrastructure preventing the provision of safe water is commonly highlighted when discussing developing countries. However, aging infrastructure in the United States (and other developed nations) is also a challenge (Wild et al., 2007). According to the Environmental Protection Agency (EPA), the aging water infrastructure is among the United States' top water priorities (EPA, 2012). Thus, infrastructure, whether lack thereof or state of repair, is expected to have an impact on water and water systems moving forward. As discussed earlier, all water is not equal in terms of use. Many countries face challenges with water quality, in addition to the quantity available. Water quality can be impacted by contamination from human and animal waste (especially in rural areas without treatment facilities or waste systems of any kind), industrial waste, and contamination from agricultural production (Wild et al., 2007). The impact of climate change on water resources is another trend that experts are currently watching. Impacts of climate change are expected to be region specific (Wild et al., 2007) but may impact water availability and systems and even trigger indirect impacts on a global scale through interrelated economic and political systems.

3. WHAT IS WATER? IS WATER A COMMODITY OR A BASIC RIGHT?

Adam Smith first posed the paradox of value now commonly referred to as the Diamond-Water Paradox:

> "Nothing is more useful than water: but it will purchase scarce any thing; scarce any thing can be had in exchange for it. A diamond, on the contrary, has scarce value in use; but a very great quantity of other goods may frequently be had in exchange for it." (Smith, 1776)

Butler (2011) summarizes Smith's (1776) discussion in which water is extremely useful but lacks exchange value, whereas the diamond is largely useless but has great exchange value, following up with the potential use of marginal utility theory or demand analysis to analyze this paradox today. Water rights and ownership have become big business with corporations battling for rights to water for a wide range of uses.

Zetland (2011) points out the dimension of scarcity inherent in Smith's Paradox; diamonds are valuable because they are scarce, whereas water is not scarce, so long as it is abundant. "Water shortages are caused by water management institutions that ignore scarcity. Economic tools can efficiently and fairly manage scarce water. Demand for water depends on technologies, tastes and prices" (Zetland, 2011). The institutions Zetland refers to are the collective rules of the game that govern who can use water, how much water they are entitled to, and which source (ground or surface water) they can obtain water from. Water rights are the most fundamental institutional form governing water use and are a necessary but not sufficient condition for improved efficiency in the allocation of this scarce resource.

Beyond production, populations of people – as well as animals – need water for survival. A lack of access to improved water sources and sanitation facilities leads to a number of consequences for individuals, regions, and societies as a whole. A lack of availability and access to safe drinking water can impact the health and well being of residents, thereby impacting productivity, investment in education, and work. The lack of safe drinking water can place significant stress on societies, limiting economic growth, and creating crippling outbreaks of water-borne or water-spread illnesses.

4. CONCLUSION

"Although water has become a precious commodity in many areas of the world, the price charged to consumers of water in most countries is still too low to accurately reflect its value" (Wild et al., 2007). Unless the price charged for water reflects the true opportunity cost of using more water, both in terms of the current time period and future years, it will not be allocated efficiently. Well-defined property rights for water are needed together with effective management institutions in order for private consumer decisions to result in increased social welfare where water is concerned.

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Nicole conducts interdisciplinary research that provides support for decision making regarding technology adoption, analysis of producer costs and benefits associated with alternative production processes, support for the management of purchased inputs, and insight into the implications of changing consumer demand and preferences for agricultural producers.

Dr. Ben Gramig's teaching and research activities are focused primarily on environmental and natural resource economics. He has a strong interest in the interface between agriculture and the environment, and his work is motivated by public policy and the role of human activity in environmental change.

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Ben has previously worked in a consulting setting as part of an interdisciplinary team of researchers and gained experience working with extension agents, commodity groups, farmers, environmental organizations, government agencies, and elected officials while working in the Governor's Office of Agricultural Policy in Kentucky.