

This report presents a set of concrete tools that can be used to quantify households' affordability and willingness to pay for water and wastewater services. The tools are intended for use in the preparation of major investments in the water and wastewater sector. The report includes tools for both public-private partnerships and traditional investment projects.

Water Prices in CEE and CIS Countries

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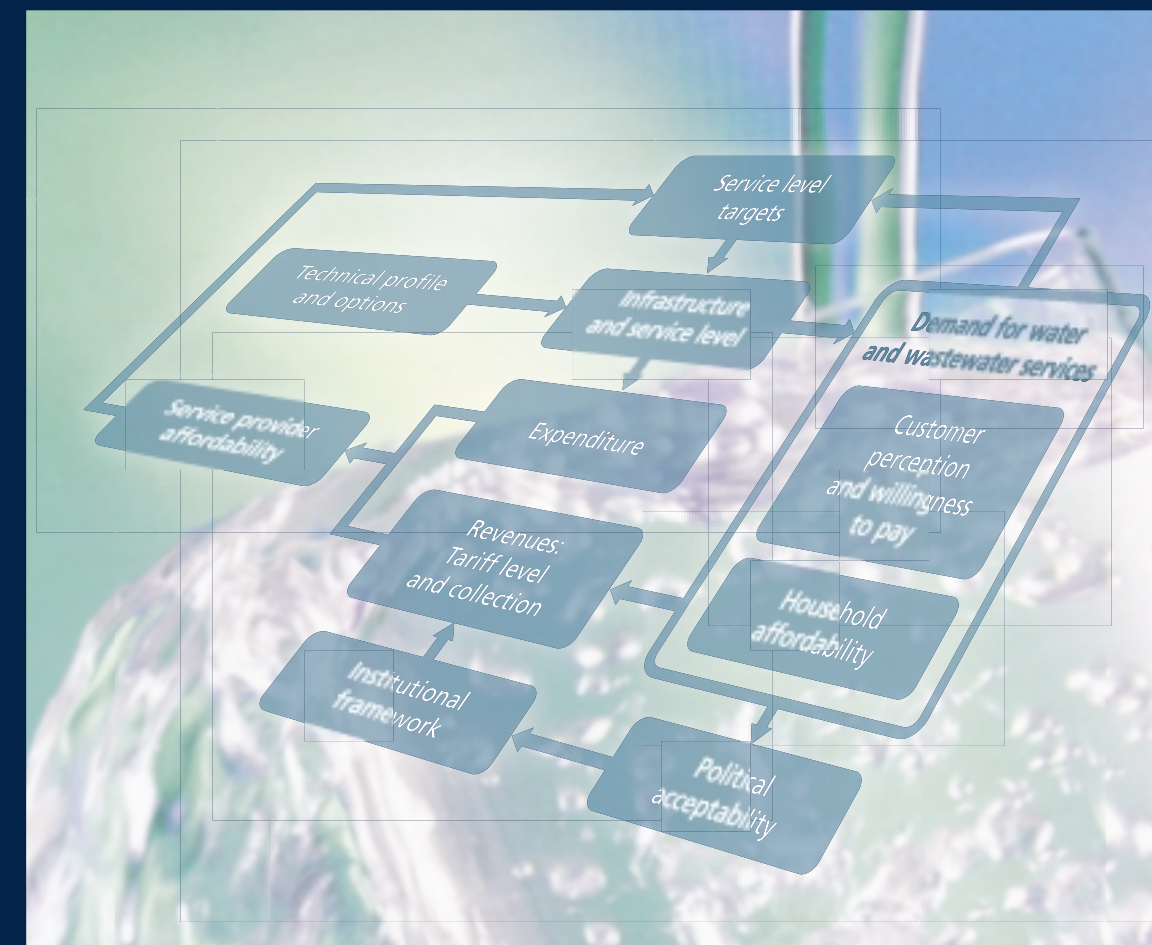
THEMATIC REPORT

Water Prices in CEE and CIS Countries

Volume II: Case Studies

A Toolkit for Assessing Willingness to Pay, Affordability and Political Acceptability

Volume II: Case Studies March 2002



**Publisher**

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Year of publication 2002**Title**

Water Prices in CEE and CIS Countries
Volume II: Case Studies
March 2002

Text

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Abstract

This report presents a set of concrete tools that can be used to quantify households' affordability and willingness to pay for water and wastewater services. The tools are intended for use in the preparation of major investments in the water and wastewater sector. The report includes tools for both public - private partnerships and traditional investment projects

Other information

This report was prepared by COWI in association with Accent Marketing and Research.

The work was financed by the Danish Environmental Protection Agency (DEPA) as part of the Danish Cooperation for Environment in Eastern Europe (DANCEE).

The work was coordinated by a DEPA steering committee also comprising representatives of the European Bank for Reconstruction and Development (EBRD).

The opinions expressed are those of the consultant. The Danish Ministry of the Environment - Danish Environmental Protection Agency (DEPA), the European Bank for Reconstruction and Development (EBRD) and the beneficiary authorities may not agree with these opinions.

Terms

Stated preference, water and wastewater, affordability, willingness-to-pay, political acceptability

Edition closed January 2002**Number of pages** 196**Format** A4**Number of copies** 500**Electronic** www.mst.dk/dancee**Graphic concept** Linneballe Designers as**Printed by** Kailow Graphic A/S**Paper** 100g CyclusOffset / 300g ProfiSilk**Price** Free**ISBN** 87-7972-218-0

The Printed matter is approved under the Nordic environmental label. Identity number 541 134 This ensures that the printed matter meets the official environmental requirements during its life cycle. Printed on official environmentally approved paper with vegetable-based printing inks.

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*A Toolkit for Assessing Willingness to Pay,
Affordability and Political Acceptability*


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DANCEE

Danish Cooperation for Environment in Eastern Europe
Ministry of the Environment

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ABBREVIATIONS AND ACRONYMS

BOT	Build, operate, transfer
BVK	Brno Water and Wastewater Utility
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
DANCEE	Danish Co-operation for Environment in Eastern Europe
DEPA	Danish Environmental Protection Agency
EBRD	European Bank for Reconstruction and Development
EU	European Union
GDP	Gross domestic product
IFC	International Finance Corporation (World Bank group)
IFI	International Financial Institution
ISPA	Instrument for Structural Policies for Pre-accession
Lt or LTL	Lithuanian Litas
O&M	Operation and Maintenance
PLN	Polish Zloty
PPP	Public-private partnership
PR	Public relations
PWIK	Poznan Water and Wastewater Utility
RP	Revealed preference
SP	Stated preference
UAH	Ukrainian Hrivna
UfW	Un-accounted for water
WB	The World Bank
WTP	Willingness to pay

The following currencies and conversion rates have been used in the report

For Brno

1 CZK = 0.20 DKK as of October 1999 equivalent to

1 EUR = 36.75 CZK as of October 1999

For Poznan

1 PLN = 1.80 DKK as of November 1999 equivalent to

1 EUR = 4.14 PLN as of November 1999

For Kaliningrad:

1 RUR = 0.28 DKK as of November 1999 equivalent to

1 EUR = 26.58 RUR as of November 1999

For Borovichi

1 RUR = 0.27 DKK as of November 2001 equivalent to

1 EUR = 27.18 RUR as of November 2001

For Ukmerge

1 LTL = 1.96 DKK as of September 1999 equivalent to

1 EUR = 3.80 LTL as of September 1999



***Water Prices in CEE and
CIS Countries***

*Appendix 13:
Case Study: Poznan, Poland*

February 2000



This case study, prepared by COWI, is being made available to the public to illustrate the methods presented in the main text of the toolkit. Neither DEPA, EBRD nor the Municipality of Poznan has verified or takes responsibility for the factual findings contained in this document. The opinions and recommendations expressed in this document are those of COWI and do not necessarily reflect the opinions or recommendations of DEPA, EBRD or the Municipality of Poznan.

Due to the time period involved in preparing the toolkit we acknowledge that certain information may not reflect the present situation of the city.

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ABBREVIATIONS AND ACRONYMS



CCTV	Closed circuit television
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
COS	Centralna (Wastewater Treatment Plant)
DANCEE	Danish Cooperation for Environment in Easter Europe
EBRD	European Bank for Reconstruction and Development
EU	European Union
lcd	litre per capita per day
LOS	Lewobrzezna (Wastewater Treatment Plant)
MB	Mechanical Biological
MC	Mechanical Chemical
O&M	Operations and Management
UfW	Unaccounted for Water
WTP	Willingness to Pay
WWTP	Waste Water Treatment Plant
PWiK	Poznanskie Wodociagi i Kanalizacja Sp. z o.o

CHAPTER 1

INTRODUCTION

Background

Over the past thirty years major infrastructure investments have often been implemented based upon detailed and systematic engineering analyses, but without much analysis of the prospective demand for the service. Today, an investor, whether public or private, will require that detailed studies of future demand and surveys of willingness to pay will have to be undertaken before investing in major infrastructure, such as transport infrastructure.

Within the water services sector, similar requirements are only now gaining ground. This may partly reflect that the nature of the revenue risk is different in water services. Cars can avoid a toll road by taking alternatives routes, but urban households cannot avoid receiving water / delivering wastewater from / to the monopoly water utility.

The rationale

However, water/wastewater utilities also face revenue risks, for example:

- Reduction of water consumption by consumers;
- Political protests impacting on the level of approved tariffs;
- Poor collection rates for water bill, etc.

EBRD and DANCEE have entrusted COWI to prepare a tool kit for consultants / analysts working for policy makers who want to address these, and related revenue risk issues, while designing water and wastewater service infrastructure investments. The toolkit will include practical guidelines on how to assess affordability and willingness to pay for water and wastewater services.

An integrated approach

The design (and cost) of a water and wastewater service infrastructure is not just a technical issue. Different designs lead to different service levels and cost structures, and each of the service levels are likely to be perceived differently by the consumer and thus to lead to different acceptability levels of the applied water prices. This should be integrated into an infrastructure design to reduce revenue risk and to make sure that a service level and an associated price level, acceptable to/optimal for the consumers, is applied. At the same time, affordability issues may set an overall limit for the possible increase in average tariffs and thus for the level of ambition with regard to future service levels if these are to be financed by the users. This implies that the analyses of the toolkit should be carried out concurrently with the technical analysis.

Reduction of revenue risk requires integration of design, cost and WTP considerations. This requires a close dialogue between the technical team, the affordability and WTP analysts, and the policy makers.

The research project and its case studies

COWI is carrying out the project in order to design a toolkit based on literature research, extensive consultations with stakeholders and three case studies.

The Poznan case study is one of three case studies being undertaken by COWI as part of the preparation of the toolkit. The other case studies are being undertaken in Brno (The Czech Republic) and Kaliningrad (Russia). The subjects of analyses, and the analytical methods used, have differed somewhat between the cities in order to provide the best basis for the preparation of the toolkit.

The primary purpose of each case study has been to provide insights into the design of the toolkit. The secondary purpose has been to provide city authorities with information on the link between acceptability of future (higher) water tariffs and customer perceptions of water service levels in a broad sense.

This working paper has been prepared with both of these purposes in mind.

Acknowledgements

The present working paper has been prepared by Mikkel Birkeland, Karsten Vesth-Hansen, Michael Jacobsen, Arne Rønnest and Zsuzsa Lehoczki, all COWI. Chris Heywood and Michelle Wheadon, from Accent Marketing and Research contributed to designing and implementing the stated preference survey. Krzysztof Podemski of Ankieter was instrumental in implementing the stated preference survey and provided comments on the design. Many people in Poznan generously provided their time and inputs in discussions with the team. In particular Magdalena Weselowska from the City Administration and Pawel Chudzinski, PWiK have been instrumental in assisting the team. The people met have been listed in Appendix 13.4. Peter Christensen (COWI) supervised the market research and Michael Jacobsen (COWI) is overall responsible for the "Acceptability of Water Prices in CEE and CIS countries" project and for this working paper.

Structure of paper

The structure of the paper is as follows.

Chapter 3 provides background information on the technical situation. This background information serves two purposes. It enables the foreign reader to read this working paper as a "stand-alone" paper. Furthermore, it describes how the project team perceived the technical situation, whilst designing the market research on acceptability of higher tariffs.

This chapter also discusses likely future investment levels and their likely consequence for tariffs, thus setting the stage for the discussions of affordability and willingness to pay.

In Chapter 4, we briefly describe the institutional set-up as we have understood it. This forms the background for our analysis of how the water service and tariff issue is perceived and how it may be framed (or influenced) in the future. We note that there are different understandings of water quality in Poznan today and that this, together with the observed willingness to pay for improved service, may be used to gain support for an "improved water at higher tariffs" strategy. We also note that lack of information among consumers today is a key issue.

In chapters 5 and 6 we present the results of the willingness to pay analyses and of the analyses of affordability issues.

CHAPTER 2

EXECUTIVE SUMMARY

The level of service in Poznan, for both water and wastewater, is high in relation to many other cities in Poland and in the CEE. There is a corresponding high tariff level. The tariff level is uniform for different consumer groups. Thus tariff increases due to a policy to end cross-subsidisation by industry belongs to the past.

The (ongoing and planned) level of investments in water and wastewater services in the city of Poznan is high. This reflects the need to renovate a system which (in parts) is quite old, the need to comply with EU requirements and a desire to expand the current high level of services to gminas surrounding Poznan. Acknowledging the high level of service currently found in Poznan, we have focused on willingness to pay to avoid deterioration in future service levels and have compared that with willingness to pay to have improvements within water supply. We have assessed, but not quantified by applying the stated preference methodology, willingness to pay for improved wastewater treatment (to comply with EU legislation), and we have not assessed willingness to pay more in order to expand services in the surrounding gminas. Both of these are legitimate policy objectives and our choice solely reflects the desire to test different aspects of willingness to pay in different case study cities.

Average income levels in Poznan are higher than average for Poland. In general affordability does not seem to be a major issue in Poznan (within reasonable investment levels and tariff increases). However, there are vulnerable groups for whom the issue of affordability is likely to need consideration. There are opportunities to address the issue of affordability for low-income groups through the tariff structure and through tariff collection policies etc. However, these have not been analysed or elaborated on in this working paper.

Consumers perceive the services of PWiK (cold water supply) less unfavourable than for most other utilities. However, there is ample room for improvement. 40% of consumers feel that the cold water services and wastewater services are not worth the current price. Furthermore - and in contrast to the factual situation - most consumers believe that tap water is not drinkable. This may reflect a lack of information about actual water quality, it may reflect habits and it may reflect that many consumers are unsatisfied with taste, smell and colour (in that order). A limited number of samples exceed the standards for iron, manganese, turbidity and colour (in that order) thus giving (limited) backing to consumer complaints about taste, smell and colour.

The willingness to pay analyses show a significant willingness to pay to avoid deterioration in service levels. The WTP is higher for young people than for old, higher for women than for men and (not surprisingly) lower for persons from lower income households than for persons from average and higher income households.

Interestingly, almost half of all water consumers believe that the appropriate strategy for PWiK in the future is to increase service levels and tariffs, 40% believe that the appropriate strategy is to maintain current service levels and tariffs, while only 10% are undecided or prefer lower service levels and tariffs. This situation may explain why the question of water tariffs in Poznan has not emerged as a significant political issue until now.

However, in relation to potential future tariff increases it is worth noting that the analyses indicate that consumers perceive their level of information about water and wastewater services to be low. This increases the risk that sudden and significant water price increases will be seen as arrogant and not justifiable. To address this issue the existing procedures and practice for tariff-setting could be complemented by a more participatory process during which the public understanding of the intention and the need of changes should be targeted.

CHAPTER 3

TECHNICAL PROFILE

The following chapter and the "Poznan Technical Profile" table in Appendix 2 comprise a brief technical profile of the water and wastewater systems of Poznan, and anticipations of future investment requirements. Refer to Appendix 3 for a list of reports used.

The objective of the technical profile is to provide technical background information necessary for the assessment of the public's acceptability of water and wastewater tariffs.

The profile is brief, and is based on data collected from available reports and discussions with water utility staff.

The water and wastewater services are entrusted the Poznanskie Wodociagi i Kanalizacja Sp. z o.o. (PWiK), a limited liability company 100% owned by the City of Poznan. A restructuring process is in progress, where the aim is to have private sector participation through concession.

3.1 Overall service level

Poznan has about 578,000 inhabitants. PWiK serves not only Poznan but also cities south, east and north of Poznan through interlinked systems: Lubon, Puszczykowo, Mosina, Swarzedz, Czerwonak and Murowana Goslina. The total population in the service area is 678,000 persons. The water supply coverage is assessed at 97%.

With regard to the wastewater system, the PWiK serves essentially the same area as for water supply and the coverage is about 85% (94% in Poznan city). There are three separate wastewater systems: (i) Poznan, Lubon, Swarzedz and part of Czerwonak, (ii) Mosina and Pouzczykowo, and (iii) Murowana Goslina and part of Czerwonak.

3.2 Existing water supply system

Poznan utilises groundwater, mainly through infiltration systems along the Warta River. The groundwater is treated to remove iron and manganese, as the raw water content of iron and manganese is too high, and the water is further chlorinated. The water quality, after treatment, fulfils current standards. The current water quality at consumer level is generally high, with only a limited number of samples exceeding the standards (about 2% of the chemical samples and 1% of the bacteriological samples). This means that the iron content increases in the network due to the networks ferrous pipes. It should be noted that the current Polish standard for iron is 0.5 mg/l; in the future the EU standard of 0.2 mg/l will have to be fulfilled.

The system has sample storage.

The water network is comprised of 1,122 km of water pipes, and 352 km of connections. About $\frac{3}{4}$ of the pipe network have dimensions < 250 mm. More than half of the pipes are of cast iron, and about 30% are plastic. The pipe network is relatively new, only about 32% of the pipes are more than 30 years old and approximately 16% of the pipes are more than 50 years old.

3.3 Existing wastewater collection and treatment

The wastewater system is comprised of 901 km of sewers, including 242 km of connections. The system is basically a separate system (only 25% of the pipes form a combined system).

The wastewater system is comprised of four systems and five wastewater treatment plants. The main Poznan system has two wastewater treatment plants, the Centralna (COS) and the Lewobrzezna (LOS) plants.

The largest plant (COS) is under modernisation. The new capacity will be 200,000 m³/day and the plant will provide MB treatment with some nutrient removal (effluent criteria is 30 mg Tot-N/l. Tot-P criteria is 1.5 mg/l. The second largest plant (LOS) is a MC plant with a present load of 48,000 m³/day.

3.4 Consumer groups, unit water consumption and metering

The water balance has been estimated by VA-Projekt as follows:

- Total water production: 117,416 m³/day;
- Total water consumption: 246 lcd;
- Hereof domestic consumption: 143 lcd;
- Unaccounted-for-Water: 62 lcd equal to 20%.

This means that the domestic consumption comprises about 58% of the total consumption. The domestic unit water consumption (143 lcd) is comparable to unit demands in North-western Europe. The UfW is not excessive.

3.5 Water and Wastewater Operations

The water supply provides 100% coverage of 24 hours supply per day at a design pressure of minimum 5 m. Reportedly only a few minor areas face pressure problems.

As mentioned above, the water leaving the water treatment plants fulfils applicable water quality standards, and only a few samples, which reach the consumers exceed the standards. The most frequent parameter for non-fulfilment are iron, manganese, turbidity and colour, and to a minor degree bacteriological parameters. This means that the water quality changes in the network, mainly due to the ferrous materials (with regard to the chemical parameters) and due to polluted reservoirs or leaks (with regard to the bacteriological parameters).

The number of recorded breakdowns is 42 per km per year for water pipes (115 per km per year if connection pipes are included) which is lower than, for instance, Brno, and much lower than for most CIS countries, but much higher than, for instance, in Scandinavia.

The number of blockages in the wastewater network is 280 per km per year, which is quite high (eg. six times the average for UK); and substantially higher than, for instance, Brno.

The annual rehabilitation intensity has been estimated at:

- Water pipe network: 0.9% which appears on the low side, but reasonable. The number of failures appear to be high compared to a corrosion condition assessment made during the Technical Audit. This corrosion assessment suggests that 8% of all iron pipes (ie about 73 km of pipes) have through-the-wall corrosion and need to be replaced. It is estimated that a further 0.3% of the pipes will become fully corroded per year;
- Wastewater collection network: 0.2%, which also appears on the low side, but reasonable. CCTV inspections have begun but only a limited part (< 5%) of the network has been inspected. The Technical Audit suggests that 42 km of wastewater collectors (6%) are to be upgraded within 5 years.

3.6 Staffing and Staff Efficiency

The staff of the water and wastewater utility comprises 998 employees. Selected staff efficiency indicators are:

- 1000 persons served per staff member: 0.68
- 1000 m³ of water sold per year per staff member: 57
- Km of water and wastewater pipes per staff member: 2.03

These indicators are comparable with other CEE countries. Compared to North-western Europe the staffing is high.

3.7 Investments

The firm Aqua has, in 1996, outlined an investment programme for PWiK, but it is based on demographic and water demand projections which have become outdated. Furthermore, the investment programme anticipates a severe present condition of the water and wastewater networks. In connection with the preparation of a concept paper for the restructuring of Posnan water and wastewater company in 1998, some preliminary adjustments to the investment programme were proposed, without actually making detailed technical assessments.

Finally, a full technical review has been made by VA Projekt.

The investment programmes are summarized in the following table: all figures in Mill USD:

Table 3.1: Investment Programmes

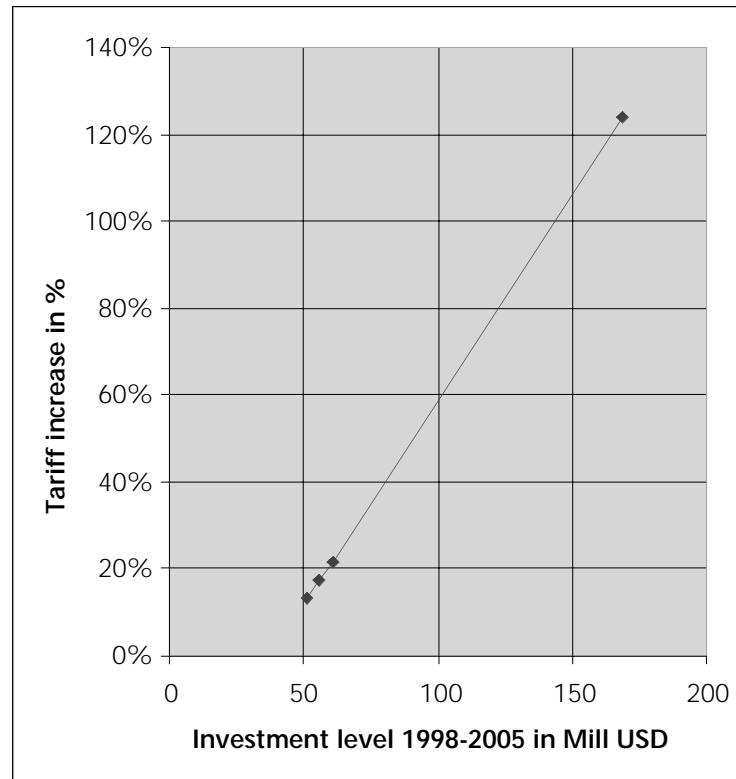
Component	Aqua, 1996		Booz-Allen, 1998	
	1995-2005	2005-2015	1998-2005	2006-2020
Water intakes (and treatment)			9	30
Water network			7	106
Water Total	42	119	16	136
Wastewater network	90-113	211	35	289
Grand total	132-155	330	51	425
Central WWTP	90		44	

According to discussions with PWiK, the annual "internal" investments for 1999 and 2000 are about 40-50 mill PLN/yr. (10 mill USD/yr.). It should be noted that the City finances most development investments, for instance 85% of the Central WWTP, scheduled for completion ultimo 2000.

The completion of the Central WWTP will result in increased O&M costs notably for power supply and general maintenance of the 350 mill PLN investment (this has been taken into account in the financial model of Booz-Allen & Hamilton).

The overall tariff increases for various levels of investments have been assessed in the financial model of Booz-Allen & Hamilton. The results are illustrated in Figure 3.1.

Figure 3.1: Relationship between medium term investments and resulting tariff increases, Poznan 1998 - 2005.



With regard to the required investments for water pipe renovation, it appears that the Technical Audit recommendations will result in investment levels closest to the Booz-Allen estimates. It is consequently anticipated that the level of investments of the Technical Audit will be of the same order as those of the Booz-Allen & Hamilton estimates, ie at about 50 mill USD for the period 1998-2005. This means that we are at the lower end of the curve shown above, say at about a 20% increase in tariffs.

If the PWiK were to finance full cost of completion of the COS WWTP (estimated 44 mill USD by Booz-Allen), the 1998-2005 investments will be about 100 million USD, and the tariff increases will be up to 60%.

The current level of PWiK investments of about 10 mill USD annually will require an approximate 20% increase in tariffs (one time).

CHAPTER 4

INSTITUTIONAL FRAMEWORK AND POLICY NETWORK ANALYSIS

4.1 Purpose and structure of analysis

The purpose of this chapter is to describe political and institutional factors, which can be expected to influence the future process of setting water tariffs in Poznan.

Specifically, the chapter addresses the following issues:

- The process of water tariff setting: which actors are involved? Is the process open or closed? Do few or many actors determine the outcome?
- The current status of water tariffs as a political issue: is it a salient or non-salient issue? Have many different viewpoints been articulated? Is it perceived by the decision-makers as a sensible issue?
- The framing of the water tariff issue: how is the issue defined (and by who) and how will the framing of the issue influence the likelihood of getting acceptance of higher water tariffs?

Information was compiled during a fact-finding mission to Poznan in October 1999 during which the above subjects were discussed with representatives of the PWiK, the prominent parties on the Poznan political scene, different departments with the Poznan City Administration, NGOs, and research institutes. Please see Appendix 4 for a list of organisations and persons met.

4.2 The water tariff setting process

4.2.1 Description

In accordance with general provisions in force in Poland, the municipality of Poznan is responsible for setting tariffs for water and waste water. The current tariff setting procedure follows the following steps:

- 1 Material indexes for production costs (increases) are approved by Board of PWiK, as well as agreement on inflation; and a planned increase in power and heating costs.
- 2 Following the PWiK Board approval, the various departments make the actual calculations, coordinated and compiled by the Economist Department.
- 3 The tariffs are approved by PWiK Board and the PWiK Supervisory Board.
- 4 The tariff proposals are sent to City Board. The board may consult the Office for Competition and Consumer Protection (the antimonopoly office) and other institutions. There are no legal regulations describing how and when the Office should be involved. However, in reality the Office has during recent years always been asked for its opinion by the City Administration before the actual increases were approved.
- 5 The City Board seeks advice from the City's Committee of Municipal Economy and the Committee of Finance. Following recommendations from these bodies, it approves the proposals or request explanations and further documentation.
- 6 The tariffs are incorporated in the financial plans of the PWiK which are approved by the supervisory board and finally by the general assembly.

For the past two years the proposed tariffs by PWiK have been approved, as suggested by PWiK, without discussion.

It appears that the Poznan City Board is ultimately responsible for setting the level of tariffs increases and that three actors are involved: PWiK, the City Board, and the Office for Competition and Consumer Protection (anti-monopoly office), whereas other stakeholders, like NGOs, and political parties are not directly involved.

The process is therefore somehow "sheltered" from the central political scene, i.e. the City Council. It is the impression thus, that the decisions taken by the City Board are seen as of a predominantly administrative and "neutral" nature, compared to the City Board which is the arena for the explicit political decisions and controversies.

As a consequence, for a political party in opposition - currently the SLD party, the existing institutional set-up seems to make it more difficult to campaign on the water issue than if water tariffs were set by the City Council. In this case the opposition party would be more involved. Until a few years ago, water tariff setting was indeed within the competence of the City Council but the council assigned this competence to the Poznan City Board.

Also, in everyday activities and planning, PWiK does not interact much with the political system. Nor does the company involve itself systematically with e.g. NGOs and housing co-operatives. The housing co-operatives - in spite of representing the tens of thousands of tenants - have not received advance notification of changes in water prices, nor have they been directly included in the policy process as a stakeholder.

4.2.2 Assessment

The water tariff setting process takes place within a quite well established and closed framework where the main participants are PWiK and the City Board.

This may be a rational set-up in business-as-usual situations without drastic changes in the water tariffs. However, in the case of significant increases in water pricing which are to be made in the coming years, the existing procedures for tariff-setting could be complemented by a more participatory process during which public understanding of the intention and the need for changes should be targeted. Otherwise, one runs the risk that sudden and significant water price increases will be seen as arrogant and not justifiable. This could eventually lead to a decline in the political will to reform the water sector in Poznan.

4.3 Water tariffs as a political issue

The question of the future design of water tariffs in Poznan has not emerged as a significant political issue until now. Consequently, statements given by interviewees are of a very general nature. Thus it is difficult to anticipate what specific attitudes the dominant actors will articulate when - or if - the issue paves its way to the political agenda. However, different perceptions of water tariffs can be detected among e.g. the political parties.

4.3.1 The City Board

The City Board is an executive body made up of representatives from the ruling political coalition which, since the autumn of 1998, consists of the Union Freedom Party and the AWS party. The board finds that the provision of water should take place with respect to the cost-recovery principle. However, at the same time, the City Board has decided to fund major investments such as the refurbish-ment of the central wastewater treatment plant. Although subscribing to this guiding principle of cost-recovery, the two parties within the coalition have a somewhat different priority of the issue.

4.3.2 The Political Parties

There are three political parties represented in the Poznan City Council. A brief description is given in Table 4.1.

Table 4.1: The political parties on the Poznan political scene - Attitudes towards future water tariff increases.

	Freedom Union, UW	Solidarity Electoral Action, AWS	Social Democracy of Poland, SLD
Position	Part of ruling coalition	Part of ruling coalition	In opposition
Description of party	<ul style="list-style-type: none"> Liberal 	<ul style="list-style-type: none"> Social-Conservative 	<ul style="list-style-type: none"> Social Democracy
Stance on water tariff	<p>Clearly in favour of higher water prices in return for better water quality. Thinks that a major part of the Poznan population has a standard of living where high-quality water is a natural thing.</p> <p>In favour of the cost-recovery principle.</p>	<p>In principle in favour of the cost-recovery principle for provision of water; however thinks it is unrealistic in the short run to let the water price increase significantly.</p>	<p>Accepts that water prices will have to increase in the future. But the changes should take place gradually and be designed carefully to minimise the social costs.</p> <p>Does not think the cost-recovery principle will be implemented in Poznan in the near future.</p>

The UW party is willing to let the water prices reflect the full cost of water provision, even within a short period of time, whereas the SLD party advocates for a much slower development and requires that more attention be paid to the social impact of such changes. The position of the AWS party seems to somewhere in between. In conclusion, at the current stage, the political level acceptability of higher water prices seems to be neither high, nor low. The specific level of political acceptability depends on how the water issue actually will be framed. For a discussion hereof see Section 4.4.

4.3.3 The water industry

Peoples' attentiveness to water pricing is recognised by PWiK. The company is therefore exploring additional revenue sources other than higher water prices by which to finance investments.

Alternative revenue sources under consideration are:

- to expand company activities to other cities (due to excess water supply capacity);
- to start selling water in bottles. The bottled water would be of the same quality as water distributed via the pipe networks. Already now PWiK is suspicious that some of the water sold on bottles is taped from the PWiK distribution system.

Producers of bottled water and individual water filtration systems also belong to the water industry. They have an economic interest in people perceiving the water quality as low as it will increase the demand for such products. According to information given by representatives from PWiK, the local administration, and research institutes filtration systems are promoted aggressively. However, the market research does not support this view.

4.3.4 Environmental groups

According to a representative of a local environmental group, called the Section of City Cyclists - Environmental Friendly Transportation in the City, environmentalists find it difficult to deal with the water tariff issues due to its complexity. It involves environmental objectives, social impact, and (lack of) trust in public authorities. Environmentalist fully supports the environmental objectives (decrease water consumption, improve WW treatment) but they would like compensation schemes to be introduced simultaneously with introduction of higher water prices in order to lessen the negative social impact. Moreover, they would like PWiK to show itself as a company with transparent procedures and high management competence. They also would like to see PWiK reach out to the civil society and to interact with the NGOs directly, such as inviting them to meetings and discussions.

4.3.5 Housing co-operatives

Two housing co-operatives were interviewed. They find it, for various reasons, difficult to make water pricing a political issue. The reasons are, among others, that there is a common understanding within the general public that prices will eventually have to increase over the coming years, and the tenants are somehow reluctant to allow the representatives of housing co-operatives to involve themselves in political activities. Moreover, it is feared that their voices would not be heard within political-administrative circles if the housing co-operatives eventually were to engage in political activity.

4.3.6 Assessment

The case of a future application of the cost-recovery principle, for the provision of water services in Poznan, may become an emerging political issue. For now only some of the conjunctures are visible. However, it has been detected that the political parties put different emphasis on the issue and that they do, to a varying degree, consider the social impact of a water pricing reform.

4.4 The Framing of the Water Issue

4.4.1 Description

To frame a policy issue is to compose data, information, values and perceptions in such a way that it creates a certain perception of reality. Issue framing is therefore essential for policy outcomes. If a situation is framed as problematic it facilitates other options and decision-making opportunities that if framed as non-problematic. Framing is thus not a "neutral" exercise but an important policy-making activity. It follows that political actors often are involved in more or less deliberate policy framing activities. They all create a different "reality" which facilitate the fulfilment of their interests and ideology.

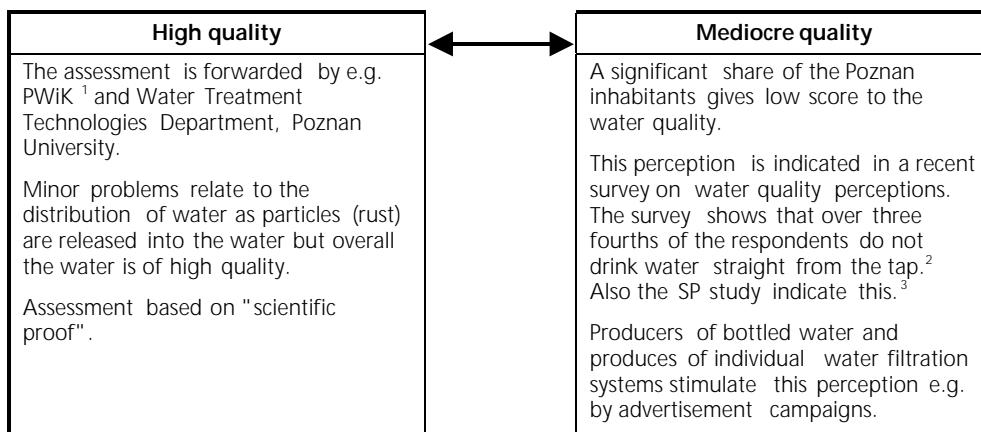
A striking feature of the "water situation" in Poznan is that it is framed differently by different actors.

At least two different positions can be identified: one claiming that the water is of high quality and another perceiving the quality as mediocre. The first position is based on what is seen as "real" data; i.e. monitoring of water quality and scientific reports, the other being based on the sensing of the water.

The two positions are contrasted in Figure 4.1.

<p>1 See e.g. 1998 PWiK annual report.</p>	<p>2 See the survey "Opinions of Individual Users of Water and Wastewater Networks", conducted by Ankieter June 1999 on behalf of PWiK. Some caution should be applied, however, when interpreting the high consumption of bottled water as a de-facto expression of willingness to pay for higher water quality as the phenomenon of bottled water may be more apt interpreted sociological rather than technically-functionally. Among many people bottled water connote "western lifestyle" - in order words it is fashionable; it is becoming the norm. Therefore it may not be sufficient to improve the water quality to revert that norm.</p>	<p>3 40 percent of the consumers find that the water quality is neither good nor bad. There are more consumers finding the water very poor or poor than consumers perceiving that water as very good or good. Very few consumers drink the water straight from the tap. Compared to the number of household that does not drink water from the tap, the overall rating of the water quality is quite positive.</p>
<p>4 Interview with Ms Mustyna Wisniersk-Jdozak the Department of Organisation PWiK.</p>		

Figure 4.1: Two different perceptions of Poznan water quality



During interviews with representatives of the political parties, some concern was expressed as to what degree increased water tariffs would go hand in hand with improved water quality. It appears clearly that the parties who either strongly (the UW party) or moderately (the AWS and SLD parties) support future water tariffs increases expect an improvement of the water quality.

They all see the issue as "higher water prices for better quality" and not "higher water price to sustain current quality". They therefore tend to see the water quality as not (sufficiently) good. As discussed in the following chapter, the political parties reflect the perception of the voters on this issue.

4.4.2 Assessment

Seen in this light, it could be interpreted as a political asset that a significant share of the inhabitants gives a low score to water quality. It will make it easier to get the population to accept higher water tariffs, provided improvement can be guaranteed, when the current situation is framed as "problematic".

A representative of the PWiK, however, rejects the somehow bold thesis that it is in the long-run interest of the decision-makers that the population - the voters - has a negative perception of the water quality on the ground that it will make them swallow price increases⁴. Rather, this person insists that PWiK will strive to close the gap between the company's measurement of water quality and peoples perception of the water.

No "truth" on the quality of the Poznan water exists; it is perceived differently by different actors. The political parties frame the water issue as a matter of "higher water tariffs in return for improved water quality".

It has been noted that producers of bottled water and individual water filtration systems have an economic interest in people perceiving the water quality as poor as it will increase the demand for such products. On the other hand PWiK wants the population to accept its product as good and healthy, but the company does not seem to have developed a strategy to counter the apparently false information/perception being given by e.g. bottle water producers.

To sum up, in the light of the future investments in e.g. the pipe system and the corresponding expected increase in water tariffs, the fact that many inhabitants perceive the current situation as somehow "problematic" may increase the political and public acceptability of higher water tariffs.

4.5 Concluding assessments

This study of the political acceptance of higher water prices, and the description of the current set-up for setting the tariffs, does not give a clear-cut picture of the Poznan case. The results should also been seen in the light of the limited scope of the study. However, the study gives grounds for drawing four conclusions.

- 1 **Political acceptability.** The political acceptability of significant higher water tariffs in Poznan is likely to be low if investments are not accompanied by tangible improvements. It is difficult to foresee a situation where the politicians will be able to "sell" the issue to the voters as a matter of service maintenance rather than improvement. However, as noted below consumers are willing to pay significant amounts to avoid service and quality deterioration. This may make framing the water issue in terms of "higher tariff for higher service" easier.
- 2 **Not one accepted "truth" of water quality.** A second observation is that an accepted truth in regard of the quality of the water being provided by the PWiK does not exist. On the one hand we find statements, "proofs" and monitoring results pointed to high quality, on the other hand it can be observed that many decision-makers (and significant parts of the general public, according to the SP analysis) see the water quality as unsatisfactory.
- 3 **Framing may determine outcome.** A third conclusion follows from the above, namely that "framing of the Poznan water situation" probably will be of crucial importance for the future discussions on investments in water supply and WW treatment. The combination of 1) politicians having a need for a solid you-will-get-better-water argument in return for burdening the people of Poznan with additional costs and of 2) many people having a mistrust in the current water quality could lead to the delicate conclusion that:
 - it is a strategic and political asset that people have a "too negative" perception of the water they consume;
 - it is in the interest of PWiK to carefully consider the manner and timing of a correction of this attitude, as it may strongly influence peoples' willingness to pay and the politicians' willingness to support higher tariffs.
- 4 **High degree of concurrence.** There seems to be a quite high degree of concurrence between people's willingness to pay and politicians' willingness to decide.

The SP analysis shows that 49% thinks charges should be increased and service quality improved whereas 41% thinks charges and quality should remain at the same level as now. These figures seem to fit with the signals given by the political parties that the prices should either increase at only slow pace (if no improvement will follow) or significant increases should correspond with service improvement.

CHAPTER 5

WILLINGNESS TO PAY

5.1 Introduction

The objective of this chapter is to present the methodology applied and the results of the stated preference survey.

The methodology comprises a number of steps. These include background research, qualitative research and quantitative research. Each of the steps is discussed in the section on methodology.

The quantitative research is based on interviews with 150 consumers living in Poznan and being responsible for paying the household water bill.

In order to assess the willingness to pay a stated preference approach has been used, and the results indicate some willingness to pay. There is willingness to pay both to avoid a worsening and to obtain improvements of present services.

5.2 Stated preference survey methodology

The method applied in this stated preference survey contains a number of tasks. These include:

- 1 Background research;
- 2 Qualitative research;
- 3 Design of questionnaire;
- 4 Pilot survey;
- 5 Final survey;
- 6 Data analysis.

Each of the points are discussed below.

5.2.1 Background research

The first step in the analyses is background research. The purposes of the background research are to:

- Understand the realistic technical options/alternatives and in particular their impact on realistic service levels;
- understand payment collection, enforcement and usage measuring principles and practices, and the financial standing of the utility;
- understand the socio-economic context, in particular income levels and distribution and types of households.

The background research have also included:

- Discussions with other team members covering technical and financial issues;
- consultation of earlier reports, statistics, working papers giving general introduction to the utility and the local economy in Poznan.

5.2.2 Qualitative research

Following the background research, qualitative research amongst customers is undertaken. The purposes of the qualitative research are to:

- Gain a first understanding of which service factors are perceived as important by customers, and which factors are the more important;
- gain a first rough understanding of willingness to pay for water and waste water services and the most important factors;
- understand the cultural context and wordings/formulations understood by consumers in relation to water and waste water utilities.

Two types of interviews were carried out in Poznan. Six face-to-face interviews and one focus group with six respondents. An open-ended topic guide was applied in both types of interviews.

The face-to-face interviews were conducted in an interview room. Two interviewers interviewed each respondent with consecutive translation by a professional interpreter. Each interview lasted between 30 minutes and 50 minutes.

The focus group was carried out with simultaneous translation when respondents were speaking and consecutive translation when the moderator was speaking. There was one moderator supported by an assistant moderator. The focus group was taped on video. The focus group lasted about 2 hours and 15 minutes.

The qualitative research is critical, as the outputs form the limitations to what is going to be explored during the quantitative research.

5.2.3 Design of questionnaire

On the basis of the information gathered in the background research and the qualitative work the questionnaire is designed. The questionnaire includes:

- present water and wastewater services;
- attitude toward the water services;
- willingness to pay for improvements and to avoid a worsening;
- socio-economic background.

Many subjects can be covered by a questionnaire. However, a selection has to be made in order to keep the length of an interview acceptable to the respondent. Therefore e.g. wastewater treatment has not been covered in depth in the research for Poznan.

A long list of possible improvements to and worsening of the water services was identified in the qualitative research. The possible changes in service levels are divided into three groups. The most important services are included in a stated preference game as described below, but only a limited number of services can be evaluated in the stated preference game. Importance-rating questions are included in the questionnaire to have the respondents' evaluation of other services. Finally, some possible changes of service levels were assessed to be of minor relevance/importance and they have not been included in the questionnaire.

The willingness to pay is examined by using stated preference games. An example of a choice task in the stated preference game is presented in Table 5.1. Here the respondent must decide whether they would prefer to pay 50% more to have water without any smell at all, or whether they would prefer to have completely clear water with a chlorine smell and pay the same amount as at present. If smell is an important issue to the respondent B is preferred, if clear water and/or money saving is important to the respondent A is preferred.

Table 5.1: Example of a choice pair

A	B
INTERRUPTIONS: as now SMELL: smells of chlorine even after boiling COLOUR: completely clear COST: as now	INTERRUPTIONS: as now SMELL: no smell at all COLOUR: as now COST: plus 50%

A number of choice-tasks, such as the above, are presented to each respondent. There is a limit to the number of choices a respondent can make while remaining concentrated and while still presenting a realistic choice.

The stated preference game consists of four factors:

- Interruptions;
- Smell;
- Colour;
- Cost.

The stated preference analysis explores both the willingness to pay for improvements and the willingness to pay to avoid worsening. Three levels represent each of the factors. The levels describe different service levels and they are the service levels that can be evaluated when analysing the game. For the service factors the first level is a worsening, the second status quo, and the third is an improvement. The costs only increase in comparison to the present situation.

Table 5.2: Factor and levels in the stated preference game

Factor	Levels
Interruptions	- once a month - as now - no interruptions at all
Smell	- smells of chlorine even after boiling - as now - no smell at all
Colour	- slightly coloured - as now - completely clear
Cost	- as now - plus 10% - plus 50%

5.2.4 Pilot survey

The pilot survey is used to test the design of the questionnaire and to identify necessary changes. In Poznan, 25 interviews were conducted and the results were analysed. The answers are checked in order to ensure that all questions are well understood and that the stated preference game was working well. Checking the stated preference games includes assessing if all parameters are relevant to the consumers, and if the levels of e.g. cost are perceived to be within realistic limits. As an example if respondents choose alternatives with the lowest cost in most stated preference questions the cost levels should be adjusted downward.

In the pilot, the respondents were presented with 12 choice-tasks, and in the final the number of choice-tasks was reduced to eight. In this stated preference game, eight choice-tasks are within the capabilities of the respondent, while 12 choices were too many. In other applications, eg with a shorter total questionnaire, the number of choices can be higher without incurring problems.

5.2.5 Final survey

Including the changes to the questionnaire from the pilot survey the final questionnaire was made. 125 respondents were chosen at random and interviewed. However, only respondents responsible for paying the water bill were interviewed.

5.2.6 Data analysis

Both the data from the pilot questionnaire and the data from final questionnaire is included in the statistical analysis. This is possible because only few changes were made to the pilot questionnaire. However, where questions differ in the two versions the results from the pilot questionnaire are excluded.

The stated preference data is analysed by applying advanced statistical tools. A so-called logit model is estimated. Before estimating the model a set of a priori hypotheses is described and these are tested in the model. Examples of such a priori hypotheses are:

- consumers with higher income have a higher willingness to pay;
- consumers with a water meter have a higher willingness to pay because they are able to adjust consumption as a response to an increase in tariffs.

