

Affordability of Household Water and Sewerage Services in Waitakere City – A Case Study



B. Mahmood and H. Jing



Affordability

- Anything **scarce and in demand** commands a price
- Water is scarce in some context so **water pricing** becomes an acceptable instrument of public policy
- One particular area of water policy that has become increasingly subject to pricing principles is that of **public water and wastewater services**
- Therefore the issue of “**affordability**” needs a degree of prominence by policy makers
- Two terms “**Water Poverty**” and “**Water Affordability**” and OECD has favoured the later term i.e. ‘affordability’ , which means the ‘**ability to pay**’ (OECD, 2003).
- **No equivalent standard** (as fuel poverty) has been set for water
- **Indicative affordability** bench (ranging from 3 to 5%) for water rates has been reported by many governments and international organisations.



Two Concepts of Measuring Affordability

- **Macro affordability** – relates to average household water charges to either average household income or average household expenditure for the whole country.
- **Micro affordability** – allows disaggregated in various ways: by income group, by region, by family type or by a particular burden threshold.
- **Micro measure concerns** the situation from **low income to high income** families, and it just **fills the part** that might be missed while taking the macro measures



Water Charges in OECD Countries

- ⊙ **Why different charges?** (e.g. water use, pollution, tradable permits, release of specific pollutants, etc) - to making **water more accessible, healthier and more sustainable** over the long term.
- ⊙ OECD countries (New Zealand is a member of it) are working toward the goal of **“internalising”** the full marginal costs (including environment costs) into decisions that affect **water use and water quality**.
- ⊙ Because of **water quality and environmental standards** - Water charge levels have been rising in most OECD countries in recent years.
- ⊙ Concern about the affordability of household water services for **low to medium income households and retired people**, has led to the development of a range of **policy measures aimed at resolving affordability problems** (still meeting economic and environmental goals).
- ⊙ In general, **policies** that target specific **vulnerable groups – through income-related support** – have been found to be more efficient at achieving their objectives than **across-the-board subsidies**.



Water Charges in New Zealand

- ◎ **Four different water services** provided to households: **water supply, sewage disposal, rainwater disposal from buildings, and rainwater disposal from highways.**
- ◎ Two fundamentally different ways in which the cost of providing any one - or all four - of these services can be met, i.e. **providing funds from local or national taxation**; and **making direct or indirect charges** on households and others (Palmer, 2005).
- ◎ Charges based on **property rates**, uniform annual charges (**UACs**), and **flow based or consumption charges** are used individually or in combination for water supply.
- ◎ With **UACs and charges based on property rates** there is **no economic incentive** for consumers to reduce their water consumption through efficiency measures.
- ◎ Research shows that **meters and flow based charges** have been introduced, both in New Zealand and overseas, there has been a significant change in behavior and a decrease in demand on a per capita basis (PCE, 2001).



Rationale

- Higher Investing costs due to water quality and environmental standards
- Recent, large and sustained rise in the average water and sewerage charges of Waitakere city households
- Need to develop water and sewerage pricing system to get the balance of the water industry performance and the public benefit.



Focus of the Study

The focus of this study was to analyse the issue of water and sewage service charges affordability in the Waitakere city.



Methodology

- ◎ The **population, annual gross income** for different groups, and the **number of household** for each income group data were obtained from Statistics NZ and Waitakere City Council (WCC) for 1996, 2001, and 2005.
- ◎ The **annual quantity of water** supplied, **price of unit** water supply, and **average annual sewerage** service's charges data were obtained from WCC for the reporting years.
- ◎ The households were grouped by their **income levels** from lowest to highest (i.e. 1 to 9), within their median and average values of income and percentage of household in each group for each reported year.
- ◎ **Micro affordability** analysis was used in this study.
- ◎ The **annual water charge per household** was estimated using the annual water quantity supplied to the whole Waitakere City, price of unit bulk water, and the number of household in the City.
- ◎ The **annual water and sewerage charges** were added to get the total annual water and sewerage service charges.



Methodology

Assumptions:

- ⦿ A **3% value** was assumed as a benchmark to assess and analyse the issue of affordability for household water and sewerage charges in the Waitakere city.
- ⦿ As no data could be obtained for water consumption per household in the city, therefore, it was assumed that the **daily consumed water per household is constant** (i.e. 680 litres per day per household) since 1996.

Data Limitations

- ⦿ The data that was available for the purposes of analysis is not detailed and **lacks in household composition and water consumption patterns**, especially, of the lowest to medium income households. Further, there is wide variation in individual circumstances.
- ⦿ Having acknowledged these problems it was, nevertheless, possible to draw together the data in a way that enables a preliminary analysis of particular circumstances, and from there to draw general (not detailed) conclusions.



