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"A Common Share" - Water Supply Choices in Urban Turkey

Butt

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Anya Butt, Murat Basaran, Aysel Acar, Derya Eroglu, Mehmet Karakuyu and Ali Demirci

Turkey is a rapidly urbanizing region. Its largest city, Istanbul, with a population of approximately 12 million people, houses almost a quarter of the country's population, and is experiencing an annual increase of 400,000 people. From 1985 to 1990, Istanbul experienced a 25% growth in population (DIE, 1997) and even in the next ten year period, growth did not abate, as the city grew over 30% in population from 1990 to 2000 (DIE, 2004). Daily domestic water requirements in Istanbul averaged 2.6 million m^3 in 2000. Its next largest city, Ankara, has over 4 million inhabitants and also has experienced a 23% growth from 1990 to 2000 (DIE, 2004). Both cities continue to act as major attractive forces in migration, but at the same time, neither is well situated to support a burgeoning urban population with ever-growing water needs. Ankara is situated on the Anatolian plateau, marked by an overall dearth in moisture, while Istanbul is located straddling the Bosporus on travertine limestone terrain and thus both cities rely heavily on surface water reservoirs for their water needs.

On-going urbanization and development dominate the local landscape, requiring water resources and supply systems to keep apace for both domestic and industrial use. The water consumed annually in Turkey is estimated to be around 108 billion m^3 (Dokmen et al, 2002), with the majority of that water coming from surface water sources, largely reservoirs. Per capita, 150 L/day are being used for drinking and other purpose (Ercan, 1995). In contrast, the water consumption in 1994 was only 32 billion m^3 (Dokmen et al, 2002).

Attempts to safeguard local water supply sources have met with limited success, largely due to the rapid urban growth. Istanbul currently covers a surface area of 5.7 km^2, but its expansion is currently moving to incorporate more of the surroundings into the city, so that the city of Istanbul is starting to more accurately resemble the district of Istanbul which is often the basis for census data. As the city continues to grow, water pollution issues are also increasing. Often urban growth occurs as unauthorized settlements, referred to as *gecekondus*. Much of the urbanization within the city is unplanned, often in regions set aside by the government as conservation zones around reservoirs (Curi and Mandalinci, 1991). In order to protect water quality, the city has established conservation zones around the reservoirs, which through spatially delineated buffers regulate the type of land use within each zone (Timur and Eren, 1991). But, the city is expanding faster than its infrastructure and enforcement of legislative codes is often inadequate, so that sewage disposal may in the future become more vital that fresh water supply (Timur and Eren, 1991).

Daily water need is expected to average 250 L/person (Demirci, 1997). Thus, for a population of 10.3 million in Istanbul (DIE, 2001), expected water demands exceed 2,575,000 m^3/day, which represents a yearly demand of almost 940 x 10^6 m^3 (Demirci and Butt, 2001). The current supplies are just barely adequate, when groundwater resources and old, isolated spring systems are included. As the population of Istanbul keeps growing, and the industrial sector of the region develops, these demands will increase, requiring ISKI to develop ever more supplies. The master plan casts the water supply network further afield, drawing water from Iznik Lake across the Marmara Sea, as well as harvesting water from streams draining to the Black Sea over 200 km to the northwest of Istanbul (ISKI, 2000). The attempts to divert water from far outside of Istanbul's boundaries in part may reflect this growing issue of water pollution.

Both Ankara and Istanbul have municipal agencies that control the water supply to and within the cities. These agencies are known as ASKI and ISKI, respectively, an acronym for Ankara

Water and Canal Institute and Istanbul Water and Canal Institute. Water supplied by ISKI and ASKI is provided on a variable rate system. Rates are divided on type of establishment (residential, commercial, industrial, construction, public administration and special buildings, such as schools, and hospitals). Numerous pious foundations (*vakfi*) maintain and supply water to public fountains. These, though, tend to be located at sites surrounding the Bosporus Straits, especially in the less populated northern regions (Ödekan, 2000).

Turkey relies heavily on water diversion projects to satisfy to meet these needs. Currently, over 90% of the water demand is met by surface water (Ercan, 1995). Even while Turkey has a history of providing water to neighborhoods through the creation of public fountains responding to the Islamic precept of water as a common good to be shared by all, water is increasingly becoming a commercial commodity. Attempts to control the water quality of existing surface water supplies are on-going, but partially in response to a lack of faith in the state purification process of water supply system and in part due to the rapid development of new unofficial housing sites, independent water merchants and elaborate in-house filtration systems are growing in number. In one suburb of Istanbul, housing approximately 32,000 people, over forty independent water merchants were operating in 2001 (Butt et al, 2001). Water vendors have always been a constant fixture in Turkey's economy, and these continue to provide service to the cities. In addition, aggressive marketing campaigns by water sold in polycarbonate plastic bottles has captured a large share of the bottled water market (Butt et al, 2001). While it is generally cheaper to buy water in bulk, the polycarbonate plastic bottles, marketed mostly by larger establishments, are packaged as small 0.5 L or larger 1.5 L bottles, sizes that are easier to stock for markets and easier to carry for customers. Overall, the price of water between 1996 and 2000 has remained relatively constant in Merter, Istanbul in terms of its value in US dollars (Butt et al, 2001), the price in Turkish liras has kept pace with the national inflation rate.

The packaged water market is a growing industry in Turkey and extremely competitive. Yearly, the water market grosses $250 million and the market is expanding 20% every year (Ödekan, 2000). Water vendors provide a bulk of the drinking water to customers in the cities. The home delivery and the lower price of the larger 19L bottles by the independent vendor appears to insure that for domestic use, there will continue to be a strong market. To date, there have been no studies examining differences in pricing between districts in the large cities of Turkey, more specifically differences in prices between the sections of town that have municipal water connections and elect to purchase water from independent vendors and those exist as *gecekondus* - unplanned housing - where the municipal infrastructure is not as well developed and choice of water supplier is not as available.

In this paper, we examine water prices in both Ankara and Istanbul over the last five years, examining both the state water supply and water prices from independent bottling agents, as well as survey data of water availability and usage among residents in various districts and the role of public fountains in today's modern society.

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Author contact information:

Anya Butt, Assistant Professor
Division of Natural Sciences
Box 05, Central College
Pella, IA 50219
(641) 628-7496
anya.butt@central.edu

Ali Demirci, Mehmet Karakuyu, Murat Basaran, Aysel Acar, Derya Eroglu
Department of Geography
Fatih University
Karaağac Yolu, Bűyűkcekmece
34900 Istanbul, TURKEY
Phone: (90 532 799 2998), Fax: (90 212 889 0832)