The model also allows for different willingness to pay for consumers with different backgrounds, e.g. age and gender. For age and gender the model process is exploratory, that is no priori hypotheses are needed. However, all effects in the model must have a clear interpretation.

In order to ensure that the sample is representative, it is tested whether the age and gender distribution in the sample differs from the distribution in the Poznan region. Census data from 1996 on urban inhabitants is used. The test indicates that some groups are over represented in the sample, and therefore all results are weighted by age and gender. By weighting with the age and gender distribution of entire population, it is assumed that all groups are equally responsible for paying the water bill. Hence, the results can be interpreted as representative.

5.3 Qualitative research

The qualitative interviews were based on a topic guide prepared using background information about Poznan including information from the technical part of the team.

Respondents were selected by random. The respondents covered a large variety of age, household size, income and employment status. Also, respondents from different districts of Poznan were included. However, there was an over-representing of respondents with higher education. In general, the target should be to have all groups of the population represented.

Results from the qualitative work

A wide variety of subjects were discussed.

Water quality

The tap water is perceived as undrinkable. The interviewees boil the water before using and buying bottled water is normal. Few of the interviewees have water filters installed. The interviewees mentioned the following problems with service: Pressure, chlorine taste, bad taste, sediments, and rust. Several of the interviewees have experienced service interruptions.

The interviewees did not receive information from PWiK on water services. Some of the interviewees obtain limited information on the water services through local media.

Water consumption and metering

Metering is common and most of the consumers interviewed in the qualitative research have individual metering and some pay per head in the household. However, PWiK does not manage the individual meters in a block of flats.

Some of the interviewees have undertaken measures to reduce consumption. However, saving water was not a key issue.

Water cost

The interviewees were aware of how much their normal monthly payment is but were not aware of the unit costs. Some of them thought water and wastewater services had increased in price at the same rate as other prices, but some thought there have been no increase for water services the last two years. Prices for gas and electricity and petrol were in general perceived to have increased much more.

The respondents in the qualitative research would pay for better quality of tap water, but they would probably continue to buy bottled water and continue to boil water for drinking. People would in general not accept lower prices with lower service. This could indicate that there is still some willingness to pay. In the group, there was some resistance against tariff increases. However, this is a natural "defensive" reaction by respondents when prompted directly about price increases.

Table 5.3: Subjects discussed in the qualitative research included in the stated preference game and the importance ratings.

Stated Preference	Importance ratings
Interruptions	Healthiness
Smell	Sediment
Colour	Taste
Cost	Speed of re-supply after interruption
	Information
	Pressure
	Wastewater treatment

5.4 Quantitative research

In this section the results of the questionnaire are presented. The socioeconomic characteristics of the respondents are analysed in order to see if all groups of respondents are represented in the sample. However, the respondents in the sample are all responsible for paying the water bill.

The results from the questionnaire indicate that the consumers are quite positive towards the water services in Poznan but only few drink the water straight from the tap. There is some willingness to pay for improved service and for some aspects an even higher willingness to pay to avoid a worsening.

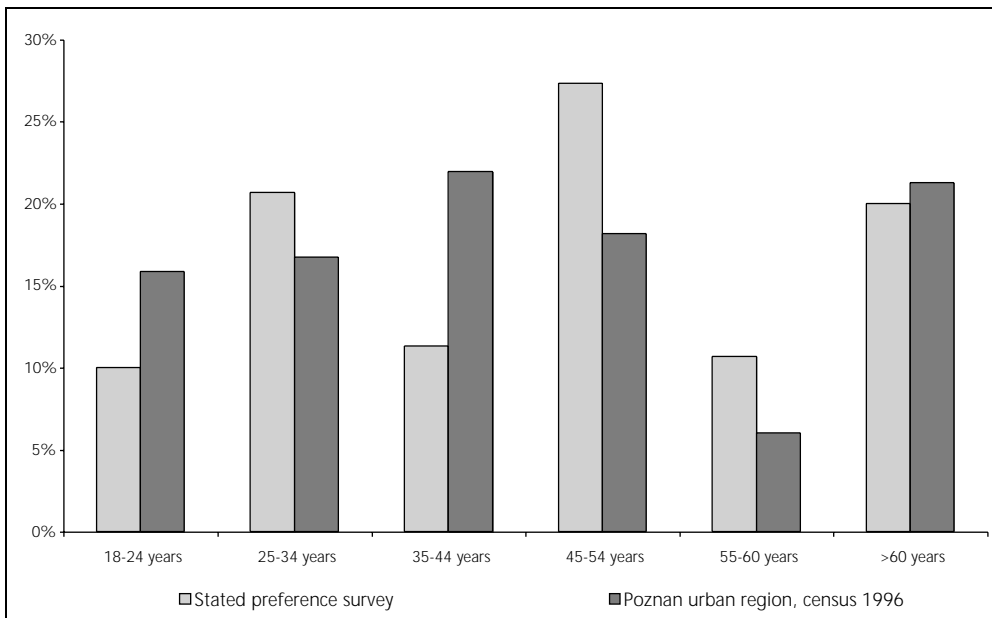
5.4.1 Socio-economic characteristics

There is an overrepresentation of women in the sample. 63% of the respondents are women. In Poznan women are also over represented - 53% of the inhabitants in Poznan are women.

The age distribution is illustrated in Figure 5.1. All age groups are represented among the respondents.

The age and gender distribution is compared to the age distribution of urban part of the Poznan region in 1996 (population 960.859). There is no general overrepresentation of e.g. young people or retired people, cf. Figure 5.1. However, e.g. males between 35 and 44 years of age are underrepresented, while women between 45 and 60 are over represented. To make the results of the analysis representative the observations have been weighted to reflect the population in the region.

Figure 5.1: Age distribution of respondents



Most of the respondents do not have children living in the household. In 31% of the households there are children aged 6 to 17 years, and in 15% of the households there are infants less than 6 years old, cf. Table 5.4. Most of the households with children have only one child living in the household.

Table 5.4: Type of household

	Percent
Households without children	61%
Households with children	39%
Households with children aged 6-17 years	31%
Households with children age under 6 years	15%

Note: The data is not weighted.

The households are equally divided into respondents living in rented accommodation and privately owned accommodation, cf. Table 5.5. More than half of the respondents live in flats.

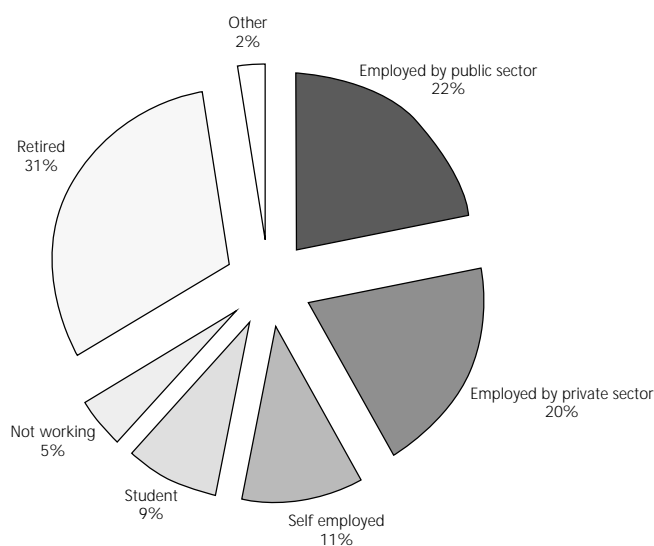
Table 5.5: Type of accommodation

	Percent
Rented co-operative flat	19%
Rented municipality-owned flat	9%
Rented company-owned flat	2%
Rented house	18%
Rented accommodation	47%
Privately owned co-operative flat	24%
Privately owned flat in municipality owned building	3%
Privately owned house	25%
Privately owned accommodation	51%
Other	1%
Total	100%

Note: The data is not weighted.

A majority of the respondents are employed, both in the public sector and the private sector as well as self-employed. No farmers are represented in the sample, cf. Figure 5.2.

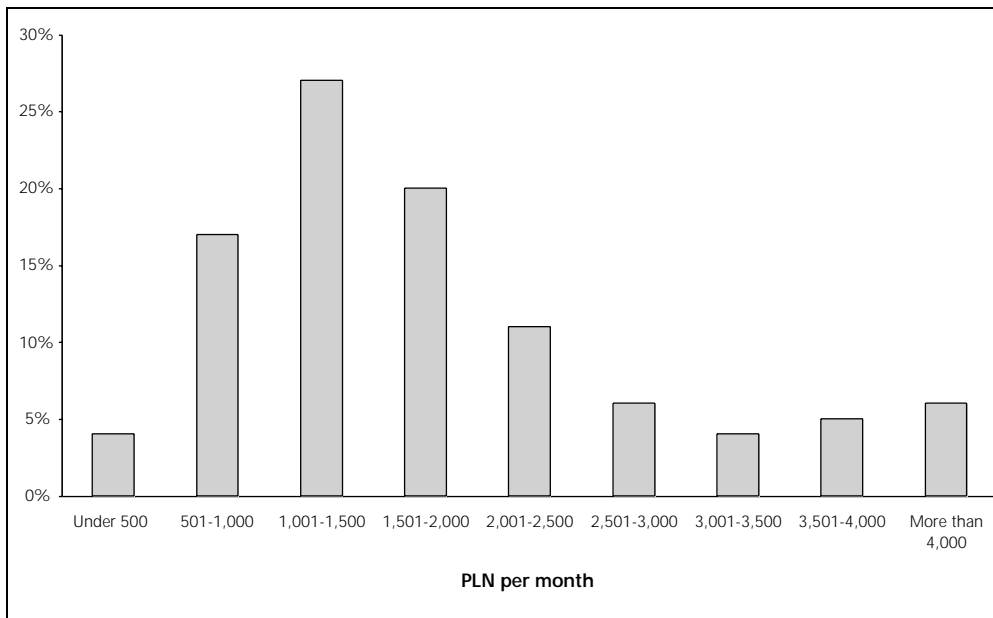
Figure 5.2: Employment status of the chief earner of the household



Note: The data is not weighted.

The distribution of the monthly household income after tax is illustrated in Figure 5.3. Most of the households have an income between 500 and 2,000 PLN. One fifth of the respondents did not wish to state their income.

Figure 5.3: Household income distribution



Note: The distribution in the table is based on 100 households; 26 respondent refused to state their income and the pilot data is omitted because of a different categorisation. The data is not weighted.

5.4.2 Water and Wastewater services

The results presented in the rest of this chapter are weighted to reflect the age and gender distribution in Poznan. As basis for the weights, the urban population in the Poznan region is used (population: 960.859). By weighting the observations, the results reflect the entire population in Poznan. However, there are only minor differences between the weighted results and the unweighted results.

Payment

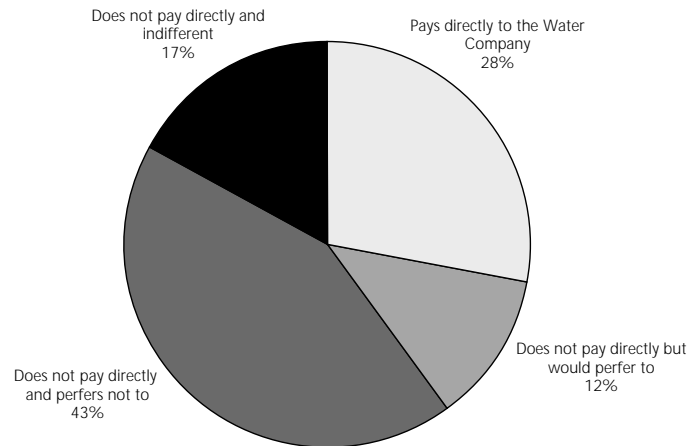
The consumption on water is likely to be affected by the way consumers are billed. If consumers are billed according to the amount of water consumed they are more likely to reduce water consumption as a result of an increase in prices.

Two thirds of the respondents interviewed have their own household meter for cold water. 10% of the respondents have a meter for the block of flats where they live, and 19% have no meter at all. Almost all households with meter are billed according to the consumption.

More than one fourth of the households pay the water bill directly to PWiK, cf. Figure 5.4. Almost all households living in their own private house pay directly to the PWiK. The rest of the households pay to administration, co-operative, landlord etc.

People living in households not paying directly to PWiK are not interested in doing so; 12% of all households would like to pay to the PWiK.

Figure 5.4: Payment of water bill



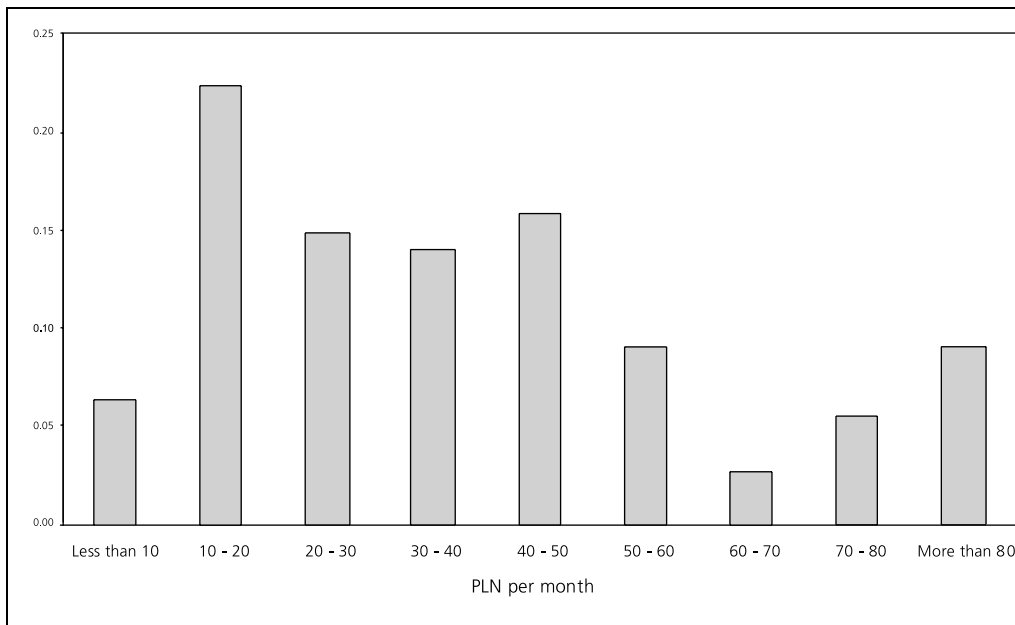
Note: The data is weighted by the aged and gender distribution of the Poznan urban region, census 1996.

One third of the consumers in the sample pay the water bill with other items that is especially the consumers not paying directly to PWiK. Consumers living in privately owned house pay the bill separately.

20% of all households know the water company PWiK. The knowledge of the name of the company is highest among the consumers paying directly to the company. Among the consumers paying their bills somewhere else only 10 percent know the name of the water company.

The distribution of the amount paid for water services is illustrated in Figure 5.5. The average amount spend on water services is 43 PLN per month and it is increasing with the number of people in the household, especially children.

Figure 5.5: Household payments for cold water services

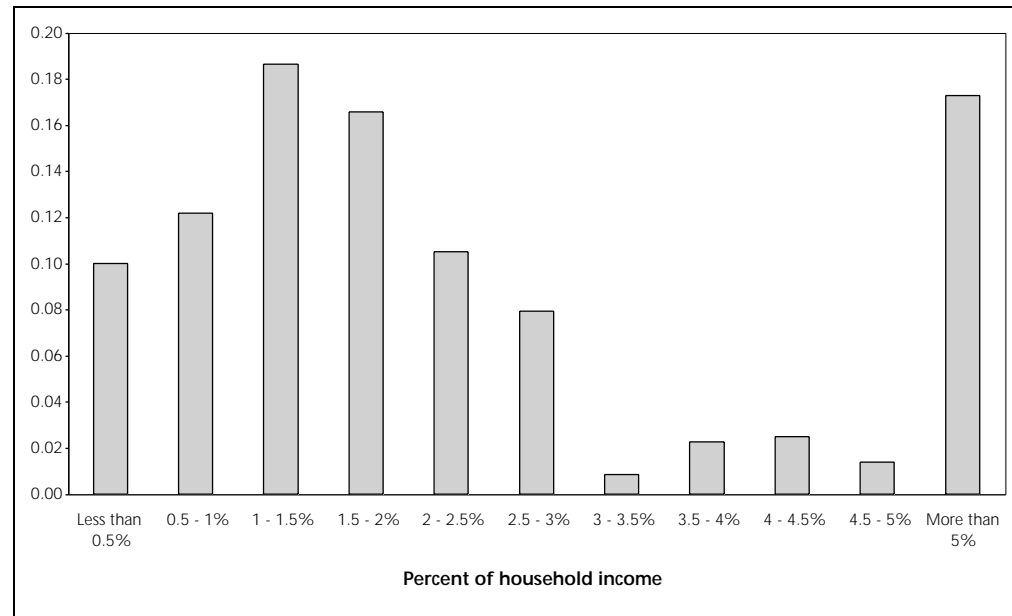


Note: The figure is based on 141 consumers. 9 consumers were not able to state the amount paid. 51 respondents gave an estimate on their water bill, 90 respondents brought their water bills to the interview. The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

On average around 3% of the household income after tax are spent on water services, but the percentage varies between different income groups, cf. Figure 5.6.

17% of the households pay more than 5% of the income.

Figure 5.6: Water bill as a percentage of the household income after tax



Note: The figure is based on 114 consumers. The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

The average household consumption of water is ca. 11 m³ per month. This is equivalent to between 3 and 4 m³ water per member of household. More than half of the consumers has not changed the water consumption the last two years. One fourth have increased the water consumption mostly because a change in the number of members of the household and for reasons like garden watering and the children getting older.

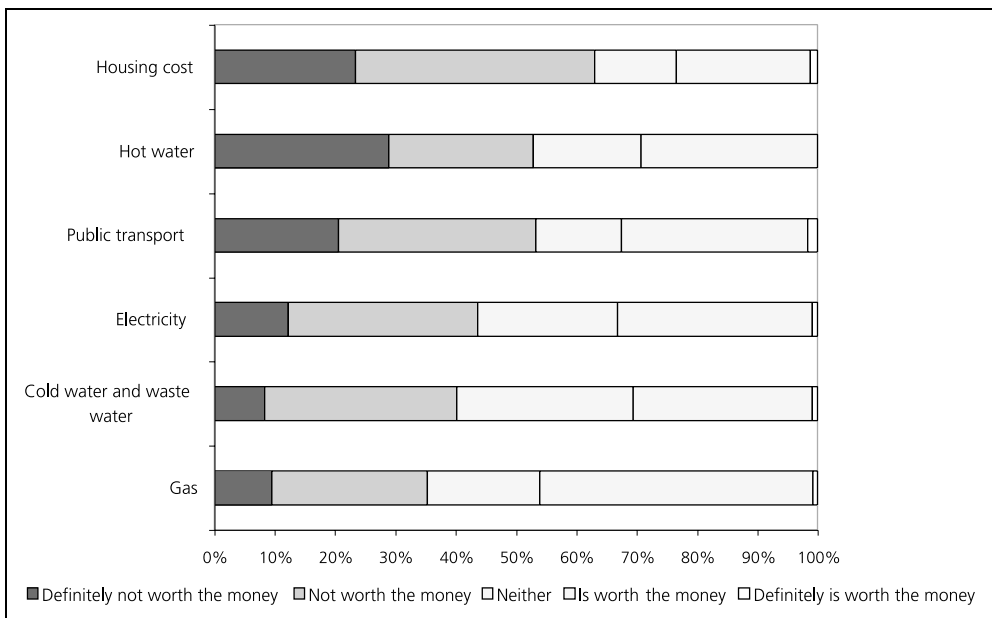
12% of the households have decreased the water consumption. More than half of these respondents give money saving as the reason for the decrease and some consumers have reduced their consumption after having a water meter installed. None has reduced the water consumption for environmental reasons.

A majority of the consumers do not find themselves able to reduce water consumption. The consumers able to reduce water consumption will do it e.g. by using less water when they wash the dishes and by watering the garden less often.

Quite few consumers are aware of the increases in water tariffs within the last two years. One out of six gives their opinion about the increases and they vary from a 15% to a 100% increase.

Compared to other utilities fewer consumers find that the cold-water services and wastewater services is not worth the money. However, 40% of the consumers think that the cold-water services and wastewater services is not worth the money at present, cf. Figure 5.7.

Figure 5.7: Rating of services in terms of the money paid for the services



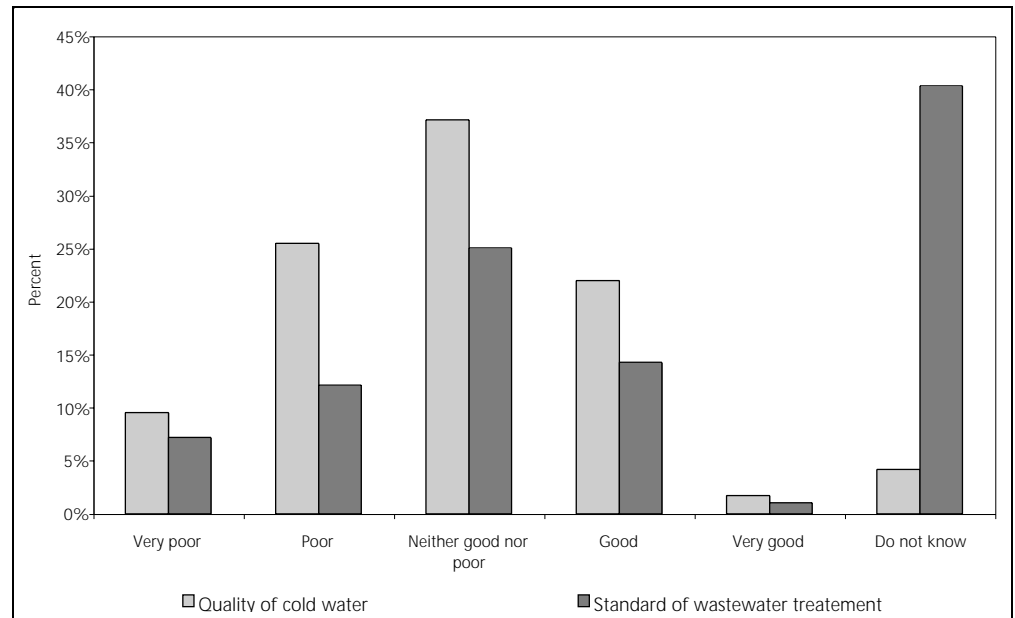
Note: Not all of the services are relevant to all respondents. This applies especially to hot water, public transport and housing cost (consumers who have their own private house do not find the question applicable). The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Quality of water services

The consumers are divided in equally sized groups in the question of water quality, cf. Figure 5.8. Almost 40% of the consumers find that the water quality is neither good nor bad. Most consumers have not experienced a change in the water quality within the last few years. 13% think that water quality has improved at 8% find that water quality has worsened.

The consumers have less knowledge about the standard of wastewater treatment. A large proportion does not know the standard of wastewater treatment, and there is the same number of consumers finding the wastewater treatment poor as finding the wastewater treatment good. 86% of the consumers are not aware of a change in the wastewater treatment within the last few years, and the last 14% have experienced an improvement.

Figure 5.8: Rating of the quality of cold water and the standard of wastewater treatment



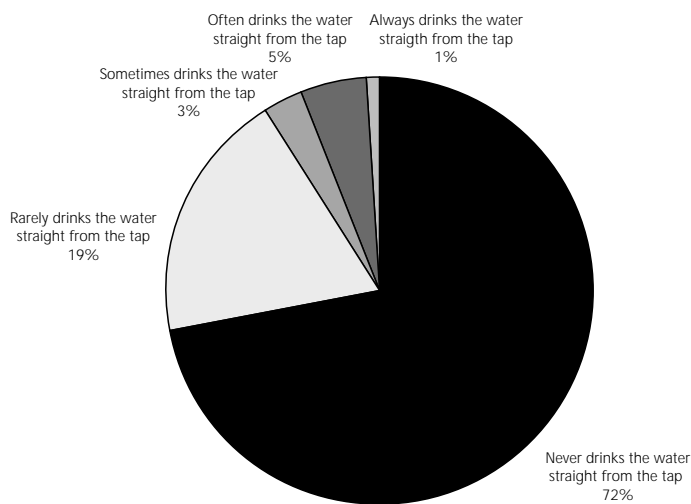
Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Few consumers drink the water straight from the tap, cf. Figure 5.9. Compared to the number of household that does not drink the water straight from the tap, the overall rating of the water quality is quite positive. The most important reasons for not drinking the water straight from the tap are:

- healthiness/pollution of the water, 54 %
- taste, 24 %
- habit, 15 %
- smell, 3 %
- colour, 2 %

There is a large proportion referring to healthiness and pollution as the reason for not drinking the water straight from the tap, and these are aspects not easily monitored by the consumers. Hence, the perception that the water is unhealthy might also be due to habits. If the water is healthy to drink as most tests indicate, cf. Chapter 3, there is a need to inform the consumers that the water is actually drinkable.

Figure 5.9: Drink tap water straight from the tap

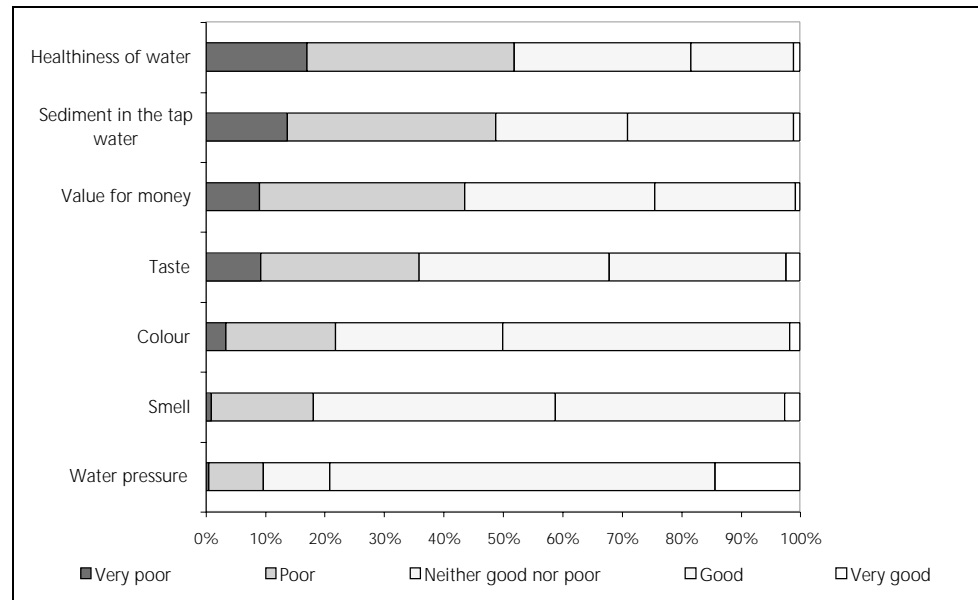


Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Instead of drinking the water straight from the tap 85 % of the households buy bottled water. Each household buys almost 7 litres per week on average. Only few households have a water filter; 8% have a separate small container to filter the water, and 4% have a filter in the pipe.

Most consumers are very satisfied with the water pressure. The quality of the water in terms of colour and smell is also not rated poor by a lot of respondents, cf. Figure 5.10. On the other hand the consumers are dissatisfied with the healthiness and the sediment in the water.

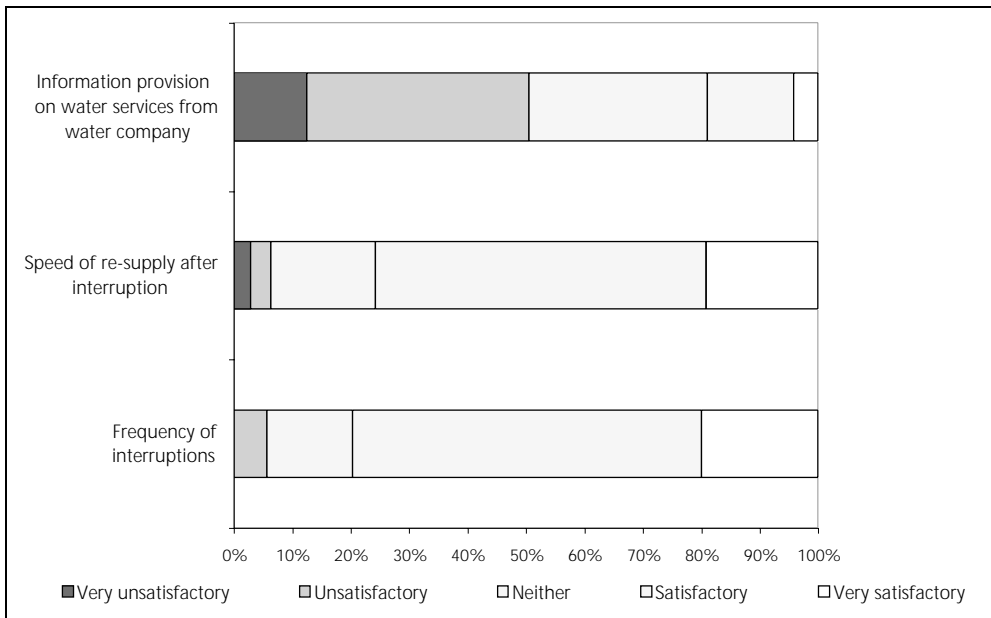
Figure 5.10 Rating of various aspects of the water quality



Note: Between 1% and 5% were not able to rate the quality aspects. The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Consumers are quite satisfied with the frequency of interruptions and also the speed of re-supply after an interruption, cf. Figure 5.11. Hence the frequency of interruptions is not a matter a large proportion of the consumers find important to improve.

Figure 5.11: Satisfaction with information provision and the speed of re-supply after interruption



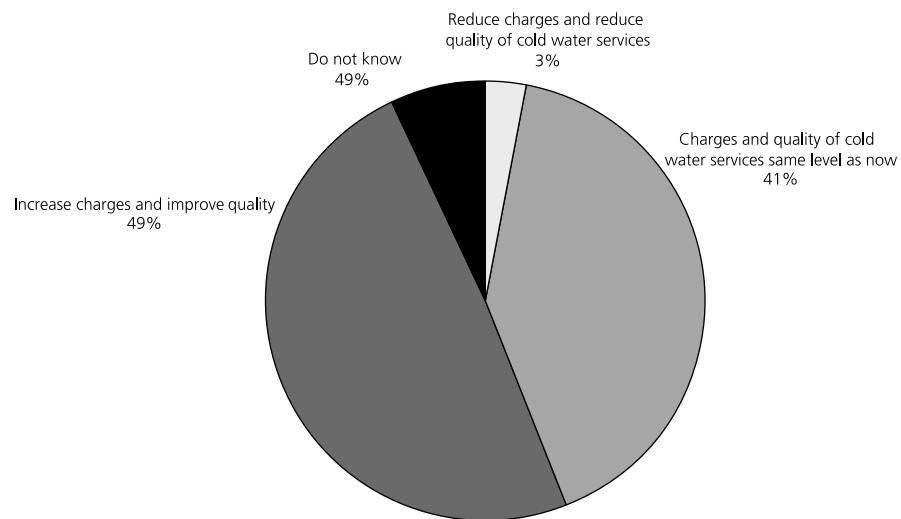
Note: Between 1% and 5% were not able to rate the quality aspects. The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

There is more dissatisfaction concerning information provision from PWiK. Less than one third receives information about the water services. Those consumers that do get information are primarily obtaining the information from local newspapers, radio and television. Hardly any consumers receive information from PWiK.

5.4.3 Willingness to pay for water services

Although few consumers drink the water directly from the tap not all consumers think water services should be improved - that is if improvements are accompanied with an increase in the cost. On the other hand only 3% think that water charges and water services should be decreased, cf. Figure 5.12. 49% of the consumers think that charges should be increased and quality should be improved.

Figure 5.12: Preferred strategy concerning water services and water charges



Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Reasons given for not improving water quality and increasing water charges are e.g. that consumers find that charges are already too high (24 %), and that the consumers find that they are not able to pay more (16 %).

Stated preference analysis

The stated preference analysis is exploring both the willingness to pay for improvements and the willingness to pay to avoid worsening. Factors included in the analysis are:

- Interruptions;
- Colour;
- Smell.

The purpose of the analysis is to find the willingness to pay for improvements or to avoid a worsening of these factors.

Unplanned interruptions are included because a lack of investment might imply an increasing number of interruptions and therefore it is relevant to assess the willingness to pay to avoid interruptions. However, it should be noted that the average age of water supply pipes is reasonably young and current level of interruptions is better than most cities in the region.

Two possible changes in the frequency of interruptions are included in the analysis:

- Monthly unplanned interruptions;
- No unplanned interruptions at all.

Colour and smell are included in the analysis because the qualitative work indicated that these are important parameters to the respondents. As for interruptions two changes are included in the analysis, a worsening of the colour and an improvement:

- The water is slightly coloured;
- The water is always completely clear.

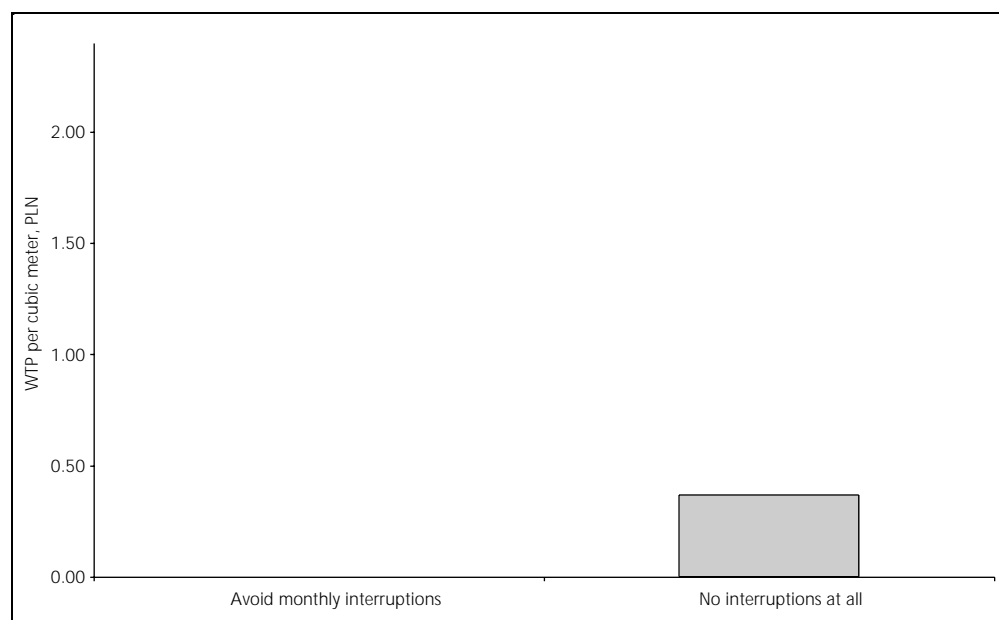
Finally smell is represented by the changes:

- The cold water has no smell at all;
- The cold water smells of chlorine even after boiling.

The average willingness to pay for the interruption changes is illustrated in Figure 5.13. The willingness to pay is reported in PLN per cubic meter.

There is no measurable willingness to pay to avoid monthly, unplanned interruptions. On the other hand there is a willingness to pay to have no interruptions at all. The respondents are on average willing to pay 12% of the current average cost per cubic meter.

Figure 5.13: Average willingness to pay to avoid monthly interruptions, and to have no interruptions at all



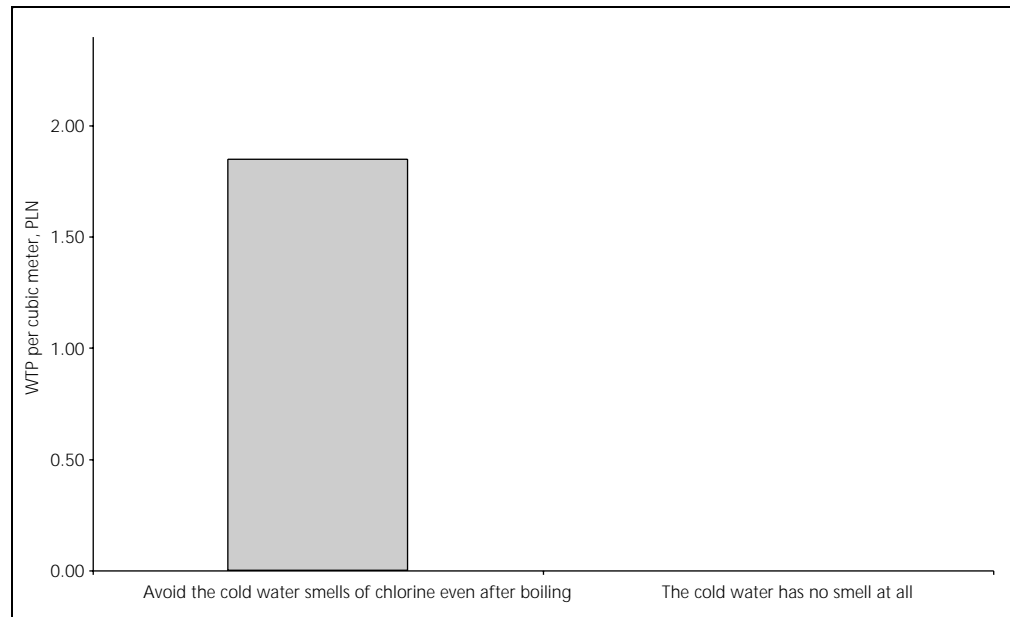
Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Interruptions are rather infrequent at present, e.g. the frequency is lower than in Brno and in most CIS countries. So the consumers might have difficulties in evaluating the disutility of a monthly interruption.

In terms of willingness to accept higher tariffs, avoidance of more frequent interruptions does not seem to be an argument that is appreciated by the consumers.

The highest willingness to pay is to avoid a smell of chlorine in the cold water; the consumers are willing to pay 64% more to avoid the chlorine smell. The willingness to pay to have water with no smell at all is insignificant but positive. This indicates that the consumers find that the smell of the water is very good at present, cf. Figure 5.14.

Figure 5.14: Average willingness to pay to avoid that the cold water smells of chlorine even after boiling, and the cold water has no smell at all



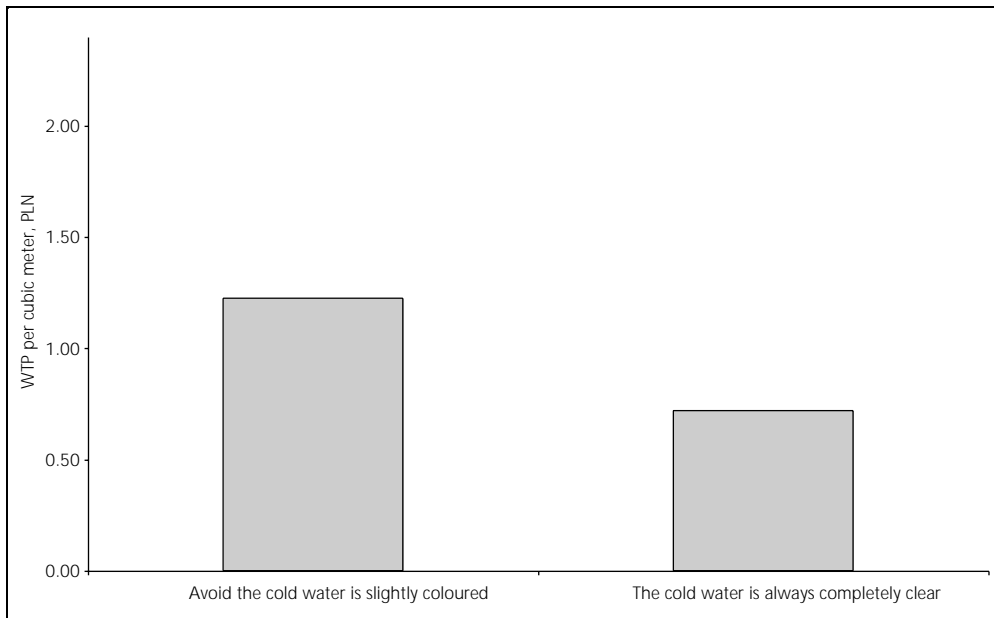
Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

The water is chlorinated at present. The result here indicates that the consumers are not heavily dissatisfied with the present smell of the water, but that consumers would be willing to pay higher tariffs to avoid even more chlorine in the cold water.

If an investment in water services makes it possible to avoid using more chlorine consumers are willing to accept higher tariffs.

The consumers are willing to pay both to avoid the water getting slightly coloured (with traces of rust) and to have the water completely clear. This indicates that the water is not perceived completely clear at present and that the water is not slightly coloured. The consumers are on average willing to pay 41% more on the monthly bill to avoid that the water gets slightly coloured, and they are willing to pay 24% more to have completely clear cold water.

Figure 5.15: Average willingness to pay to avoid that the cold water is slightly coloured, and the cold water is completely clear



Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Improvements to the colour of the water can be appreciated as an argument for increasing tariffs in Poznan. Also, avoiding that the colour of the water gets stronger can generate some willingness to pay.

The willingness to pay varies somewhat between age groups and between income groups. The consumers are divided into two income groups based on the household income per member of household:

- Consumers with income in the lowest quartile (25%). That is less than 375 PLN/capita monthly;
- Consumers with income above the lowest quartile.

The willingness to pay as a percentage of the present water cost is given in Table 5.6.

Table 5.6: Willingness to pay for improvement and to avoid worsening. Increase in current payments

	Age 18-34	Women Age 35-54	Age 55-	Age 18-34	Men Age 35-54	Age 55-
Lower income quartile (25%)						
Avoid monthly unplanned interruptions*	0%	0%	0%	0%	0%	0%
No unplanned interruptions at all	14%	10%	6%	11%	8%	5%
Avoid the cold water smells of chlorine even after boiling	69%	49%	30%	53%	40%	27%
The cold water has no smell at all	0%	0%	0%	0%	0%	0%
Avoid the cold water is slightly coloured	46%	32%	20%	35%	27%	18%
The cold water is always completely clear	27%	19%	12%	21%	16%	10%
Not in the lower quartile						
Avoid monthly unplanned interruptions	0%	0%	0%	0%	0%	0%
No unplanned interruptions at all	26%	14%	7%	16%	11%	6%
Avoid the cold water smells of chlorine even after boiling	129%	72%	38%	82%	55%	32%
The cold water has no smell at all*	0%	0%	0%	0%	0%	0%
Avoid the cold water is slightly coloured	85%	48%	25%	55%	36%	21%
The cold water is always completely clear	50%	28%	15%	32%	21%	13%

Note: * represents that the effect is not significantly different from zero. The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

Consumers with a low income per member of household are in general willing to pay less than consumers with a higher income. For instance, the willingness to pay to avoid the chlorine smell varies between 27 and 69% extra for consumers in the lowest quartile and between 32 and 129% extra for rest of the consumers. The variations depend on age and gender.

Young consumers are in general willing to pay more for the water services than older consumers are. When seeking acceptability of the water tariffs special attention should be given to make consumers above 55 years accept the increasing charges. Also, the willingness to pay is in general higher for women than for men.

Various hypotheses that did not lead to an affirmative conclusion were explored during the data analysis. These are:

- Consumers with income in the highest quartile (75%) do not have a willingness to pay that exceed the willingness to pay among other consumers above the 25% quartile;
- A different willingness to pay depending on if the water bill is based on consumption or not. Consumers having the water bill based on consumption were expected to have a higher willingness to pay because they are able to adjust the consumption but this is not the case;
- Households with children are not in general willing to pay more for better water services than households without. But there is some evidence in the sample that people with infants are willing to pay more in order to get improved services. However, this effect is omitted due to the low number of respondents with infants.

5 The willingness to pay for a less polluted environment is examined in depth in a parallel study for Brno.

Importance ratings

The willingness to pay for changes in the services can be compared to the importance ratings of other items. This is possible because some of the service improvements included in the stated preference game are included in the importance ratings as well.

The respondent was asked to rate the items on a scale from "very important" to "very unimportant". In order to compare the results, an index was calculated from the importance ratings. The values of the index give a priority of the items, cf. Table 5.7.

Completely clear water is the most important improvement. This indicates that the consumers are willing to pay less than 24% extra for each of the other service improvements in the table. Having no unplanned interruptions at all is prioritised no. 11. This indicates that consumers are willing to pay less than 12% extra in average for the service improvements at priority 12-13.

Table 5.7: Priority of service improvements

	Priority
Always completely clear water from the water tap	1
The quality of waste water treatment implies wide variety of fish in river and safe swim	2
Level of waste water treatment meets EU standards	3
No sediment in the tap water	4
Cold tap water tastes the same as still bottled water	5
Cold water safe for children to drink straight from the tap	6
The cold tap water has no smell at all	7
Re-supply of cold water after interruption within two hours	8
Advice about water saving methods to your household in a leaflet	9
Consistently high cold water pressure	10
No interruptions at all to the cold water supplied to your household	11
Information on water quality once a year	12
Free 24h-phone number for water services information	13

Note: The data is weighted by the age and gender distribution of the Poznan urban region, census 1996.