Results and Discussion

Population and Household Growth

- Highest population growth rate that is one of the highest in New Zealand, averaging at **2.3%** each year (compared to the national average of 1.0%).
- The population is expected to grow **20.2%** by 2016, from its current level of 190,000 (approx.).
- The results showed that the total numbers of household increased by **44.7%** (i.e. from 41625 to 60224) between 1996 and 2005 (including parents with and without children).

Population served	189,932
Total properties served	63,359
Residential properties served	60,224(95%)
Business properties served	2,745(4%)
Other properties served	390(1%)
Total water serviced area (ha)	16,028
Water serviced area within MUL (Metropolitan Urban limits - ha)	8,228(51%)
Bulk water supplied to operators (m ³ /annually)	16,302,198
Water consumed per property (l/day)	628

Table 1: An overview of water services provided to the residents of Waitakere city (*Sources: Auckland Water Industry Annual Performance Review, 2003/04*).

Income Distribution in Waitakere Area



Income groups	1996				2001			
	Annual income (\$)	Household %	Household number	% income spent on water & wastewater	Annual income (\$)	Household %	Household number	% income spent on water & wastewater
1 Lowest	16598.8	13.54%	5637	2.97%	19801.6	13.52%	5901	3.31%
2	20000	7.97%	3318	2.46%	25000	3.96%	1728	2.62%
3	25000	4.57%	1902	1.97%	30000	7.01%	3060	2.18%
4	30000	8.40%	3495	1.65%	40000	7.86%	3429	1.64%
5	40000	12.40%	5163	1.23%	50000	9.21%	4020	1.30%
6	50000	11.20%	4662	0.99%	70000	17.84%	7788	0.99%
7	70000	19.35%	8055	0.74%	90000	13.29%	5799	0.79%
8	90000	12.34%	5136	0.59%	100000	9.52%	4155	0.73%
9 Highest	100000	7.35%	3060	0.55%				

Table 2: The percentage of income spent on water and sewerage service's charges by each income group for 1996 and 2001 (as the household number data could not be obtained for 2005).

