IMPACT OF THE NEW WATER PRICING STRUCTURE AMONG VARYING RESIDENTIAL ECONOMIC SECTORS IN SARATOGA SPRINGS

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ABSTRACT

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Water scarcity is a very real concern on the global level. Estimates of water scarcity indicate that 41% of the world's population, or 2.3 billion people, live in river basins characterized by "water stress" or frequent water shortages (WRI 2005). A full 1.7 billion of these people live in "highly stressed" water basins where problems of local food production and economic development are severe (WRI 2005). Rapidly increasing water consumption practices are considered to be largely responsible for this growing scarcity. Between 1990 and 1995 global water consumption increased six-fold (WRI 2005). This rate continues to increase with the growth of agricultural, industrial, and domestic practices.

According to Carmen Revenga, senior associate of the WRI, "better management of water resources is the key to mitigating water scarcities in the future and avoiding further damage to aquatic ecosystems" (WRI 2005) The results of her research indicate that a more efficient use of water may drastically expand the viability of the limited resources available (WRI 2005). According to Peter Gleick, co-founder and President of the Pacific Institute for Studies in Development, Environment, and Security, the potential impact of conservation is large enough that even with population growth it could delay or perhaps eliminate the need for new water sources (Gleick, at. al. 2005).

The most efficient water conservation measures are those that address the least efficient water practices. The Pacific Institute determined that residential water use account for 54% of the total water used in urban areas (Gleick, at. al. 2005). This

percentage is even larger in suburban and rural areas. Because residential use accounts for a large percentage of total water use in most cities, policies aimed directly at reducing water consumption among their residential users provide many opportunities for water conservation. Water rate structures are an important tool policymakers use to encourage efficient water use. Studies conducted by the Western Resources Advocates (WRA 2004) indicate that cities with water rate structures "accurately reflecting the value of water and the costs of obtaining new water supplies" have lower per capita water use and are able to maximize the longevity of existing water suppl

charge is simply the amount an individual ends up paying (regardless of the structure used) for each unit of water consumed.

Saratoga Springs is nationally recognized as a center of tourism due in large part to the presence of horse racing, the New York Ballet, and the Philadelphia Orchestra in the summer months. According to the City Council Board (2001), it is this "balance of economic and sociological assets that makes Saratoga Springs an attractive destination with an active, year-round residential and business community." Recent Census Data from 2000 confirms that Saratoga is a desirable location for new residents. The City's population has risen nearly 10% from 1990 levels and is projected to increase nearly another 10% by 2010 (CDTA 2004). Saratoga Springs has shifted to the classification of an urbanized area as a result of this recent population growth (CDTA 2004). The City and Cou

in both the long and short term, reside

charged a consumption fee of $8.50, for a total rate charge of $15.50 as opposed to the prior $20.90 flat rate (City Council 2005). As previously demonstrated, this new breakdown provides lowest water users with a decrease in their total water bill. According to Bill McTygue, Director of Utilities, most residential wat

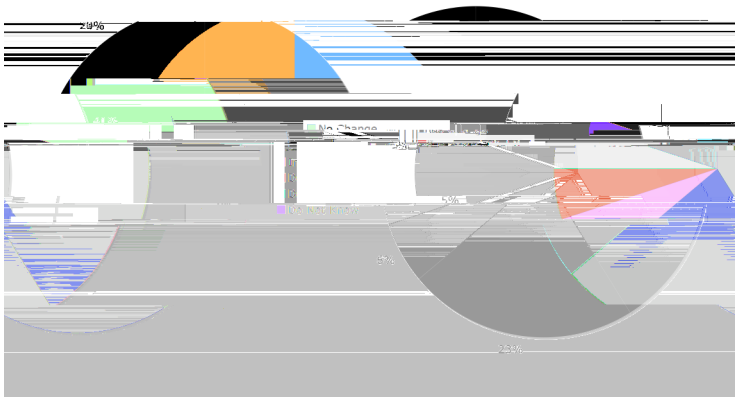
their water use (City Council 2005). According to Thomas McTygue, Commissioner for the Department of Public Works, despite the descending pricing structure still in place for industry, the higher end users will still be facing significant increases in their water bill ranging from $350 to $2,500 per quarter (City Council 2005). A key player in the structural reorganization said it would have been unwise to "turn [big business and local industries] on their back" (Pers. Com. Anonymous 2006).

It should be noted that Saratoga Springs uses a combined water and sewer bill. The sewage bill is approximately 2.5 times higher than the water bill. The discrepancy between the two taxes is attributed to the fact that while water is internally controlled by Saratoga Springs, sewage and waste are outsourced and managed by Saratoga County. While Saratoga County was ranked between 4th and 6th for lowest water prices in New York State, it was ranked considerably higher (16th to 21st) for sewage and waste in almost every consumption bracket due to these external controls. The exception to the trend is found in the highest industrial consumption category wherein Saratoga Springs was ranked 4th and 5th for water and sewage/waste water (Black and Veatch 2001).