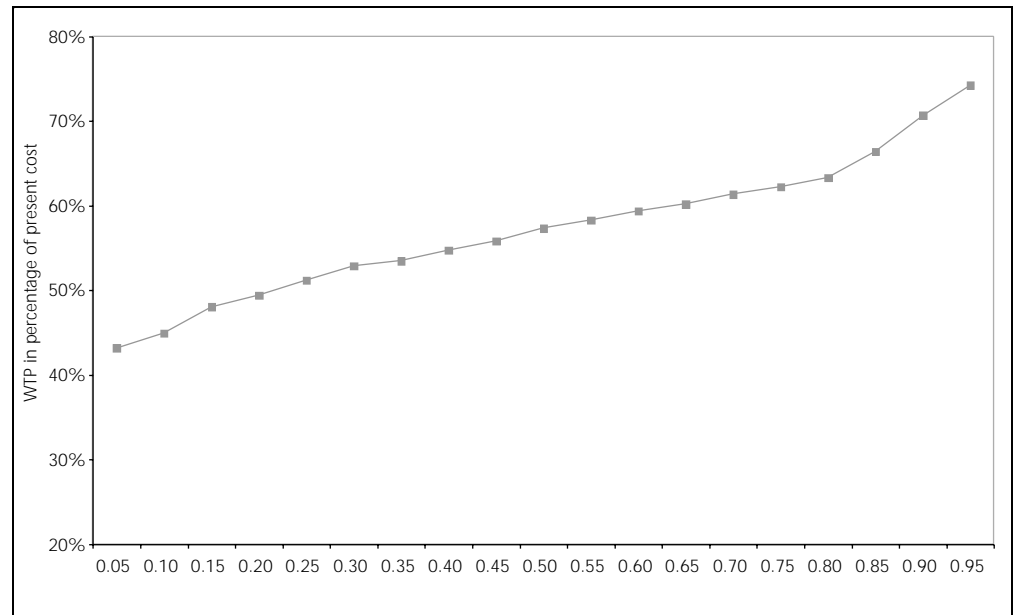
There are two environmental aspects in the table and they are prioritised second and third. Although respondents can find an improvement important without being willing to pay for it the results indicate a willingness to pay for better wastewater treatment. Therefore environmental improvements can be used as an argument for increasing tariffs⁵.

Also, no sediment in the tap water is a possible improvement that will enhance the acceptability of an increase in water tariffs.

Uncertainty

The results of the stated preference analysis are statistically uncertain. In order to illustrate the uncertainty a confidence interval is calculated for the willingness to pay to avoid chlorine smell of the water. This is the willingness to pay that is estimated with the best precision. The confidence interval is calculated for men aged between 34 and 44 in the income group with an income above the lower quantile, cf. Figure 5.16.

Figure 5.16: Confidence interval for the willingness to pay to avoid the water smells of chlorine even after boiling, males with income higher than 25% quantile, 35-44 years old.



The willingness to pay varies within 45% and a good 75% in a 90% confidence interval. This illustrates that while the magnitude of the result is reasonable the exact figure is quite uncertain.

Finance

Finally, the consumers were asked if they prefer an increase in water charges up front or they prefer an increase water charges that is implemented over five years. The options are:

- Full 20% increase next year and no further increase for the next four years;
- 7% increase year on year for the next five years.

The consumers are divided equally between the two options. 46% prefer the full increase up-front, while 52% prefer the more slow adjustment of prices. The consumers preferring the full increase up front have a higher average household income.

5.4.4 Market study on water and wastewater by Ankieter

The market research company Ankieter conducted a study on water and wastewater services in Poznan and surrounding municipalities in 1999. In total 999 interviews were conducted, 802 in Poznan and 127 in the surrounding municipalities.

The results from the Ankieter report do not differ substantially from the research presented in this report. The results for Poznan were:

- 72% of the household pay based on consumption. In the stated preference sample used in this report 67% pay based on consumption.
- 20% of the respondent do know the actual tariffs for water (1.47 PLN) and wastewater (1.55 PLN). A majority of the respondents find wa-ter tariffs are too high.
- Most consumers think that households should economise on water usage, and most respondents find that the current tariffs make them economise on water usage.
- 79% of the households never drinks the water but most households use tap water for tea and coffee, etc. In the sample used in this report 72% never drink the water straight form the tap.
- Among the four items taste, smell, colour, and pressure, taste is found the most unsatisfactory, smell is the second most unsatisfactory and colour third most unsatisfactory - respondent are quite satisfied with the pressure. In the sample used in this report the taste of tap water is also found poorest of the four, but not the most important to improve.
- 39% of the respondents have had at least one interruption of the water supply during the last 12 month - most consumers find interruptions onerous.
- A majority does not know how wastewater is treated, but 72% think that authorities should spend more on wastewater treatment. In this report it is found that to improve the environment is also very important.

There are a lot of common results when comparing the results of the research by Ankieter and the results in this report. So the main conclusions of this report are supported by the report by Ankieter.

5.5 Conclusions on market research

The consumers in Poznan are not, in general, dissatisfied with either the cold water quality or the standard of wastewater treatment. However, few consumers drink the water straight from the tap, and almost half of the interviewed respondents are willing to pay higher tariffs to improve quality. Quite few prefer a worsening combined with lower tariffs.

The consumers find healthiness of the water poor and there is a willingness to pay for improving the colour of the water and a decrease in the frequency of interruption, although the consumers are not unsatisfied with the present situation.

The willingness to pay to avoid a worsening of the present water quality is higher than the willingness to pay for an improvement. In particular, this applies to the colour of the water and the chlorine smell. This indicates that consumers are willing to accept higher water tariffs if a worsening of the water quality can be avoided.

The willingness to pay varies between different income and age groups. The higher income the higher willingness to pay, and the group of respondents more than 55 years of age are not willing to pay as much as the younger consumers.

The following policy guidelines can be derived from the analysis:

- Significant WTP to avoid decreasing quality;
- WTP is not fully exploited;
- Avoid smelling water is very important argument for price increases;
- Avoid unclear water is very important argument for price increases;
- Environment is an argument for price increases (for waste water services);
- Information level is considered low;
- Different information approaches for different age groups; and
- Metering will not increase WTP.

5.6 Lessons learnt for "toolkit" methodology

Qualitative research

- Both the focus group and in-depth interviews worked well and did provide valuable information about the water services in Poznan. The tested translation concept worked well and this is important, especially in the focus group.

Quantitative research

- The stated preference method worked well. The consumers understood the trade-offs and chose logically.
- It was not possible to identify a willingness to pay to avoid a worsening of the frequency of interruptions. The reason might be that most consumers are not familiar with the consequences of an unplanned interruption. It is important that all factors and levels of the game should be easy to understand and evaluate for the consumers.
- The sampling and interviews worked well. The method of conducting the interviews is very important to the quality of the results. Therefore the research aspect is dependent on good local counterparts.
- When deciding on the number of observations, a trade off between number of interviews and precision is made. If more respondents are interviewed more precise estimates can be estimated and the modelling procedure becomes easier.

CHAPTER 6

DEMAND FOR WATER AND AFFORDABILITY

6.1 Demand for water

PWiK revenues depend on the quantity of water and wastewater services sold to different consumer groups. Therefore it is important to predict how the quantity of water demanded will respond to the increasing tariffs. Tariff is not, of course, the only factor influencing demand. The set of factors differs in importance for major consumer groups such as: industry, agriculture, institutional users and households. Here we deal only with households.

6.1.1 Households demand

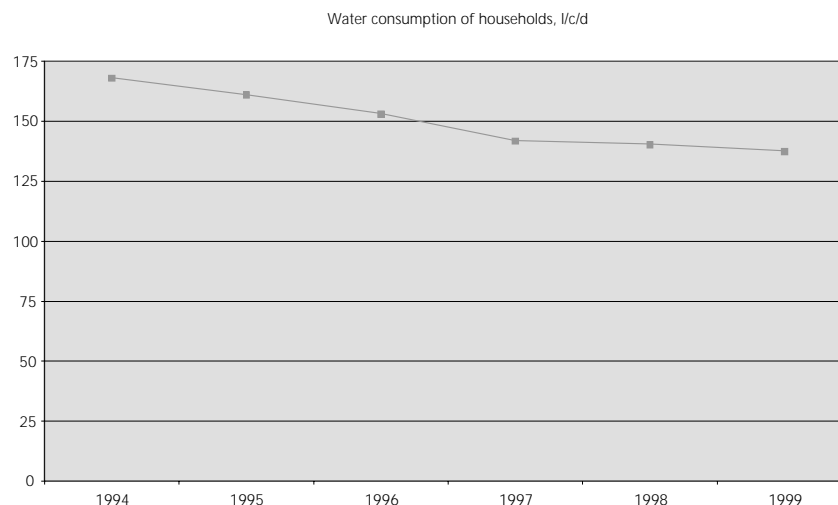
Consumer taste and income are major determinants of water demand. Availability and prices of technical options for water savings are also important factors, particularly when the average income is increasing.

As households' wastewater bills are normally based on water consumption, the households' demand for wastewater services is therefore embodied in the demand for water services. Consequently, the relevant price variable determining the demand for water is not simply the water tariffs but the combined water and wastewater tariffs.

A high level of per capita consumption allows a quick reduction in water use, since the reduction can be achieved through simple measures. This is usually the case when very low tariffs are drastically changed. This is no longer the case in Poland. The next change depends largely on the income position of the households. Real price increase results in lower consumption but for low income households it is the result of cutting back consumption at the expense of convenience. Higher income households reduce their consumption through investments in water savings that allow them to maintain the same level of convenience.

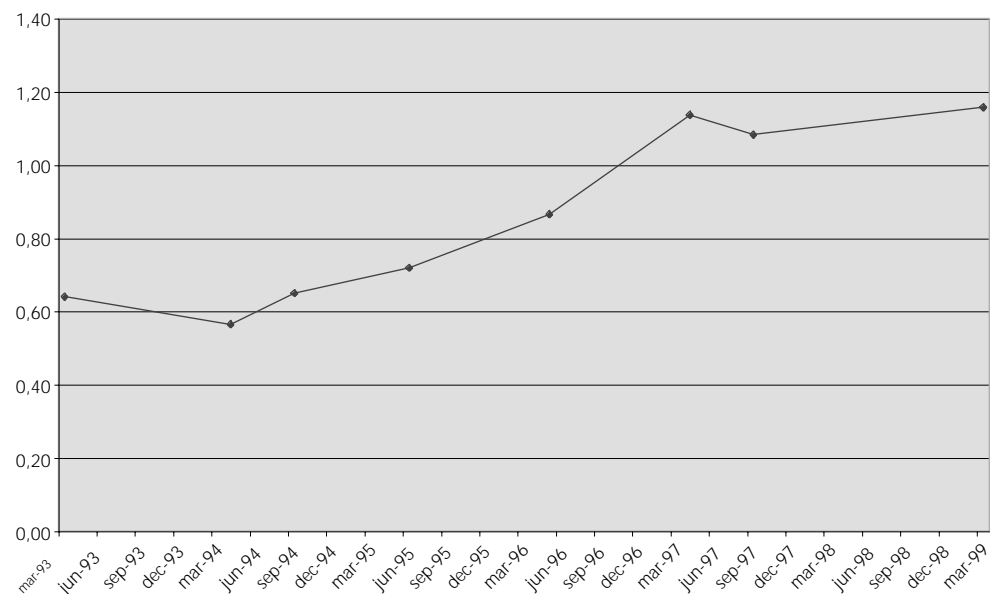
In Poznan, household water demands have fallen by approximately 20% over the last five years, as illustrated in the figure below. They have now reached a level of approx. 140 l/c/d. This is still slightly higher than the low levels reached in some large Scandinavian towns (e.g. Copenhagen 121 l/c/d). However, the room for "easy" reductions is clearly exhausted and further reductions are likely to require significant changes in water use habits.

Figure 6.1: Development of Water Consumption in Poznan 1994 - 1999



When comparing the development of water consumption with the increase in real tariffs, it can be seen that the reduction of water consumption took place from 1993 to 1997, which is also the period when consumers experienced a major increase in real tariffs. Since 1997, the increase in real terms has been very modest.

Figure 6.2: Development of water (+wastewater) tariffs in real terms (1993 PLN)



Given that the water demand is already quite low, and that affordability for most income groups is reasonably high, the probability for a sharp decrease in water consumption, in response to future tariff increases, is not very high. As it is assumed in the feasibility studies, some decline can be predicted but it is likely that the consumption level would be stabilized in few years time due to income increases and exhausting the technical options for water savings.

6.2 Ability to pay

The ability to pay assessment is usually limited to a comparison of expenditure on water and wastewater services to the average disposable income. Problems with ability to pay, however, appear in lower income families. In the assessment of the acceptance of higher tariffs and the likely revenue stream after tariffs increase the impact on lower income groups must be analysed.

In case of wide range of income distribution even if the average family disposable income allows tariff increase, the large group of poor households can threaten acceptance and undermine the revenue predictions through non-payment. On the other hand, if the tariff increase is affordable for average income families but too high burden for small group of poor families a well designed subsidy schema can smooth the way of implementing the higher tariffs.

Major problem with affordability analysis beyond the rule of thumb approach is the difficulties to get the region/city specific income distribution data.

Statistical data are usually available at the national level. These might be used as proxy for overall income distribution data. When city specific income data are difficult to get efforts to collect city specific income data could be concentrated on determining the minimum income level and ratio of households living at or below that level.

6.3 Availability of data

Poznan city specific disposable income and expenditure data is available for 1996 only. Poznan region specific data can be obtained from the national household expenditure survey for 1998.

The problems with that data:

- there are no income groups created and organised information accordingly;
- the sample size for Poznan region for the different occupational groups is not known but is likely too low to make statistically sound conclusions.

National data are available for 1997 but also only according to occupational groups.

6.4 Income distribution assessment

Income distribution is shown below by occupational category for Poznan relative to the rest of Poland. The share of water/wastewater expenditures in total expenditures is also shown for these groups.

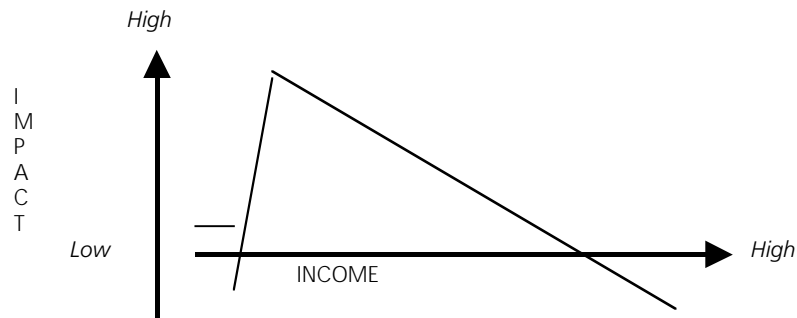
Table 6.1 Income and Water Expenditures in Poznan and Poland

Monthly disposable per capita income in PLN			Water exp. in income
	National	Poznan Region	
Employees	510.4	587.9	0.9%
Employees-farmers	425.3	498.9	0.3%
Farmers	480.0	601.1	0.2%
Self employed	585.3	709.1	1.1%
Retirees	581.2	664.2	1.2%
and Pensioners	439.6	498.7	1.2%
Maintained from non-earned income	240.0	323.8	1.4%
Average	497.1	589.4	0.9%

Bearing in mind the caveats with regard to data quality mentioned above, the income distribution in Poznan doesn't seem excessively skewed. The families receiving social assistance comprise about 4% of the households. These can be considered the low income families.

Representatives of Department of Health and Social Affairs, Poznan City Administration inform that the poorest 4-5 %of the population de-facto will not be affected a lot of higher water prices. Already now many people in this group does not pay for water but are dependent on various subsidies to cover daily costs. Rather, the impact will be felt heavily by those not living on subsidies but a small personal income. The possible distribution of real impact is illustrated below.

Figure 6.3: Simplified illustration of the impact of higher water tariffs



The socio-economic impact of a high level of investments and thus tariff increases might have as a side-effect that the municipality would have to allocate more resources to subsidies.

Moreover, there is a political dimension to this. The UW voter segment belongs to the better off part of the population - the people least affected by water tariff increases - whereas SLD voters typically will be among those mostly effected. This may also explain why the UW party in particular favours water tariff increases, whereas the AWS party and the SLD party may calculate that increases in water tariffs will burden their voters.

6.5 Concluding remark

In Poznan there is not likely to be a major affordability issue for tariff increases of the volume being discussed in this report (approximately + 20%)

Appendix 13.1: SP Questionnaire

B

Water in Poznan

Interviewer name:

Date:

Time:

Introduction

Good morning/afternoon/evening. My name is and I am carrying out research for Ankieter. We are interested in your experiences and attitudes towards the cold water services you receive.

The Poznan City authority and the water company are aware of this research but the research is independent of them.

Therefore, all your answers will be confidential.

Background Information

Q1. First, I would like to ask you some questions about your accommodation and your household. How many years have you lived here?

Q2. How many adults (aged 18 years and over) live in this household including yourself?

Q3. How many children (aged 6-17 years) live in this household?

Q4. How many infants (aged under 6 years) live in this household?

Q5. What is the employment status of the chief earner of the household? **PROBE**

Employed by public sector	1
Employed by private sector	1
Self employed	1
Farmer	1
Student	1
Not working	1
Retired	1
Other	1

Water Services

Q6. Do you have a separate cold water meter for your household?

1	Yes	3	No	1	3
2	No, water meter is for block of flats	4	Don't know	2	4

Q7. Do you pay based on consumption measured on your cold water meter?

1	Yes	3	Don't know	1	3
2	No			2	

Q8. Are you billed directly by the water company?

1	Yes GO TO Q10	2	No	1	2
---	----------------------	---	----	---	---

Q9. Would you prefer to pay your cold water bill directly to the water company than to the administration, co-operative or landlord?

1	Yes	3	Don't know	1	3
2	No			2	

Q10. Do you know which organisation is responsible for your cold water services, that is the supply of cold water and waste water services?

1	Yes, PWIK	3	No	1	3
2	Yes, other	4	Don't know	2	4

IF NOT PWIK, INFORM RESPONDENT THAT PWIK RUN WATER SERVICES

Q11. How do you rate the quality of your cold tap water? **SHOWCARD A**

1	Very poor	4	Good1	4	
2	Poor	5	Very good	2	5
3	Neither good nor poor	6	Don't know	3	6

Q12. How would you rate the quality of the following aspects of your cold water supply on a scale of 1 = very poor to 5 = very good. **SHOWCARD A**

	Very poor	Poor	neither	Good	Very good	don't know/not applicable
sediment in the tap water	1	2	3	4	5	9
smell	1	2	3	4	5	9
colour	1	2	3	4	5	9
taste	1	2	3	4	5	9
water pressure	1	2	3	4	5	9
healthiness of water (potability)	1	2	3	4	5	9
value for money (price)	1	2	3	4	5	9

Q13. How would you rate the quality of the following aspects of your cold water supply on a scale of 1 = very unsatisfactory to 5 = very satisfactory. **SHOWCARD B**

	Very unsatisfactory	Unsatisfactory	Neither	Satisfactory	Very Satisfactory	Don't know/not applicable
frequency of interruptions	1	2	3	4	5	9
speed of re-supply after interruption	1	2	3	4	5	9
information provision on water services from water company	1	2	3	4	5	9

Q14. Do you drink the cold water straight from the tap? **PROBE**

1	No, never	4	Yes, often GO TO Q16	1	4
2	Yes, rarely	5	Yes, always GO TO Q16	2	5
3	Yes, sometimes			3	

Q15. Why don't you drink the cold water (more often)?

.....

Q16. Have you noticed any change in the quality of your cold water in the last few years?

1	Cold water improved	3	No change	1	3
2	Cold water worsened	4	Don't know	2	4

Q17. How would you rate the current standard of waste water treatment in Poznan on a scale of 1 = very poor to 5 = very good ? **SHOWCARD A**

1	Very poor	4	Good	1	4
2	Poor	5	Very good	2	5
3	Neither good nor poor	6	Don't know	3	6

Q18. Are you aware of any change in the quality of waste water treatment in the last few years?

- | | | | | | |
|---|----------------------|---|------------|---|---|
| 1 | Waste water improved | 3 | No change | 1 | 3 |
| 2 | Waste water worsened | 4 | Don't know | 2 | 4 |

The Need for Investment

Q19. If PWIK had to choose between the three following options which do you think they should choose?

- | | | |
|---|--|---|
| 1 | Reduce charges and reduce quality of cold water services | 1 |
| 2 | Keep charges and quality of cold water services at the same level as now | 2 |
| 3 | Increase charges and improve the quality of cold water services GO TO Q21 | 3 |
| 4 | Don't know GO TO Q21 | 4 |

Q20. Why do you think that charges for cold water services should not be increased? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

- | | |
|--|---|
| I cannot afford to pay any more | 1 |
| Further investment in cold water and waste water treatment is not necessary..... | 1 |
| Other cities or regions have lower charges than Poznan | 1 |
| As a general principle water charges should not be increased | 1 |
| It will result in social hardship for the poorest sections of society | 1 |
| Increase charges will simply add to profits for PWIK..... | 1 |
| Water charges are too high now | 1 |
| Increasing charges will cause a decrease in consumption | 1 |
| Water costs should not increase unless water quality is improved | 1 |
| Other (please write in) 1 | |

Q21. Where do you get information about your cold water services from? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

- | | |
|----------------------------------|---|
| I get no information..... | 1 |
| Local newspaper(s)..... | 1 |
| National newspaper(s) | 1 |
| Radio | 1 |
| Television | 1 |
| By phoning PWIK | 1 |
| PWIK offices..... | 1 |
| PWIK leaflet..... | 1 |
| Council | 1 |
| By post from PWIK..... | 1 |
| Family/friends/colleagues..... | 1 |
| From the bill..... | 1 |
| From co-operative/landlord | 1 |
| From my job | 1 |
| Other (please write in)..... | 1 |

Bills

Q22. How much do you pay for your cold water services? **PROBE FREQUENCY AND WRITE IN**

Zloty per month:..... Zloty per two months:.....

IF DON'T KNOW ASK RESPONDENT TO REFER TO BILL OR PROVIDE ESTIMATE

INTERVIEWER RECORD IF ESTIMATE OR FROM BILL

- | | | | | | |
|---|----------|---|------|---|---|
| 1 | Estimate | 2 | Bill | 1 | 2 |
|---|----------|---|------|---|---|

Q23. Is the cold water services bill included with other items or separate?

- | | | | | | |
|---|--------------------|---|----------|---|---|
| 1 | With other item(s) | 2 | Separate | 1 | 2 |
|---|--------------------|---|----------|---|---|

Q24. What is the cold water consumption in your household?

Per month: cubic meters

Per two month period: cubic meters

Don't know

Q25. Are the following services worth the money you pay for them on a scale from 1 = definitely not and 5 = definitely are? **READ OUT; SHOWCARD C**

	No, definitely not	no, not	neither	yes, are	Yes, def. are	not applicable
Electricity	1	2	3	4	5	9
Gas	1	2	3	4	5	9
Public transport	1	2	3	4	5	9
Housing costs	1	2	3	4	5	9
Cold water services	1	2	3	4	5	9
Hot water	1	2	3	4	5	9

Q26. Has your household changed its consumption of cold water in last two years?

1 Yes, reduced	3 No GO TO Q28	1 3
2 Yes, increased	4 Don't know GO TO Q28	2 4

Q27. Why has your household changed water usage? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

To save money.....	1
For environmental reasons	1
Change in number of people in household	1
Other (please write in).....	1

Q28. Could your household reduce its cold water usage (any further)?

1 Yes	2 No GO TO Q30	1 2
-------	-----------------------	-----

Q29. How would you reduce your household cold water usage?

.....

Q30. How much has the cost per cubic metre for cold water services gone up in the last two years? **IN % or Zloty**

Zloty..... %.....	
Don't know	999

Q31. Does your household buy bottled water?

1 Yes	2 No GO TO Q33	1 2
-------	-----------------------	-----

Q32. How many litres of water does your household buy a week on average?

.....

Q33. Does your household have a water filter?

1 Yes, in the pipe in the house	3 No	1 3
2 Yes, a separate small container	4 Don't know	2 4

Willingness to pay

I am now going to ask you to choose between different options for your cold water services. These options will include different levels for:

- Unplanned interruptions to the cold water supplied to your household during the day time for 1-2 hours:
 - either as it is now or
 - no interruptions at all
 - once a month

- The smell of the cold water from the tap:
 - either as now or
 - no smell at all
 - smells of chlorine even after boiling

- colour of the cold water
 - either as now or
 - always completely clear
 - slightly coloured (with traces of rust)

- The cost you pay for cold water services per month*/two months* (*INTERVIEWER USE WHATEVER PERIOD THEY GET BILLED IN):
 - either current, that is (see Q22)
 - current plus 10%, that is (Q22 plus 10%)
 - current plus 50%, that is (Q22 plus 50%)

For each pair of options I would like you to say which you would prefer. You may not like either, but please choose one.

When making your choices please assume that all other aspects of cold water services not mentioned are the same as now.

A	or	B	A	B
INTERRUPTIONS: as now SMELL: as now COLOUR: completely clear COST: PLUS 50%		INTERRUPTIONS: once a month SMELL: smells of chlorine even after boiling COLOUR: completely clear COST: as now		
A	or	B	A	B
INTERRUPTIONS: once a month SMELL: smells of chlorine even after boiling COLOUR: completely clear COST: as now		INTERRUPTIONS: once a month SMELL: no smell at all COLOUR: as now COST: PLUS 50%		
A	or	B	A	B
INTERRUPTIONS: as now SMELL: as now COLOUR: completely clear COST: PLUS 50%		INTERRUPTIONS: as now SMELL: no smell at all COLOUR: slightly coloured COST: as now		
A	or	B	A	B
INTERRUPTIONS: once a month SMELL: smells of chlorine even after boiling COLOUR: completely clear COST: as now		INTERRUPTIONS: as now SMELL: smells of chlorine even after boiling COLOUR: as now COST: PLUS 10%		
A	or	B	A	B
INTERRUPTIONS: once a month SMELL: no smell at all COLOUR: as now COST: PLUS 50%		INTERRUPTIONS: as now SMELL: no smell at all COLOUR: slightly coloured COST: as now		
A	or	B	A	B
INTERRUPTIONS: no interruptions at all SMELL: smells of chlorine even after boiling COLOUR: slightly coloured COST: PLUS 50%		INTERRUPTIONS: as now SMELL: smells of chlorine even after boiling COLOUR: as now COST: PLUS 10%		

A	or	B	A	B
INTERRUPTIONS: no interruptions at all SMELL: smells of chlorine even after boiling COLOUR: slightly coloured COST: PLUS 50%		INTERRUPTIONS: as now SMELL: no smell at all COLOUR: slightly coloured COST: as now		
A	or	B	A	B
INTERRUPTIONS: once a month SMELL: as now COLOUR: slightly coloured COST: PLUS 10%		INTERRUPTIONS: once a month SMELL: no smell at all COLOUR: as now COST: PLUS 50%		

Q34. If your cold water bill was going to increase, which would you prefer?

- 1 The full 20% increase to be added to your water bills for the next year and no further increase for the next 4 years.
- 2 7% increase to be added to your water bills, year on year, for the next five years. This means that after 5 years you would have paid 15% of your annual water bill more, overall, compared to option (1).

1
2

Q35. I would now like to ask you how important it would be to you for the following improvements to be made to the cold water services you receive using the following scale: **SHOWCARD D, READ OUT**

- No sediment in the tap water
- The cold tap water has no smell at all
- Always completely clear water from the cold water tap
- Cold tap water tastes the same as still bottled water
- No interruptions at all to the cold water supplied to your household
- Re-supply of cold water after interruption within two hours
- Consistently high cold water pressure
- Cold water safe for children to drink straight from the tap
- The water company provides an information leaflet on cold water services once a year eg water quality test results and information on water and waste water investments
- Free 24 hour telephone number for water services information
- The quality of waste water treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safe
- The level of waste water treatment meets EU standards
- The water company provides advice about water saving methods to your household in a leaflet
- The cost of cold water stays the same as now

SHOWCARD E

	very un- important	un- important	neither	important	very important
No sediment in the tap water	1	2	3	4	5
The cold tap water has no smell at all	1	2	3	4	5
Always completely clear water from the cold water tap	1	2	3	4	5
Cold tap water tastes the same as still bottled water	1	2	3	4	5
No interruptions at all to the cold water supplied to your household	1	2	3	4	5
Re-supply of cold water after interruption within two hours	1	2	3	4	5
Consistently high cold water pressure	1	2	3	4	5
Cold water safe for children to drink straight from the tap	1	2	3	4	5
The water company provides an information leaflet on cold water services once a year eg water quality test results and information on water and waste water investments.....	1	2	3	4	5
Free 24 hour telephone number for water services information.....	1	2	3	4	5
The quality of waste water treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safe	1	2	3	4	5
The level of waste water treatment meets EU standards	1	2	3	4	5
The water company provides advice about water saving methods to your household in a leaflet	1	2	3	4	5
The cost of cold water stays the same as now	1	2	3	4	5

Q36. What type of accommodation do you live in?

1	rented co-operative flat	5	privately owned co-operative flat	1	5
2	rented municipality owned flat	6	privately owned flat in municipality owned building	2	6
3	rented company-owned flat	7	privately owned flat in company-owned building	3	7
4	rented flat in private house	8	privately owned house	4	8
9	other				9

Q37. In which of the following bands is your monthly household income after tax? **READ OUT OR SHOW RESPONDENT**

01	Under 500 PLN per month	07	3,001-3,500 PLN per month	01	07
02	501-1,000 PLN per month	08	3,501-4,000 PLN per month	02	08
03	1,001-1,500 PLN per month	09	4,001-4,500 PLN per month	03	09
04	1,501-2,000 PLN per month	10	4,501-5,000 PLN per month	04	10
05	2,001-2,500 PLN per month	11	over 5,000 PLN per month	05	11
06	2,501-3,000 PLN per month	12	refusal	06	12

Q38. How old are you?

1	18-24	4	45-54	1	4
2	25-34	5	55-60	2	5
3	35-44	6	61 or older	3	6

Q39. INTERVIEWER:CODE GENDER

1	Male	2	Female	1	2
---	------	---	--------	---	---

THANK YOU FOR YOUR HELP IN THIS RESEARCH

I confirm that this interview is completely confidential

Interviewer's signature:

Appendix 13.2: Statistical Tables

Poznan, Technical Profile

Indicator	Sub indicator	Unit	Figure	
Land Use	Proportion of population living in housing blocks / flats	% of total population	~40%	
	Population served	Nos	676,000	
Overall Water Supply Coverage	Piped water supply population coverage	% of total population	97%	
	Percentage of population served through house connections	% of population served		
	Percentage of population served through standposts (if any)	% of population served		
Overall Wastewater Coverage	Population served by wastewater collectors	Nos	504,367	
	Wastewater collection system population coverage	% of total population	85%	
	Percentage of population served by septic tanks	% of total population	16%	
	Percentage of population served by other sanitation systems (if any)	% of total population		
	Separate sewer system coverage (as opposed to the combined system)	% of population served by sewers	~24%	
Overall Wastewater Treatment Situation	Amount of wastewater not treated at all	% of total wastewater		
	Amount of wastewater receiving mechanical treatment only	% of total wastewater		
	Amount of wastewater receiving mechanical-biological treatment	% of total wastewater	4%	
	Amount of wastewater receiving mechanical-chemical treatment	% of total wastewater	19%	
	Amount of wastewater receiving mechanical-biological treatment with N and/or P removal	% of total wastewater	77%	
Existing Water System Brief	Groundwater supply	% of total	100%	
	Surface water supply	% of total	0%	
	Water treatment plants	Nos	6	
	Water treatment plants, total capacity	m ³ /day		
	Water treatment plants, total production	m ³ /day	163,000	
	Transmission mains, length	km pipes		
	Pumping stations	Nos		
	Storage Reservoirs	Nos	4	
	Storage Reservoirs, total volume	m ³	93,000	
	Distribution system, total	km pipes	1,122	
	House Distribution system, <= 250 mm	%	79%	
	House Distribution system, > 250 mm	%	21%	
	Service Pipes (connections)	km pipes	362	
	Age of pipes, % of pipes more than 30 years old	% of pipes	32%	
Age of pipes, % of pipes more than 50 years old	% of pipes	16%		
Existing Wastewater System Brief	Wastewater collectors including connections, total	km sewers	901	
	Wastewater collectors, <= 450 mm	%	82%	
	Wastewater collectors, >= 450 mm	%	18%	
	Age of sewers, % of sewers more than 10 years old	% of sewers	90%	
	Age of sewers, % of sewers more than 55 years old	% of sewers	18%	
	Pumping stations	Nos		
	Wastewater treatment plants	Nos	6	
	Wastewater treatment plants, total capacity	m ³ /day		
	Wastewater treatment plants, total load	m ³ /day	197,000	
	Final disposal of sludge			
Unit Consumption - Water Balance	Total water production	m ³ /day	156,000	
	Total water consumption	m ³ /day	156,000	
	Domestic water consumption	m ³ /day		
	Gross unit water consumption per capita	l/d	264	
	Domestic unit water consumption per capita	l/d	143	
	Unaccounted-for-water (total production-total consumption divided by total production)	l/d	62	
	Unaccounted-for-water in percent of production	% of production	20%	
	Unaccounted-for-water per km pipe	m ³ /km pipe/day	21	
Consumer Groups and Metering	Total connections, water supply	Nos		
	Household Domestic connections	Nos	30,005	
	Household Industrial connections	Nos		
	Household Institutional connections	Nos		
	Domestic metering coverage	% of domestic connections		
	Industrial metering coverage	% of industrial connections		
	Institutional metering coverage	% of institutional connections		
	Total connections, wastewater collection and treatment	Nos	26,377	
	Operations, Water	Number of days of production	Nos days per month	30
		Number of hours of production	Nos hours per day	24
Population with 24 hours supply		% of population served	100%	
Population with 18-24 hours supply		% of population served		
Population with 12-18 hours supply		% of population served		
Population with 6-12 hours supply		% of population served		
Population with < 6 hours supply		% of population served		
Breakdowns on distribution system		Nos breakdowns/yr	475	
Breakdown intensity		Nos breakdowns/100 km pipes/yr	42	
Consumer complaint frequency		Nos complaints/100 connections/yr		
Yearly water pipe rehabilitation		km water pipes repaired per year	10.3	
Water pipe rehabilitation intensity (km pipes repaired per year as % of total network)		% of total length of network	0.9%	
Chemical water quality not fulfilling the standards		% failures of water samples	2%	
Key parameter(s) not fulfilling the standards		Fe, Mn, Col.		
Operations, Wastewater	Biochemical oxygen demand (BOD) not fulfilling the standards	% failures of water samples	1%	
	Blockages	Nos blockages/yr	2,500	
	Blockages intensity	Nos blockages/100 km sewer/yr	260	
	Yearly sewer rehabilitation	km of sewers repaired per year	2.1	
	Sewer rehabilitation intensity (km sewers repaired per year as % of total network)	% of total length of network	0.2%	
	CCTV inspection of sewers	km of sewers inspected totally	34	
	CCTV inspection intensity	% of sewers inspected	4%	
	Effluent standard, BOD, standard	mg BOD/l	16	
	Effluent standard, SS, standard	mg SS/l	40	
	Effluent standard, NH3, standard	mg NH3/l	30-Jae	
	Effluent standard, Tot-N, standard	mg Tot-N/l	30	
	Effluent standard, Tot-P, standard	mg Tot-P/l	1.5	
	Effluent quality not fulfilling the standards	% failures of effluent samples		
	Key parameter(s) not fulfilling the standards			
Efficiency	Number of staff	Nos	990	
	Staff Efficiency I	1000 persons served per staff member	0.68	
	Staff Efficiency II	1000 m ³ water sold per year per staff member	57	
	Staff Efficiency III	km water and wastewater pipes per staff member	2.03	

Appendix 13.3: Literature Used

Important background documents for the technical profile include:

- Investment programme for PWiK, carried out by the local firm Aqua in 1996;
- Brief technical review in connection with preparation of Concept Paper for the Restructuring of Poznan Water and Wastewater Company by Booz-Allen & Hamilton in 1998; and
- Technical Audit of Poznan Water and Wastewater Assets by VA-Projekt, 1999. This report was available in October 1999 to read, but not to copy, and was then not issued in its final edition.

Appendix 13.4: List of Persons Met

Appendix 13.4: List of persons met

Name of Organisation

Political Parties & City Council

Freedom Union, UW
Social Democracy of Poland, SLD
Solidarity Electoral Action, AWS
The City Council

Person(s) interviewed

Mr Andrzej Radke
Mr Antoni Szczucinski

Mr Tomasz Kayser
Mr. Slawomir Jerzyrski

The Local Administration

The Municipal Property Department, Poznan Municipality

The Department of Health and Social Affairs. Poznan Municipality
The Tenants Department of City of Poznan

Mr Jerzy Kusnierek,
Ms Magdalena Wesolowska
Ms Alicja Szczesniak
Ms Aleksandra Konieczna

The Water Industry

The Management Board of PWiK
The Department of Organisation, PWiK
Economist Department of PWiK

Mr Pawel Chudzinski
Ms Mustyna Wisniersk-Jdozak
Ms Barbare Urbanska-Konik

NGOs, & Consumer Organisations

The Poznan Group for Environmental Friendly Transportation
Poznan Housing Co-Operative
The Council of the Housing District of Osiedla Rusa

Mr Piotr Matczak
Mr Krzysztof Winiarz
Mr Wojciech Gaczek

Others

The Office for Competition and Consumer Protection
(Anti-Monopoly Office)
Institute of Sociology, Poznan University
Institute of Physical Geography, Poznan University
Water Treatment Technologies Department, Poznan University

Mr Edward Stawicki
Mr Krzysztof Podemski
Mr Alfred Kaniecki
Mr Jacek Nawrorki

***Water Prices in CEE and
CIS Countries***

*Appendix 14:
Case Study: Brno, The Czech Republic*

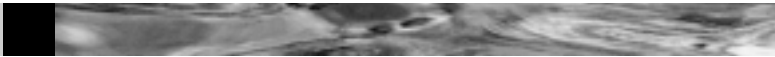
March 2000



This case study, prepared by COWI, is being made available to the public to illustrate the methods presented in the main text of the toolkit. Neither DEPA, EBRD nor the Municipality of Brno has verified or takes responsibility for the factual findings contained in this document. The opinions and recommendations expressed in this document are those of COWI and do not necessarily reflect the opinions or recommendations of DEPA, EBRD or the Municipality of Brno.

Due to the time period involved in preparing the toolkit we acknowledge that certain information may not reflect the present situation of the city.

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ABBREVIATIONS AND ACRONYMS



BVK	Brneske Vodárny a Kanalizace
CCTV	Closed circuit television
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
CZK	Czech Koruna
DANCEE	Danish Cooperation for Environment in Easter Europe
EBRD	European Bank for Reconstruction and Development
EU	European Union
lcd	litre per capita per day
WTP	Willingness to Pay
WWTP	Waste Water Treatment Plant

CHAPTER 1

INTRODUCTION

This paper constitutes the working paper on water services in Brno. The working paper is a part of the toolkit project on acceptability of water prices in central and eastern European countries.

Background

Over the past thirty years major infrastructure investments have often been implemented based upon detailed and systematic engineering analyses, but without much analysis of the prospective demand for the service. Today, an investor, whether public or private, will require that detailed studies of future demand and surveys of willingness to pay will have to be undertaken before investing in major infrastructure, such as transport infrastructure.

Within the water services sector, similar requirements are only now gaining ground. This may partly reflect that the nature of the revenue risk is different in water services. Cars can avoid a toll road by taking alternative routes, but urban households cannot avoid receiving water / delivering wastewater from / to the monopoly water utility.

The rationale

However, water/wastewater utilities also face revenue risks, for example:

- Reduction of water consumption by consumers;
- Political protests impacting on the level of approved tariffs;
- Poor collection rates for water bill, etc.

EBRD and DANCEE have entrusted COWI to prepare a toolkit for consultants / analysts working for policy makers who want to address these, and related revenue risk issues, while designing water and wastewater service infrastructure investments. The toolkit will include practical guidelines on how to assess affordability and willingness to pay for water and wastewater services.

An integrated approach

The design (and cost) of a water and wastewater service infrastructure is not just a technical issue. Different designs lead to different service levels and cost structures, and each of the service levels are likely to be perceived differently by the consumer and thus to lead to different acceptability levels of the applied water prices. This should be integrated into an infrastructure design to reduce revenue risk and to make sure that a service level and an associated price level, acceptable to/optimal for the consumers, is applied. At the same time, affordability issues may set an overall limit for the possible increase in average tariffs and thus for the level of ambition with regard to future service levels if these are to be financed by the users. This implies that the analyses of the toolkit should be carried out concurrently with the technical analysis.

Reduction of revenue risk requires integration of design, cost and WTP considerations. This requires a close dialogue between the technical team, the affordability and WTP analysts, and the policy makers.

The research project and its case studies

COWI is carrying out the project in order to design a toolkit based on literature research, extensive consultations with stakeholders and three case studies.

The Brno case study is one of three case studies being undertaken by COWI as part of the preparation of the toolkit. The other case studies are being undertaken in Poznan (Poland) and Kaliningrad (Russia). The subjects of analyses, and the analytical methods used, have differed somewhat between the cities in order to provide the best basis for the preparation of the toolkit.

The primary purpose of each case study has been to provide insights into the design of the toolkit. The secondary purpose has been to provide city authorities with information on the link between acceptability of future (higher) water tariffs and customer perceptions of water service levels in a broad sense.

Acknowledgements

The present working paper has been prepared by Peter Christensen, Mikkel Birkeland, Karsten Vest-Hansen, Michael Jacobsen and Zsuzsa Lehoczki, all COWI. Chris Heywood and Michelle Wheadon, from Accent Marketing and Research contributed to designing and implementing the stated preference survey. Ladislav Tuhovcák was instrumental in implementing the stated preference survey and provided comments on the design. Many people in Brno generously provided their time and inputs in discussions with the team. Peter Christensen (COWI) supervised the market research and Michael Jacobsen (COWI) is overall responsible for the "Acceptability of Water Prices in CEE and CIS countries" project and for this working paper.

CHAPTER 2

WILLINGNESS TO PAY

2.1 Introduction

The objective of this chapter is to present the methodology applied and the results of the stated preference survey.

The methodology comprises a number of steps. These include background research, qualitative research and quantitative research. Each of the steps is discussed in the section on methodology.

The quantitative research is based on interviews with 150 consumers living in Brno and being responsible for paying the household water bill. While the estimates for the willingness to pay is presented in this chapter the estimates for the water demand elasticities are presented in Section 2.5.

In order to assess the willingness to pay a stated preference approach has been used, and the results indicate some willingness to pay. There is willingness to pay both to have improved water quality and to have a cleaner environment.

2.2 Stated preference survey methodology

The method applied in this stated preference survey contains a number of tasks. These include:

- 1 Background research
- 2 Qualitative research
- 3 Design of questionnaire
- 4 Pilot survey
- 5 Final survey
- 6 Data analysis.

Each of the points is discussed below.

2.2.1 Background research

The first step in the analyses is background research. The purposes of the background research are to:

- Understand the realistic technical alternatives and in particular their impact on realistic service levels;
- understand payment collection, enforcement and usage measuring principles and practices, and the financial standing of the utility;
- understand the socio-economic context, in particular income levels and distribution and types of households.

The background research have also included:

- Discussions with other team members covering technical and financial issues;
- consultation of earlier reports, statistics, working papers giving general introduction to the utility and the local economy in Brno.

2.2.2 Qualitative research

Following the background research, qualitative research amongst consumers is undertaken. The purposes of the qualitative research are to:

- Gain a first understanding of which service factors are perceived as important by consumers, and which factors are the more important;
- gain a first rough understanding of willingness to pay for water and waste water services and the most important factors;
- understand the cultural context and formulations understood by consumers in relation to water and waste water utilities.

In Brno twelve face-to-face interviews with consumers were carried out. An open-ended topic guide was applied. The face-to-face interviews were conducted in an interview room. Two interviewers interviewed each respondent with consecutive translation by a professional interpreter.

The qualitative research is critical, as the outputs form the limitations to what is going to be explored during the quantitative research.

2.2.3 Design of questionnaire

On the basis of the information gathered in the background research and the qualitative work the questionnaire is designed. The questionnaire includes :

- present water and wastewater services;
- attitude towards the water services;
- attitude towards BVK;
- willingness to pay for improvements of the tap water quality and the wastewater treatment;
- water demand elasticities (for price and income);
- political observance and attitude towards EU;
- socio-economic background.

Many subjects can be covered by a questionnaire. However, a selection has to be made in order to keep the length of an interview acceptable to the respondent.

A long list of possible improvements to the water services was identified in the qualitative research. The most important services are included in a stated preference game as described below, because only a limited number of services can be evaluated in the stated preference game.

An example of a choice task in the stated preference game is presented in Table 2.1. Here the respondent must decide whether they would prefer to pay 14 Kc extra to have tap water as good as bottled water, or whether they would prefer to have better wastewater treatment and pay the same amount as at present. If tap water quality is an important issue to the respondent B is preferred, if clean wastewater and/or money saving is important to the respondent A is preferred.

In both alternatives wastewater treatment meets the EU standards. This is altered in other choice-tasks.

Table 2.1: Example of a choice pair

A	B
Cold water is as good as bottled water Surrounding rivers and reservoirs are as now Cold water cost is 42Kc per cubic meter Wastewater treatment meets EU standards	Cold water quality as now The wastewater treatment means that surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safely Cold water cost is 28Kc per cubic meter Wastewater treatment meets EU standards

Eight choice-tasks, such as the above, are presented to each respondent. There is a limit to the number of choices a respondent can make while remaining concentrated and while still presenting a realistic choice.

The stated preference game consists of four factors:

- Water quality;
- Standard of wastewater treatment;
- Cost;
- Wastewater treatment and EU-standard.

Usually four is the maximum number of factors the respondents are able to evaluate in one stated preference game. This is the reason why e.g. information issues have not been included in the game.

The stated preference analysis focuses on exploring the willingness to pay for improvements. Two or three levels represent each of the service improvements. Each level describes a service improvement and these service improvements are the ones that can be evaluated when analysing the game. The costs are increasing in comparison to the present situation in all choicetasks. The levels are described in Table 2.2.

Table 2.2: Factor and levels in the stated preference game

Factor	Levels
Water quality	- drinkable but with a chlorine taste - as now - as good as bottled water
Wastewater treatment	- as now - the wastewater treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safely
Cost ¹	- 28 Kc per cubic meter (as now) - 31 Kc per cubic meter - 35 Kc per cubic meter - 41 Kc per cubic meter
EU-standard of wastewater treatment	- as now - wastewater treatment meets EU-standards

Note: (1) One third of the respondents was presented to a game with lower cost levels, i.e. 28, 32 and 34 Kc.