Unit Price of Drinking Water

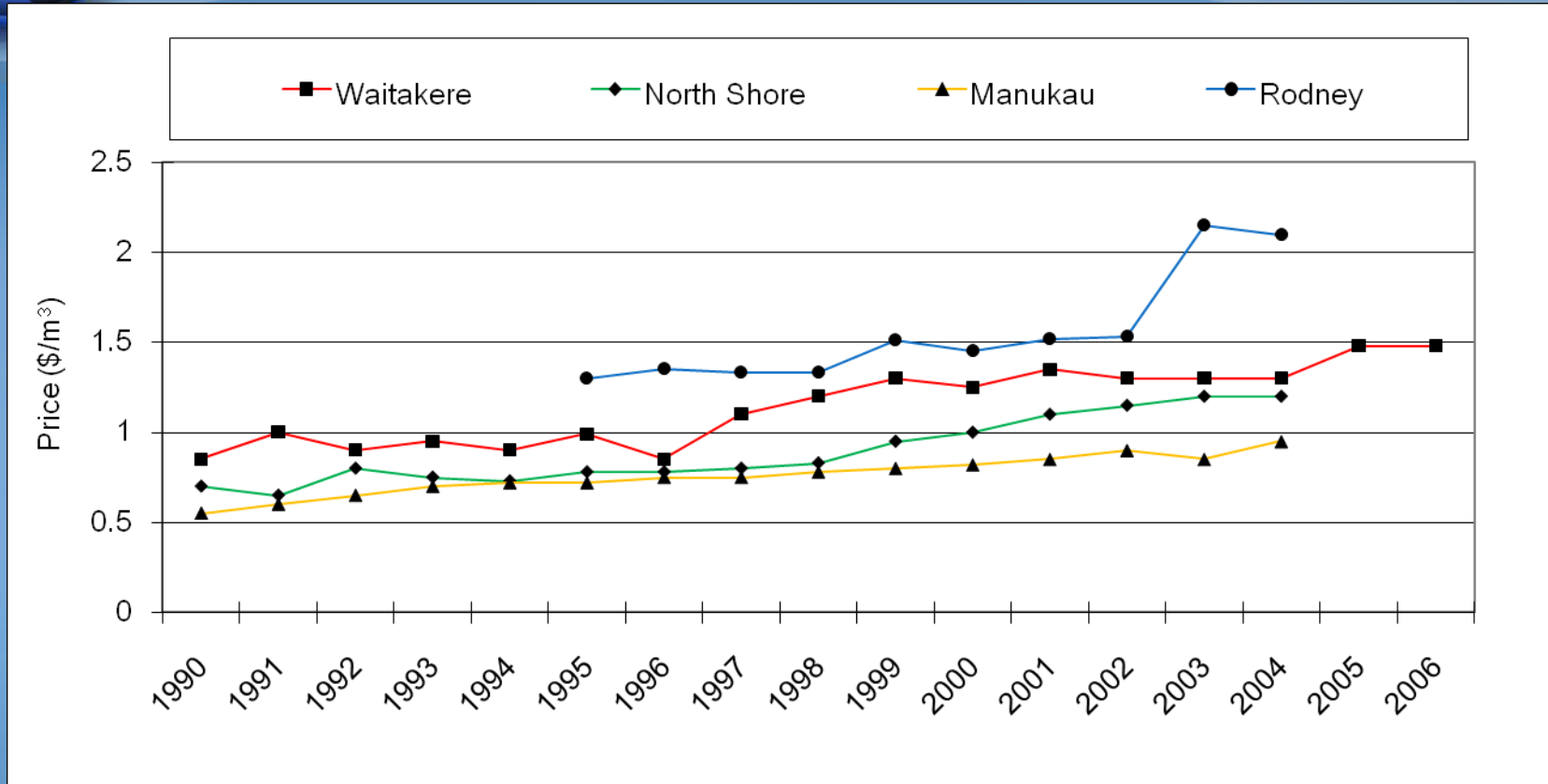


Figure 1: The unit price of drinking water for the main cities of the Great Auckland Region from 1990 to 2006 (*Data sourced: Watercare, 2005*).