The distribution of wealth in Saratoga Springs appears to follow a standard bell

In order to stratify sampling across various economic sectors, 2005 Geographic Information Systems (GIS) Parcel data was used. From these data, median household income was determined for each of the City's 27 block groups. Block group is the smallest unit for which for the US Census tabulates data and is usually equivalent to one neighborhood. Household income bracket categories were created to group the block groups with similar household incomes together. The household income bracket categories were as follows: $0-$20,000, $20,000

Figure 1: Reported Water Bill Change for All Respondents



The majority of respondents, a full 88%, reported no change in their water use habits as a result of the new water pricing structure. No one reported a significant increase in his or her water use and only one respondent reported that his or her water use had increased slightly since the implementation of the fee structure. Approximately 11% of our respondent pool reported a decrease in their water use, whether slight or significant, as w r

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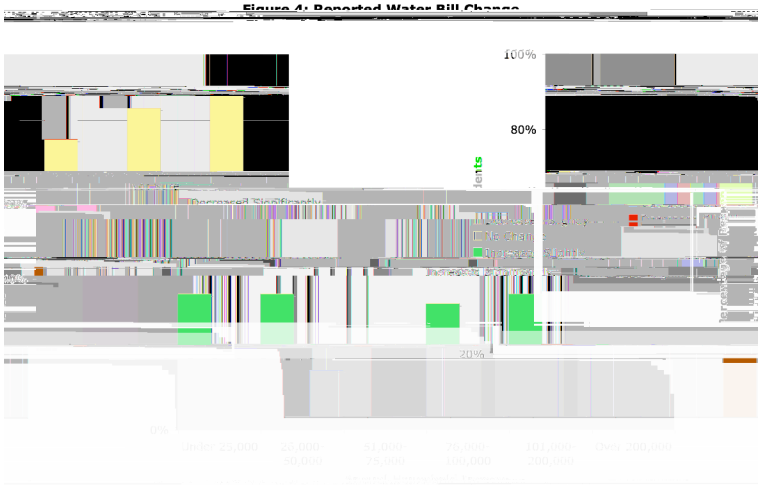
Roughly the same percentage of respondents in each income bracket reported that their water bills had not changed. A notable percentage of respondents with annual incomes of $51,000 and higher indicated that they were not sure whether or not their water bills had changed. Those indicating a slight or significant decrease in their bills were scattered. Participants in all income brackets indicated a slight increase in their water bills. Only those participants in the highest income bracket indicated a significant increase in their water bills (Figure 4).



A graph similar to Figure 4 was also created that removed the “not sure” responses. With this group removed, a relationship between water bill increase and income becomes apparent. As income increased, the percentage of respondents reporting an increase (slight or significant) in their water bills also increased, with the exception of the 76-100,000 group (Figure 5).

accurately determine statistical significance. A bivariate tabulation function was performed to assess the statistical significance of reported income and reported water bill change Chi Square, the test of statistical significance for bivariate tabular analysis was equal to 29.992. The asymptotic significance value was 0.225. A bivariate tabulation function was also performed to assess the statistical significance of reported income and reported water use change. Chi Square was equal to 27.635. The asymptotic significance value was determined to be 0.118 (Appendix III).

Responses to Qualitative Questions

The qua

in Saratoga Springs. A full 50% of the respondents in the lowest income bracket replied that they were unsure of their impact

Discussion

Quantative Analysis

As reported annual household income

There were several trends and themes evident when analyzing the responses we received to our qualitative questions. The first qualitative question asked whether the new pricing structure had changed the respondents' view of water. This question resulted in answers indicating t

income brackets felt exempt for different reasons. In the lower income brackets, many respondents stated that their water use was paltry in comparison to Saratoga's total water consumption. Respondents in the higher income brackets expressed a similar sentiment but also indicated that they had more water-intensive household practices than they cared to admit. One example of this trend is evident in the following quote from a 43 year-old female in the over $200,000 annual household income bracket who said: "[I don't think my consumption effects the larger water issues in Saratoga Springs] because I don't use much water. I mean, I have a sprinkler system

While an essential par

Because survey participants are often hesitant to report their household income, future studies should account for this by generating a significantly larger sample size. Future studies should also be conducted after the new water pricing structure has been in place for several billings. It is expected that after repeated billings, residents will become more aware of the new structure. If the results of future studies continue to suggest that the changes in the structure are not affecting consumption rates, it is advisable that more aggressive structural modifications occur.

Residential Customer Survey

Block group: _____
Phone number: _____
Date/Time: _____

_____
_____

3. How would you say your total water use has changed as a result of the new water pricing structure?

- ! Decreased slightly
- ! Decreased significantly
- ! Increased slightly
- ! Increased significantly
- ! Has not changed

Now I'd like to ask you a couple of general questions.

4. Has the pricing structure changed your view of water? (Prompt: How has the new water pricing structure changed your view of water issues in Saratoga Springs?)

_____
_____
_____
_____
_____
_____
_____
_____

5. Do you think your individual reductions in water use have an influence on the larger water issues in Saratoga Springs? (Prompt: If "No", then "why not?" If "Yes" or "Maybe", then "How"?)

_____
_____
_____
_____
_____5__ H_ _otS_

! Post Graduate Degree

10. What is your annual household income? Again, stop me when I get to the correct range.

! Under $25,000
! $26,000 - $50,000
! $51,000- $75,000
! $76,000- $100,000
! $100,000- $200,000
! Over $200,000
! Refuse to Answer

Thank you so much for your time. This information may prove extremely beneficial to future pricing structure policy implemented in Saratoga Springs.

Interview Questions for Semi-Str

Appendix III:

INCOME1 * WATERBIL Crosstabulation

Chi-Square Tests

Count

		WATERUSE					
		decr sig	decr sli	incr sli	no chnge	not sure	Total
INCOME1	101-200		1		12		13
	26-50	1			5		6
	51-75	1			14		15
	76-100	1			10		11
	ovr 200				5	1	6
	undr 25		2	1	5		8
Total		3	3	1	51	1	59

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.635[a]	20	.118
Likelihood Ratio	20.601	20	.421
N of Valid Cases	59		

a. 24 cells (80.0%) have expected count less than 5. The minimum expected count is .10.

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