Three different designs of the stated preference game were made. Two designs with the levels in the above table and one design with lower cost, i.e. 28, 32, and 34 Kc. This is in order to be able to make a statistically sound model.

Price and income elasticities for water demand are also examined in the survey for Brno. The respondents are asked to state water consumption and income in 1997 and 1999. This enables a calculation of the income elasticity.

In order to estimate a price elasticity stated intention questions are included in the questionnaire. An example is:

- If cold water and wastewater costs were 42 Kc per m³, do you think your household would reduce the amount of cold water it uses? If affirmative: How much?

Each respondent is presented to two stated intention questions where the price per cubic meter differs. Also, like the cost levels in the stated preference game, the prices per cubic meter is varied for different types of questionnaires.

The estimated elasticities are presented in Section 2.5.

2.2.4 Pilot survey

The pilot survey is used to test the design of the questionnaire and to identify necessary changes. In Brno, 25 pilot interviews were conducted and the results were analysed. The answers are checked in order to ensure that all questions are well understood and that the stated preference game is working well. Checking the stated preference games includes assessing if all levels are relevant to the consumers, and if the levels of e.g. cost are perceived to be within realistic limits. As an example, if respondents choose alternatives with the lowest cost in most stated preference questions the cost levels should be adjusted downward. This was in fact the case for the pilot in Brno.

2.2.5 Final survey

By including the changes to the questionnaire from the pilot survey the final questionnaire was made. 125 respondents were chosen at random and interviewed. Only respondents responsible for paying the water bill were interviewed.

2.2.6 Data analysis

Both the data from the pilot questionnaire and the data from final questionnaire are included in the statistical analysis. This is possible because only few changes were made to the pilot questionnaire. However, where questions differ significantly in the two versions the results from the pilot questionnaire are excluded. This is the case for the stated preference game.

The stated preference data is analysed by applying advanced statistical tools. A so-called logit model is estimated. Before estimating the model a set of a priori hypotheses is described and these are tested in the model. Examples of such a priori hypotheses are:

- consumers with higher income have a higher willingness to pay;
- consumers with a water meter have a higher willingness to pay because they are able to adjust consumption as a response to an increase in tariffs.

The model also allows for different willingness to pay for consumers with different backgrounds, e.g. age and gender. For age and gender the model process is exploratory, that is no a priori hypotheses are needed. However, all effects in the model must have a clear interpretation.

In order to ensure that the sample is representative, it is tested whether the age and gender distribution in the sample differs from the distribution in Brno. Census data from 1998 is used. The test indicates that some groups are over represented in the sample, and therefore all results are weighted by age and gender. By weighting with the age and gender distribution of entire population, it is assumed that all groups are equally responsible for paying the water bill. Hence, the results can be interpreted as representative.

2.3 Qualitative research

The qualitative research was based on a topic guide that was prepared using background information about Brno. Interviews were carried out as face-to-face interviews in interview rooms. Two members of the project team interviewed each respondent with consecutive translation by a professional interpreter.

Each interview lasted between 30 minutes and 1 hour and 5 minutes (design time around 35 minutes). Twelve interviews were carried out.

Respondents were selected by random. The respondents were between 24 and 75, and represents different employment status and different income groups. Also, the respondents covered in the qualitative work have different political standpoints and resided in various districts throughout Brno. Hence, the respondents interviewed represent a broad spectrum of inhabitants in Brno.

2.3.1 Results from the qualitative work

Water quality

Most of the respondents interviewed do not drink the water directly from the tap. Instead they buy bottled water.

The majority of respondents interviewed are willing to pay for better tap water, but some respondents would prefer to keep the low quality of tap water alongside the present price and continue to buy bottled water for drinking.

Wastewater standard

The respondents interviewed are aware of the environmental problems implied by a low standard of wastewater treatment. The main perceived indications of problems with present wastewater treatment are smelly river, lack of fish or not possible to eat fish cached in the river, and not possible to swim in the river.

The respondents also mentioned other sources of pollution than wastewater from households. A few respondents believe industries are the main polluters, and one claims that households do not to pollute at all.

A majority of the interviewed respondents were aware that the EU requires a certain level of wastewater treatment for the Czech Republic to become a member of the European Union.

Most of the respondents are willing to pay more for better wastewater cleaning. Accepted increase of price ranges from 10% to "several times". One respondent wished to have a guarantee or refund of price increase if improved wastewater treatment do not benefit the local environment.

Water cost

Most of the interviewed respondents are not aware of how much their normal monthly payment is, but aware of the unit costs.

Most respondents think water and wastewater services have increased in price at the same rate as other services. This is in spite of the fact that water prices have increased much more than other prices and wages in the past two years.

Perceptions of what would happen if consumers do not pay the water bill are mixed. Some think that consumers not paying are cut off and some think nothing happens. Almost all respondents interviewed find it reasonable to cut off consumers not paying their water bills - at least after a warning.

All twelve respondents would keep on paying their bill even if the price was increased.

Metering and water consumption

Most of the twelve respondents have individual metering for the flat or house and the rest have a meter for the block they live in. However, the individual meters in a block of flats are not managed by BVK. The landlord uses these to monitor the use of water.

Most respondents interviewed have undertaken measures to reduce consumption e.g. by repairing leaks fast, showering, and using less water in the bathtub. Some indicate that they can reduce consumption further.

There is a certain level of environmental concern among the twelve respondents interviewed. A majority recycles or would like to recycle if facilities were available. But also, some do not undertake any actions at all to act friendly to the environment.

Knowledge of BVK

Most of the twelve respondents know BVK. They do not believe that BVK is inefficiently managed. However, some indicate that competition would be better, that BVK is a monopoly, and that foreign involvement would lead to better management.

A few had heard about some foreign involvement in BVK, and there are no clear preferences for a Czech versus a foreign operator among the twelve respondents. On the contrary, there is not a lot of confidence in a state-owned company among the interviewed respondents.

Many respondents are aware that a new major wastewater treatment plant is being planned. The aware respondents know that the plant is expensive to build.

Upon prompting, most of the respondents trust that investments by BVK will lead to better wastewater treatment and a better local environment.

Information

The respondents interviewed do not find themselves well informed about water issues by BVK. However, they are able to obtain information through local media (press and radio) on the water and waste-water services.

2.4 Quantitative research

The number of respondents included in the stated preference study is 150, i.e. 125 from the final questionnaire and 25 from the pilot questionnaire. Because of modifications between the pilot and the final questionnaire the 25 respondents from the pilot questionnaire are not always included in the results presented in the following.

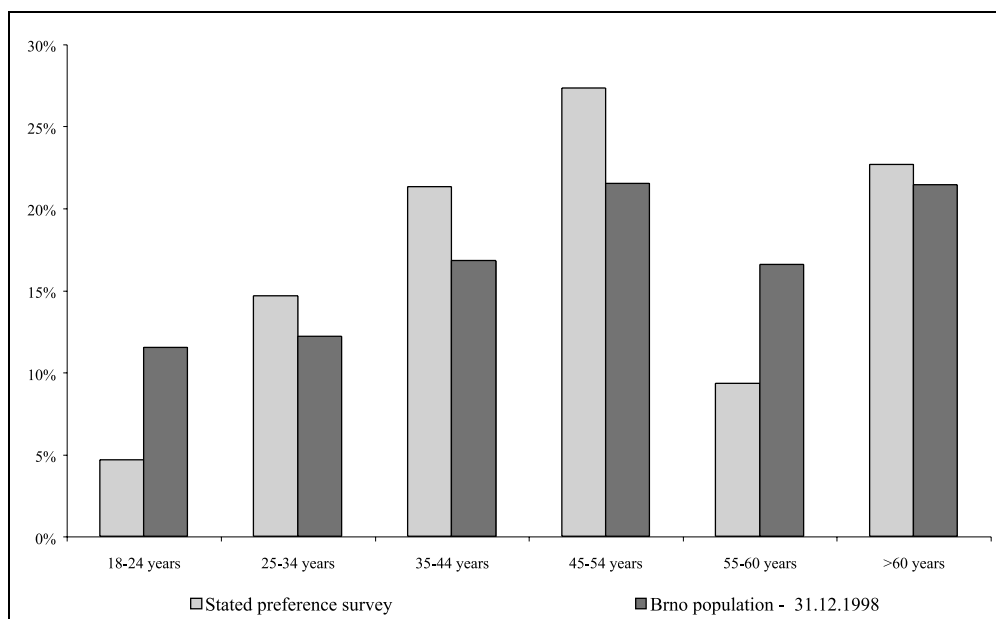
While the results for the willingness to pay is presented in this section the survey results for the water demand elasticities is presented in Section 2.5.

2.4.1 Socio-economic characteristics

A majority of the 150 respondents are women (58%) and more than half of the respondents are older than 44 years. For this reason the age and gender distribution is compared to the age distribution for the Brno population by 31 December 1998. The total population at this date was 384,727 inhabitants.

The comparison between the sample distribution and the Brno distribution is shown in Figure 2.1. Males between 18 and 34 years are under-represented whereas males between 55 and 60 years are over-represented. For females the age groups between 18 and 24 years and between 55 and 60 years are under-represented, whereas women between 25-34 years are over-represented. In order to have a representative sample of Brno the results of this survey have been weighted. This means that the results are representative to the entire population and not necessary to the consumers responsible for paying the water bill.

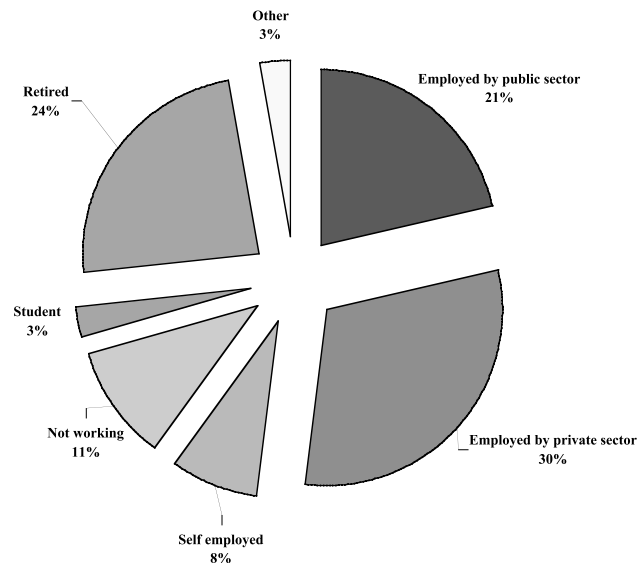
Figure 2.1: Age of the respondents, stated preference survey and the population in Brno by 31.12.1998



Three quarters of the respondents have been living in Brno for more than ten years. The average time in Brno, for all respondents, is 21 years.

The employment status for the respondents is shown in Figure 2.2. Two thirds of the respondents are employed. The largest employer is the public sector (31%). There is a relatively high proportion of retired people (24%) among the respondents, which is expected considering the number of respondents older than 60 years.

Figure 2.2: Employment status of the respondents



Note: These results are not weighted.

The distribution on type of accommodation is shown in Table 2.3. The respondents are equally divided into rented accommodation and privately owned accommodation, cf. Table 2.3. A majority lives in flats.

Table 2.3: Type of accommodation

Rented flat	47%
Rented house	1%
Rented accommodation, total	48%
Privately owned flat	11%
Privately owned house	41%
Privately owned accommodation, total	52%
Total	100%

Note: These results are not weighted.

The number of household members varies between one and eight with an average just above three. More than half of the households do not have children, cf. Table 2.4.

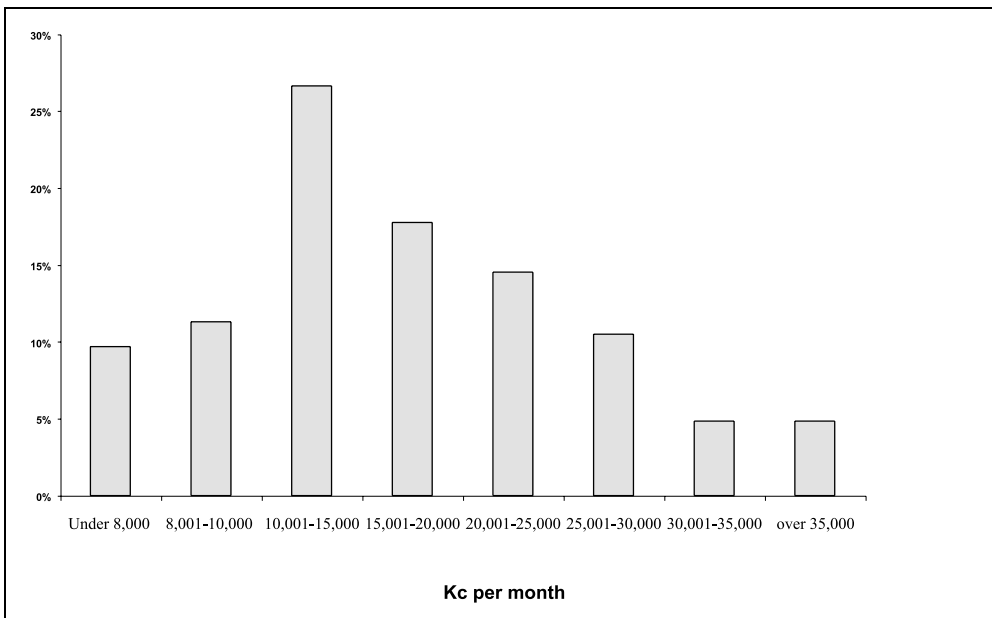
Table 2.4: Type of household

Household without children	58%
Household with children	42%
Households with children aged 6-17 years	35%
Households with children less than 6-years	13%

Note: These results are not weighted.

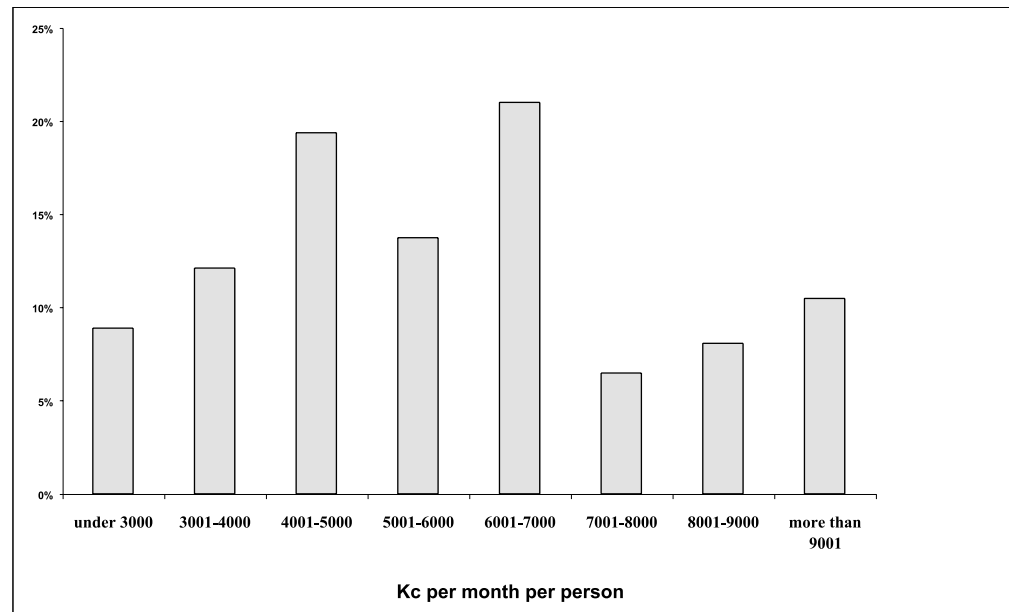
The distribution of monthly household net income is represented in Figure 2.3.

Figure 2.3: Distribution of monthly household income after tax in Kc



Note: The 25 answers from the pilot questionnaire are not included. The results are valid for 124 respondents. These results are not weighted.

Figure 2.4: Distribution of monthly net income per person



Note: These results are not weighted.

The income data in the survey can be compared to the official income data from the second quarter of 1999. In the second quarter of 1999 the monthly net income was 6,774 Kc per person. This can be compared to the monthly average of 5,936 Kc per person in the stated preference survey. When comparing the figures it should be kept in mind that the average from the survey is calculated by using the midpoint of each interval, and is collected in the third quarter rather than the second. A majority of the respondents experienced an increase in the income during the last two years. 17% of the household have experienced a decrease in the income that amount to between 5 and 70% of the previous income, and 20% did not have any change in their income. The change in income is equally distributed among different age groups.

Political observance

Table 2.5 compares the votes of the respondents in the 1998 municipal election with the results for the 1998 regional election in Brno. The column showing the municipal election is the one from the stated preference survey.

The results are very close for the main political parties, which indicate that the stated preference survey is politically representative to the inhabitants of Brno.

Table 2.5: Brno 1998 municipal (stated preference sample) versus 1998 regional election

	Survey data: Municipal election, 1998	Regional election, 1998
Civil Democratic Party (ODS)	33%	29%
Social Democratic Party (CSSD)	18%	22%
Christian and Democratic Union (KDU-CSL)	9%	13%
Communist Party of Czech and Moravia (KSCM)	5%	11%
Union of Liberty (US)	1%	10%
Independent candidates	6%	1%
Other small parties	4%	9%

Note: These results are not weighted.

Some of the respondents did not want to reveal their votes in the 1998 municipal and 28% answered that they did not vote. In the 1998 regional election in Brno 61% did not vote.

Almost half the respondents (46%) think that the Czech Republic should join EU in 2003 as planned. 17% think that it should be later. Only 12% do not think that the Czech Republic should join EU in 2003.

Environmental concern

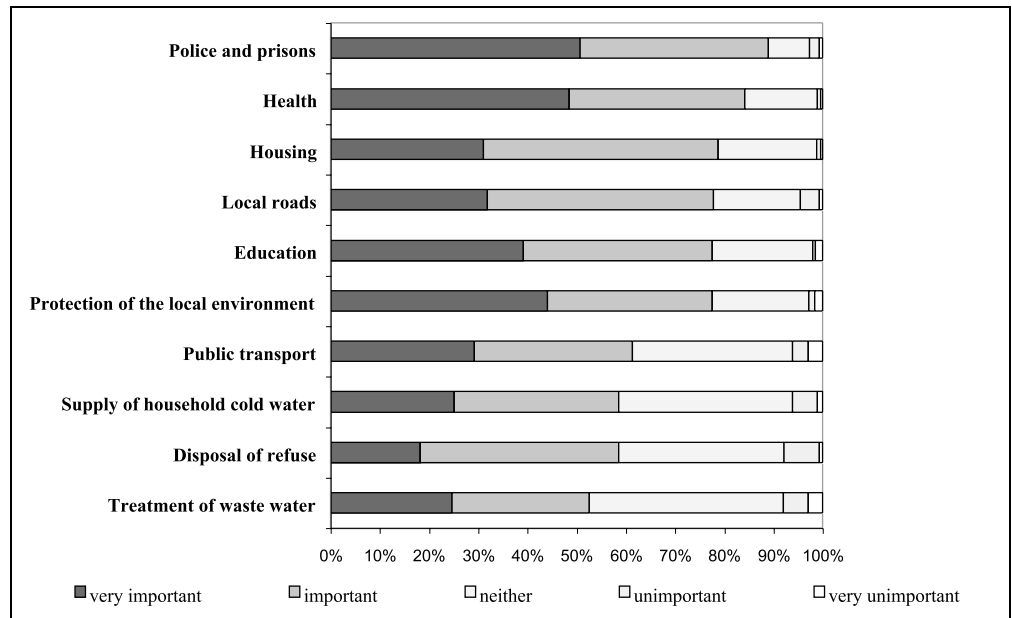
More than three-quarters of the respondents recycle waste. They mainly recycle paper, glass and plastics. 19% of the respondents states that they agree with various environmental organisations like Greenpeace, Children of the Country, Rainbow Movement, and Veronica. Half of the respondents do not have an opinion towards the organisations.

2.4.2 Public services

For the respondents the most important public services to improve are health and police and prisons. These services are followed by protection of local environment, public transport, local roads and housing. Treatment of wastewater and supply of cold water are in the low end. However, most consumers find protection of the local environment important, and a large group is aware that the lack of wastewater treatment results in local environment problems.

For all these services the majority states that improvements are important or very important to them.

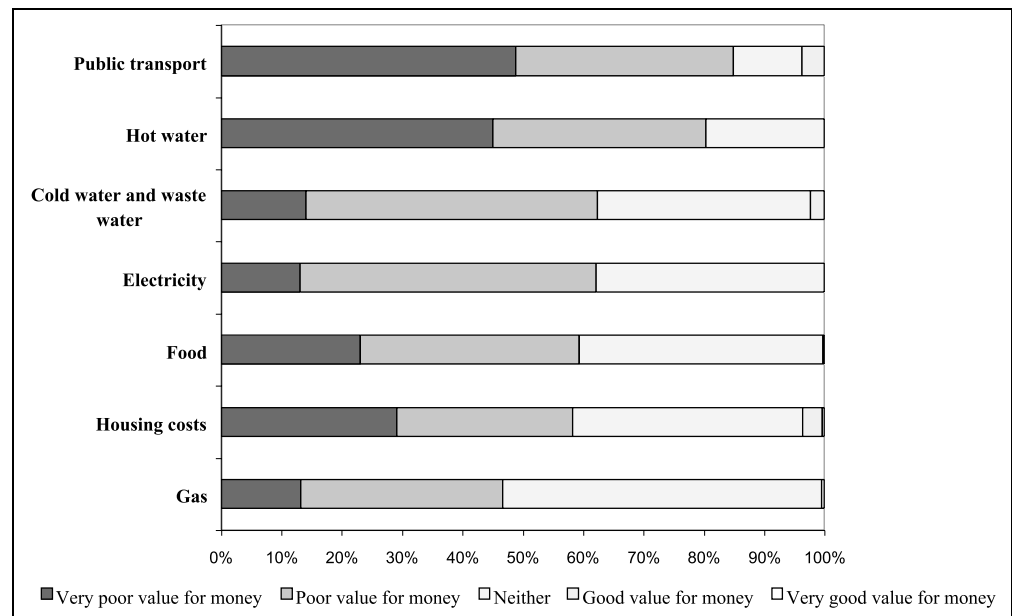
Figure 2.5: Level of importance for improving the public services



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

The consumers are generally dissatisfied with all utilities in terms of value for money, cf. Figure 2.6. They are also quite dissatisfied with the value for money of cold and wastewater services.

Figure 2.6: Ranking utilities in terms of value for money



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

2.4.3 Water and wastewater services

Water consumption

The average monthly water consumption is approximately 9 m³ per household. On the top of this consumption, two thirds of the respondents buy bottled water. The weekly purchase per household is 11 litres, which amounts to 3.5 litres per person. 7% of households buy more than 20 litres per week. The large amount of bottled water consumed indicates that a large proportion of the consumers do not drink the tap water directly from the tap.

Around half of the respondent changed their consumption of cold tap water in the last two years. 30% reduced the tap water consumption and 20% increased the tap water consumption. The main reasons for these changes were to save money (45%) and because of a change in the number of people in household (30%).

35% of the respondents find themselves able to reduce their water consumption while most consumers find that they cannot reduce consumption any further, Table 2.6. The highest ability to reduce consumption of water is found among consumers that are not aware of the change in consumption during the two years.

Table 2.6: Possible reduction in water consumption

	Change in consumption in last two years			
	Reduction	Increase	Don't know	Total
Able to reduce cold water usage(further)	8%	8%	19%	35%
Not able to reduce cold water usage (further)	22%	11%	11%	65%
Total	30%	19%	50%	100%

Note: The data have been weighted

The main proposals made for reducing the cold water usage are a more economical way of washing dishes, toilet use, and to take shower instead of bath.

Water payment

More than two thirds of the households have separate cold water meter, and almost all households with a meter are billed according to the meter. Half of the households pay the bill for cold water and the wastewater is with other items, and the other half pay the water bill separately.

Table 2.7 shows the consumers perception of the increase of the cost per cubic meter for cold water and wastewater treatment during the last two years.

Table 2.7: Increase of the cost per cubic meter for cold water and wastewater treatment in the last two years

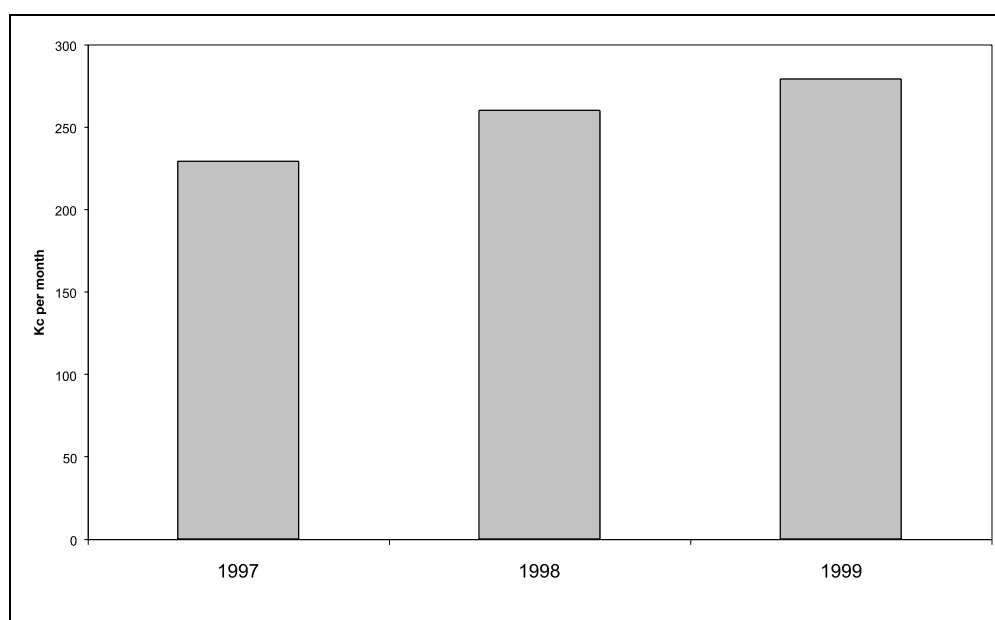
	Percentage
Less than 10%	3%
10%-25%	34%
26%-35%	16%
36%-50%	7%
More than 50%	3%
Do not know	36%
Total	100%

Note: Data are weighted by the age and gender distribution of Brno, census 1998.

In fact between 1997 and 1999 price have increased of 27% for water and 33% for wastewater. A lot of consumers are underestimating the real increase. Also, a majority is not aware of what part of the bill is for cold water supply and what part of the bill is for wastewater treatment.

The average amount paid by the consumers is illustrated in Figure 2.7. The amount has increased from 260 Kc in 1997 to 279 Kc in 1999.

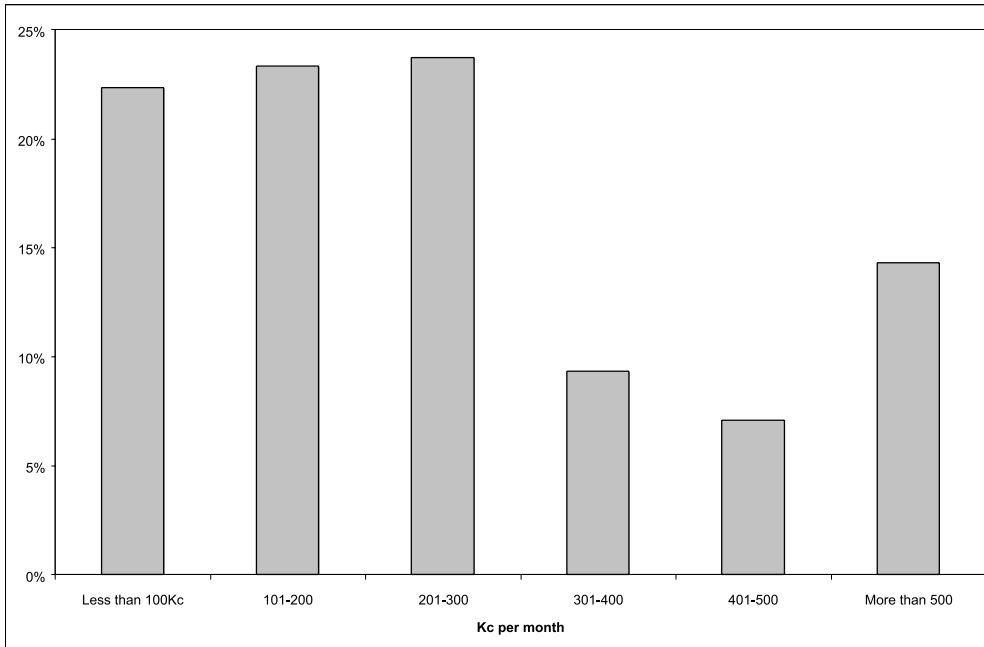
Figure 2.7: Average household payment for cold water and wastewater, Kc per month



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

The distribution of the monthly water bill is shown in the table below for 1999. Most households pay less than 300 Kc. per month.

Figure 2.8: Distribution of the household water bill in Kc per month, 1999

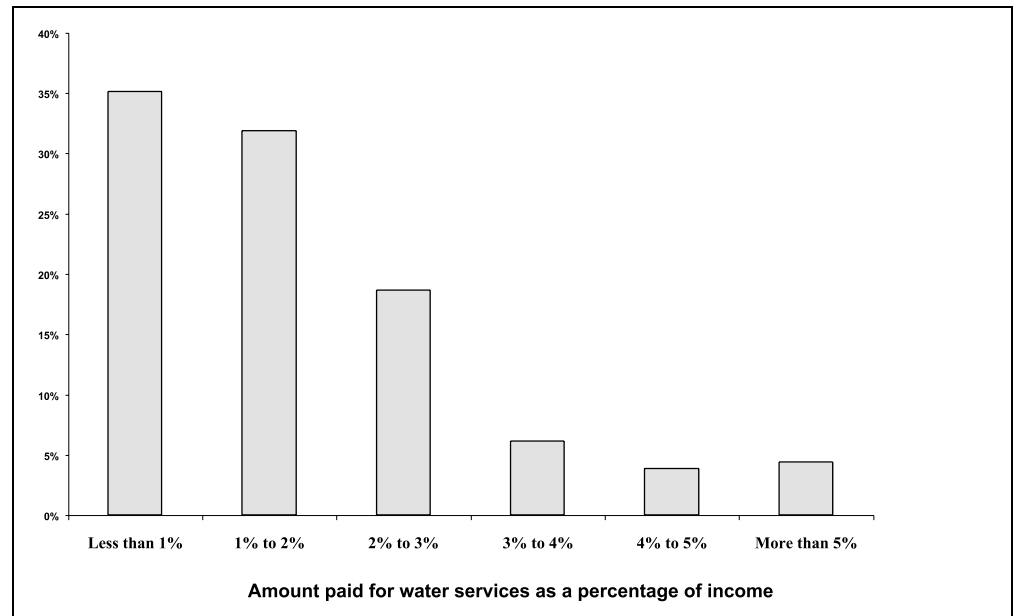


Note: The figure is based on 144 consumers, 6 did not state the amount they paid. From the final questionnaire 87 consumers brought their water bill to the interview and 32 gave an estimate. Data are weighted by the age and gender distribution of Brno, census 1998

The consumers' attitude towards non-payers was also examined. 64% of the respondents think that non-payers of water charges should be disconnected.

The average payment for water services is just below 2% of the household net income. The distribution of the proportion of the income spent on water services is shown in Figure 2.9. More than a third of the consumers pay less than 1% of the income, while less than 5% pays more than 5% of the net household income.

Figure 2.9: Distribution of the household water bill in Kc per month, 1999



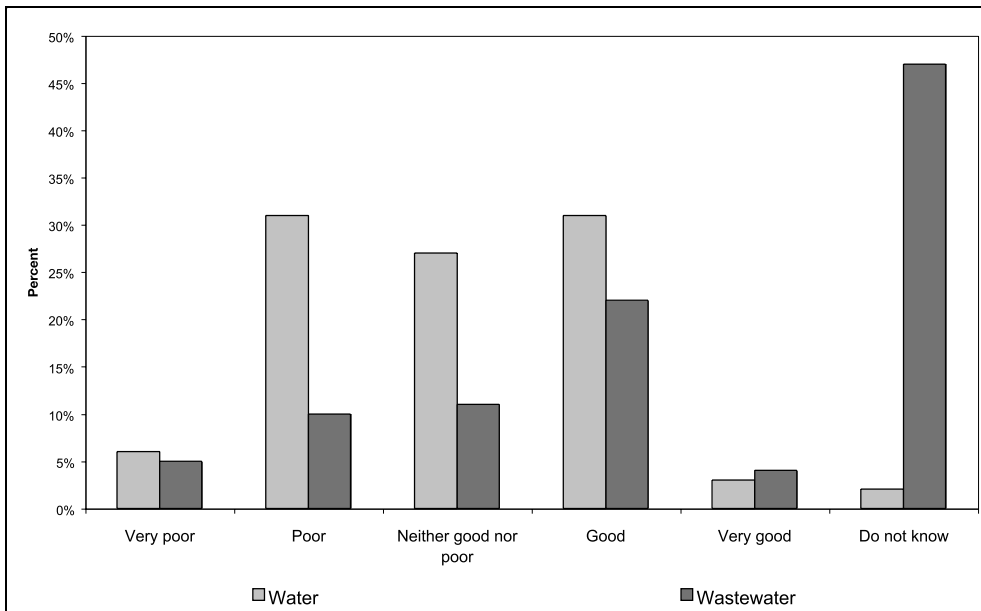
Note: Data are weighted by the age and gender distribution of Brno, census 1998

Water quality and standard of wastewater treatment

The consumers are divided into equally sized groups concerning the quality of cold tap water. A third of the consumers find the water quality good and another third find the water quality poor; the rest find that the water quality is neither good nor poor. The ranking of the quality of cold tap water and wastewater treatment is shown in Figure 2.10.

It is more difficult for the consumers to rank the standard of wastewater treatment. Almost half of the consumers (47%) cannot rank wastewater standard. This is quite a lot compared to the few consumers that cannot rank the cold water quality. For wastewater, the consumers who state their opinion have an opinion in favour of good quality.

Figure 2.10: Ranking of the cold tap water quality and wastewater services



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

Half of the respondents did not notice any change in the quality of cold water in the last few years and one-third think that quality has improved. For wastewater, only 16% think that quality has improved and 36% did not notice any change.

One-third of the respondents thinks that the wastewater treatment results in local environment problems and 46% have no opinion. The following table describes the type of environment problems they have in mind.

Table 2.8: Local environment problems due to wastewater treatment

Bad quality water for people down stream	23%
Bad smell of rivers	14%
Algae in water	10%
Inability to swim in rivers/reservoirs	9%
Inability to fish/eat fish from rivers	5%

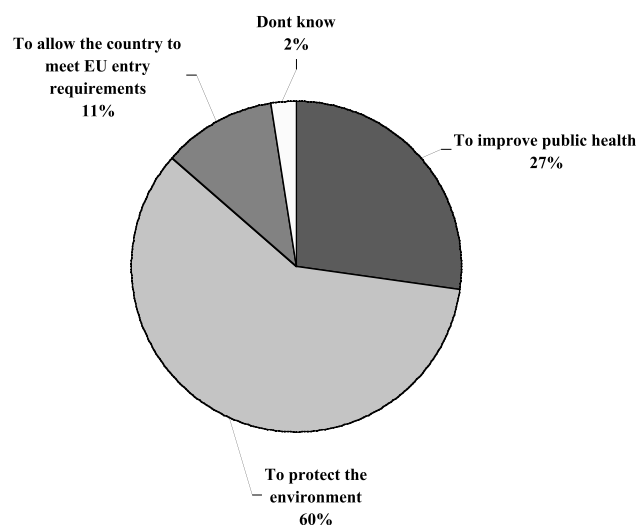
Note: The table is based on the 31% of the respondents who do think that the current wastewater standard causes problems to the local environment. The data have been weighted

Comparing the Czech standard for wastewater to EU standard, 20% of the respondents think that waste water treatment in the Czech Republic are the same as EU standard, 32% do not know and 43% think that Czech standard is worse than EU standard. Only 7% state that the Czech standard is better than EU standards.

In fact the new instruction of government no. 82/1999 from 22 March 1999 that sets up new acceptable indicators of water quality from Czech wastewater treatment plant is stricter than the current EU standard. The wastewater treatment plant in Brno satisfies all except one of the indicators. So the inhabitants are not aware of the difference between Czech and EU standards, and have a perception that differs from the facts.

The most important reasons for improving wastewater standard are to protect the environment, cf. Figure 2.11.

Figure 2.11: The most important reason for improving wastewater treatment



Note: The data have been weighted.

Attitude towards BVK

Most consumers are aware that BVK is the organisation responsible for the cold water supply and wastewater treatment in Brno. The consumers find that the water company in Brno should be own by the municipal authorities, cf. Table 2.9. Only 13% are in favour of the present ownership, that is a combination of public and private ownership, and domestic and foreign.

Table 2.9: Who should be responsible for providing cold water?

The municipal authority	71%
A private company that is Czech owned	6%
A private company that is foreign-owned	2%
A combination of the above	13%
Do not know	6%
Total	100%

Note: The data have been weighted.

The perception of BVK's corporate policy is that they are more interested in profits and in servicing consumers. 64% of the consumers think that the BVK cares more about profits than customers and only 4% have the opposite opinion.

Information

A fifth of the consumers do not receive any information about the water services. Another fifth get information from BVK whereas the media such as newspapers, television and radio provides most information.

Table 2.10: Sources of Information about BVK, or water and wastewater services

I get no information	21%
I get information from	
Newspaper(s)	69%
From the bill	22%
Television	22%
Information from BVK	19%
Radio	15%
Family/friends/colleagues	9%
From co-operative	6%
From my job	6%
Council	5%
Local broadcast	3%
District Town Hall	1%
From internet	1%

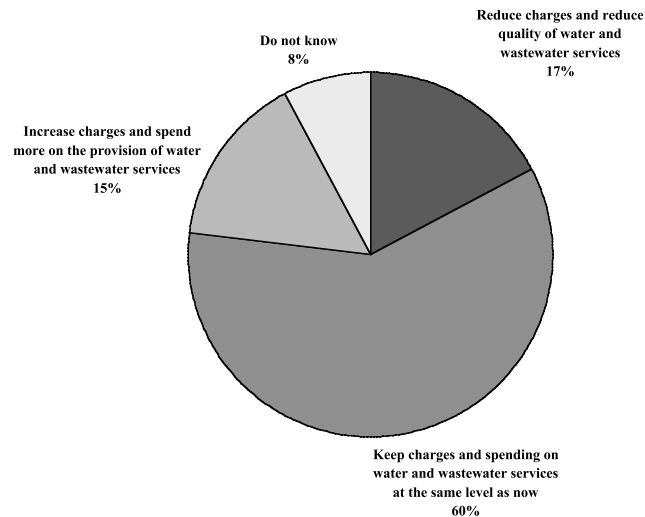
Note: The data do not sum up to 100% as the respondents can refer to more than one source of information. The data have not been weighted

As an example of the information level among the consumers 53% of the respondents know that a new wastewater plant was planned in Brno.

2.4.4 Willingness to pay to improve water and wastewater services

Although consumers are buying a lot of bottled water only 15% are in favour of increasing charges and improving quality and 60% would like to keep the charges and the quality as it is now, cf. Figure 2.12. More consumers are in favour of reducing prices and quality than improving quality and increasing prices.

Figure 2.12 Preferred strategy concerning water services and water charges



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

Among the 77% of the respondents who are in keeping or reducing the price levels the reasons are presented in Table 2.11.

Table 2.11: Reasons for not increasing charges for cold water and wastewater treatment

Water charges are too high now	35%
Water cost should not increase unless water quality is improved	26%
It will result in social hardship for the poorest sections of society	24%
I cannot afford to pay any more	23%
Increasing charges will cause a decrease in consumption	9%
As a general principle water charges should not be increased	8%
Increase charges will simply add to profits for BVK	4%
Other cities or regions have lower charges than Brno	3%
Investment in water and waste water treatment is not necessary	1%

Note: The percentages do not sum up to 100% because respondents were allowed to state more than one reason. The data have been weighted.

The purpose of the stated preference analysis is to find the willingness to pay for improvements of the services. The factors included in the analysis are:

- The quality of the cold water supplied,
- The standard of the wastewater treatment,
- Wastewater treatment meets EU standard.

For the quality of the cold water two possible changes suggested to the respondents:

- The water is drinkable but with a chlorine taste,
- The water is as good as bottled water.

According to the results the perception among consumers is that the present water quality is superior to the first change proposed, i.e. water is drinkable and without a chlorine taste. However, the quality is not as good as bottled water. The notion of bottled water is easy to handle for the respondents. It both guarantees quality of taste and healthiness.

For the quality of the wastewater treatment there is only one improvement proposed in the first factor:

- The wastewater treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safely

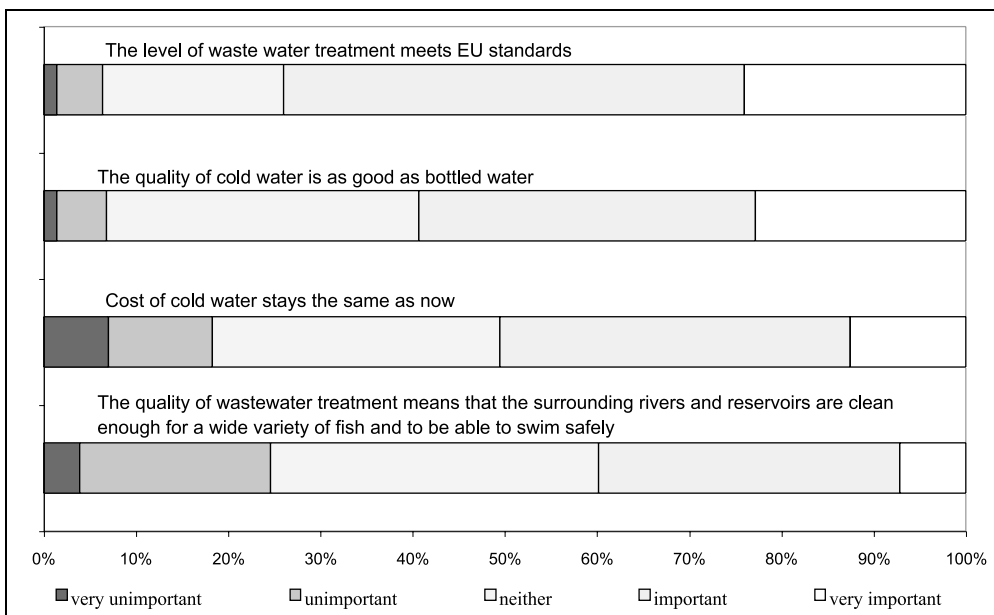
In order to examine the importance of meeting EU requirements a factor is included where the standard of wastewater treatment either meets or do not meet the EU standard. The change presented to the consumer is:

- Wastewater treatment meets EU standards.

This factor enables the analysis to identify a willingness to pay for meeting EU-standard that is not due to the improvement in the environment.

The ranking of the factors included in the stated preference analysis is shown in Figure 2.13. The ranking is presented in prioritised order with the most important improvement at the top. The most important improvement is to meet the EU-standard. Half of the consumers find it important to keep the charges as now.

Figure 2.13: Ranking of the factors included in the stated preference game



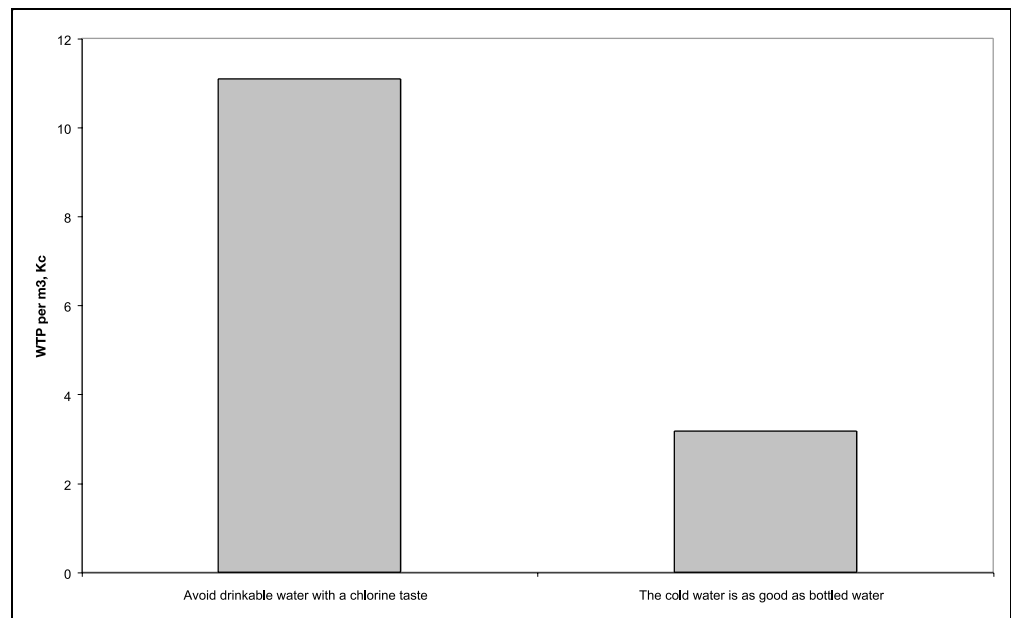
Note: The data have been weighted.

There is a willingness to pay for improvements, both for improvements to the water quality and the wastewater treatment. The average willingness to pay is illustrated in Figure 2.14 as extra payment per cubic meter.

On average the consumers are willing to pay about 3 Kc extra per cubic meter to have water as good as bottled water. This indicates that respondents do not find the present tap water quality as good as bottled water.

There is an even greater willingness to pay to avoid "drinkable water with a chlorine taste". The willingness to pay is ca. 11 Kc per cubic meter, which indicates that consumers find the present quality better than that description.