Water and Sewerage Charges

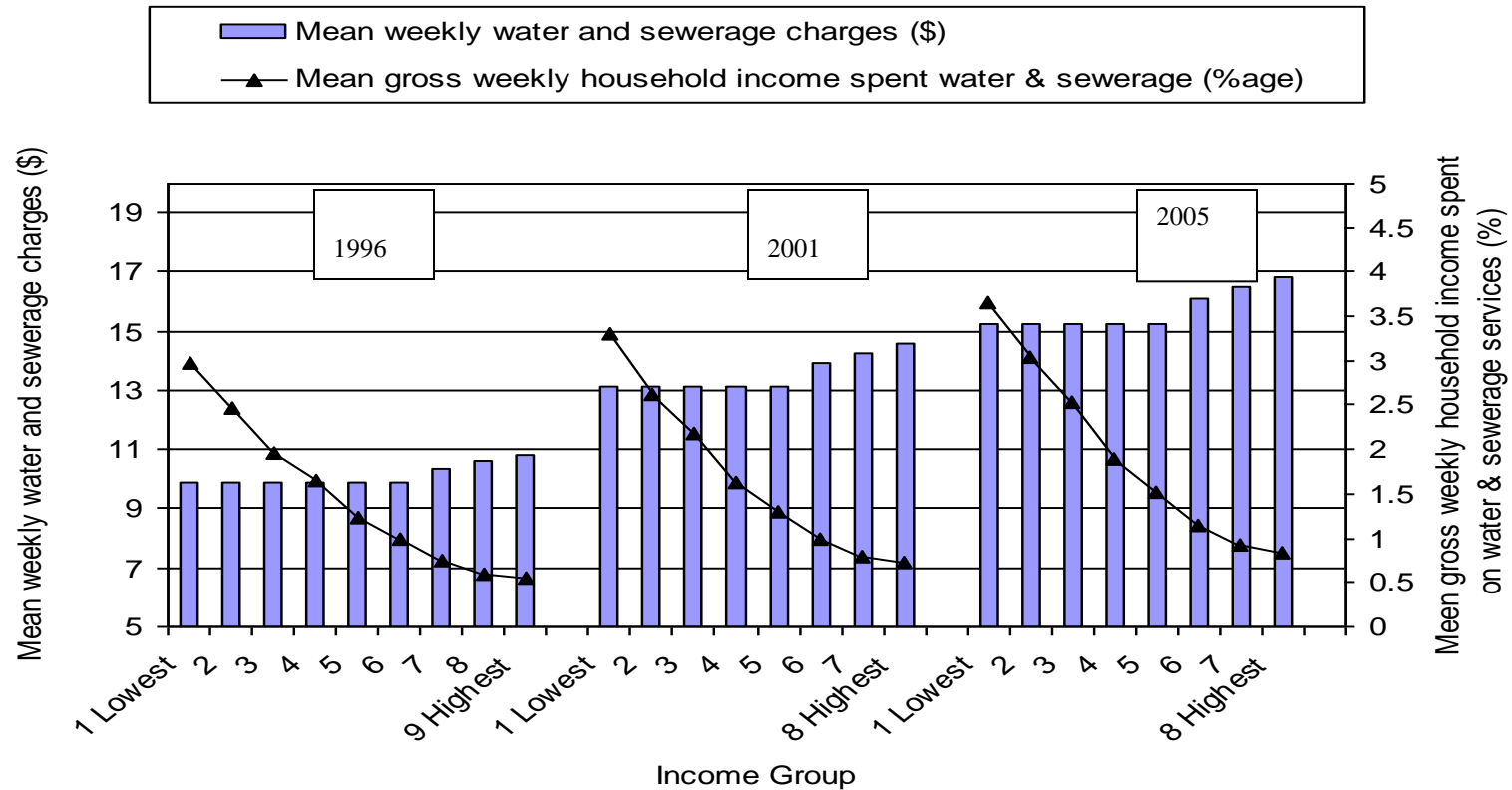


Figure 2: A comparison of mean weekly water & sewerage charges and the percentage of weekly gross income spent by each income group on water and sewerage services in 1996, 2001, and 2005.



Water and Sewerage Charges

The results showed that:

- The mean weekly gross income varied between **\$319** and **\$1923** (from lowest to highest income group) over the past 10 years .
- The annual water and sewerage charges (combined) have gone up by **59.5%** since 1996 (i.e. increased from \$616 in 1996 to \$982 in 2005).
- The **lowest income group** spent 2.97%, 3.31%, and 3.66% of their mean gross weekly income on water and sewerage charges in 1996, 2001, and 2005, respectively (i.e. **23.23%** increase for the lowest income group, since 1996).
- The **highest income group** spent 0.55%, 0.73%, and 0.84% of their mean gross weekly income on water and sewerage charges in 1996, 2001, and 2005, respectively (i.e. **52.7%** increase for this group since 1996).



Water and Sewerage Charges

The results also showed that:

- The lowest income household group paid **2.97%** of their income into water and sewerage service weekly in **1996**, which was close to the assumed benchmark **3%**.
- While in 2001 and 2005, it increased to **3.31%** and **3.66%**, respectively, (i.e. 10% and 22% more OR an excess of 0.32% and 0.66% over the assumed fixed benchmark of 3%).
- The **lowest income groups are spending a big slice of their income** on water and sewerage charges than that of highest income group.



Why 3% Affordability Benchmark?

- The medians of spending by households on water and sewerage charges as a percentage of gross income were **1.23%**, **1.47%**, and **1.71%** for 1996, 2001, and 2005 years, respectively.
- The choice of 3% appears to be reasonable as it was above the average median value of **1.47%** (which is less than **1.5%** i.e. half of the assumed benchmark).
- Sawkins and Dickie (2005) reported that there is no commonly agreed affordability benchmark in the UK. For England and Wales an indicative water affordability measure has been adopted by DEFRA (i.e. 3% of household income).
- International Organisations – For examples, **3 - 5% by World Bank**, **3% by UK**, and **2.5% by US** government.



Summary and Conclusions

Based on the findings of this study the following conclusions can be drawn:

- Since 1996 the average **annual water and wastewater** charges increased by **77% and 42%**, respectively (i.e. a combined increase of **59.5%**).
- The percentage that the **lowest income group's income** spent on water and wastewater service's charges increased from **2.97% in 1996 to 3.66% in 2005**.
- The percentage that the **highest income group's income** spent on water and wastewater service's charges increased from **0.55% in 1996 to 0.84% in 2005**.
- The lowest income groups are spending a big slice of their income
- Measuring the affordability is complex and inexact; **household composition** and **choice** are significant factors.



Summary and Conclusions

- **Households with dependent children**, for instance, may be less able to spend more of their income on housing costs than households with no dependent children.
- Furthermore, households with higher incomes are able **to exercise more choice** over how much they spend on housing costs.
- **Affordability** can play an important role to analyze the water charge, and check if the water and sewerage service's charges are at a reasonable level.
- This study has **attempted to identify some of the issues**, but it has not reduced the need for further, more detailed analysis of the **household composition and water consumption patterns** of the lowest to median income households.