Figure 2.14: Average willingness to pay to avoid drinkable water with a chlorine taste, and to have a water quality as good as bottled water



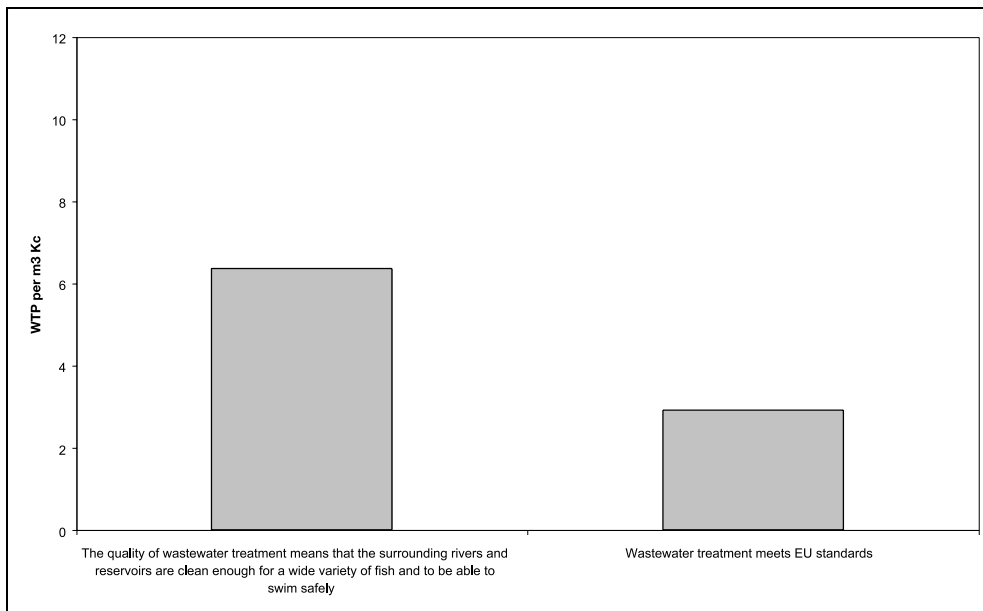
Note: Data are weighted by the age and gender distribution of Brno, census 1998.

Consumers are also willing to pay more to get an improvement in the wastewater treatment. They are willing to pay 6 Kc more if the better wastewater treatment leads to an improvement to the environment.

Hence, a cleaner environment can be used as an argument for increasing water charges.

Also there is a willingness to pay if wastewater treatment meets the EU standards. This indicates both that consumers find it important to meet the standards per se - a majority think that the Czech Republic should join EU - and that the perception is that the EU standard is higher than the Czech standard.

Figure 2.15: Average willingness to pay to have an improved environment and for meeting EU standard



Note: Data are weighted by the age and gender distribution of Brno, census 1998.

The willingness to pay differs for different socio-economic groups. In general:

- women have a higher willingness to pay than men;
- consumers with a low income have a lower willingness to pay than other consumers; and
- young consumers are willing to accept a higher increase to get an improved environment.

The willingness to pay as a percentage of the present charges for various groups is presented in Table 2.12.

Table 2.12: Willingness to pay per cubic meter

	Willingness to pay			
	Consumers with income below the 25 th percentile ¹		Consumers with income above the 25 th percentile ¹	
	Men	Women	Men	Women
Avoid drinkable water with a chlorine taste	23%	37%	31%	65%
Tap water like bottled water	7%	11%	10%	20%
Clean environment, consumers younger than 35 years	20%	32%	27%	56%
Clean environment, consumers older than 35 years	12%	19%	16%	33%
Waste water treatment meets EU requirement	6%	10%	8%	17%

Note: (1) Monthly household income per person. Data are weighted by the aged and gender distribution of Brno, census 1998.

The consumers have been divided into two groups according to the income per person: Consumers having an income lower than the 25th percentile of the sample and consumer having a higher income (4,200 Kc after tax). There is a difference in the willingness to pay for these income groups but a correspondingly higher willingness to pay cannot be found among consumers in the highest 25th percentile.

This result indicates that the water charges are perceived high for the 25% of the population that is less well off economically.

Consumers aged younger than 35 years are willing to pay more in order to have a "clean environment" than older respondents are. This indicates that young consumers will be more willing to accept increases if a cleaner environment can be the result.

Furthermore, it was examined if consumers with a meter installed are willing to accept higher charges than consumers without a meter. The reason for this could be that consumers with a meter are able to adjust water consumption as a reaction to higher charges per cubic meter. However, this hypothesis could not be affirmed and hence installing individual meters does not seem to lead to a higher acceptability of an increase. Finally, it was examined if consumers in favour of EU membership are willing to pay more for the wastewater treatment in order to meet the EU standard than other consumers are. This is not the fact.

2.5 Estimation of price and income elasticities

In order to analyse the relation between tariffs, income and water demand, detailed information on these issues is needed, on a household level. Macro-economic data on income, water consumption and tariffs can also be used if a sufficiently long time series is available. However, micro-economic models often give a more precise description of the customers' behaviour.

The price sensitivity can be found by using both revealed preference data (RP) and stated preference data (SP). SP data should be used if good RP data is not available. In Brno some RP data were available. The case study used a combination of RP and SP data to estimate the price (and income) sensitivity of water demand as described below.

No registered data was available on water demand and income in Brno. Therefore, the respondents were asked to bring their water bills for the last three years to the interview. These water bills were used to obtain data on the amount spent on water by each of the households. In cases where the respondents did not have the water bills, the amount was estimated. Furthermore, the respondents were asked to state the changes in their income over the past three years.

Two specific changes in the water tariff were presented to the respondents as SP questions. The respondents were asked to state the expected consumption for each of the tariffs. This was done in order to obtain an assessment of the sensitivity of water demand to changes in price.

For each household in the sample we collected data on the water consumption, tariffs and income for the last three years. The data were collected by asking the respondents to bring their water bills to the interview. Further, we collected SP data by asking the respondents if they would change the amount of water consumed if the tariff was changed by a specific amount. See the table below for an overview of the data collected.

Table 2.13: Data for calculation of price and income elasticity of water demand

Data name	Water consumption	Price per m ³	Income
Actual present situation	Present consumption	28.80 Kc/m ³	Present income
Actual (or perceived) change in the last two years	Actual reduced consumption	Actual increase in prices (or perceived)	Actual change in income
Stated intention, 32 Kc/m ³	Intended reduced consumption	32 Kc/m ³	Present income
Stated intention, 34 Kc/m ³	Intended reduced consumption	34 Kc/m ³	Present income

It is assumed that respondents who answer "don't know" to the change of income have had unchanged income. Furthermore, the price changes within the last two years were "estimated" 31% (equivalent to de facto price change) for people who state that they do not know the change and to the perceived price changes for those who do "know" the change.

The sensitivity is measured by elasticities. The price elasticity is defined as:

- the percentage change in water demand in response to a 1% increase in the price per cubic meter.

This elasticity is assumed to be negative, as the consumption is expected to decrease in response to higher tariffs. Furthermore, it is expected that the elasticity is low, i.e. numerically less than one. This means that the water consumption decreases by less than 1% in response to an increase in the water tariff of 1%.

This is anticipated because water is a necessity that most households would continue to consume even if the tariff increases. A decrease in water consumption can be due to more water efficient installations, changed habits, etc.

The response in water consumption is expected only if the tariff is paid per cubic meter. If, instead, the tariff is paid per household member, the price elasticity of demand is expected to be zero, i.e. no change in water demand as a result of a price change.

The **income elasticity** is defined as:

- the percentage change in water demand in response to a 1% increase in income.

The income elasticity is assumed to be positive, as consumers are expected to increase their consumption as they become wealthier. The general income elasticity may change over time and differ among income groups.

In economies with high incomes, most consumers have satiated their demand for water, and a further increase in water consumption is therefore not likely. In this case, the income elasticity is low.

On the other hand, in economies where water consumption is a significant item in the household budget, an increase in income is likely to have greater impact on water consumption. In this case, the income elasticity is high.

It is plausible that the income elasticity changes for households with different levels of income. For instance, a poor family might increase its water consumption more than a wealthy family in response to an increase in the family income. This is because the wealthy family has reached a threshold where it uses the amount of water it wishes to use without considering the price.

To benefit from historical data collected in Brno, a model is estimated. To compute the price and income elasticity, it is necessary to know how the respondents will react to an increase in price, other things being equal. Therefore, a demand model including all data collected is estimated.

$$\ln(\text{Water Demand}_{it}) = \alpha + \beta \ln(\text{Tariff}_{it}) + \gamma \ln(\text{Income}_{it}) + \varepsilon_{it}$$

The prefix \ln indicates that a logarithmic transformation has been made, β is the price elasticity and γ is the income elasticity. ε_{it} is the unexplained part. The index i is the household, while index t indicates that there are more observations for each household.

The price elasticity is estimated at -0.18, which means that a price increase of 10 per cent results in a 1.8 per cent decrease in water consumption. The income elasticity is estimated at +0.33, which means that an increase of 10 per cent in income results in a 3.3 per cent increase in water consumption.

Hence, the water consumption of the respondents is, quite insensitive to price, but the income elasticity is relatively high. The results show that the households are not likely to reduce their water consumption very much in response to an increase in price, but that they will use more water if their income increases. The low sensitivity to price is expected since households in Brno have already reduced their consumption to a level that is similar to that of West European cities with low per capita water consumption.

2.6 Conclusions

The consumers in Brno are not, in general, dissatisfied with either the cold water quality or the standard of wastewater treatment. However, two thirds of the consumers buy bottled water. More than three-quarters of the interviewed respondents are not willing to pay higher tariffs to improve quality. 17% prefer lower quality of service combined with lower tariffs.

However, the stated preference analysis reveals a willingness to pay for improving the water quality and wastewater standard. The willingness to pay to avoid a worsening of the present water quality is higher than the willingness to pay for an improvement. In particular, this applies to the taste. Also, consumers are willing to pay for better wastewater treatment in order to improve the environment.

The willingness to pay varies between different gender, age, and income groups. Consumers in the low income group are willing to pay less than other consumers, and women are willing to pay more than men are. The group of consumers younger than 35 years are willing to pay more for an improvement of the wastewater treatment leading to a better environment than older consumers are.

The following policy guidelines can be derived from the analysis:

- Environment is an argument for price increases (for wastewater services);
- To make wastewater treatment meet the EU demand is a good argument;
- Tap water as good as bottled water is also an argument that is appreciated;
- Different information approaches for different age groups;
- Avoid chlorine taste is very important argument for price increases; and
- Metering will not increase WTP.

2.7 Lessons learnt on method

Qualitative research

- The in-depth interviews worked well and did provide valuable information about the water services in Brno.

Quantitative research

- The respondents in the qualitative work reveal somewhat higher willingness to pay than found in the quantitative research.
- It is possible to find willingness to pay for environmental improvements, and the connection between wastewater treatment and environment was well understood.
- It is possible to estimate elasticities from survey data by collecting the most important determinants for water demand. This includes water consumption, income and number of persons in household.

CHAPTER 3

TECHNICAL PROFILE

The following chapter comprises a brief technical profile of the water and wastewater systems of Brno, and anticipations of future investment requirements.

The objective of the technical profile is to provide technical background information necessary for the assessment of the public's acceptability of water and wastewater tariffs.

The profile is brief, and is based on data collected from available reports and discussions with utility staff.

The water and wastewater services is entrusted the BVK (Brnenské Vodárny a Kanalizace) a joint stock company owned by City of Brno (51%), Suez Lyonnaise des Eaux (39%) and minority share holders (10%). An original lease is now being renegotiated for a period of 25 years.

Important background documents for this technical profile includes annual reports and the report Proposed Price Control Formulas - Water and Wastewater (BVK), COWI & London Economics, July 1999. Furthermore, a number of meetings were held with BVK, VOV (responsible for development of the VIR project) and Brno City Administration (Department of Water and Forest Management and Agriculture, and City Hygienic Station).

3.1 Overall Service Level

Brno has about 400,000 inhabitants. Almost 100% of the population is connected to the water supply system, and about 94% are connected to the wastewater collection system.

3.2 Existing Water Supply System Brief

Brno has three main sources of raw water:

- Brezová. Groundwater of high quality. Capacity: 780-1400 l/s depending on year and season. This source provides about 1,180 l/s or 96.5% of the water supply to Brno.
- Pisárky: Surface water from River Svratka. Capacity 680 l/s. This source only provides 43 l/s or 3.5% of the water supply to Brno.
- Vir: Surface water from the existing Vir Reservoir (on the Svratka River some 60 km north of Brno). Capacity 1,700 -2,300 l/s. Scheduled for taken into production in 2000.

The groundwater is not treated except for chlorination. The surface water of Pisárky is treated in the Pisárky Water Treatment Plant, renovated some 6-7 years ago. The Vir water will be treated in the new Svarec WTP with a capacity of 2,300 l/s.

There are 32 pumping stations and 59 reservoirs in the water system, and 1,086 km of water pipes. About half of the pipe network is in dimensions > 150 mm. 77% of the pipes are of grey iron. The pipe network is rather old. 47% of the pipes are more than 30 years old, and 29% of the pipes are more than 50 years old. About 1% is even about 100 years old.

3.3 Existing Wastewater Collection and Treatment Brief

The wastewater system is mostly of the combined system, mixing sewage and stormwater. There are about 875 km of wastewater collectors, about 15 wastewater pumping stations and one mechanical-biological wastewater treatment plant at Modrice.

The existing Modrice WWTP has a capacity of 2,500 l/s. The present load is 1,150 l/s. Sludge is disposed off on agricultural land.

3.4 Consumer Groups, Unit Water Consumption and Metering

The water consumption / water balance can be assessed at:

- Total water production: 109,863 m³/day;
- Total water consumption: 86,301 m³/day, equal to 215 lcd;
- Domestic consumption: 50,685 m³/day, equal to 126 lcd;
- Unaccounted-for-Water: 23,562 m³/day, equal to 21%.

This means that the domestic consumption comprises about 58% of the consumption. The domestic unit water consumption (126 lcd) is comparable to unit demands in North-western Europe.

3.5 Water and Wastewater Operations

The water supply provides a 100% coverage of 24 hours of supply per day.

The water quality has changed in recent years. Previously the water quality of the surface water from Pisárky was poor. In 1994-95 up to 50% of the samples taken by the BVK did not fulfil the standards.

In 1997 the failure rate had improved to 4% and in 1998 it was 0%. For samples taken in the water network the water quality has likewise improved from failure rates of 25% in 1994 to < 1% in 1996-98.

With regard to wastewater effluents the failure rate (according to the current standards) has been constant at < 1% over the past 5 years.

New wastewater effluent standards have been introduced by Regulation no 82 of 22 March 1999. The new standards require stricter biological treatment (reduction of BOD) and nitrification, more strict phosphorus removal and some denitrification. The current wastewater treatment plant does not have the required capacity to provide nitrification, denitrification and biological phosphorus removal to cope with the new standards.

Annual number of recorded breakdowns is 268 per km per year, which is quite high compared to North-western Europe. The number of blockages in the wastewater network is reported at 37 per km per year, which is comparable to for instance the average for UK.

The annual rehabilitation intensity has been estimated at:

- Water pipe network: 0.9% per year, which appears on the low side, but reasonable.
- Wastewater collection network: 0.6% per year, which also appears on the low side, but reasonable.

3.6 Staffing and Staff Efficiency

The staff of the water and wastewater utility comprises 604 employees. Selected staff efficiency indicators are:

- 1000 persons served per staff member: 0.66
- 1000 m³ of water sold per year per staff member: 52
- Km of water and wastewater pipes per staff member: 3.25

These indicators are comparable with other CEE countries. Compared to North-western Europe, the staffing is high.

3.7 Investments

The current investments into maintenance comprises about 110 mill CZK for annual repairs (financed by BVK) and 217 mill CZK for annual reconstruction (financed by the City), in total 327 mill CZK.

The planned investments into maintenance have been forecasted at about 180 mill CZK for annual repairs and 250 mill CZK for annual reconstruction, in total 430 mill CZK in maintenance per year.

The construction costs for the new (expanded) Modrice Wastewater Treatment Plant have been estimated at 1,610 mill CZK.

Finally, it has been decided to entrust the operation of the VIR water transfer scheme to BVK. It has been assumed that water from Pisárky will be phased down to cover only a marginal percentage of the supply, simultaneously with introducing water from VIR. In 2004 it is anticipated that 20% of the water is supplied from VIR.

In connection with the new 25 years concession a study on price formula has been carried out. This report contains several scenarios for future investments and corresponding tariff levels. An implementation of Modrice WWTP would result in tariff increases of about 30-40%.

Brno, Technical Profile Summary

Indicator	Sub-indicator	Unit	Figure	
Land Use	Proportion of population living in housing blocks / flats	% of total population	~80%	
Overall Water	Population served	Nes	400 461	
Supply Coverage	Piped water supply population coverage	% of total population	96%	
	Percentage of population served through house connections	% of population served	0	
	Percentage of population served through standposts (if any)	% of population served	0	
	Percentage of population served through standposts (if any)	% of population served	0	
Overall Wastewater Coverage	Population served by wastewater collectors	Nes	391 424	
	Wastewater collection system population coverage	% of total population	94%	
	Percentage of population served by septic tanks	% of total population	6%	
	Percentage of population served by other sanitation systems (if any)	% of total population	0%	
	Separate sewer system coverage (as opposed to the combined system)	% of population served by sewers	low	
Overall Wastewater Treatment Situation	Amount of wastewater not treated at all	% of total wastewater	0%	
	Amount of wastewater receiving mechanical treatment only	% of total wastewater	0%	
	Amount of wastewater receiving mechanical-biological treatment	% of total wastewater	100%	
	Amount of wastewater receiving mechanical-biological treatment with N and P removal	% of total wastewater	0%	
Existing Water Systems Brief	Groundwater supply	% of total	96.50%	
	Surface water supply	% of total	3.50%	
	Water treatment plants	Nes	1	
	Water treatment plants, total capacity	m ³ /day	51 640	
	Water treatment plants, total production	m ³ /day	3 730	
	Transmission mains, length	km pipes		
	Pumping stations	Nes	32	
	Storage Reservoirs	Nes	59	
	Storage Reservoirs, total volume	m ³		
	Distribution systems, total	km pipes	1 086	
	Hereof Distribution systems, <= 150 mm	km pipes	67%	
	Hereof Distribution systems, > 150 mm	km pipes	43%	
	Service Pipes (connections)	km pipes	362	
	Age of pipes, % of pipes more than 30 years old	% of pipes	47%	
	Age of pipes, % of pipes more than 50 years old	% of pipes	29%	
	Existing Wastewater Systems Brief	Wastewater collectors, total	km sewers	875
		Wastewater collectors, <= 500 mm	km sewers	
		Wastewater collectors, > 500 mm	km sewers	
		Age of sewers, % of sewers more than 30 years old	% of sewers	
		Age of sewers, % of sewers more than 50 years old	% of sewers	
Pumping stations		Nes	15	
Wastewater treatment plants		Nes	1	
Wastewater treatment plants, total capacity		m ³ /day	216 000	
Wastewater treatment plants, total load		m ³ /day	99 215	
Final disposal of sludge			agriculture	
Unit Consumption - Water Balance		Total water production	m ³ /day	105 478
		Total water consumption	m ³ /day	81 855
		Domestic water consumption	m ³ /day	52 786
		Gross unit water consumption per capita	l/cd	204
	Domestic unit water consumption per capita	l/cd	132	
	Unaccounted-for water (total production-total consumption) divided by total production	m ³ /day	23 552	
	Unaccounted-for water in percent of production	% of production	22%	
	Unaccounted-for water per km pipe	m ³ /km pipe/day	27	
	Consumer Groups and Metering	Total connections, water supply	Nes	41 687
		Hereof Domestic connections	Nes	
Hereof Industrial connections		Nes		
Hereof Institutional connections		Nes		
Domestic metering coverage		% of domestic connections		
Industrial metering coverage		% of industrial connections		
Institutional metering coverage		% of institutional connections		
Total connections, wastewater collection and treatment		Nes	43 600	
Operations, Water		Number of days of production	Nes days per month	30
		Number of hours of production	Nes hours per day	24
	Population with 24 hours supply	% of population served	100%	
	Population with 18-24 hours supply	% of population served	0%	
	Population with 12-18 hours supply	% of population served	0%	
	Population with 6-12 hours supply	% of population served	0%	
	Population with < 6 hours supply	% of population served	0%	
	Breakdowns	Nes breakdowns/yr	2 813	
	Breakdown intensity	Nes breakdowns/100 km pipes/yr	268	
	Consumer complaint frequency	Nes complaints/100 connections/yr		
	Yearly water pipe rehabilitation	km water pipes repaired per year	9.7	
	Water pipe rehabilitation intensity (km pipes repaired per year as % of total network)	% of total length of network	0.9%	
	Chemical water quality not fulfilling the standards	% failures of water samples	low (<1%)	
	Key parameter(s) not fulfilling the standards		Fe	
	Operations, Wastewater	Bacteriological water quality not fulfilling the standards	% failures of water samples	low (< 0.1%)
		Blockages	Nes blockages/yr	326
Blockages intensity		Nes blockages/100 km sewers/yr	37	
Yearly sewer rehabilitation		km of sewers repaired per year	5.0	
Sewer rehabilitation intensity (km sewers repaired per year as % of total network)		% of total length of network	0.6%	
CCTV inspection of sewers		km of sewers inspected totally	202	
CCTV inspection intensity		% of sewers inspected	23%	
Effluent standard, BOD, old / new standard		mg BOD/l	17 / 15	
Effluent standard, SS, old / new standard		mg SS/l	35 / 20	
Effluent standard, NH ₃ , old / new standard		mg NH ₃ /l	18 / 5	
Effluent standard, Tot-N, old / new standard		mg Tot-N/l	- / 15	
Effluent standard, Tot-P, old / new standard		mg Tot-P/l	1.8 / 1.5	
Effluent quality not fulfilling the standards		% failures of effluent samples	5% ?	
Key parameter(s) not fulfilling the standards			N / NH ₃	
Efficiency		Number of staff	Nes	604
		Staff Efficiency I	1000 persons served per staff member	0.66
	Staff Efficiency II	1000 m ³ water sold per year per staff member	49	
	Staff Efficiency III	km water and wastewater pipes per staff member	3.25	

CHAPTER 4

INSTITUTIONAL FRAMEWORK AND POLICY NETWORK ANALYSIS

4.1 Purpose and Structure of Analysis

The chapter's aim is to analyse the political and institutional factors that influence the process of setting water tariffs in Brno. Specifically, the chapter addresses the following issues:

- The process of water tariff setting: Which actors are involved? What are their main interests when it comes to deciding on tariff levels? What is the relative importance of public acceptability in shaping decisions as opposed to other interests?
- The current status of water tariffs as a political issue: Are tariff levels perceived by the different actors in the policy process (the "Policy Network") as a politically sensitive issue? What are the factors that explain these perceptions?
- The public perception of the water tariff issue: What are the public's attitudes to water related issues? How will these perceptions influence the likelihood of getting acceptance of higher water tariffs? How are these attitudes channelled into the Policy Network? To what degree do existing institutional arrangements themselves influence public opinions?

4.2 Tariff Setting

4.2.1 Responsibility for Tariff Setting

In the Czech Republic municipal authorities are ultimately responsible for setting the level of tariff increases. In practice this means that Brno's tariffs are set by the City Assembly based upon a proposal from the water utility (BVK).

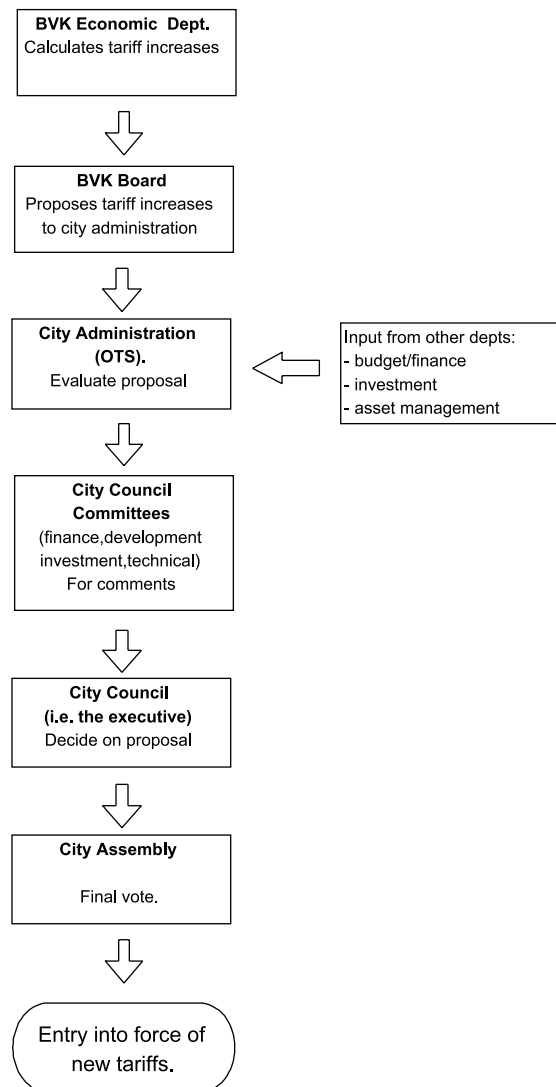
The Czech Ministry of Finance is officially charged with ensuring that these tariffs only cover "justifiable costs" and do not lead to "inappropriate profits". However, interview sources indicated that the lack of a clear definition of "justifiable costs" and "inappropriate profits" mean that the actual influence of the Ministry of Finance in the tariff setting process is very limited.

4.2.2 Description of the Process

Figure 4.1 provides a detailed overview of the tariff setting process. It should be noted that until 1998 this procedure was an annual one. However, with the City Assembly's adoption of a 5-year tariff formula in August 1999 the tariff levels will not be on the City Council's agenda again until 2004.

Figure 4.1: Tariff Setting Procedures

Tariff Setting Procedures



This diagram represents the "formal" process for tariff setting. However, it can also be considered as the process, since there is no evidence of any "informal" actors (such as consumer groups, industrial users of water etc.) being actively involved at any stage in the setting of water tariffs.

Consultation

The process of tariff setting is currently characterised by a lack of public information and consultation and the proposals for tariff increases are not published until they have been finally agreed by the City Assembly. BVK did organise a presentation of the proposed tariff formula to interested political parties and NGO's, but it was felt by several participants that the presentation was overly technical and did not clearly spell out the implications of the proposed tariff increases on household budgets. A lack of

access to financial information about BVK (including information on tariffs) is a concern voiced by (opposition) political parties, NGOs, and even selected members from the city administration.

4.2.3 The Main Actors in the Policy Process and their Interests

During the interviews carried out in Brno it became apparent that the most important actors in this process were BVK and the City Council. These two bodies have a very good working relationship which is demonstrated by the fact that, without exception, BVK's proposals for tariff increases have been accepted unamended.

The City Council

Brno City Council is the 11 person executive body made up of representatives from the ruling political coalition. The coalition which makes up the current City Council is dominated by the Civil Democratic Party (ODS) which has controlled the city administration since 1992. The parties which make up the coalition have an effective majority in the City Assembly and therefore the Council is able to exercise effective control over local policies.

The City Council have good relations with BVK and until July 1999 the only city representatives on BVK's supervisory board and board of directors were those from the ruling coalition.

According to interviews with the political parties in the City Council the main interests in raising wastewater tariffs can be summarised as:

- Technical - modernising the city's outdated wastewater treatment facilities; and
- Political - the long term objective of EU membership is clearly one of the main motivations for carrying out investments in the water supply and wastewater sectors. Public opposition would have to be very substantial before it became a more important issue for policy makers than meeting the requirements for EU membership.

BVK

One reason for the strength of BVK's position is its access to technical and financial information/expertise - which makes it very difficult for other actors in the policy process to question the assumptions which lie behind the proposals for tariff increases. BVK also benefits from its good working relations with the City Council.

Its main interest in increasing wastewater tariffs is that this will allow for a major upgrade of the system which it is responsible for running. This will in turn allow the company to meet environmental standards and thereby reduce the fines and charges which are payable for the emission of pollutants.

4.2.4 Assessment

In the absence of either public debate or organised lobbying it would appear that public acceptability is not the major consideration when deciding on tariff levels. Indeed, given the public's "silence" on this issue, it would be reasonable for the key policy makers to conclude that tariff levels are generally acceptable for the population of Brno.

It would therefore appear that technical and political interests are the key determinants of the level of investment and hence the level of tariffs (i.e. EU membership, technical requirements, and - in the case of BVK - reducing pollution charges).

4.3 Water Tariffs as a Political Issue

To date, the level of water tariffs has not emerged as a significant political issue in Brno. Neither officials from BVK nor local politicians have ever been lobbied on the specific issue of water tariffs and they have not been a major issue in the local press.

As a consequence of this situation it is not surprising that water tariffs have not figured as an important issue for local politicians. The level of water tariffs was not a campaign issue for any of the parties either during or since the last local election. However, despite this low level of explicit politicisation different perceptions of water tariffs can be detected among the different political parties. These different perceptions are discussed below.

4.3.1 The Political Parties

There are three political parties represented in the Brno City Council (i.e. in the ruling coalition). A brief description is given in Table 4.1 and Table 4.2.

Table 4.1: The political parties in the governing coalition: Attitudes towards future water tariff increases.

	Civil Democratic Party (ODS)	Christian and Democratic Union (KDU-CSL)
Role in Gov't	<ul style="list-style-type: none"> Largest party and has been major partner in city government since 1992. 	<ul style="list-style-type: none"> Junior party in ruling coalition with seven seats in Assembly.
Description of party	<ul style="list-style-type: none"> Liberal 	<ul style="list-style-type: none"> Social-Conservative. Strong rural support.
Stance on water tariff	<p>As the dominant party in local government the opinion of the ODS is effectively the same as that of the City Council.</p> <p>They are strongly in favour of making necessary technical investments in municipal infrastructure which are seen as an investment in the future.</p> <p>While concerned of potential social impact of increased water tariffs (when combined with all other municipal charges), party representatives do not feel that prices are too high or that this has become a political issue.</p>	<p>Accept that increased tariffs are necessary in order to cover increased investments. At the same time there is a very real ("Christian") concern of the effect of higher utility charges on customers and specifically socially vulnerable customers.</p> <p>Water tariffs in themselves are not a major political issue (although the combined weight of all social charges is seen as a problem).</p> <p>A specific local concern is their strong support for the VIR water supply project as it will benefit many of the party's supporters resident in small villages on the outskirts of Brno.</p>

Table 4.2: The political parties in opposition: Attitudes towards future water tariff increases.

	Social Democratic Party (CSSD)	Communist Party of Czech and Moravia (KSCM)
Role in Gov't	<ul style="list-style-type: none"> Largest opposition party (12 out of 55 Assembly seats). Never been in government. 	<ul style="list-style-type: none"> Second largest opposition party with 6 seats.
Description of party	<ul style="list-style-type: none"> Market oriented social democracy. Typical supporters as middle classes and over 50. 	<ul style="list-style-type: none"> Particularly strong amongst the socially vulnerable sections of society and the retired.
Stance on water tariff	<p>Despite an active interest in water related issues, the party has no specific point of view relating to water tariffs. These are not felt (at present) to be an important political issue - although the general increases in the cost of all municipal services is recognised as being very important to voters.</p> <p>When the Assembly voted on the tariff proposal the CSSD was split with some members voting for and some voting against the proposal - however, the major objections were procedural rather than against the actual level of tariff.</p>	<p>Water charges are one part of the bigger issue of a too high "cost of living". Not strong party interest in specific tariff proposals (since not felt to be a major issue with voters).</p> <p>General concern that water is an essential good to which individuals have a basic right and that increased tariffs make charges unaffordable for the socially vulnerable. The preferred policy is therefore to subsidise tariffs for socially vulnerable groups and to maintain a system of cross-subsidisation from industry to households.</p> <p>Strong objection to a private company managing the utility.</p>

Even the main opposition parties are generally supportive of investments in water infrastructure and accept the broad principle of increasing tariffs to facilitate these investments. As the above tables illustrate, water tariffs are not seen as being a major political issue by any of the main political parties.

This situation can explain why during the Autumn 1999 vote on the future management of water services (which included a proposed formula for tariffs increases) the only major political party to hold a formal position against the proposals was the Communist party - and even then, it was the ownership status of BVK and not tariff increases that was the main reason for their opposition.

While water tariffs are not viewed as a specific campaigning issue, it is worth noting that the increased cost of overall living expenses is a major concern for many political parties. In addition, there is some hostility from certain political parties towards BVK (due to a perceived lack of consultation, and "excessive" levels of profits and salaries).

4.3.2 Interest Groups

"Veronica" is an environmental NGO, which is actively campaigning on water issues. However, the group's main objective is improving water quality and it does not directly address tariff issues. It is generally supportive of making investments in the water sector although it is concerned about getting "value for money" - for example, the investments in Modrice WWTP are welcomed but there is also a feeling that an equivalent reduction in pollution could be achieved at less cost.

According to all interview sources there are no other interest groups involved in water issues.

1 The actual results are provided in the chapter on the Stated Preference results.

2 Bills did go up by 27% for WS and 33% for WWT.

4.3.3 Structural Factors for Reduced Politicisation

A study of the existing situation in Brno reveals several structural factors which reduce the political sensitivity of water tariffs:

- The ruling coalition is in a very strong position. The Civil Democratic Party (ODS) has controlled the city administration since 1992 and there is no obvious threat to its position. The next elections are reasonably distant - in 2002. These factors mean that the local politicians in the City Council are likely to feel confident enough to push through potentially unpopular measures - such as increases in utility charges.
- There are no organised interest groups interested in initiating a campaign on the issue of tariff increases.
- The limited extent of public information and consultation is likely to reduce public debate over tariff increases which in turn will reduce its importance as a political issue.
- The agreement on a 5-year tariff formula means that the level of annual tariffs is effectively on "auto-pilot" and, barring unforeseen circumstances, will not be discussed by the City Assembly until 2004. This mechanism is likely to "insulate" the issue of water tariffs from the political process.

4.3.4 Assessment

Since Brno's water tariffs are decided by a political body (the City Assembly) it is reasonable to anticipate the attitudes of the public (i.e. voters) would have a major, if not decisive influence in deciding the city's policy. But in reality this is not the case. The study of the existing situation reveals that tariff policy is considered as a technical as opposed to a political issue. Reasons that can help to explain this situation are: (i) the lack of public involvement in the tariff setting decision process on water tariffs, and (ii) the different structural factors described above.

In order to obtain a clearer picture of the present situation it is necessary to move beyond the political process and look in some further detail at actual public attitudes. This will be the subject of the next part of this chapter.

4.4 Public Perceptions

The survey carried out by the Stated Preference team revealed many important issues relating to public attitudes to water issues in general and water tariffs in particular¹. The most relevant of these attitudes, for the purposes of the institutional analysis, are described below:

Opposition to Tariff Increases for Many

A clear majority of respondents were against an increase in charges (55% wanted a standstill on both tariffs and new investments, and 22% were prepared to accept reduced investments in water infrastructure in return for reduced charges). The main reason given for this opposition was on the grounds of affordability and there was a noticeable feeling that charges were already too high (an opinion expressed by 38% of those opposing further tariff increases).

Affordability not an Issue for Others

At the same time, a sizeable percentage of the population (36%) had no idea if their bill went up over the last two years². It must be assumed that for this percentage of the population that the question of affordability has not arisen as a practical concern - which can help explain the fact that water tariffs do not appear to be a major public concern.

Perceived Need to Improve Services

There is a general consensus that it is important to improve standards of local water supply and waste water treatment. However, this sentiment is weaker when it comes to water supply and treatment than for other public services. The most important public services are health, public order and education: a finding that suggests that these issues are more likely to be important to voters (and therefore to local decision makers) than water services.

Reasons for Making Investments

Wastewater

In the case of wastewater treatment, only 11% rated the existing service as poor or very poor, 26% of the population saw it as good or very good, and 45% felt themselves unable to give an opinion on the quality of wastewater services. This finding indicates that popular demand for increased investments in waste water is low and with no obvious dissatisfaction with the existing situation it is likely to be a difficult task to convince the population that new investments are necessary. In a hypothetical situation, respondents felt that improving local environmental conditions was clearly the most important reason for investing in wastewater treatment - but only one third of those questioned felt that wastewater was an actual environmental concern in the Brno region.

Water supply

The situation is somewhat different in the case of drinking water, where 35% of the population rated the quality of drinking water as being poor or very poor (even though technically the water is of a good quality). This finding is backed up by the relatively high consumption of bottled mineral water, and these consumers are likely to be prepared to pay more for an improved water quality.

At the same time, just over 35% of population rated the quality of drinking water as being good or very good. It is unlikely that these individuals would find it acceptable to raise tariffs in order to improve the quality of tap supply.

The Dogs that Didn't Bark

In terms of testing the methodological approach, it is also instructive to look at potential reasons for making investments that in reality did not influence public attitudes. These were:

- EU accession (while most citizens are supportive of the Czech Republic joining the EU very few link this to the need to make investments in the water sector);
- the level of charges in Brno compared to other towns;
- a perception of excessive profits for BVK; and
- a feeling that the proposed investments are not actually needed.

4.5 Influence of Institutional Factors on Public Opinion

The only institutional factor that registered in the opinion survey was concerning the ownership of the water utility.

A clear majority of the population were aware that BVK was responsible for water supply and there was some implicit opposition to the existing institutional arrangement with 71% of the population expressing the opinion that water services should be provided by local government. Only 2% of those questioned felt that the best service would come from a foreign owned company (which is in fact the current situation).

There is a marked difference between public opinions and those of policy makers. This is most noticeable in the following instances:

- policy makers perceive a strong technical need to invest in the system while the population do not appear to be particularly dissatisfied with the existing level of service;
- the other major motive BVK and the City Council have for making the investment is meeting EU standards, but this is only a very minor concern for the population; and
- over a third of the population are of the opinion that the quality of water is poor - when the technical assessments confirm that water quality is actually high.

The survey provides no indication of the reasons for this situation, although it is possible to conjecture that the limited PR activities carried out by BVK and the lack of public consultation on tariff/investment questions are contributory factors.

4.6 Conclusions

This study of the political acceptance of higher water prices, and the description of the current set-up for setting the tariffs, gives grounds for drawing the following main conclusions.

1 **Political acceptability of tariffs:** The political acceptability of significantly increased water tariffs is currently high as evidenced by the acceptance of the proposed tariff formula. The ODS has a solid power base in Brno and as long as this remains the case the tariff levels are unlikely to be challenged. The main opposition party (CSSD) have no specific objections to the tariffs and many members voted for the package containing the tariff proposal. In the absence of any lobbying or grassroots pressure over the tariff issue it is unlikely that any of the mainstream parties will change their existing position and actively oppose the (already agreed) charges.

The Communist party is the most serious opponent of the increased charges but there is little prospect of their being included in the city government.

It can therefore be concluded that the political risk to the implementation of the proposed tariffs is low.

2 **De-politicisation of the issue:** The setting of water tariffs is currently considered as a technical rather than a political issue. This is somewhat surprising given the scale of the investments and the lack of evidence of public support for the investments. Reasons for this situation include:

- a consensus amongst political parties on the technical need for investments and the corresponding need to increase consumer charges;
- certain aspects of the policy structure which help take the political sting out of the tariff debate;
- a lack of knowledge/strong interest amongst the public in water tariffs (over a third of those surveyed did not know how much they paid, and there has been no lobbying at all on the subject); and
- a lack public and institutional consultation on the issue - which may have avoided it being picked up as a potential political issue.

This situation will tend to re-enforce the political acceptability of the situation and places BVK in a very strong position since it has the monopoly on technical information.

3 Precisely such a campaign occurred in the UK in the years following the privatisation of the water industry. Severe droughts led to reduced service levels and resulted in a major press campaign against "unjustified" higher tariffs.

3 Low degree of concurrence. There is a marked difference between popular demand for new investments (low) and politicians' willingness to make these investments (high). While this situation has not (yet) translated itself into any pressure on policy makers it is nevertheless undesirable that public policy is so far out of step with public opinion.

It is possible to foresee circumstances where this passive opposition to higher tariffs is turned into an active hostility (for example, a major consumer campaign in the press³). Under such a situation the tariff issue would become politicised and this could risk to the implementation of the tariff proposals.

It is therefore in the interests of BVK and the City Council to invest in public information and public relations activities in order to gain acceptance of their investment and tariff proposals.



***Water Prices in CEE and
CIS Countries***

*Appendix 15:
Case Study: Kaliningrad, Russia*

September 2000



This case study, prepared by COWI, is being made available to the public to illustrate the methods presented in the main text of the toolkit. Neither DEPA, EBRD nor the Municipality of Kaliningrad has verified or takes responsibility for the factual findings contained in this document. The opinions and recommendations expressed in this document are those of COWI and do not necessarily reflect the opinions or recommendations of DEPA, EBRD or the Municipality of Kaliningrad.

Due to the time period involved in preparing the toolkit we acknowledge that certain information may not reflect the present situation of the city.

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ABBREVIATIONS AND ACRONYMS



CCTV	Closed circuit television
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
DANCEE	Danish Cooperation for Environment in Easter Europe
EBRD	European Bank for Reconstruction and Development
EU	European Union
KVK	Kaliningrad Vodocanal
lcd	litre per capita per day
UfW	Unaccounted for Water
WTP	Willingness to Pay
WWTP	Waste Water Treatment Plant

CHAPTER 1

INTRODUCTION

Project objective and output

The aim of the current project is to develop an enhanced methodology to assess households' ability and willingness to pay for improved water and wastewater services. The project is being carried out for the European Bank for Reconstruction and Development (EBRD) and Danish Co-operation for Environment in Eastern Europe (DANCEE) funded by DANCEE.

The EBRD and DANCEE intend to publish the improved methodology as a guide for consultants working on the preparation of major investment projects in the water and wastewater sector in the CEE and NIS countries. The enhanced methodology is being developed based on three case studies which have been made under the present assignment, Brno (the Czech Republic), Poznan (Poland), Kaliningrad (Russia).

The primary purpose of the project is to develop a methodology, not to present results on ability and willingness to pay for each of these cities. Therefore, the working papers focus on methodological issues and **will not** present answers to questions like: "What should be the future tariff in the case study town?"

Why this project?

In the water services sector even major infrastructure investments were hitherto decided based upon detailed and systematic engineering analyses, based on norms for the prospective demand for services.

At the same time potable water was, and continues to be, considered a social good. The public sector has an obligation to ensure that all citizens have access to safe and adequate supplies of potable water. In urban areas the public sector is also obliged to ensure collection and adequate treatment of wastewater. In the NIS countries there has been a tradition to finance provision of water and wastewater services mainly from public budgets and only to a limited extent from user charges.

However, public budgets are squeezed between revenue shortfalls and continuing large demands for expenditures. At the same time the water services sector in many cities has a backlog of necessary investments. It is necessary to carry out large investments in many cities soon in order to avoid significant deterioration in service levels or to achieve acceptable service levels.

NIS countries and municipalities are looking to international finance and investors to contribute to these investments. However, such investors will look to minimise the risk on debt service or will require a significant risk premium. Often the investor will go beyond a municipal guarantee and request detailed studies of likely future revenue for the water and wastewater utility.

What is the project about?

Revenues depend on tariffs, tariff collection and the demand for water and wastewater services. Household reactions depend on household acceptability of water tariffs. Political acceptability of water tariffs is another key variable in determining the likely future tariffs and collection rates.

This project attempts to develop a methodology to describe both household and political acceptability of water tariffs in quantitative and qualitative terms.

Water utilities are natural monopolies and urban households cannot avoid taking water/deliver wastewater from/to their monopoly producer. However, the water utility is still exposed to revenue risks, such as:

- The level of approved tariffs is difficult to predict due to:
 - changes in federal regulations;
 - political protests in response to tariff increases (planned or approved);
- Reduction of water consumption by (metered) consumers;
- Poor collectability of water bills.

What is specific for Kaliningrad?

The Kaliningrad case study demonstrates how (an early version) of this methodology has been used in Kaliningrad.

Similarly to the situation in other Russian towns, the Vodokanal in Kaliningrad has very little autonomy in proposing (or setting) water tariffs compared to the water and wastewater utilities in the CEE. Thus in Kaliningrad we have analysed political acceptability of water tariffs in the light of the federal regulations that influence revenues from municipal utilities.

At the same time, a major part of the transition to full cost recovery for a number of other municipal and public services, such as rent, heating and electricity still lies ahead, compared to the CEE, where the major transition (though not all of it) has taken place. Thus in Kaliningrad we have analysed household acceptability of water tariffs in the light of a future, where the cost of other utility tariffs are likely to increase, while wages will more or less remain at their present level.

Finally, the Russian macro-economic situation continues to be somewhat unstable. Renewed bursts of inflation and/or exchange rate depreciation cannot be ruled out. The planned investment project includes loans up to USD 31 million in foreign currency. Thus the Rouble denominated debt service will depend crucially on future foreign exchange rate developments. In Kaliningrad, we have given a qualitative assessment of household acceptability of higher tariffs as a result of exchange rate depreciation.

Acknowledgements

The present working paper has been prepared by Michael Jacobsen, Mikkel Birkeland, Alexander Martushevich, Sergei Zaletov and Arne Rønne, all COWI. Chris Heywood and Michelle Wheadon, from Accent Marketing and Research contributed to designing and implementing the stated preference survey. Boris Novichkov of COWI Moscow has assisted the team. The Kaliningrad Statistical Committee was instrumental in implementing the stated preference survey and in providing comments on the design. Many people in Kaliningrad, and in particular Mr. Kovalenko, Head of the Economics of City Municipal Facilities Department, Division on Economics and Investment Policy, generously provided their time and inputs in discussions with the team. The people met have been listed in Appendix 15.1. Mikkel Birkeland (COWI) supervised the market research and Michael Jacobsen (COWI) is overall responsible for the "Acceptability of Water Prices in CEE and CIS countries" project and for this working paper.

Structure of this working paper

This paper initially reviews the current and expected future service level in Kaliningrad, the major investment components and their cost implications. This is done in Chapter 3.

In Chapter 4 we assess the political acceptability of tariff increases in the light of the institutional framework.

In Chapter 5 we present the results of the household survey of consumer willingness to pay for improved water services. In Chapter 6 we turn to pertinent affordability issues based on available income and household expenditure data.

Finally, some conclusions emerge in terms of the methodology and these are briefly listed in Chapter 7.

CHAPTER 2

EXECUTIVE SUMMARY

The planned water and wastewater project in Kaliningrad demands significant increases in water tariffs. The Krüger Feasibility Report¹ assumes that the tariff almost has to triple compared to the tariff in 1998. A number of federal regulations influence the tariff setting in municipal utilities. According to a presidential decree, the share of payments by the population for communal services should be 60% of the total costs. However, it seems that in reality the tariffs are negotiable, and therefore water tariffs must be analysed in conjunction with tariffs for other public services.

Public acceptability is more likely if the public is well informed, receive due notification of intended increase and if these increases are clearly linked to the investment project. This is important because water tariffs might emerge as a salient political issue if a tripling of the water tariffs is implemented over a short period of time.

Furthermore, consideration should be given to a mechanism that automatically causes the cost of water services to be indexed in order to avoid a renewed gradual reduction in water prices resulting from a cumbersome approval process.

The consumers in Kaliningrad are in general dissatisfied with the cold water quality. Few consumers drink the water straight from the tap, and almost half of the interviewed respondents are willing to pay higher tariffs to improve the quality. If the cold water quality is improved the respondents are willing to pay 20% extra. The willingness to pay varies between different income and age groups. The increases in the water tariff as anticipated in the feasibility study from Krüger, by far exceed the present willingness to pay.

Furthermore, the affordability analysis indicates that cold water service will become a significant item on the household budget. This is expected to create problems for a large part of the population in Kaliningrad as food expenditure at present exceeds 50% of the income for most households. Hence, a significant increase in the cold water tariff will probably imply that a large proportion of the households will be unable to pay the water bill.

Therefore, consideration should be given to introduction of water meters, new tariff structures, and compensation for households for which the higher tariffs are unaffordable.

CHAPTER 3

TECHNICAL PROFILE

The objective of the technical profile is to provide technical background information necessary for the assessment of the households' acceptability of water and wastewater tariffs.

The profile is brief, and is based on data collected from available reports and discussions with water utility staff.

The Kaliningrad Vodocanal (KVK), which is a municipal company, provides the water and wastewater services.

3.1 Overall service level

Kaliningrad has about 450,000 inhabitants. KVK serves 92% of city territory. 90% of the city population have the in-house water services, 2% - consume the water from the water taps in the streets (within KVK water supply network) and the remaining 8% - are either not connected to the KVK water network or are connected to the other utilities water supply networks.

With regard to the wastewater system the KVK serves 90% of the city inhabitants. At the same time about 1.5 % of domestic wastewater is collected by KVK from the territory not served by the utility.

The total production of drinking water is estimated as 186,300.00 m³/day. This estimate is based on the capacity of pumps at pumping stations. It is thus more a reflection of a norm-based production than of actual consumption. The norm for issuing bills for water consumption depends on the type of housing and on certain living conditions, e.g. apartments with or without hot water, wastewater collection etc.). Therefore the norms vary from approximately 85 l/c/d - for dormitories/hostel up to approximately 300 l/c/d for the apartments with in-house water supply and wastewater collection.

3.2 Existing water supply system

Kaliningrad utilises three different sources of water:

- Water from the river Pregolia (Southern water intakes No.1 and No.2);
- Water from reservoir storage – about 8.7 mill m³, filled by precipitation (Central water intake);
- Ground water.

There are four water purification and pumping stations in Kaliningrad:

- 1 South water intake No 1, which delivers water from the riv. Pregolia with raw water storage for 7 days;
- 2 South water intake No 2, which delivers water from the riv. Pregolia with raw water storage for 10 days;
- 3 Central water intake, which delivers water from the storage (around 8.7 mill m³);
- 4 Underground water.

The first two stations deliver about 120,000.00 m³ per day while the central water intake gives about 35,000.00 m³ per day. The underground water intake gives about 33,000.00 m³ per day although the maximum capacity of this intake is 230,000.00 m³ per day.

All surface water is treated with chemicals (Aluminium) and chlorinated and ground water is also chlorinated. There is no strict division of the city into water supply zones as it was constructed as a circuit supply system.

The water network comprises of 481.5 km of water pipes, and 121.4 km of water mains. About 190.5 km of the pipe network is in dimensions less than 300 mm. More than 95% of the pipes are of cast iron and about 5% are of steel.

3.3 Existing wastewater collection

There are two types of wastewater collection system in Kaliningrad:

- Combined sewerage system;
- Separate sewerage system.

The wastewater system comprises of 536 km of sewers. Concrete is the main material used for the pipelines.

3.4 Existing waste water treatment

There is only one wastewater treatment plant. The plant is only for mechanical treatment. Treatment process consists of:

- Screens;
- Sand traps;
- Primary clarifiers.

The design capacity is 68,000.00 m³ per day. Factual (estimated) capacity is about 160,000.00 m³ per day. Treated water is discharged into the bay.

Sludge from the clarifiers goes to the sludge beds. The sludge is then (illegally) used for private gardening.

Regional Environmental Committee has approved temporary discharge limits for KVK and does not charge fees or penalties because of environmental activities in connection with the EBRD project.

3.5 Consumer groups, unit water consumption and metering

The information, available to the team, about the "water balance" is presented in Table 3.1.

Table 3.1: Water Balance Information, based on October 1999 data

Text	Note	Figure
Total water production	Based on capacity of pumps	186,300 m ³ /day
Household consumption	Based on the norms 85-300 lcd (depending on accomplishment of the apartments) for 450,000 population	99,000 /day
Industrial consumption	Based on meters or average consumption in case where the meter is temporarily out of operation	22,000 m ³ /day
Budget enterprises consumption	Based on meters or average consumption in case where the meter is temporarily out of operation	14,000 m ³ /day
UFW	Not known - figure corresponds to residual calculation.	51,300 m ³ /day
"Treated" wastewater	Estimated inflow to WWTP	160,000 m ³ /day
WWTP capacity	Design capacity	68,000 m ³ /day

All figures concerning water production are very rough estimates. There are no water meters installed at the water purification plants, which means that water production is calculated as design capacity of pumps multiplied by operation hours. Several years ago several Russian produced ultrasonic water meters were installed at the water purification plants but after operating for one year they were damaged and their usage was cancelled.

Domestic consumption is also calculated on the norm basis. In reality household consumers are likely to receive significantly less water than the norm of 85-300 l/cd. In other words while the billed tariff is very low the real m³ tariff is likely to be somewhat higher.

The overall situation with regard to water metering in the city is very poor. Only some of the buildings are equipped with group water meters (industrial enterprises, administration, office etc. but not housing). These water meters are not properly maintained so measurement results are not reliable.

In total there are about 2,500 apartments equipped with meters and about 500 the households who reside in private houses pay according to the meters installed.

In 1997, the KVK made a calculation of the costs involved in installing group meters in the city. The result was that the expense for equipping all buildings with group meters would amount to 20 billion roubles (in 1997 prices) and this was not affordable. Besides the financial problem there is also a technical problem : due to the poor condition of some of the pipelines in the buildings it is difficult to install new water meters. However, all newly constructed living apartments are equipped with individual water meters for hot and cold water.

The KVK, as well as other firms, provide services for the installation of individual meters according to personal request of inhabitants. They charge approximately 1,500 RUB (700-800 RUB for the meter itself plus 700-800 RUB for its installation).

3.6 Water supply system operations

3.6.1 System performance

The water supply does not provide a 100% coverage of the 24 hours supply. The reason is the lack of capacity of the water purification plants. That is why some of the plants (central water station) stop delivering water during the night (from 24:00 till 05:30) and then treat the water and store it in order to have enough water during the day.

The pressure in the network also differs, 28 – 30 meters in one district to 8 – 10 m in another. Often flats on the 4th and 5th floors have insufficient water during the daytime.

The performance of the network is very poor. The number of breakdowns are about 100 – 130, per kilometre, per year. The network is designed so that in order to repair some of the breakdowns it is necessary to switch off whole districts of the city. This of course reduces the service level to customers. Currently, neither capital repairs nor rehabilitation of the network are carried out and this has been the situation for several years.

3.6.2 Water quality

The sanitary authorities in the region have established a good system for monitoring the quality of drinking water. According to data presented, the quality of drinking water generally corresponds to the federal standard. However, there are some deviations from the standard (failed tests). The failed tests typically relate to:

- Colour (likely to be a result of water treatment process and lack of 24 hour supply);
- Residual aluminium (in particular where water is supplied by Southern treatment plant No. 2);
- Residual chlorine (likely to be a result of water treatment in particular during periods where additional chlorine is used due to poor quality of raw water supply).

The main source of water is river Pregolia. The river is very shallow. During strong westerly winds, water flows from the bay into the mouth of the river. As a result the discharge from WWTP reaches the water intakes. When this occurs the supply of water to the two water intakes (No 1 and No 2) is shifted to two emergency reservoirs which have limited capacity of about one week. If this situation lasts for more than a week there may be a problem with adequate raw water supplies.

Sometimes the central water source, which is refilled by precipitation, may substitute the missing river water. However, if the summer has been dry the source may not be able to provide sufficient water.

In these cases the city water supply faces a predicament. The Sanitary authorities will authorise the use chemicals and chlorine above standard levels for water treatment. As a result, the residual concentration of Aluminium and Chlorine can be higher than standard. In extreme cases (last in 1997) use of water for drinking and cooking may be prohibited and water is then supplied to citizens in cans.

One of the complaints of inhabitants is the colour and the taste of delivered water. The reason can be the way in which the system operates i.e. the fact that the water supply is cut off at night.

Data presented by the sanitary authorities shows that since 1991, significant improvements in the quality of water have been achieved for chemical and for microbiological contamination. The authorities explained that this is due to the closure of a paper and pulp factory (which polluted the river with large amounts of phenol and other substances) and to an improved co-operation with the KVK.

3.7 Wastewater collection system operation

The main problem of the sewerage network is the lack of capacity. Some of the main gravity pipelines work in pressure mode.

Flooding of ground floors and streets occurs from time to time. During heavy rainfall it is sometimes necessary to open direct emergency discharges.

3.8 Implications of the planned project

The feasibility report from Krüger estimates the total cost of the project to be USD 592 million, and this includes physical and price contingencies, financial cost, PIU support and institutional strengthening.

Furthermore, the report from Krüger concludes that an increase in tariffs of 287%, compared to the 1998 level, is needed in order to make the project feasible, cf. Table 3.2.

Table 3.2: Necessary tariff increases in order to have a feasible project

Year	1999	2000	2001	2002	2003	2004	2005	2006
Increase	30%	20%	20%	40%	30%	6%	6%	1%

However, the actual total payments were halved in the first half of 1999 so the necessary increase of payments was not fulfilled. Due to the increase in the water tariff in July 1999, the real water tariff was 17% above the 1998 level by the end of 1999.

Hence, when compared to the 1999 level, it is necessary to increase tariffs at a higher level than that shown in Table 3.2. This is discussed in Chapter 6.

CHAPTER 4

INSTITUTIONAL FRAMEWORK AND POLITICAL ACCEPTABILITY ANALYSIS

This chapter is based on interviews with City Administration officials and representatives of political parties, and the political acceptability of increases in cold water tariffs is discussed.

4.1 The framing of the water issue

There is no doubt an intention among prominent representatives of the city administration to increase water tariffs. This intention is due to a principal acknowledgement of the rationale of full cost-recovery. The administration would, in principle, also prefer, that the repayment of the EBRD loan could be covered by revenue generated solely by the Kaliningrad Vodokanal, - and not by the city budget / tax payers in general.

However, these considerations should be viewed in contrast to those which tend to lead to a slow adoption of a cost recovery policy, namely:

- Widespread concern over the social impact, i.e. that higher water tariffs are unaffordable to major segments of the population;
- The lack of an automatic inflation adjustment mechanism for water tariffs and the fact that water tariff changes have been irregular since 1996;
- The fact that if the cost of municipal services make up 19% or more of a household net income, this household is entitled to a social subsidy. This will lead to some spill over of higher tariffs in higher municipal expenditures for social purposes. The benefits of targeted subsidies do not seem to be appreciated by politicians and city administration officials.
- Apparently, at Federal level, it is currently being discussed whether the date for full cost recovery for municipal services from the year 2003 should be postponed until the year 2008. This lessens the pressure on the Kaliningrad political-administrative system to implement full cost recovery tariffs;
- The city administration has not yet developed a strategy on how to implement a cost-recovery policy for the water and wastewater services. It is our impression that the City is finding it very difficult to decide how to deal with the many conflicting objectives;
- Some of the civil servants interviewed have a rather relaxed or realistic attitude towards the water tariff issue, stating that full-cost allocation to the consumers easily may take a period of 10 years to achieve.
- Part of the city administration seems quite prepared to repay the water loans (partly) via the city budget, if the tariffs do not generate a sufficient revenue stream the coming years. However, it is not clear to the team whether the city has calculated how this would impact on their ability to maintain other expenditures.

4.2 The service level issue

Representatives of political parties see the drinking water quality issue as being very high on the political agenda in Kaliningrad. Drinking water quality is particularly discussed in terms of regularity of supply and hygienic water quality. There is a wide spread perception (which is partly wrong as discussed above) that it is unhealthy to drink the water in Kaliningrad.

Surprisingly there is limited concern among political representatives about the absence of wastewater treatment in Kaliningrad. However, the population interviewed assigns high priority to achieving a clean aquatic environment in the river and bay.

This "bias" in the perception of what is important, in relation to the cost structure of the proposed project has implications for the way in which the benefits of the project and the tariff increases,

2 It is not clear from the text whether communal services, in the last bullet, also include gas and electricity. Generally, these services are not considered to be communal services. In the Presidential Decree "On the reform in the communal services in the Russian Federation" it is written that payments for gas and electricity supply are included into the subsidy calculation.

resulting from the project, should be presented. It seems that there is a need to emphasise the benefits of the wastewater treatment component and to consider, carefully, how the tariff increases are explained to the population.

4.3 Tariffs regulations

A number of federal regulations influence revenues from municipal utilities. In our view these federal regulations are not always clear. They may be subject to interpretation and they may in certain cases be internally inconsistent.

The key regulations are:

- Decree of the President of the RF dated April 28, 1997, #425 «On the reform in the communal services in the Russian Federation»;
- Ordinance # 66 «On introducing a regional standards (for 1999) of transition into a new system of payments for communal services in Kaliningrad Oblast» issued by Head of Kaliningrad Oblast Administration on February 16, 1999.

According to the presidential decree and its regional implementation:

- the share of payments by the population for communal services is (to be) 60% of the total costs of communal services (maintenance and repair of houses, including capital; heat supply, water supply, gas supply, electricity supply); and
- the maximum allowable share of household expenditure for (payment for) houses and communal services in total household income, calculated based on social norm of consumption of communal services - is (to be) 19%².

Furthermore, the payments of municipal services is regulated by:

- Regulations No.5- Φ3 «On veterans», No. 181- Φ3 «On social protection of invalids in the Russia Federation», No.3062-1 «On social protection of population which was influenced by radiation due to Chernobyl Nuclear Power Station catastrophe», No.1761-1 «On rehabilitation of victimised people due to political repression», No. 98- Φ3 «On the status of the heroes of USSR and RF and Cavalier of Order of Honor of 1st, 2nd and 3rd degree», etc. and by privileges to 43 specified segments of the population stating that households belonging to these groups only pay a part (typically 50%) of the water and wastewater tariff, cf. list in Appendix 2. The rest is to be paid by federal and municipal authorities to the Vodokanal.

4.4 Tariffs for municipal services

In general, all municipal services are paid according to norms, though there are about three thousand households which pay for cold water according to the meters. Only gas and electricity are paid according to consumption. Table 4.1 illustrates the costs of municipal services plus gas and electricity. As an example we have chosen the costs for one person living in a one-room apartment. Specific costs will depend on the number of persons and the size of the apartment as well as on actual consumption for gas and electricity.

³ Cold and hot water tariffs are determined separately and part of the tariff for cold water exceeds that for hot water by 40%. This anomaly is likely to be related to EBRD focus on cold water tariffs as the basis for the loan covenants.

Table 4.1: Cost of municipal services in Kaliningrad 01 Nov 1999 - one person living in a one-room apartment

Prices for one room 32 m ₂ standard apartment with one person	Units	Tariff	Actual price	Full cost recovery ¹	Cost recovery
RUB per month				in per cent	
Housing services					
Rent payment	Per m ²	1.00	32.00	32.00	100%
Lift	Per person	7.00	7.00	10.00	70%
Garbage	Per person	2.10	2.10	2.40	88%
Sub-total			41.10	44.40	93%
Communal services					
WS and WW	Per person	16.51	16.51	27.52	60%
Central heating	Per m ²	0.98	31.36	188.78	17%
Hot water	Per person	11.57	11.57	65.77	18%
Sub-total			59.44	282.07	21%
Gas and electricity - 100%					
Electricity	Per kWh	0.38	15.58	15.58	100%
Gas ²	Per m ³	0.80	11.70	11.70	100%
Sub-total			27.28	27.28	100%
Total			127.82	353.75	36%

1. This is the full cost recovery level calculated officially. It may differ to what one would consider "full cost recovery" using international accounting standards. In addition, prices have been evaluated at local prices and not at border prices. For example the price of electricity is low compared to international prices.

2. The gas consumption norm is deviate from 1.3 to 28 m³ a month (and depends on availability of central heating, hot water, type of heater for hot water, type of apartments' heating) with monthly payments (1 person) of 11.7 - 25.2 RUR, in the case of meter installed - the price of gas is - RUR 0.8 per 1 m³. In the case of gas heating of apartments a person should pay RUR 2.93 per 1 m² of apartment, while the consumption norm is 6.5 m³ a month by 1 person, in the case of meter installed the household should pay RUR 0.55 per 1 m³.

The table illustrates that the level of cost recovery differs widely from service to service. For most of the services the cost recovery is above the 60% mentioned in the presidential decree, but the present cost recovery is quite low for central heating and hot water³. Furthermore, the table illustrates that even using official full cost recovery figures consumers still only pay approximately one third of the "full cost" of these services. As a total this seems to be significantly below the 60% mentioned in the presidential decree.

Both characteristics indicate that the price of municipal services is set through a negotiation process rather than as the result of clear and transparent regulations.

4.5 A note on social considerations

Social considerations are high on the agenda of policy makers and administrators in Kaliningrad. Table 4.2 illustrates the share of the cost of municipal services in total income for two typical family types.

Table 4.2: Monthly cost of municipal services, gas and electricity relative to income for two typical household types - Kaliningrad 01 Nov 1999

	Income	Cost of services at current prices		At "full cost recovery" prices	
		RUB	% of income	RUB	% of income
Typical pensioner (single)	450	128	28%	354	79%
Typical wage earner (single) ¹	1,465	128	9%	354	24%

The table illustrates that social considerations are very important in order to assess the affordability of full cost recovery of municipal services because the ability to pay full cost recovery tariffs differs widely between socio-economic groups. A typical pensioner will clearly not be able to pay full cost recovery tariffs. At the same time a typical wage earner may still pay a smaller share (of a higher income) if he had to pay full cost recovery tariffs for all municipal services than the typical pensioner pays today. The issue is further elaborated in Chapter 6.

There are currently two types of regulation in force to protect the weaker social groups. One regulation states that persons who can demonstrate that their expenditure for municipal services exceeds 19% of their income can apply for a subsidy. Only few households (approximately 4,000 households or 2% of the total) have applied for such a subsidy.

The lists of so-called privileged categories of the population constitute the other regulation. In Kaliningrad 43 groups composed of between 5 persons and more than 60,000 persons generally pay only 50% of the expenditure for municipal services.

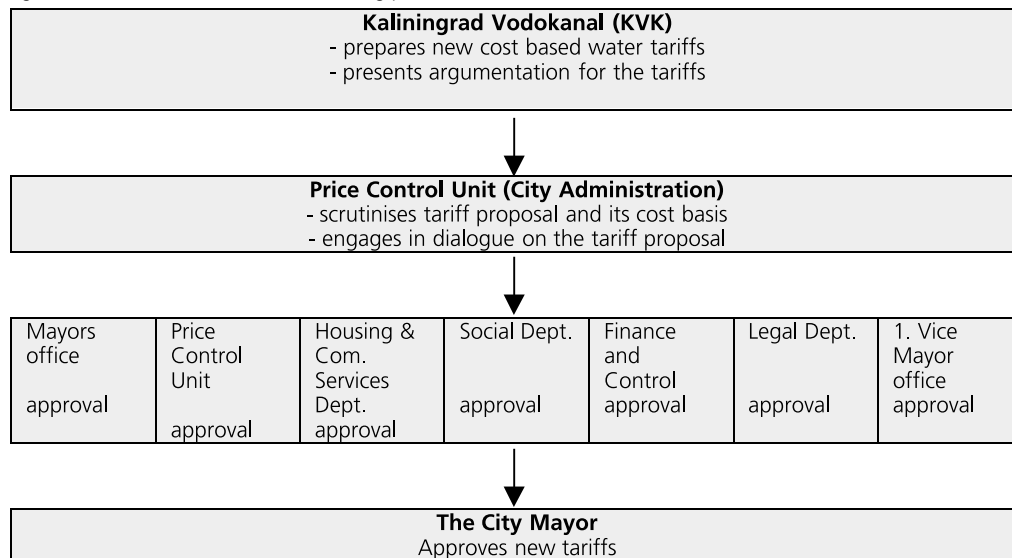
4.6 The tariff setting process

The Kaliningrad municipal authorities are responsible for setting and inflation-correcting the water tariffs. Until mid 1996, the tariffs were corrected for inflation on a quarterly basis but since then the adjustments have become fewer and correspondingly more drastic.

4.6.1 Description of current situation

The tariff setting process is illustrated in Figure 4.1.

Figure 4.1: Overview of current tariff setting process



Several aspects should be noted. Firstly, no direct political influence is exercised, as it is not within the competence of the city council to deal with water tariffs. The decision-making is very much an internal administrative affair that involves a range of city administration departments.

Secondly, no anti-monopoly authorities are involved. The Price Control Unit somehow guards consumers' interests. However, this unit should also serve the interest of the Vodokanal; hence it sees itself primarily as the one securing that proper decisions in line with tariff formulas are being taken rather than "the consumers voice".

Thirdly, the process is closed. Neither environmental groups nor industry representatives have a say during the process. The representatives of the organisations that we have interviewed express that, not only do they have no influence on water tariff policy, they have very little information about ongoing discussions about the water and wastewater service level and tariffs. In that way the city administration "protects" itself from the Non-Governmental Organisations. The cost hereof may be that the rationale of water pricing is not being spread widely within the civil society.

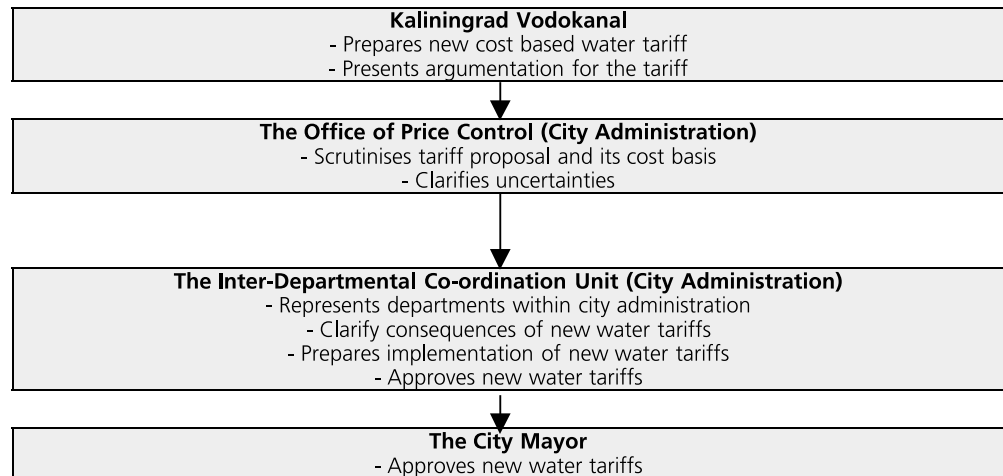
Fourthly, the current system of setting tariffs effectively leaves the Mayor's office with the right to veto the tariff.

Finally, it should be remarked that a number of departments within the city administration have to approve the new tariffs. Until now, this has taken place informally but also somewhat chaotically. Therefore a new structure, which is briefly described below, has been planned.

4.6.2 The Proposed Inter-Departmental Co-ordination Unit

It is currently under consideration whether to establish an inter-departmental coordination unit aimed at formalising, what is now an informal, co-ordination and negotiation process between the departments. The departments should be represented by high-ranking civil servants having autonomy and "weight" to take decisions on behalf of the department that they represent. The inter-departmental co-ordination unit will also include the representatives from the largest enterprises in the city. For an overview of the new structure see Figure 4.2.

Figure 4.2: The proposed structure for the water tariff setting process



The proposed structure is justified on the grounds that water tariff increases have several practical consequences and therefore should be co-ordinated. If this is the case the new structure definitely seems logical and is an improvement vis-à-vis the existing situation.

Rather than being a purely technical-administrative forum the new unit could develop into an arena for bureaucratic policy-making where the various departments would seek to maximise influence over the direction and content of the water pricing policy. In order to avoid this, it is important that the politicians lay out unambiguous principles for water pricing to secure that the new forum only performs the role of co-ordination.

4.6.3 Who actually decides water tariffs?

Similarly to the situation in other Russian towns, the Vodokanal in Kaliningrad has very little autonomy in proposing (or setting) water tariffs compared to the water and wastewater utilities in the CEE.

The municipal administration, which formally is responsible for approving new tariffs, is constrained by a number of federal regulations. Perception of the rigidity of these constraints differs. A number of persons interviewed within the administration including the Price Control Unit of the Housing and Communal Services Department have expressed that the federal regulations on tariff setting leave little room for interpretation and negotiation. However, we do not share this view.

In our opinion, the tariff setting process has many characteristics of a political / administrative bargaining process under unclear (and dynamic) rules. We base this judgement on the design of the

tariff setting process, the many revisions to tariff proposals which occur during each "round" of tariff approval and the lack of consistency in adherence to federal regulations. The latter may be exemplified by the wide difference in officially calculated cost recovery between, say, hot and cold water, cf. Table 4.1 above. The federal regulation does not distinguish in between hot and cold water.

The Mayor, who is able to veto any proposal and the Vice Mayors and Heads of Departments who have to approve the tariff proposals each have significant influence on the tariff setting process. Their influence is enhanced by the close character of the process.

Politicians, environmental groups, consumer and industry representatives have little or no direct influence on the process of setting water and wastewater service levels and tariffs. Effectively politicians, NGOs, consumer and industry representatives who want to influence the process will have to attempt to influence the process directly via the Mayor or via these bureaucrats.

4.6.4 Conclusions

In relation to the tariff setting process three conclusions emerge:

- Due to the complexity and lack of internal consistency between the regulations, in reality the issue of setting of water tariffs is negotiable. However, a large number of actors are actually or potentially involved.
- Water tariffs cannot be analysed in isolation, but must be analysed jointly with tariffs for other public services such as rent, heating and power.
There are two reasons for the latter point:
 - Household budgets are so tight that ability to pay for one municipal service depends on the cost of the other. Households for which total costs surpass the threshold of 19% of income are eligible for a subsidy. Thus simultaneous changes in charges for municipal services may have spin-off effects on municipal expenditures through the subsidy mechanism. These spin-off effects need to be taken into account.
 - The regulations formally link the tariffs together (stating that on average there should be 60% cost recovery).
- Serious consideration should be given to a mechanism that automatically causes the cost of water and other municipal services to be indexed in order to avoid a renewed gradual reduction in water prices resulting from a cumbersome approval process.

4.7 The political - administrative acceptability of higher water tariffs

It is our impression that water pricing in isolation is not a well-defined political issue. Politically, the water tariff issue is assessed jointly with tariffs for other municipal service and broader socio-economic policy concerns, such as growth and employment, taxation structure etc. This is true both for those political parties such as the "Pensioners Party", which is very concerned with the socio-economic situation of the population in a traditional sense, and for parties like Jabloko, which combines their concern for the socio-economic situation of the population with a perception of the need to transform the economy towards greater use of market mechanism. As discussed in Chapter 6 there is clearly an issue of af-for-da-bility for large segments of the population in Kaliningrad.

We were informed that the 150% tariff increase, implemented during the summer of 1999, caused some reactions from the general public in the forms of letters and telephone calls to the city administration and quite some press coverage. However, judging from interviews with ordinary citizens there is widespread

appreciation that the water tariffs had not been increased for a long period prior to the July 1999 increase and that water tariffs had "fallen" behind the prices of other utilities such as electricity.

Some interviewees expressed that psychologically it is not recommendable to impose few but drastic changes. Rather, these interviewees preferred to return to the pre-1996 situation where water tariffs were adjusted on a quarterly basis.

Furthermore, there was a sentiment that if the public was informed properly and in due time, before the tariff increases and if these were clearly linked to the investment project, it would be easier for the public to accept the tariff increases. On the other hand, the complicated process of increasing tariffs may argue in favour of a few drastic increases until the desired level of "real" water tariffs has been established. However, if the full cost-recovery principle was to be implemented and costs should include the cost of operating, maintaining and servicing the loan of the investment project this would be likely to result in a tripling of the water tariffs (from Nov. 1999 level) over a short period of time. In this case the issue may most likely emerge as a salient political issue.

4.8 The link between water tariffs and municipal expenditures

In Kaliningrad there are a couple of links between the level of the water tariffs and the municipal expenditures.

As far as we understand, the city has agreed, as part of the contract with the EBRD, to meet any shortfall in debt servicing by the Vodokanal from the municipal budget. In this way, a shortfall in Vodokanal revenue (for whatever reason including an insufficient increase in the tariffs) will be fully offset by an increase in municipal expenditures for debt servicing. Thus, the city administration may decide that on the margin it is beneficial for the general taxpayers to pay for the improved water services rather than for water consumers to pay. As mentioned above, parts of the city administration believes this to be the right policy. It has not been part of our TOR to assess whether this is a realistic policy in terms of the expected municipal revenues and competing expenditure demands.

When the household water tariff is increased it affects all households, both those who can afford to pay and those who cannot. For 43 privileged groups, 50% of the increase is transformed into an obligation which the federation or the municipality is to pay to the Vodokanal. Since the federation traditionally does not pay their obligation, the full 50% of the increase is de facto transformed into an obligation which the municipality is to pay. The 43 privileged groups constitute approximately 50% of the population; hence the municipality effectively is obliged to pay 25% of any revenue increase resulting from increased tariffs. In practice this obligation to pay is cancelled out against Vodokanal payables to the municipality.

Finally, citizens may apply for a subsidy for the part of their communal services, which exceeds 19% of their income. The procedure is cumbersome for the citizen and currently only used by approx. 2% of all households, although a much higher share of households is likely to be entitled to such a subsidy. Thus an increase in water tariffs may trigger a higher propensity to apply for this subsidy.

It would be possible for the city administration to calculate the effects on the city expenditures under different assumptions about price increases, Vodokanal revenues, and about the propensity to apply for subsidies. However, such calculations are apparently not being made.

CHAPTER 5

WILLINGNESS TO PAY

5.1 Introduction

The objective of this chapter is to present the methodology applied and the results of the stated preference based survey for finding willingness to pay.

The methodology comprises a number of steps. These include background research, qualitative research and quantitative research. Each of the steps is discussed in the section on methodology.

The quantitative research is based on interviews with 150 consumers living in Kaliningrad and being responsible for paying the household water bill. The respondents are already in an expenditure survey panel, so the information on the respondents is not limited to the content of the stated preference survey.

In order to assess the willingness to pay a stated preference approach has been used, and the results indicate some willingness to pay. There is willingness to pay to improve water quality and to get 24 hours supply with consistently high water pressure.

5.2 Stated preference survey methodology

The method applied in this stated preference survey contains a number of tasks. These include:

- 1 Background research
- 2 Qualitative research
- 3 Design of questionnaire
- 4 Pilot survey
- 5 Final survey
- 6 Data analysis.

Each of the tasks is elaborated in the following paragraphs.

5.2.1 Background research

The first step in the analyses is background research. The purposes of the background research are to:

- Understand the realistic technical options/alternatives and in particular their impact on realistic service levels;
- understand payment collection, enforcement and usage measuring principles and practices, and the financial standing of the utility;
- understand the socio-economic context, in particular income levels and distribution and types of households.

The background research in Kaliningrad have also included:

- Discussions with other team members covering technical and financial issues;
- consultation of earlier reports, statistics, working papers giving general introduction to the utility and the local economy in Kaliningrad.

5.2.2 Qualitative research

Following the background research, qualitative research amongst customers is undertaken. The purposes of the qualitative research are to:

- Gain a first understanding of which service factors are perceived as important by consumers, and which factors are the more important;

- gain a first rough understanding of willingness to pay for improved water services and the most important factors;
- understand the cultural context and formulations understood by consumers in relation to water and wastewater utilities.

Two types of interviews were carried out in Kaliningrad. Six face-to-face interviews and one focus group with six respondents. An open-ended topic guide was applied in both types of interviews. However, they were each designed to the type of interview they were used.

The face-to-face interviews were conducted in an interview room. Two interviewers interviewed each respondent with consecutive translation by a professional interpreter. Each interview lasted between 50 minutes and 60 minutes.

The focus group was carried out with simultaneous translation. The topic guide was translated into Russian and in addition two option pairs were presented to test willingness to pay. The moderator was from the local consultant and she was briefed before the focus group took place. The respondents sat round a large table with the moderator. The research team sat at another table a few metres away with an interpreter who provided consecutive translation of the moderator and the respondents. The focus group lasted about one and a half hours.

It was decided that the interview team would not interfere in the conduct of the group regardless of what happened so that the method could be tested.

5.2.3 Design of questionnaire

On the basis of the information gathered in the background research and the qualitative work the questionnaire is designed. The questionnaire includes:

- present water and wastewater services;
- attitude toward the water services;
- willingness to pay for improvements;
- socio-economic background.

Many subjects can be covered by a questionnaire. However, a selection has to be made in order to keep the length of an interview acceptable to the respondent. Therefore e.g. wastewater treatment has not been covered in depth in the research for Kaliningrad.

A long list of possible improvements to the water services was identified in the qualitative research. The possible changes in service levels are divided into three groups. The most important services are included in a stated preference game as described below, but only a limited number of services can be evaluated in the stated preference game. Importance-rating questions are included in the questionnaire to have the respondents' evaluation of other services. Finally, some possible changes of service levels were assessed to be of minor relevance/importance and they have not been included in the questionnaire.

The willingness to pay is examined by using stated preference games. An example of a choice task in the stated preference game is presented in Table 5.1. Here the respondent must decide whether she prefers to pay 50% more to have water that is always safe to drink, with no smell at all, and supplied

24 hours a day with good pressure or water as now and only 10% more expensive. If water quality and supply are important issues to the respondent A is preferred, if money saving is important to the respondent B is preferred.

Table 5.1: Example of a choice pair

A	B
WATER QUALITY: always safe to drink directly from the tap SMELL: no smell at all SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure. COST: plus 50%	WATER QUALITY: as now SMELL: as now SUPPLY AND PRESSURE: as now COST: plus 10%

A number of choice-tasks like the above are presented to each respondent. There is a limit to the number of choices a respondent can undertake while remaining concentrated and giving a realistic choice. In Kaliningrad eight choice-tasks were presented to each of the respondents.

The stated preference game consists of four factors:

- water quality;
- smell of cold water;
- supply and pressure; and
- cost.

The stated preference analysis is exploring the willingness to pay for improvements. Different levels represent each of the factors. The levels describe different service levels and they are the service levels that can be evaluated when analysing the game. For the service factors all levels as least as good as the present situation and the costs are only increasing compared to the present situation. The levels are described in Table 5.2.

Table 5.2: Factors and levels in the stated preference game

Factor	Levels
Water quality	<ul style="list-style-type: none"> • as now • always safe to drink directly form the tap
Smell of cold water	<ul style="list-style-type: none"> • as now • no smell at all
Supply and pressure	<ul style="list-style-type: none"> • as now • 24 hours supply and pressure as now • 24 hours supply and always good pressure
Cost	<ul style="list-style-type: none"> • as now • plus 10% • plus 25% • plus 50%

Respondents

The respondents in the survey were chosen from the consumer panel in Kaliningrad. This should make the respondents representative to the entire population in Kaliningrad.

The consumers in the expenditure panel are chosen based on a list of the population in 1994. The population was divided into groups with similar characteristics, based on:

- age;
- gender;
- sources of income;
- level of education;
- size of household;
- type of living area, apartment; and
- availability of land for growing vegetables and fruits.

The consumers in the expenditure panel are chosen randomly from the groups and hence representative to the general population. The respondents interviewed in the stated preference survey are a sub-sample of the respondents in the expenditure sample. Only respondents living inside Kaliningrad were interviewed. Hence, the results are representative to the inhabitants of Kaliningrad, and the sample need not to be weighted to represent the inhabitants.

5.2.4 Pilot survey

The pilot survey is used to test the design of the questionnaire and to identify necessary changes.

In Kaliningrad, 25 interviews were conducted and the results were analysed. The answers are checked in order to ensure that all questions are well understood and that the stated preference game is working well. Checking the stated preference games includes assessing if all parameters are relevant to the consumers, and if the levels of e.g. cost are perceived to be within realistic limits. As an example if respondents choose alternatives with the lowest cost in most stated preference questions, the increases in cost levels should be adjusted down-ward. This was actually the fact in Kaliningrad.

5.2.5 Final survey

Including the changes to the questionnaire from the pilot makes the final questionnaire. 125 households were chosen from the expenditure panel and interviewed. The household member responsible for paying the water bill was interviewed.

5.2.6 Data analysis

Both the data from the pilot and the data from final questionnaire are included in the statistical analysis. This is possible because only few changes were made to the pilot questionnaire. However, where questions differ in the two versions the results from the pilot are excluded.

The stated preference data is analysed by applying advanced statistical tools. A so-called logit model is estimated. Before estimating the model a set of a priori hypotheses is described and these are tested in the model. Examples of such a priori hypotheses are:

- consumers with higher income have a higher willingness to pay;
- only consumers living on higher storeys are willing to pay for better water pressure.

The model also allows for different willingness to pay for consumers with different background, e.g. age. However, all effects in the model must have a clear interpretation.

5.3 Qualitative research

The qualitative interviews were based on two topic guides prepared by using background information about Kaliningrad, including information from the technical part of the team. One topic guide was designed for the in-depth interviews and another topic guide was designed for the focus group. To have a topic guide designed for the focus group is helpful for the moderator. Stimulus was used in the focus group in the form of choice pairs forming basis for discussion. Two stated preference choices were presented to the group for discussion.

The conduct of the focus group was relatively successful, particularly considering the lack of experience of the moderator. Some areas of discussion were not probed as much as we would have liked, with some group members occasionally dominating and others not being asked their opinions. Nonetheless, the group was satisfactory and useful, and the information provided by the focus group differed from that obtained by the in-depth interviews.

Obviously, awareness questions cannot be tested in a focus group without including e.g. a small questionnaire to be filled in individually by the group members.

5.3.1 Results from the qualitative research

Respondent characteristics

The respondents were chosen by the Regional Statistical Committee in Kaliningrad. The respondents were:

- predominantly female and middle aged, but all age groups were represented;
- all living in flats;
- representing a wide range of income groups; from 600 roubles per month for a two-person household to 7,500 roubles a month for a household of two adults and a child; and
- mostly employed, many by the Regional Statistical Committee.

Interviewees were asked to indicate on a map where they lived. This was because there are three sources of water in the city – one provides ground water and two provide water from the river. Some get water from a mix of sources. There was a good spread – five lived in the centre, two to the North West, one North, one North East, four in the South.

Finally, respondents were asked if they thought they would be better off financially next year. Most denied this.

It is assessed that the observed bias of the sample is not critical at this stage of the research because the coverage is still large.

Meters

None of the 13 respondents interviewed had a water meter although the payment for water was considered to be considerably less if a water meter was installed, since the current tariff is based on each person consuming up to 300 litres per day (depending of accomplishment of the apartments).

Five respondents wanted to get a meter. However, it was considered to be both very expensive and a complicated process. Some reported long waiting times, lack of information about how to get them, and further some expressed a need for two meters.

Information

The respondents receive information about water services by the Vodokanal. Leaflets, newspaper, television, etc distribute information on when water can not be drunk (e.g. in the summer when the winds blow from the West). Also information is usually provided about interruptions due to e.g. repairs. Word of mouth is also a useful source.

Water quality

Water quality is believed to be poor in general. The main problems are:

- None of the respondents drink the water straight from the tap. The respondents buy bottled water, particularly in summer when the tap water is bad. Some uses filters (although these are expensive), others keep reserves of water. This is typically from a well.
- Not 24 hours supply everywhere – five said no water at night (e.g. 00:00-6:00).
- Poor water pressure – five had poor water pressure. Some reported that this varied and even described it as causing an interruption in supply during summer when lots of people in the flats used water at the same time. Others mentioned poor water pressure for those in higher storeys, if there was no pump;
- Poor colour of water – two in the group reported reddish or yellowish water, one in the in-depths interviews said the water was dirty. Those without 24 hours supply mentioned that the water is coloured immediately after it is reconnected.
- Sediment – some said there is sediment (lime scale) in the water.
- Smell – some mentioned a chemical smell, a smell of chlorine or a marshy smell.

All but three get hot water from a central source. One said they only get hot water for two hours a day.

Wastewater

There was little knowledge about wastewater treatment. One was aware that work had started on a wastewater treatment plant but had stopped. A couple described the wastewater as bad.

When asked if the Pregolya River and the Kaliningrad Bay were polluted, almost all said that they are polluted: "No one swims in the river". One mentioned dead fish in the river, another bacteria in the lake. Most blamed the paper mill for the pollution and some said that since it had closed the river/bay was not so polluted. None mentioned that the pollution came from domestic waste.

Water bills and payment

All respondents paid for water as part of their household bill. Usually this is paid to Simplex or to a local housing office. The unit cost for most items in the household bill are multiplied by the number of household members. Privileges of typically 50% applies to the total, regardless of how many in the household are qualified for privileges. About half of the 13 respondents get privileges.

Payment is often not regular. Some do not pay their bills for months until some money comes in, e.g. from a husband fisherman returning after six months.

No one knew how the tariff for cold water and wastewater is split – it is not shown on the bills.

Only one person got a subsidy for about a third of the year (a household is entitled to a subsidy if the household bills are more than 19% of household income). A few said that they knew how to obtain the subsidy although it was reported as being very complicated.

Willingness to pay

In the in-depth interviews four out of six thought the price for water is reasonable. In terms of increase in water prices there was a very high awareness of the recent large increase in the water bill (after constant prices for a long time) although the fact that it was not linked to an improvement in quality was a source of annoyance to some. A few persons were aware that the increase was to pay for a loan.

By comparison, the prices of other utilities were seen as constantly increasing (electricity, in particular, was seen as much more expensive) and therefore there was not a general belief of water price increases being linked to other price increases.

The improvements that the respondents demanded in the in-depth interviews were: 24 hours' supply, a water meter, better water pressure, improved water quality, and to be able to drink water directly from the tap. The willingness to pay varied between 10% and 300%.

In the focus group the respondents were shown two option pairs as a stimulus for discussion. In both pairs the improvements were drinking water of good quality, 24 hours supply and high water pressure. All respondents were willing to pay 20% more for the improvements but none were willing to pay 100% more.

5.4 Quantitative research

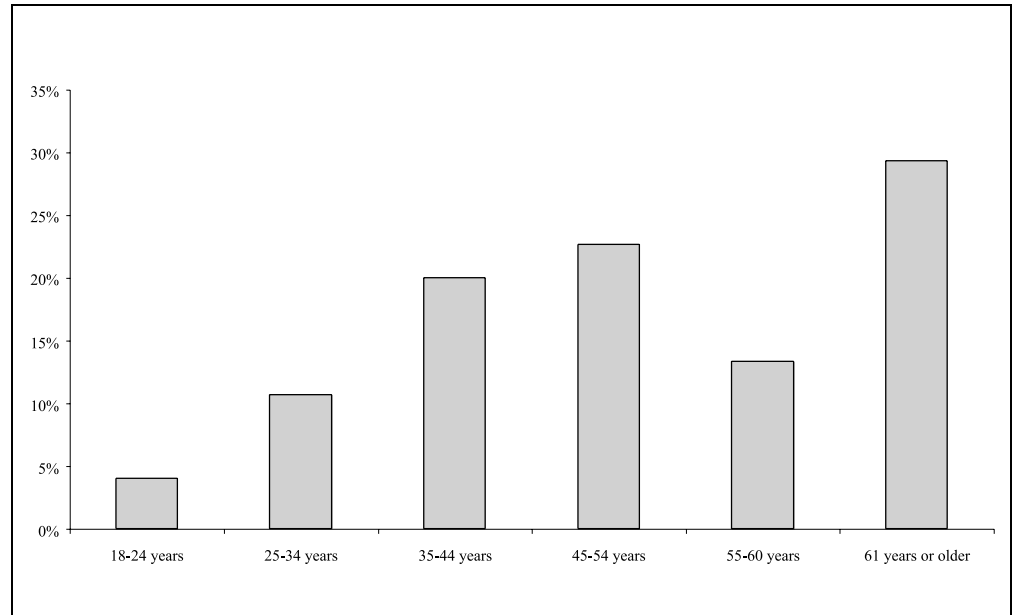
In this section the results of the quantitative questionnaire are presented. The socio-economic characteristics of the respondents are analysed to get some background information about the households. The respondents in the sample are all responsible for paying the water bill.

5.4.1 Socio-economic characteristics

There is an overrepresentation of women in the sample. 81% of the respondents are women. This is because women in Kaliningrad are often responsible for paying bills. The households interviewed in the survey represent both men and women; thus the results are interpreted as household results.

The age distribution is illustrated in Figure 5.1. All age groups are represented among the respondents.

Figure 5.1: Age distribution of respondents



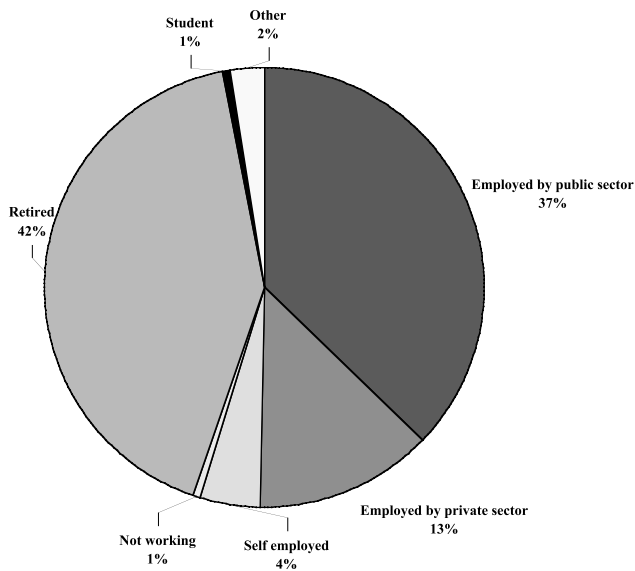
Most of the respondents do not have children living in the household. In 31% of the households there are children aged 6 to 17 years, and in 13% of the households there are infants less than 6 years old, cf. Table 5.3. Most of the households with children have only one child living in the household.

Table 5.3: Type of household

	Percentage
Households without children	63%
Households with children	37%
Households with children aged 6-17 years	31%
Households with children aged under 6 years	13%

All households live in apartments and almost all households live on the first to fifth floor. The employment status of the chief earner is shown in Figure 5.2. A majority of the respondents are employed, mostly in the public sector. The chief earner is retired in a large proportion of the households, cf. Figure 5.2.

Figure 5.2: Employment status of the chief earner of the household

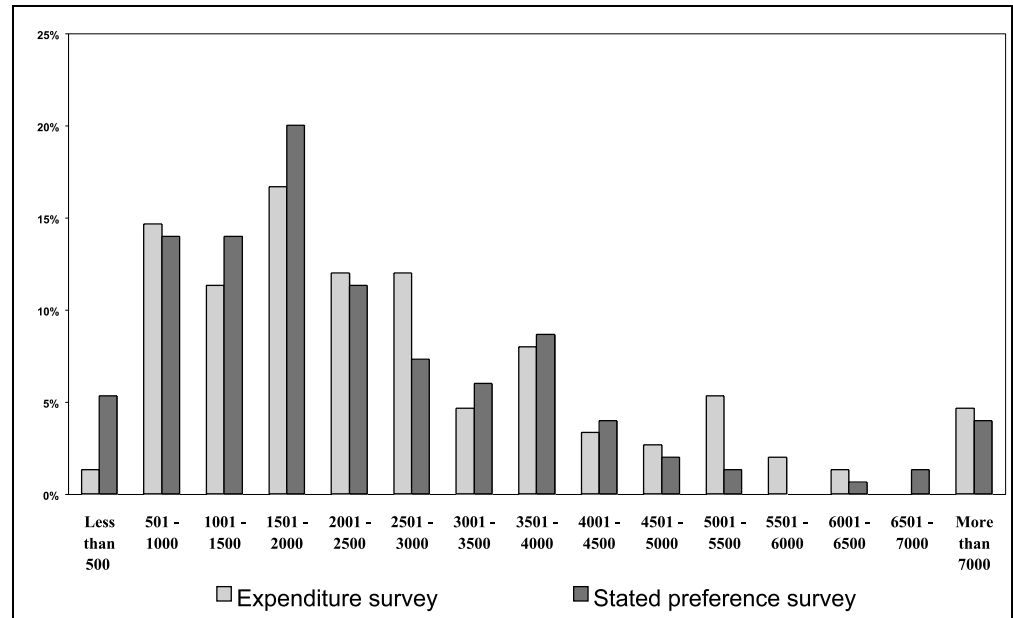


5.4.2 Income

The total expenditures in the survey do not differ significantly from the income after tax. Therefore the income is used in the calculation of the proportion of the income that is spent on cold water services and in the willingness to pay analysis.

In Figure 5.3 the income distribution in the expenditure survey is compared to the income distribution in the stated preference survey. The income in the stated preference survey is a bit lower than that of the expenditure survey. The average monthly income per household after tax is around 2,500 roubles in the stated preference survey and 2,850 roubles in the expenditure survey. This indicates that respondents tend to underestimate their income.

Figure 5.3: Household income after tax. Distribution in the expenditure survey and in the stated preference survey



Note: Both income measures include salary, income from natural resources, subsidies, and gifts. The data in the expenditure survey is from the third quarter of 1999, while the stated preference data is collected in December 1999. Sources: Kaliningrad Statistical Committee and the stated preference survey

5.4.3 Water and wastewater services

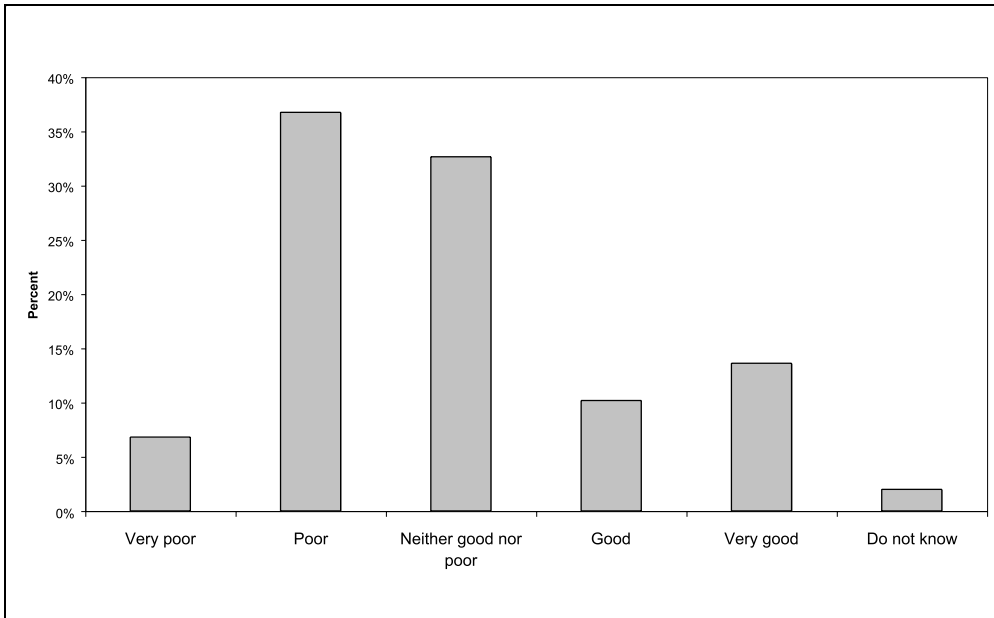
Cold water quality and drinking water

Around 43% of the households have water 24 hours a day. The most frequent times where water is not provided are during the night, between 0:00 and 6:00. However, some respondents do not have water during the afternoon.

Almost half of the consumers state that the quality of the tap water is poor or very poor. One third finds that the water is neither good nor poor and 24% of the consumers find the water good or very good, cf. Figure 5.4.

4 The percentages do not sum up to 100% as each respondent can give more than one reason for not drinking the water.

Figure 5.4: Rating of the quality of cold water

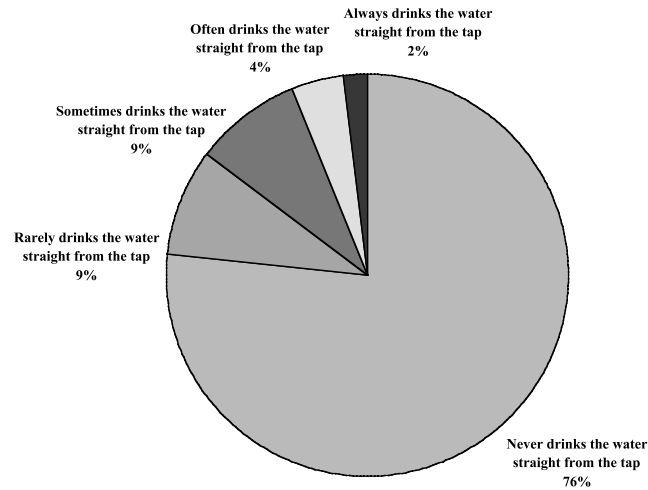


Very few consumers drink the water straight from the tap, cf. Figure 5.5. Compared to the number of households that do not drink the water straight from the tap, the overall rating of the water quality is quite positive. The most important reasons for not drinking the water straight from the tap are⁴:

- healthiness/unsafe to drink, 38%;
- quality of the water, 27%;
- information, 7%;
- smell, 6%;
- bad taste, 5%;
- sediment/rust, 5%;
- boiling of the water instead, 4%;
- drinking well water instead, 2%.

There is a large proportion referring to healthiness as the reason for not drinking the water straight from the tap, and the consumers do not easily monitor this. The general perception that the water is unhealthy is likely to be due to the fact that the water occasionally is unsafe to drink. The uncertainty which this gives rise to can make the respondents think that water is always undrinkable, cf. Figure 5.5.

Figure 5.5: Drinking water straight from the tap



Instead of drinking the water straight from the tap households get water from other sources or they use a water filter:

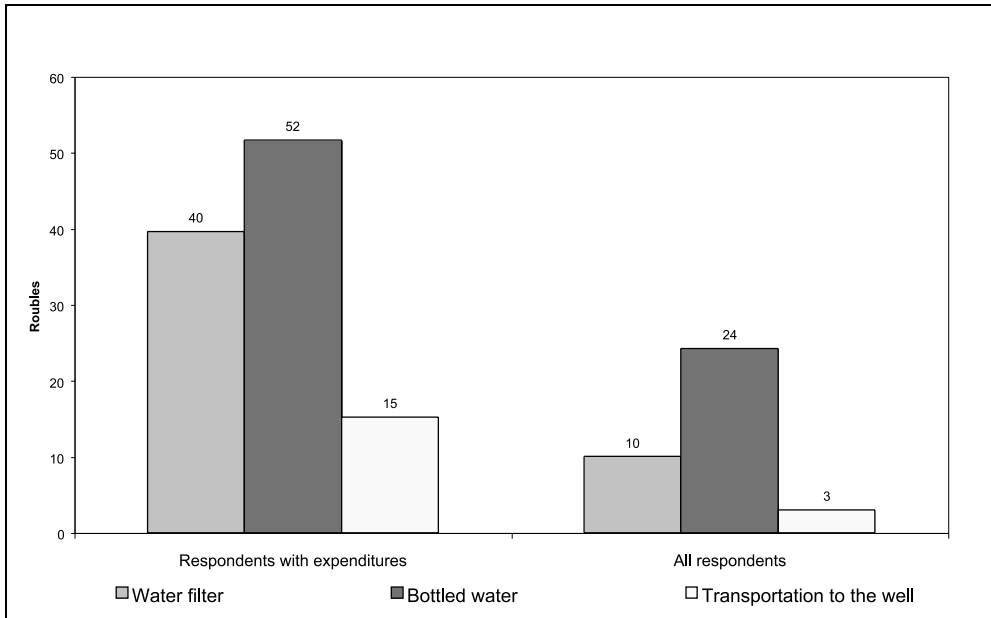
- 45% buy bottled water;
- 19% use water from a well;
- 25% have a filter.

The distance between the home and the well varies between the consumers. Very few have the well within 2 km from the home and a few travel more than 20 km to get water from the well. The amount of water and the number of trips to the well vary between summer and winter. In the summer consumers using well water have 5 trips per month using 70 litres on average, and during winter the number of trips are around 2 per month. The consumption is correspondingly low in the winter with 33 litres per month on average.

One third of the household neither buys bottled water nor uses water from the well or filters the water. Most of them still do not drink the water straight from the tap, so it is assumed that most of them boil the water.

The average expenditures per household to bottled water, filter and well water are shown in Figure 5.6. On the left hand side of the figure only households that actually have expenditures are included, so e.g. the average expenditures on bottled water is found among households buying bottled water. On the right hand side all respondents are included.

Figure 5.6: Expenditures on bottled water, water filter and well water



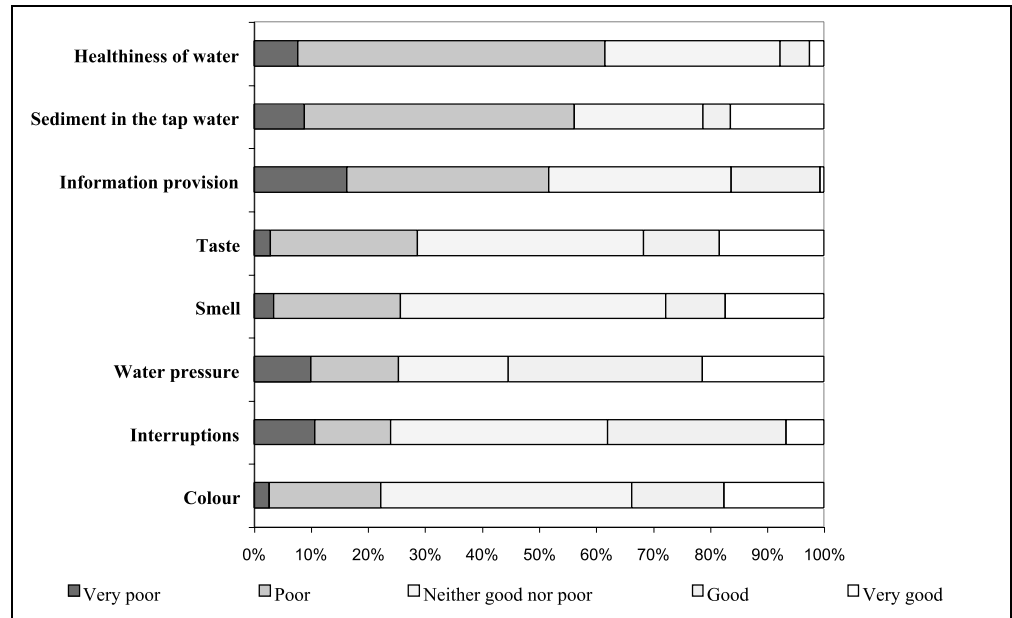
Note: Transportation cost to the well includes direct cost only.

The average monthly spending for all consumers are 37 roubles. Consumers spend more during summer time than during winter. The average amount in the water bill is 31 roubles per month; thus the present expenditures on filter, bottled water, and well water actually exceed the water bill. If the quality of the tap water improves so that the water is drinkable from the tap, tariffs can be increased by more than 100% without burdening the households any further; that is if consumers do drink the water after an improvement in quality.

Rating of aspects of water quality

The consumers were asked to rate various aspects of the water quality. The results are shown in Figure 5.7. The healthiness of water is rated poor or very poor by more than half of the respondents. However, one fifth do not know how to rate the healthiness of the water and this might be related to the information provided. The consumers are also quite dissatisfied with the sediment in the tap water.

Figure 5.7: Rating of various aspects of the water quality



Note: Between 0 and 5% were not able to rate the quality in most aspects. 9% did not know how to rate the taste and 21% did not know how to rate the quality of the water. The respondents answering do not know or not applicable have been left out of the figure.

The respondents are more satisfied with the water supply. More than half of the respondents finds the water pressure good or very good, and a large majority do not find the service related to frequency of interruptions poor. The colour of the water is perceived poor or very poor among very few respondents.

There are significant differences between the attitude in different areas of Kaliningrad. Respondents living in the centre of the city and who receive groundwater are quite positive whereas respondents living in other areas are more divided in their opinion.

In the centre of the city, all consumers are satisfied with the smell, colour and sediment. They are not sure if the water is healthy, whereas a majority of the consumers living elsewhere finds the water quality poor. Consumers living in the centre also find the water pressure good. Most of the respondents living in other areas are more divided, though quite positive.

Most consumers receive some information about the water services. More than half of the consumers receives information through newspapers, radio and television and one third receives information through their jobs. A significant proportion receives information from the Vodokanal. Around 20% of the households have received a pamphlet and some consumers have also received information by phoning Vodokanal or by visiting Vodokanal's office.

Around 25% of the households do not receive any information about the water services.

Some respondents, two-thirds, pay an extra amount for sewage. This payment is neither included in the distribution in Figure 5.9 nor in the analysis of the willingness to pay. than one reason.

Water expenditures and payment

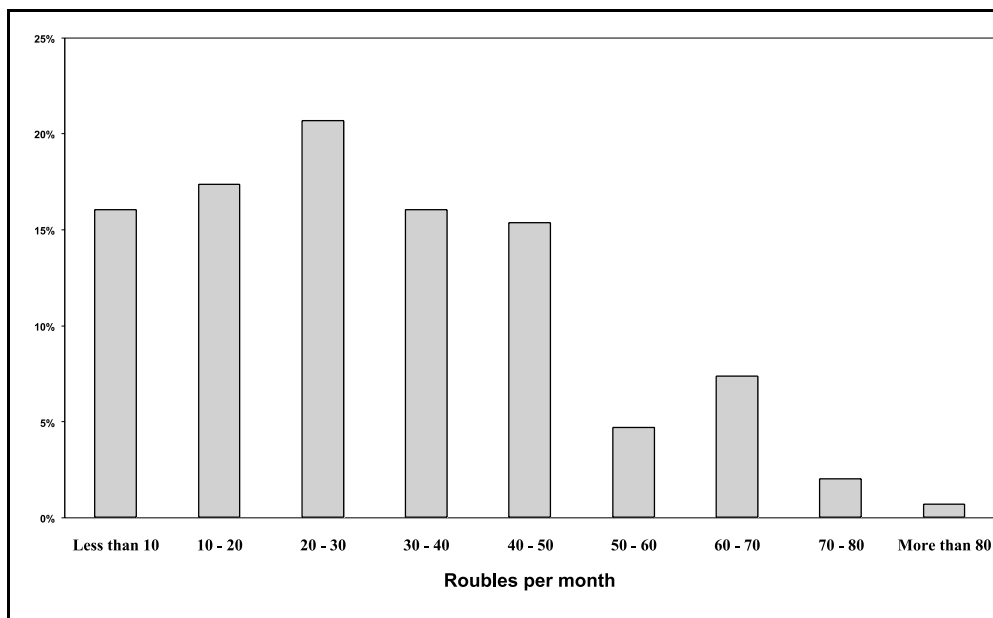
The consumption of water is likely to be affected by the way consumers are billed. If consumers are billed according to the amount of water consumed they are more likely to reduce water consumption as a result of an increase in prices.

In Kaliningrad, most consumers are billed according to the number of persons in the household. Only few of the respondents state that they have a separate meter for the household. Hence, households are not billed according to the consumption as also explained in Chapter 3.5.

The typical monthly charge of cold water is 16.51 roubles per person, and half for consumers with a privilege. In around 60% of the households one or more members receive a privilege.

On average the households pay around 31 roubles for the cold water services⁵. The distribution of the amount paid for water services is illustrated in Figure 5.8.

Figure 5.8: Household payments for cold water services



The consumers are eligible for a subsidy if the sum of expenditures on utilities and rent exceeds 19% of the household income. The willingness to pay for improvement might depend on the eligibility of getting a subsidy, as the households are not paying the increase. At present, only 2% of the households receive a subsidy.

The respondents were asked if they thought that they would be eligible to apply for a subsidy if tariffs were to increase. Half of the respondents were told that prices for rent, electricity and hot water also would increase by 20%, but there is no significant difference in the answers.

A fifth of the respondents stated they would be eligible for a subsidy after an increase of 50%, and

the proportion increases somewhat if the increase in water tariffs is 100%, cf. Table 5.4. Most of the households eligible for a subsidy would also apply for it.

Table 5.4: Eligibility for a subsidy if the water tariff increases by 50% or 100%

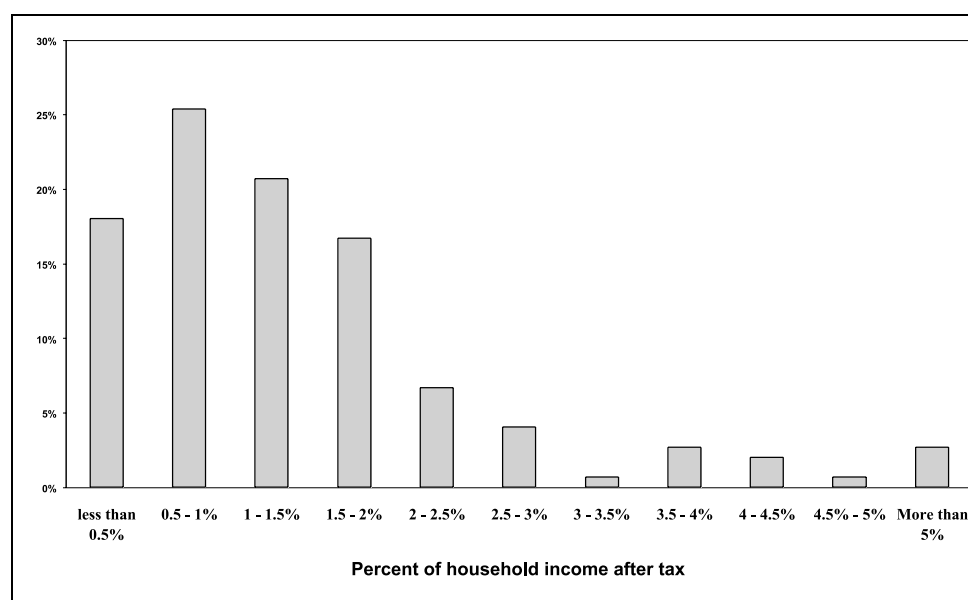
	50% increase	100% increase
Eligible for a subsidy	21%	27%
Not Eligible for a subsidy	56%	49%
Do not know	22%	24%
Total	100%	100%
Would apply for a subsidy	15%	22%

Note: Half of the respondents were told that all other prices would be constant and the other half were told the prices for rent, electricity, and hot water would increase by 20%. However, there was no systematic difference in the answers between the two groups. Only the respondents eligible for a subsidy were asked if they would apply.

More than 70% of the households paid their last water bill in the same month as the interview took place. The bills paid for were mostly related to the current month or the last month. Around 13% of the households are more than one month behind, and another 13% are two months or more behind. This means that around every fourth household does not pay the water bill on time.

The proportion of household income spent on cold water services is shown in Figure 5.9. On average 1.6% of the household income after tax is spent on water services, and the maximum around 10% of the income after tax. The percentage varies between different income groups, cf. Figure 5.9.

Figure 5.9: Water bill as a percentage of the household income after tax



Note: The figure is based on income from the expenditure survey.

Source: Kaliningrad Statistical Committee and the stated preference survey.

6 The percentages do not add up to 41% (i.e. the consumers who think that charges should not be increased) because respondents were allowed to give more than one reason.

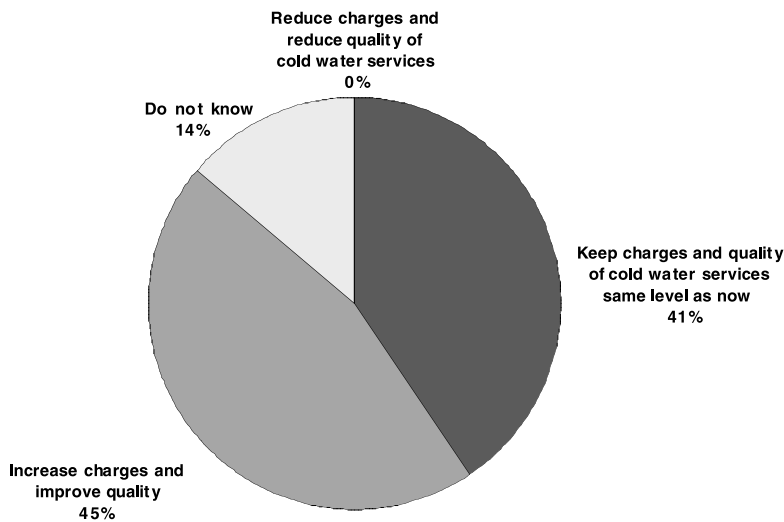
Around 5% of the households spend more than 4% of the household income after tax on water services.

When the estimated expenditures on bottled water, filter and well water are included, the average expenditures on cold water exceed 3% of the household income after tax.

5.4.4 Willingness to pay for water services

None of the consumers find that a decrease in the quality of the water services along with a decrease in the tariff is the best strategy for the Vodokanal, cf. Figure 5.10. On the other hand, 41% of the consumers think that status quo is preferable, while 45% prefer to have an increase in tariffs and better water quality compared to the situation today. Hence, consumers are generally positive towards an increase in water charges, if it is accompanied by better water quality.

Figure 5.10: Preferred strategy concerning water services and water charges



The reasons given for keeping the present water quality and not increasing water charges are e.g. that the consumers cannot afford to pay more (25%), that charges are already too high (18%), and that an increase in tariffs will result in social hardship for the poorest (9%)⁶.

Stated preference analysis

The stated preference analysis is exploring the willingness to pay for improvements. Factors included in the analysis are:

- the quality of the cold water;
- smell;
- supply and pressure; and
- cost.

The purpose of the analysis is to find the willingness to pay for the improvements. The consumers' willingness to pay to avoid a worsening can also be analysed using stated preference analysis and an example of this is found in the case study report on Poznan.

Two levels of water quality are included in the analysis:

- cold water quality as now;
- cold water is always safe to drink directly from the tap.

Smell is included in the analysis, because the qualitative work indicated that this is an important parameter for the consumers. Again two levels are included in the analysis:

- the smell of the cold water from the tap is as now;
- there is no smell at all from the cold tap water.

Supply and pressure have been included in the stated preference questions in order to explore, if households that do not have 24 hours water supply are willing to pay to get it. Pressure is included to analyse if households in some parts of Kaliningrad have low pressure and if they are willing to pay to have a higher pressure. Supply and pressure are combined in one factor with three levels:

- supply and pressure are as now;
- cold water is supplied 24 hours a day and the pressure as it is now;
- cold water is supplied 24 hours a day and always with a good water pressure.

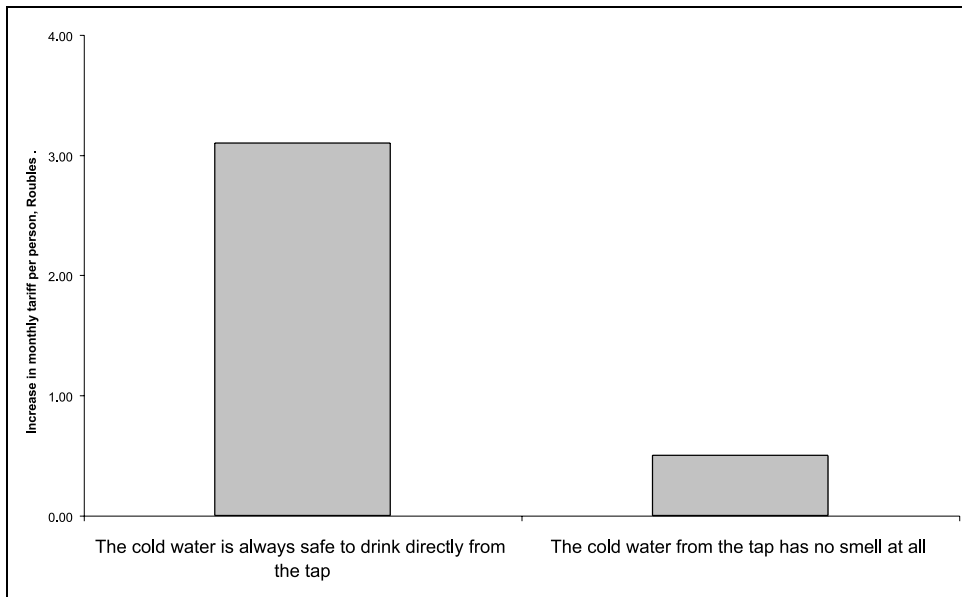
The average willingness to pay for better water quality and no smell are illustrated in Figure 5.11. The willingness to pay is reported in roubles per month per person.

The highest willingness to pay found is for having water that is always safe to drink directly from the tap. On average the consumers are willing to pay a monthly increase of 3.10 roubles per person to get water that is always safe to drink, cf. Figure 5.11. This is an increase of 19% compared to the present tariff of 16.51 roubles.

The consumers are also willing to pay to have tap water with no smell. Respondents are willing to pay 3% more to have water with no smell, that is 0.50 roubles more per person.

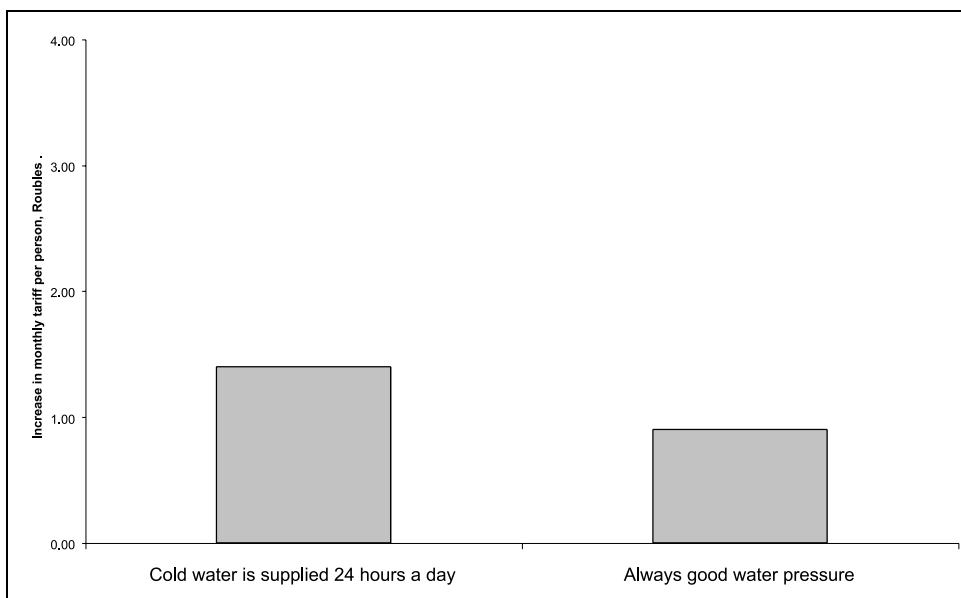
Hence an important issue to stress when increasing the water tariff is that investments make it possible to improve the water quality.

Figure 5.11: Willingness to pay to have tap water that is always safe to drink and that has no smell at all. Increase in monthly tariff per person, roubles.



57% of the respondents do not have water 24 hours a day. Among these there is a significant willingness to pay to get water 24 hours a day, cf. Figure 5.12. The consumers are willing to pay 8% higher tariffs if water is provided 24 hours per day; this is an increase in the tariff of 1.40 roubles.

Figure 5.12: Willingness to pay to have water 24 hours a day and to have good pressure. Increase in monthly tariff per person, roubles



Note: Only respondents that do not have water supply 24 hours per day are included in the willingness to pay for this. Likewise, only households living on the 4th floor or above are willing to pay for improved pressure and their willingness to pay is the one presented in the figure.

Consumers living on the 4th floor or above are willing to pay more to have a water supply with consistently high pressure. Around half of the households in-terviewed live on the 4th floor or above. The households are willing to pay 5% extra to get water supplied with consistently high pressure - or 0.90 roubles more per person per month.

Households living on the 1st to the 3rd floors are not willing to pay anything to improve the water pressure. This applies regardless of where in Kaliningrad the household lives.

Hence, supplying all households with water 24 hours a day will make an increase in water tariffs more acceptable. Improving water pressure is an issue for some households.

The total average willingness to pay is at least 20% as this is the willingness to pay if the tap water is always safe to drink and probably higher as there are some willingness to pay for other improvements as well. However, the WTP for various service improvements are not additive, so a total WTP for all service improvements cannot be derived.

The willingness to pay varies somewhat between age groups and between income groups. The consumers are divided into two income groups based on the household income per household member:

- consumers with income in the lowest quartile (25%);
- consumers with income above the lowest quartile.

The willingness to pay as a percentage of the present water cost is given in Table 5.5. Consumers with a low income per household member are in general willing to pay less than consumers with a higher income. For instance, the willingness to pay to get water supplied 24 hours a day is 6% for respondents in the low quartile and 9% for the rest.

Table 5.5: Willingness to pay for improvements. Increase in current payments

	Increase in percentage		Increase in the monthly tariff per person, roubles	
	Low income	Not low income	Low income	Not low income
The cold water is always safe to drink directly from the tap:				
18-44 years old	19%	28%	3.10	4.60
45-54 years old	15%	21%	2.40	3.50
55 years old and above	9%	14%	1.60	2.30
The cold water from the tap has no smell at all	2%	3%	0.40	0.50
Cold water is supplied 24 hours a day ¹	6%	9%	1.00	1.40
Always good water pressure ²	4%	7%	0.70	1.10

Note: (1) Only household that do not have water supplied 24 hours a day are included. (2) Only households living on the 4th floor or above are included.

Young consumers are willing to pay more to have safe drinking water. While respondents younger than 44 years of age are willing to pay between 19 and 28% more according to income, respondents in the highest age group are willing to pay 9% and 14% more. The same age dependent difference in willingness to pay does not apply for smell and water supply.

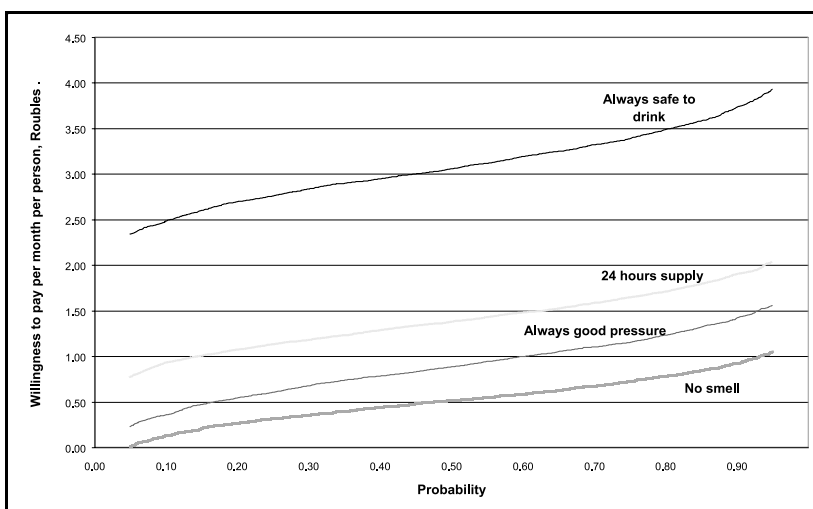
Various hypotheses that did not lead to an affirmative conclusion were explored during the data analysis. These are:

- Consumers with an income in the highest quartile (75% - the richest 25%) do not have a willingness to pay that exceed the willingness to pay among other consumers above the 25% quartile (the richest 75%);
- The difference in willingness to pay for different age groups dominates the difference between households with children and households without children. Households with children have a higher willingness to pay to get safe drinking water, but this is due to the fact that consumers with children are relatively young;
- No willingness to pay is found to improve cold water pressure on the 1st to 3rd floors;
- A general difference in willingness to pay between men and women was not estimated. This could be due to the low number of men in the survey as a difference between men and women have been observed in other case studies, typically with women having a higher willingness to pay for improvements.

Uncertainty

The results of the stated preference analysis are statistically uncertain. In order to illustrate the uncertainty, a confidence interval has been calculated for the average willingness to pay for three of the proposed improvements, cf. Figure 5.13.

Figure 5.13: Confidence interval (90%) for average willingness to pay for improved water services, that is water always safe to drink, 24 hours supply, always good pressure, and no smell. Willingness to pay in roubles per month per person.



Note: The 90% confidence interval is calculated by using the estimates from the willingness to pay analysis. Only households without 24 hours supply are included in this parameter and only households living on the 4th floor or above are included in the parameter Always good pressure.

For water always safe to drink the willingness to pay varies between 2.30 and 3.90 roubles; in percentages of the present tariff this is 14% and 24%, respectively. This illustrates that there is some uncertainty to the willingness to pay presented. Likewise, the willingness to pay to get 24 hours' supply varies between 0.80 and 2.00 roubles and the willingness to pay to get good water pressure is between 0.20 and 1.60 roubles. The willingness to pay to have water with no smell is only marginally significant and varies between 0 and 1.00 roubles. The confidence intervals are quite broad, and broader than for other case studies. This could most likely be relieved by including more interviews.

These intervals indicate that the overall results are fairly precise. However, the uncertainty is likely to be greater, if the uncertainty, e.g. due to the choice of method, is taken into account.

Importance ratings

The willingness to pay for changes in the services can be compared to the importance ratings of other items. This is possible because some of the service improvements included in the stated preference questions are included in the importance ratings as well.

The respondents were asked to rate the items on a scale from "very important" to "very unimportant". In order to compare the results, an index was calculated on the basis of the importance ratings. The values of the index give a prioritisation of the items, cf. Table 5.6.

The environment is the most important issue for the consumers. Almost all respondents find that the quality of wastewater treatment means that the surrounding rivers and bays are clean enough for a wide variety of fish and to safely swim in is either very important or important.

This is in line with almost all consumers stating that the Pregolya River and the Kaliningrad Bay are polluted. Respondents were asked to give their reasons for claiming that the river and the bay are polluted. The reasons given are:

- smell, 59%;
- colour or the look of the water, oil spots, 33%;
- discharge of industrial waste, 21%;
- lack of wastewater treatment, 15%;
- dirt in the water, 12%;
- information from media, 10%.

That the water is always safe to drink is prioritised second, and consistently good water pressure is prioritised third. The least important improvement is a free telephone line for information on water services. 15% find this unimportant, but still 78% find it either important or very important. So although it is in the bottom of the list, most consumers would appreciate such a service.

Table 5.6: Priority of service improvements

	Priority
The quality of wastewater treatment means that the surrounding rivers and bays are clean enough for a wide variety of fish and to safely swim in	1
Cold water always safe to drink directly from the tap	2
Consistently good cold water pressure	3
Always completely clear water from the cold water tap	4
The cost of cold water stays the same as now	5
No sediment in the tap water	6
The cold tap water has no smell at all	7
No interruptions in cold water supplied to your household as a result of repairs and maintenance of water pipes	8
Cold tap water tastes the same as still bottled water	9
Free 24 hour telephone number for water services information	10

Note: The answer categories are (with index point in parentheses): Very important (10), Important (8), Neither (5), Unimportant (3), Very unimportant (0), Do not know (-).

5.5 Conclusions on market research

The consumers in Kaliningrad are in general dissatisfied with various aspects of the cold water quality. Also, few consumers drink the water straight from the tap, and almost half of the interviewed respondents are willing to pay higher tariffs to improve the quality. None of the respondents in the survey prefers a worsening combined with lower tariffs. The respondents are willing to pay almost 20% extra if the tap water is always safe to drink, and probably more if all improvements are fulfilled

The consumers find the healthiness of the water poor and there is a willingness to pay for having tap water that is always safe to drink. Also there is some willingness to pay to improve the smell of the tap water, but this issue does not have high priority.

Households that do not have 24 hours' supply are willing to pay more to get it, and there is some willingness to pay to have better water pressure on higher floors.

The willingness to pay varies between different income and age groups. The willingness to pay is lower for the low income group, and young respondents are willing to pay more to have tap water that is safe to drink.

The following policy guidelines can be derived from the analysis:

- Significant willingness to pay to improve quality;
- Important arguments for price increases due to improved water supply are:
 - (1) to have tap water that is always safe to drink;
 - (2) to have water supplied 24 hours a day;
- Also, the environment is an argument for price increases (for wastewater services); and
- Different information approaches for different age groups.

CHAPTER 6

ABILITY TO PAY ISSUES

6.1 Data quality

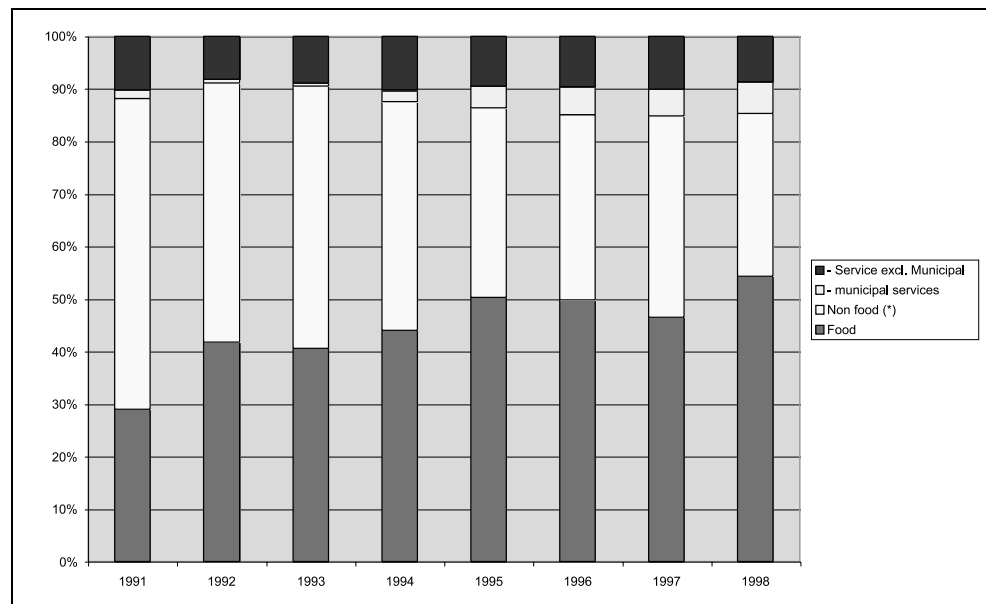
Similarly to the situation elsewhere in Russia, reliable income data is difficult to come by. As a proxy we have based the discussion in this chapter on expenditure data. The source of expenditure data is the household expenditure survey conducted once every quarter using a rotating panel. According to the Statistical Committee the panel is likely to exclude a small group of very rich citizens. We concur with this opinion.

However, for our purpose, this bias does not seem to present a major problem. Firstly, the group of rich citizens excluded is likely to be small, maybe 1-2% of the population. Secondly, this population segment is likely to be able to afford and to have a completely inelastic demand for water at any realistic price.

6.2 Household Income and Expenditure

Household income in Kaliningrad has dropped since 1990. The drop has been more than 20% (inflation adjusted) since 1994 alone. Today, the annual per capita income in an average Kaliningrad household is a little less than RUR 10,000 or approximately USD 400 per capita per year. While the income is higher when measured using purchasing power parities, clearly the income is very low by European standards. This is also demonstrated by the composition of household expenditures, illustrated in Figure 6.1

Figure 6.1 Composition of expenditures for an average household in Kaliningrad 1991 - 98



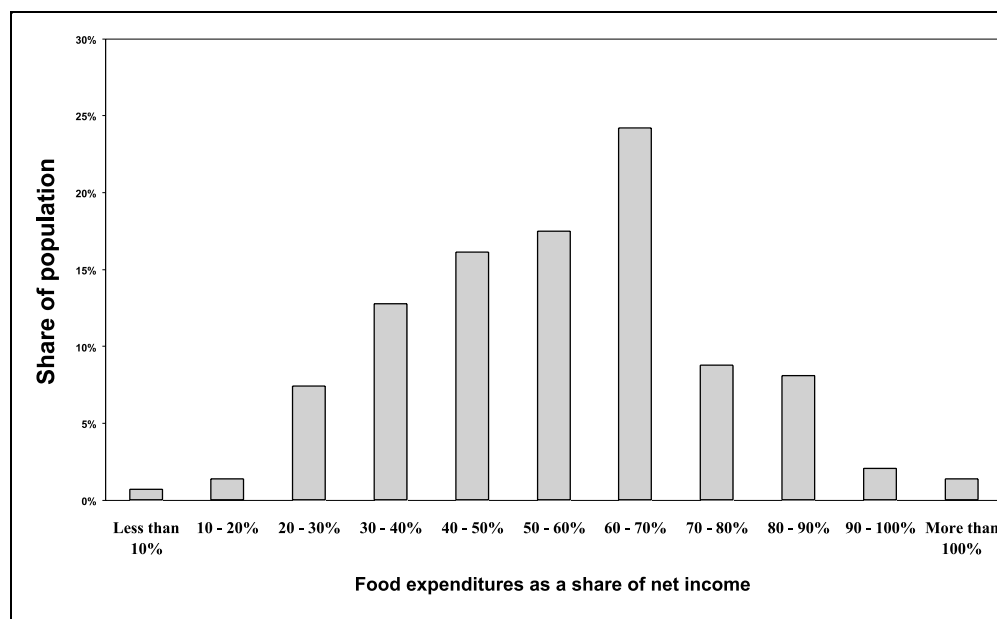
(*) Non-food includes alcohol and meals eaten outside the home

The figure illustrates how expenditure on food has increased from constituting 29% of total expenditures in 1991 to 54% in 1998. The sum of alcohol, meals outside home and non-food expenditures (clothes, furniture, electronics and hardware) has simultaneously decreased from 59% of the total to 31% of the total. The cost of services (rent, utilities, medical care etc.) has increased only slightly from 12% to 15%.

This change in the expenditure composition clearly indicates that the average citizen of Kaliningrad has become substantially poorer since 1991. A share of food expenditures of 54% in total expenditures also indicates that there is not much room for increasing charges for services.

The most recent data available on consumer expenditures are those of the third quarter of 1999. More than 60% of the households spend more than half of their income on food products, and 10% of the households pay more than 80%, cf. Figure 6.2

Figure 6.2: Food expenditures as a share of net income, third quarter of 1999



Source: SP survey and Statistical Committee of Kaliningrad

With the recent doubling of prices, today water constitutes approximately 1.6% of expenditure for an average household. However, two issues need to be considered:

- The potential simultaneous increase of other municipal tariffs; and
- The income distribution.

A doubling of the price of all municipal services and public transport (which would still not bring them to full cost recovery) would imply an increase of more than 9 percentage points in current expenditures. These 9 percentage points would mainly have to be taken out of the 37 percentage points which at present are allocated to non-food or other services (telecom, medical, legal, kindergarten, etc.). A reduction of the share of expenditures for non-food and other services to 30% at an income level of USD 400 per capita is probably closer to the minimum achievable. At the very least this would (in itself) clearly be perceived as (another) reduction in welfare for the people concerned. Chapter 5 provides information on people's perceptions hereof when combined with an improved level of water services.

The income distribution is given in Chapter 5, Figure 5.3. Every fourth household has an income

which is less than half the average income. Hence, there is a large proportion of the household that has a relatively low income, and the experience from the WTP analysis indicated that some of these households do indeed have difficulty in paying the household service bill.

6.3 WTP and planned tariff increases

The willingness to pay study concluded that respondents are willing to pay a maximum of 30% for all service improvements. This includes that the water has no smell, always safe to drink, always with good pressure and that all consumers get 24 hours service.

In Chapter 3 it was concluded that the tariff has to increase at least 287% compared to 1998 in real terms in order to make the planned improvements of the water and wastewater services feasible. This increase was proposed implemented gradually in the period 1999-2006.

The proposed tariff increases included an increase of 30% in 1999 that did not take place. The tariff was increased only by 17% compared to the average real tariff in 1998. In order to reach the planned increase of 287%, the tariff in 2000 must increase by around 33% instead of the planned increase of 20%, cf. Table 6.1.

Table 6.1: Necessary increase in water tariffs, expected increase in income and average cost of water services as a percentage of real income

	1999	2000	2001	2002	2003	2004	2005	2006
Real water tariff	17%	33%	20%	40%	30%	6%	6%	1%
Real income	-	3%	3%	3%	3%	3%	3%	3%
Water cost share	1.5%	1.9%	2.3%	3.1%	3.9%	4.0%	4.1%	4.0%

Note: By the end of 1999 the real tariff exceeded the average tariff of 1998 by 17%. The full increase is 230% as the water tariff already increased 17% compared to the average level of 1998.

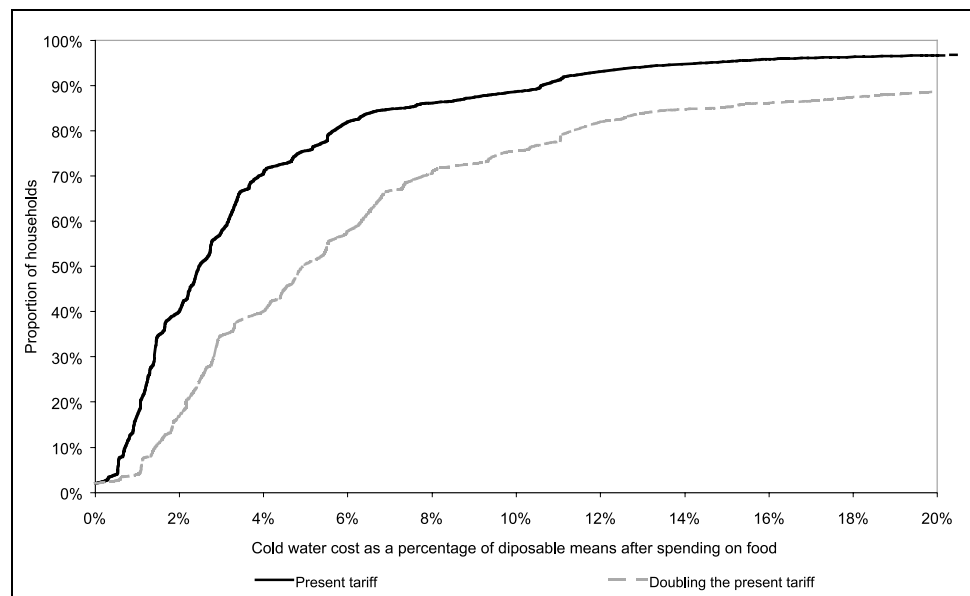
Source: Krüger, Department of Finance in Russia and COWI.

The Department of Finance in Russia expects an annual increase, in GDP pr. capita, by 3% in the years to come. If the income is assumed to increase by the same rate, the cost for water will assume an increasing part of the household expenditure. At the end of period the tariff will be around 4% of the household income, cf. Table 6.1.

The willingness to pay is hence significantly lower than the tariff increases needed.

In order to evaluate the burden on the household of the cold water bill, the share of the cold water bill of the available means after spending on food products was calculated for the households after the full tariff increase is implemented, cf. Figure 6.3. This measure is useful because it indicates the proportion of households where a significant increase in the cold water cost will have a great impact on the standard of living.

Figure 6.3: Cold water cost as a percentage of the available means after spending on food, cumulative distribution: Present and double real tariff corrected for increase in real income



Note: The increase of 200% is used as this is the planned increase corrected for increase in income by 3%.

At the present tariff level, 10% of the household spend more than 10% of their remaining means, after food expenditure, on cold water services. If cold water prices are doubled some 25% of the households will spend more than 10% of their remaining means on cold water.

Hence, if the costs for water services are increased significantly, a relatively large part of the population will envisage a water bill that accounts for a significant part of the household budget.

6.4 Payment Habits

6.4.1 Current situation

The Vodokanal collects revenue from industrial consumers and from private consumers who have elected to be connected to the water supply system by water meters.

Approximately 65% of the Kaliningrad population, most of whom live in communal owned complexes, has its water tariffs collected by the municipal billing company Simplex. The local housing office submits all relevant information on the households (e.g. number of people living in a flat and privileges) to Simplex and based on this information the calculations are made. The bills are sent to the individual families and include easy-to-understand information on how the bill has been calculated.

A general feature which complicates the calculation and collection of water tariffs is the fact that no less than 43 different categories of privileges exists. They cover half the population, thereby, clearly indicating that the system is not adequate. The future of the system is governed by federal regulation and it is currently under negotiation between the regional authorities and the federal authorities of the Russian federation. A system of "targeted assistance" is already in place as discussed in Section 4.8.

Almost 10% of the households have a debt with the Vodokanal, which is older than 12 months, cf. Table 6.2, but even in cases with long periods of non-payment services are not cut off. For technical reasons it is not possible to cut off one single flat from the water supply system.

Table 6.2: Number of households of Kaliningrad having debt to the Vodokanal (by November 1999)

	Debt for 0-3 month	Debt for 4-6 month	Debt for 7-9 month	Debt for 10-12 month	Debt for >12 month
Number of households	26,453	6,591	4,417	2,488	9,573
In % of all households	24.1	6.0	4.0	2.3	8.7

In order to make the investments feasible it is necessary to obtain better collection rates.

The planned collection rates are to increase until the year 2001, cf. Table 6.3. The level of collection is expected to increase, especially for the budget organisations and the industries.

Table 6.3: Collection rates 1997-2001 in Krüger feasibility study

	1997	1998	1999	2000	2001
Households	70%	70%	75%	80%	90%
Budget organisations	50%	60%	70%	80%	90%
Industries	50%	60%	70%	80%	90%

Source: Kaliningrad water and wastewater services feasibility study, Krüger 1999

6.4.2 Enforcement

The urgent issue of non-payment relates to budget institutions. However, if water prices are increased drastically, non-payment by household is likely to become an issue. Obviously consideration must be given on how to deal with non-payers in a situation where cutting off services to individual apartments is not possible.

Water utilities in other countries have successfully tried the following:

- Creation of a simple system of payment for households and close follow-up. This seems to be what Simplex is doing successfully in Kaliningrad;
- "Posting" information on non-payers. In places where this creates peer pressure it has been proven to be effective;
- Announcing that building blocks which have a very low ratio of payment will be cut off - and following through;
- Staging a drastic public relations step. In one city the Vodokanal announced that services to the hospital would be cut off (naturally with prior warning). The Vodokanal did cut off services to the hospital and this was reported on prime time television. This had a very positive effect on other users' propensity to pay.

6.5 Policy implications

A large part of the population will have affordability problems when tariffs start to increase, and a social targeting scheme needs to be considered. This should ensure that all groups of the population are able to afford paying the increasing water tariff.

However, there is some willingness to pay among the consumers, but there is a need for an increasing level of information provision. Most consumers find it very important both to improve the tap water quality and the wastewater treatment. In order to obtain public acceptance of increases in water tariffs it is of great importance to explain to the public that these increases are necessary to obtain a better service.

This is even more important when the service improvements are obtained only after the tariff has been increased.

CHAPTER 7

CONSEQUENCES FOR METHODOLOGY

In terms of the methodology the following conclusions emerge:

Water charges, not tariffs, should be analysed. The population is being billed according to a norm, which implies a consumption of 300 lcd (applies for most households). Metered consumption for most households is likely to be in the order of magnitude of 100 - 150 lcd.

If tariff increases lead to widespread, voluntary metering this will have significant consequences both for Vodokanal revenues and for distribution of costs among consumer groups.

Qualitative work

It is believed that the mix of in-depth interviews and a focus group discussion provides the best approach for the qualitative research. The group provided information that was not elicited in the in-depth interviews. For instance, information on the non-payment of bills over a period of time was only elicited during the group discussion despite the fact that the question was asked in the in-depth interviews on whether people paid their bill.

With respect to the two types of groups:

- Moderated by a member of the research team with consecutive translation of questions and simultaneous translation of responses (as in Poznan);
- Moderated by a local with the research team watching with consecutive translation of questions and answers (as in Kaliningrad).

There are advantages and disadvantages in connection with each type of focus group. The former provides more control for the research team and allows issues to be probed further, if necessary, but seems to inhibit a free-flowing discussion since there are breaks during translations. The latter provides for a much more free-flowing discussion although it is recommended that the group is taped (sound only or video and sound) so that the translation does not take place in the same room. It definitely affects the group dynamics with one or more respondents talking to the translator and not the other group members. Also, it is believed that this approach works better if the moderator is experienced.

Quantitative research

Mostly women have answered the questionnaire. The interviewed individuals are here thought of as representatives for the household rather than individuals. The relevant entity should be decided as part of the qualitative work.

If expenditure data are available on the respondents interviewed this is an easy way of expanding the information on the respondents while keeping a short questionnaire. This was possible in Kaliningrad because the respondents in the SP survey are chosen from an existing panel of households.

Affordability

Water charges must be analysed jointly with charges for other municipal services. The following links need to be considered:

- Affordability (household expenditures);
- Formal links (subsidy policies etc.).

Composition of expenditure is a useful complement to measure affordability. However, it is needed to develop some rule of thumb.

Appendix 15.1: List of “Experts” Interviewed

Name of Organisation

The Municipal Administration

Division on Economics and Investment Policy;
Economics of City Municipal Facilities Department

Price Control Unit, Department of the Housing and
Communal Services Department

Housing and Communal Services Department

Housing and Communal Services Department

Unit on Financing of the Communal Services,
Financial Department

The Economic Analysis Unit

Kaliningrad City Council

Deputy Chairman of City Council
Deputy Chairman of City Council
Chairman City Council

Chairman of Economical Policy and Municipal
Property Committee

Environmental Administration

The Oblast Level of the State Committee for
Environmental Protection

The Water Industry

Kaliningrad Vodokanal

Kaliningrad Vodokanal

Kaliningrad Vodokanal, Project Management Unit

Other institutions

Simplex (Municipal organisation responsible for
collection of revenues from households)

Joint Stock Company "Kaliningrad Gazautomatica"
Joint Stock Company "Kaliningrad Gazautomatica"

Political groups

Kedr

Pensioners Party

Jabloko

Persons interviewed

Mr. Lisitsyn, 1st Vice Mayor
Mr. Kovalenko, Head of Department

Ms Olga Zheleznova, Head of Unit

Mr Nikolaj Simonov, Head of Department

Ms Jatsenko Natalia,
Deputy Head of Department

Ms Galina Zakrevskaya

Ms Olga Jenrelianova, Head of Unit

Irena Fedorovna Verschinina
Vyacheslav Bogdanov
Mr. Yury L'vovich Bogomolov

Mr. Alexander Borisovitch Nepomnyashikh

Mr Vladimir Litrenko, Head of Committee

Mr. Gennady Leonidovich Bitnashlyakhta
Chief Engineer

Mr. Yury Alexandrovich Gidzenko,
Head of Billing Department

Ms. Natalia Pavlovna Matusevich,
Head of the Unit

Mr. Yuri Geogreevitch Sergeev, Director

Mr. Mikhail L. Karapysh, Director
Mr. Michael R. Lander, Head of Technical
Department

Nelia Pavlenko

Igor P. Trintjuk

Sergei V. Shuravski, Chairman of Pensioners
Party, Kaliningrad Oblast

Vladimir A. Bukolov, Vice chairman of
Pensioners Party, Kaliningrad Oblast

Vladimir Yezhikov, Oblast Duma Deputy,
Chairman of Jabloko, Kaliningrad

Appendix 15.2: List of Privileged Groups

List of privileged groups «subsidized» from the Federal Budget.

1. Invalids of the Second World War
2. Veterans of shooting wars in the territories of the other states
3. Family of the person fall in battle
4. Widow of the died invalid of the Second World War
5. Member of the family of the died participant (invalid) of the Second World War
6. Prisoner of concentration camp who was younger then 16
7. Member of the family of the died military servant of the Ministry of Defense
8. Person blockaded in Sankt-Petersburg (during the Second World War)
9. Chernobyl disaster liquidates
10. Unduly repressed, totally rehabilitated
11. Participants of the Second World War - invalids, according to the Low on Veterans
12. Many children family
13. Honorary blood donor
14. Military servants
15. Heroes of USSR and RF
16. Personnel of customhouse
17. Personnel of the Ministry of Internal Affairs
18. Soldier internationalist
19. Tax police
20. Personnel of the law courts
21. Employees of Yantar-Energo (BN: energy company)
22. Participant of the Second World War
23. Invalid of the 1st group
24. Veteran of Labor
25. Veteran of Labor (working person)
26. Invalid of the 2nd group
27. Invalid of the 3rd group
28. Family with children-invalid
29. Invalids of the Second World War, 1st group (+ local)
30. Invalids of the Second World War, 1st group
31. Employees of the budget sphere

Appendix 15.3: SP Questionnaire

Water in Kaliningrad

Interviewer name:

Date:

Start Time:

End Time:

Introduction

Good morning/afternoon/evening. My name is and I am carrying out research on behalf of COWI, an independent Danish company. We are interested in your experiences and attitudes towards the cold water services you receive from Kaliningrad Vodokanal.

This research is being undertaken for the Danish Environmental Protection Agency and the European Bank for Reconstruction and Development. The Kaliningrad City authority and the Vodokanal are aware of this research but the research is independent of them. Therefore, all your answers will be confidential.

Background Information

- Q1.** How many adults (aged 18 years and over) live in this household including yourself?
.....
- Q2.** How many children (aged 6-17 years) live in this household?
.....
- Q3.** How many infants (aged under 6 years) live in this household?
.....
- Q4.** What is the employment status of the chief earner of the household? **PROBE**
- | | |
|----------------------------------|---|
| Employed by public sector | 1 |
| Employed by private sector | 1 |
| Self employed | 1 |
| Student | 1 |
| Not working | 1 |
| Retired..... | 1 |
| Other | 1 |

Water Services

- Q5.** Do you have a separate cold water meter for your household?
- | | | | | | | | | |
|--|---|-----|---|--|----|--|---|---|
| | 1 | Yes | 2 | | No | | 1 | 2 |
|--|---|-----|---|--|----|--|---|---|
- Q6.** Do you usually receive cold water to your home 24 hours a day?
- | | | | | | | | | | |
|--|---|-----|-----------------|--|---|----|--|---|---|
| | 1 | Yes | GO TO Q8 | | 2 | No | | 1 | 2 |
|--|---|-----|-----------------|--|---|----|--|---|---|
- Q7.** Between what hours do you usually **not** receive cold water?
- From
- To:.....

Q8. How would you rate the quality of the following aspects of your cold water supply on a scale of 1 = very poor to 5 = very good.

SHOWCARD A

	Very poor	Poor	neither	Good	Very good	don't know/not applicable
sediment in the tap water	1	2	3	4	5	9
smell	1	2	3	4	5	9
colour	1	2	3	4	5	9
taste	1	2	3	4	5	9
water pressure	1	2	3	4	5	9
healthiness of water	1	2	3	4	5	9
interruptions.....	1	2	3	4	5	9
information provision about your water	1	2	3	4	5	9

Q9. Do you drink the cold water straight from the tap? **PROBE**

1 No, never	4 Yes, often GO TO Q11	1	4
2 Yes, rarely	5 Yes, always GO TO Q11	2	5
3 Yes, sometimes		3	

Q10. Why don't you drink the cold water (more often)?

.....

Q11. How do you rate the quality of your cold tap water? **SHOWCARD A**

1 Very poor	4 Good	1	4
2 Poor	5 Very good	2	5
3 Neither good nor poor	6 Don't know	3	6

Q12. Do you think that the Pregolya River and the Kaliningrad bay is polluted?

1 Yes	2	No GO TO Q14	1	2
-------	---	---------------------	---	---

Q13. Why do you say that?

.....

The Need for Investment

Q14. If the Vodokanal had to choose between the three following options which do you think they should choose?

1 Reduce charges and reduce quality of cold water services	1
2 Keep charges and quality of cold water services at the same level as now	2
3 Increase charges and improve the quality of cold water services GO TO Q16	3
4 Don't know GO TO Q16	4

Q15. Why do you think that charges for cold water services should not be increased? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

- I cannot afford to pay any more 1
 Further investment in cold water and waste water treatment is
 not necessary 1
 Other cities or regions have lower charges than Kaliningrad 1
 As a general principle water charges should not be increased 1
 It will result in social hardship for the poorest sections of society 1
 Increase charges will simply add to profits for the Vodokanal 1
 Water charges are too high now 1
 Other (please write in) 1

Q16. Where do you get information about your cold water services from? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

- I get no information 1
 Local newspaper(s) 1
 National newspaper(s) 1
 Radio 1
 Television 1
 By phoning the Vodokanal 1
 Vodokanal offices 1
 Vodokanal leaflet 1
 Council 1
 By post from the Vodokanal 1
 Family/friends/colleagues 1
 From household office 1
 From my job 1
 Other (please write in) 1

Bills

Q17. What are the charges in your last bill for each of the services in the table below? COMPLETE TABLE BELOW USING HOUSEHOLD SERVICES BILL. ALSO ASK FOR ELECTRICITY BILL AND GAS BILL IF NOT INCLUDED IN HOUSEHOLD SERVICES BILL

Service	Amount paid for total household per month
Rent (service charge)	
Heating	
Cold water (and sewage)	
Hot Water	
Gas	
Radio	
TV Aerial	
Lighting for common parts	
Waste collection	
Lift	
Electricity	
Gas	
Sewage	
Telephone	
Other (Please specify)	

Q18. Do any members of your household receive privileges which reduces the amount you pay for some of the above services?

1 Yes

2 No

1

2

Willingness to pay

Introduction

I am now going to ask you to choose between different options for your cold water services. These options will include different levels for:

- The quality of cold water from the tap:
 - either as it is now or
 - cold water is always safe to drink directly from the tap

- The smell of the cold water from the tap:
 - either as now or
 - no smell at all

- Supply and pressure of your cold water
 - either as now or
 - cold water supplied 24 hours a day and pressure as it is now
 - cold water supplied 24 hours a day and always good water pressure

- The cost you pay for cold water services per month (**INTERVIEWER TO CALCULATE AMOUNT FOR RESPONDENT FOR EACH OPTION AND WRITE BELOW - REFER TO PRICE TABLE**):
 - either current, that is (see Q17)
 - current plus 10%, that is (Q17 plus 10%)
 - current plus 25%, that is (Q17 plus 25%)
 - current plus 50%, that is (Q17 plus 50%)

For each pair of options I would like you to say which you would prefer. You may not like either, but please choose one.

When making your choices please assume that all other aspects of cold water services not mentioned are the same as now and that prices for all other services you receive remain the same.

A	or	B	A	B
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: 10% 		<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 25% 		
A	or	B	A	B
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10% 		<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: as now 		
A	or	B	A	B
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25% 		<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10% 		

A
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10%

or

B
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: as now

A B

A
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 10%

or

B
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10%

A B

A
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10%

or

B
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 25%

A B

A
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25%

or

B
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25%

A B

A
<ul style="list-style-type: none"> • WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 50%

or

B
<ul style="list-style-type: none"> • WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10%

A B

Q29. If your water bill increased by 50% and prices for all other services you receive remain the same, do you think you would be eligible for a subsidy?

1. yes
2. no **GO TO Q31**
3. don't know **GO TO Q31**
- 1 3
2

Q30. Do you think you would apply for a subsidy?

1. yes
2. no
3. don't know
- 1 3
2

Q31. If your water bill increased by 100% and prices for all other services you receive remain the same, do you think you would be eligible for a subsidy?

1. yes
2. no **GO TO Q33**
3. don't know **GO TO Q33**
- 1 3
2

Q32. Do you think you would apply for a subsidy?

1. yes
2. no
3. don't know
- 1 3
2

Q33. I would now like to ask you how important it would be to you for the following improvements to be made to the cold water services you receive using the following scale: **SHOWCARD B AND SHOWCARD C**

	very un- important	un- important	neither	important	very important
No sediment in the tap water	1	2	3	4	5
The cold tap water has no smell at all	1	2	3	4	5
Always completely clear water from the cold water tap	1	2	3	4	5
Cold tap water tastes the same as still bottled water	1	2	3	4	5
No interruptions in cold water supplied to your household as a result of repairs and maintenance of water pipes	1	2	3	4	5
Consistently good cold water pressure	1	2	3	4	5
Cold water always safe to drink directly from the tap	1	2	3	4	5
Free 24 hour telephone number for water services information	1	2	3	4	5
The quality of waste water treatment means that the surrounding rivers and bays are clean enough for a wide variety of fish and to safely swim in	1	2	3	4	5
The cost of cold water stays the same as now	1	2	3	4	5

Q34. What type of accommodation do you live in?

- 1 apartment
2 house **GO TO Q36**
- 3 other (**PLEASE SPECIFY**)..... 1 3
2

Q35. Which floor do you live on? **RECORD BELOW**

Floor number:.....

Q36. What is average amount of incoming money, per month, for each member of your household, after income tax? Please include money received from all sources **COMPLETE THE TABLE BELOW**

Person in household	Incoming money per month with tax removed
#1	
#2	
#3	
#4	
#5	
Any other sources #1. Please write in:	
Any other sources #2. Please write in:	

Q37. How old are you?

1	18-24	4	45-54	1	4
2	25-34	5	55-60	2	5
3	35-44	6	61 or older	3	6

Q38. INTERVIEWER:CODE GENDER

1	Male	2	Female	1	2
---	------	---	--------	---	---

(2) Thank you for your help in this research

I confirm that this interview is completely confidential

Interviewer's signature:

Incentive receipt

I acknowledge receipt of 50 roubles for taking part in this research

Respondent's signature:



***Water Prices in CEE and
CIS Countries***

*Appendix 16:
Case Study: Ukmerge, Lithuania and
Borovichi, Russia*

December 2001



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CHAPTER 1

INTRODUCTION

This paper constitutes the desk study on small towns, where Borovichi, Russia, and Ukmerge, Lithuania, have been chosen as cases. The paper is a part of the toolkit project on acceptability of water prices in CEE and CIS countries.

The desk study for Ukmerge is based on a study made by *Mileu, AAPC and SIC*. The latter study has been made without the toolkit, but the analysis proposed in the toolkit regarding customers perception and affordability can be carried out in the basis of the material.

However, a lack of history on revenues due to decreasing water consumption as a result of increasing prices per m³, stresses the importance of demand analysis as proposed in the toolkit.

The case study for Borovichi is based on work by *Carl Bro Management* and *The Kaliningrad Centre for Social Surveys*. The desk study was conducted as a test of an early version of the Small Towns Toolkit, but with quite limited resource input. This is also reflected in the findings which are more limited than those which would result from using the Small Town Toolkit. However, the study makes it possible to get a grasp of the situation in Borovichi.

None of the studies include an analysis of the political acceptability of an increase in water tariff in the towns, and hence a test of the Toolkit regarding these issues is not a part of this working paper. The statements and recommendations are those of the consultant and do not represent the views or policies of DEPA, EBRD or the municipal authorities.

CHAPTER 2

UKMERGE, LITHUANIA

The municipality of Ukmerge is comprised of the city of Ukmerge, six small townships, and small rural settlements. The total population of the municipality is 51,000 inhabitants, thirty-one thousand of whom reside in the city of Ukmerge.

In this chapter the technical baseline will be described briefly, and the results of the willingness to pay and affordability analyses will be presented. Most of the material is based on work in *Lithuania Environmental Financing Strategy* by Mileu and AAPC, as well as a survey conducted by SIC-Rikos Tyrimai regarding the willingness to pay for environmental services in Ukmerge.

The analysis has been made without the input of the toolkit, but the analysis carried out does cover the willingness to pay analysis by using contingent valuation methods. Likewise, the data collected in the survey is quite useful when considering affordability problems.

2.1 Technical baseline

In the city of Ukmerge, 74.5% of the city's population are connected to the water supply system. The quality of drinking water is good in Ukmerge and conforms to the standards. Regarding wastewater treatment, the city of Ukmerge completed construction of a new plant in 1998. The treatment plant complies with both Lithuanian and EU standards, and 67.7% of the households are connected.

There are 11 wards in Ukmerge district, which run the water supply and sewage systems in 23 small settlements or villages. The Municipality has estimated the costs of upgrading the water and wastewater system in the wards to be 5 million litas.

The total cost of the new wastewater treatment plant was 22 million litas, 6.4 million litas of which was in the form of a loan. At the time the municipality decided to take the loan, its calculations of cash flow suggested that the loan could be repaid out of revenues from user fees. These calculations were based on high water consumption rates that have since fallen, especially among industrial customers.

In order to resolve the consequences, the municipality has taken steps to increase tariffs for water and wastewater. The approved rates are presented in the far right column in the table below.

Table 2.1: Proposed tariffs for water and wastewater in Ukmerge (LtL/m³)

Service	Tariff in 1999-2000 LtL	Adopted tariff, LtL
Cold water supply	1.57	1.85
Wastewater	2.64	3.12
Total	3.45	4.97

Source: Mileu and AAPC

The problem faced by the municipality of decreasing water consumption as a response to an increase in the water price per m³ illustrates the importance of conducting demand analysis, cf. Chapter 4 in the Toolkit.

2.2 Willingness to pay

The willingness to pay analysis is conducted by *Mileu and AAPC* with the purpose of estimating the magnitudes to the willingness to pay for the environmental benefits associated with a number of EEC directives, including directives on drinking water. In addition, willingness to pay analysis for connection to sewerage was conducted among households not already connected.

The method used for estimated the willingness to pay is the so-called contingent valuation, which is a useful method when the proposed improvements are well known when conducting the survey.

The survey was implemented in Ukmerge in September 1999, by the firm *SIC - Rinkos Tjimai* of Vilnius. A sample of households was chosen and 755 were visited resulting in a total of 500 households completing the questionnaire.

2.2.1 Method

Drinking water

A description of the change in services was prepared which detailed the benefits respondents would enjoy if the measures stipulated in the directive were implemented. Respondents were read this description and asked if they understood it and if they had any questions.

Respondents were then asked if they would support the program if their monthly tariff for water supply/waste management was increased by an additional fee of, say, 1 litas per person per month. Respondents were given one of ten possible prices, where the lowest additional tariff offered was 0.10 litas more per person per month and the highest was 3.7 litas more per month.

The description read was:

Suppose there were a program to complete all upgrades necessary to ensure that the water supply system would be completely safe in the future and no colours or odours would be present. First, some groundwater wells that supply Ukmerge with drinking water would need to be re-drilled and repaired. Approximately 23 kilometres of water supply pipes must be reconstructed or cleaned to reduce leakage of drinking water from the system, and to be sure that the water delivered to your home would be clean and tasty. These measures together would assure that you, your neighbours, and businesses in Ukmerge would have access to drinking water that had no colour (e.g. no red or orange), no odour, tasted good and was completely safe to drink."

Respondents then said either yes they would support the program or no they would not, given the increase in the tariff. Those who said yes were then asked if they would pay an amount 30% higher than the first number given. Those who said no were given a figure 30% less than the first number given. These data were then analysed using logit regression analysis.

The willingness to pay is given in Table 2.2., indicating some willingness to pay.

Table 2.2: Willingness to pay for improved water services

Proposed Additional Tariff per person per month	Estimated Percentage of Population that would support the water supply improvement program
0.24 litas	20%
0.12 litas	50%
0.06 litas	80%

Source: Mileu and AAPC

At present, almost half of the respondents drink water directly from the tap, while the rest either boil or filter water before drinking.

The improvement of services offered to respondents was relatively modest – water supply pipe upgrading. It is therefore not surprising that willingness to pay was also modest.

Sewerage (wastewater treatment)

In Ukmerge, 43% of households indicated that they are not connected to sanitary sewerage. The description of the services offered to respondents was:

If you were connected, you would not need to service your private septic system or pit toilet. This would create a more sanitary environment in your yard. If you currently use a pit toilet, connection would allow you the opportunity to have indoor plumbing. Furthermore, there is little or no smell associated with centralized sewage systems.

Each respondent was then asked if they would support the program if they had to pay an additional monthly fee (on top of the tariff they already pay) of from 0.20 litas to 4.90 litas per person per month. The demand for sewerage services was also estimated using logit.

Half of the respondents are willing to pay an additional tariff of 0.64 litas. Hence, there is a willingness to pay for the services, cf. Table 2.3.

Table 2.3: Willingness to pay for sewerage services

Proposed additional tariff per person per month	Estimated percentage of population that would support the sewerage extension program
1.75 litas	20%
0.64 litas	50%
0.24 litas	80%

Source: Mileu and AAPC

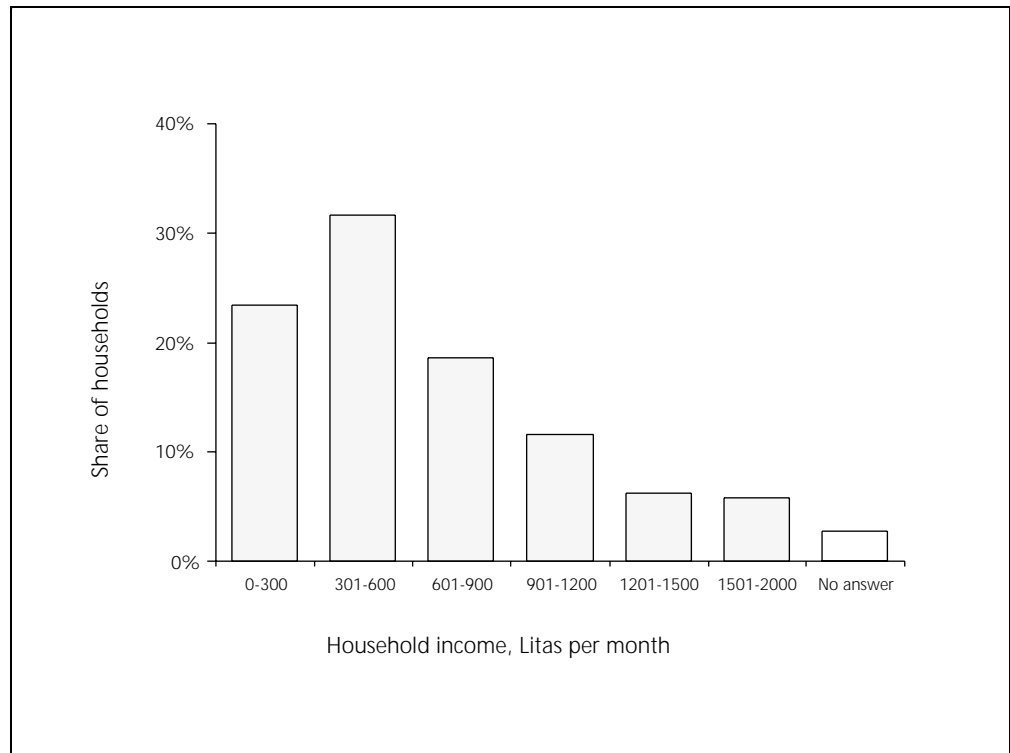
The results suggest substantial willingness to pay for sewerage services. Whether this figure is "enough", of course depends on the costs.

2.3 Affordability analysis

Although information on disposable income is not available on a municipal level, information on average monthly per capita gross earnings indicate that levels in Ukmerge are only 78% of the national average.

The distribution of income can be established from the willingness to pay survey, assuming that the sample is reasonably representative of the population in the town, cf. Figure 2.1. The average household income among the respondents interviewed was between 600 and 700 litas per month.

Figure 2.1: Income distribution in Ukmerge

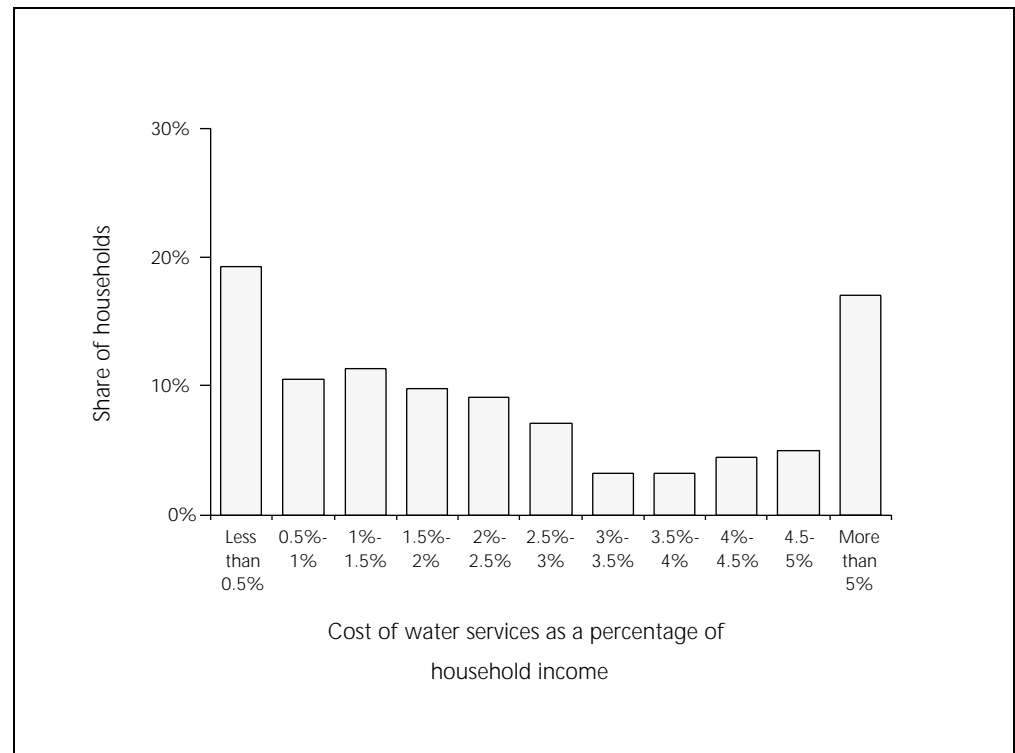


Note: 500 respondents are included in the figure. The survey was conducted in September 1999.

Sources: SIC - Rinkos Tyimai

Present and future payments for water services can be compared to income distribution in order to investigate whether there are a large number of respondents with affordability problems. Almost every sixth household pays more than 5% of the household income for water services, cf. Figure 2.2. This indicates that there is a problem of affordability for this group, especially if tariffs are increased further.

Figure 2.2: Water and wastewater cost as a percentage of income



Note: The survey included 500 respondents, 406 of them replied to the questions on water cost and household income. The figure includes 61 respondents who indicated that they do not pay for water services.

Sources: SIC - Rinkos Tyjmai

An increase to 4.97 litas as approved, cf. Table 2.1, corresponds to an increase by 18% compared to the level in September 1999.

If it is assumed that all households experience the same increase, 23% of the households will pay more than 5% of their income on water and waste water services. Among these, 9% of the households will pay more that 10% of their income to water and wastewater service.

These calculations are made under the assumption that the increase will be distributed equally and that the income is constant. Neither assumption is realistic, as the poorest households will certainly decrease their consumption of water more than wealthier households, none the less the results indicate affordability problems for a large part of the inhabitants.

CHAPTER 3

BOROVICHI, RUSSIA

Borovichi is a town with 60,000 inhabitants. In October 2001, Carl Bro Management was asked to test the Small Towns Toolkit, and as a basis for the test the project "Borovichi Drinking Water Project" was selected. Therefore, the material presented in this chapter is based on this test, supplemented by data collected by Kaliningrad Centre for Social Surveys.

Carl Bro Management collected the material within a short period of time - three days. This is enough time to get a grasp of the issues but, however, does not provide sufficient time to obtain the necessary understanding to determine whether an investment of significant size should be undertaken. The proposed resources in the Small Town Toolkit for such a study is in the order of six to eight weeks.

This chapter begins with a note on the technical baseline and is followed by an assessment of the willingness to pay and the affordability in Borovichi.

3.1 Technical baseline

The Borovichi Drinking water Project aims at evaluating the feasibility of converting the water supply from surface water to groundwater for Borovichi City. The necessary size of tariffs will be covered in the financial sections of the feasibility study. Therefore, Carl Bro Management has not investigated the size of future operational and maintenance cost as well as financial cost in the study.

The current tariff is 2.01 RUR per M3 and the norm is 320 litres per day per capita. Most households are not metered, but the metered households consume typically between 150 and 200 litres per day per household member.

The main sponsors have not yet been identified. DANCEE will probably be one of these and Russian Public Funds will be another. For DANCEE the main focus will be financial feasibility, environmental improvements and improved health conditions. This is already stated in the Inception Report. Other funding organisations will, in general, focus on the same issues, including the sustainability of the project. Own ability to pay for the operational costs in the future will have high priority, also seen in the light of a policy of removing cross subsidising.

3.2 Willingness to pay

In the survey Poll Interviewing of heads of households in the city of Borovich implemented in October 2001 by Carl Bro Management and The Kaliningrad Centre for Social Surveys, one of the issues was water and wastewater service problems.

Among the respondents, 77% indicated that the quality of cold water is not high enough. This is due to dirt and chlorination (although the water is not chlorinated). Pressure is found to low among 61% of the respondents.

The general impression is that water is very cheap, also when compared with other tariffs. Almost half, 46%, of the respondents were willing pay for water services if the cold water supply could be improved, while almost a third, 29%, were indecisive. Hence a fourth of the respondents are not willing to pay more for water services. However, no information on the level of willingness to pay is available.

The respondents' estimations of the water quality are presented below.

Table 3.1: Opinion on Cold water quality

	Very bad 1	2	3	4	Very good 5	Cannot answer
Odor	8%	11%	23%	26%	15%	17%
Taste	8%	10%	22%	22%	14%	24%
Color	10%	10%	23%	29%	15%	12%
Transparency	9%	11%	22%	28%	17%	12%

Source: Kaliningrad Centre for Social Surveys.

Only 23% of the interviewees drink water directly from the tap.

3.3 Affordability analysis

In order to evaluate affordability among the inhabitants, an affordability analysis was carried out based on the following information:

- General income data;
- Interview with Borovichi City Administration;
- Interviews with customers;
- Observations of goods and prices in Borovichi.

The conclusion reached is that there does not appear to be a problem of affordability in Borovichi with the current level of tariffs. However, the Department for social affairs in Borovichi City Administration gave the impression that Borovichi is a poor society without much ability to meet increased tariffs.

3.3.1 General income data

In Borovichi, roughly 60% of the population of working age are employed/work. Income data for employees are given in the table below.

Table 3.2: Income among employees in Borovichi, by sector

	No. of employees 2001	Average salary 2001, RUR
Industry	10,379	2,939
Communal maintenance	1,798	1,915
Agriculture	819	1,315
Sales	348	1,390
Construction/transport	1,464	2,678
Administration	99	1,376
Budget organisations	4,973	1,232
Total	19,880	2,289
Public enterprises	3,214	1,058
Grand total	23,094	2,118

Note: The data is from the first nine months in 2001.

Source: Carl Bro Management and Federal Statistic department in Borovichi

The average level of income is lower for the total population as employees generally have a higher income than students, unemployed and unregistered workers. However, income data was not available for these groups.

The minimum income level is RUR 1,075 and 4,388 persons fall into this category.

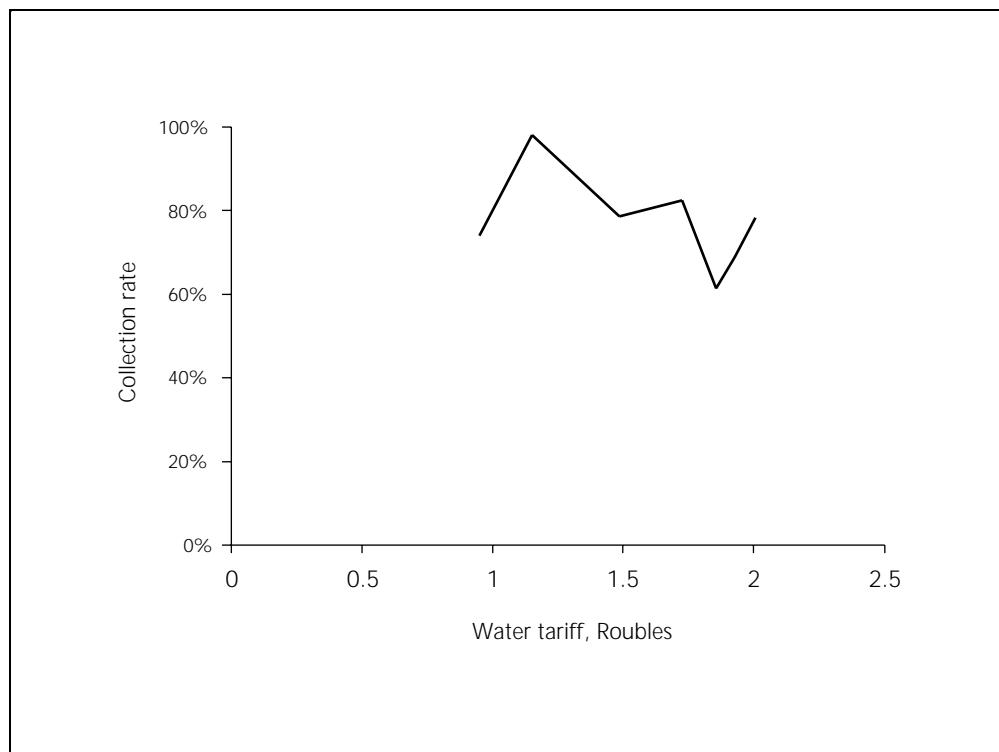
With the current water tariff and norm, a typical inhabitant in Borovichi pays approximately 19 RUR/month. Hence, for those persons living within the minimum income level, water tariffs account for approximately 2% of their income, and for the average employee, making 2,100 RUR per month, the cost for water services is around 1%.

3.3.2 Tariff increases and collection rates

In Borovichi, during the past, there have been many increases in tariffs. One way to test affordability is to compare the increases in tariffs with the collection rate, the hypothesis being that problems of affordability will result in a decrease in the collection rate each time there is an increase in tariffs.

In Figure 3.1 we show the results of six previous increases in tariffs together with changes in collection rates. The observations cover the period from January 1999 to November 2001.

Figure 3.1: Water tariff and collection rates, January 1999 to November 2001



Source: Carl Bro Management

Of the six increases, only two show a decrease in the collection rate. A preliminary conclusion is that the collection rate is not correlated with the changes made in the past two years, which leaves no indication of affordability problems.

3.3.3 Interview the Borovichi City Administration

In order to obtain information on the general income level and inhabitants' ability to afford an increase in tariffs, the Department for Social Affairs in Borovichi City Administration was interviewed.

The department organises all social programs in Borovichi and administrates social assistance programs. In addition, the department provides statistical information on income level for various groups, number of families receiving social assistance.

The Department for social affairs gave the impression that Borovichi is a comparatively poor society without much ability to meet increased tariffs. This contrasts with the results found elsewhere.

3.3.4 Interviews with customers

To investigate the level of affordability further, Carl Bro Management selected six families and analysed their patterns of consumption. The level of income for the families varies between 2,500 to 9,000 RUR per month and their size ranges from two to four. As such this provides a typical sample of the population in Borovichi.

The interviews indicated a certain ability to pay. Hence, it does not seem that there are affordability problems for typical households.

3.3.5 Observations of goods and prices in Borovichi

In order to assess the level of goods and prices in the shops, observations made in Borovichi, in November 2001, are shown in Table 3.3.

Shops were entered and the assortment evaluated for prices, quality and necessity in the main part of the city. The assessment is subjective and can as such only be used as support to the statistical information already described.

Table 3.3: Observations of good and prices in Borovichi

Food: There is no lack of food in the shops, but the food available is basic, this includes various cheeses, yoghurt but not expensive meat. In general, prices are high with the exception of grain, flower, pasta and bread. Meat prices close to Western European levels.

Cloth and shoes: Shoes are expensive, clothes are old fashioned but inexpensive. Fur coats can be purchased in the shops and it is not uncommon to see people wearing them.

Other necessities: Russian and foreign products are available in all shops. Electrical devises from abroad are available, however often under unknown brand names.

Other observations: No/few beggars in the streets, few Western type cars (10% max)

Appendix 16.1: Literature Used

Carl Bro Management: *Test of the Small Towns Toolkit in Borovichi, 2001.*

Kaliningrad Centre for Social Surveys: *The results of the poll interviewing of heads of households the city of Borovichi, 2001.*

Mileu and AAPC: *Lithuania Environmental Financing Strategy, 2001.*

SIC - Rinkos Tyrimai: *Willingness to pay for upgrading municipal environmental services to European Union standards in the town of Ukmerge, Lithuania. 1999.*