THE INFLUENCE OF CUSTOMER PERCEPTIONS OF URBAN UTILITY WATER SERVICES ON BILL PAYMENT BEHAVIOUR: FINDINGS FROM UGANDA

by

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Don't you know? Haven't you heard? The Lord is the everlasting God; …He strengthens those who are weak and tired. …those who trust in the Lord for help will find strength renewed…they will walk and not grow weak.

Isaiah 40: 28-31.

DEDICATION

This book is dedicated

To my late mother *Omukaikuru Atwooki* Dorothy Kayaga, on the sixteenth anniversary of her demise, for her special care and love to me from birth, through to maturity; and for her inspiration in the reminder of my journey of life;

And

To my late wife Abwooli Annette Kayaga, for her love and understanding, her brevity during her ten years' battle against breast cancer, and for her great inspiration to the children Martha, Rita, Doris and Mark.

Service Quality, Customer Satisfaction and Paying for Water Services: Empirical Findings from Urban Centres of Low-income Countries

ABSTRACT

Intensive research activities in low-income countries during the International Drinking Water Supply and Sanitation Decade (1981-1990) led to the conclusion that cost recovery is a prerequisite for the sustainability of water services provision. The challenges for cost recovery are greater in urban areas of low-income countries where, it is projected, 88% of all the increase in global population will live by 2015. In spite of these challenges, available data show that the bill collection efficiency in selected urban water utilities in Africa in 1996/97 ranged from as low as 50%.

This study used empirical data, obtained through a cross-sectional survey in eleven towns in Uganda, to establish the influence of customer perceptions on bill payment behaviour. Using qualitative methods, a questionnaire was developed, pretested, piloted and refined, before it was sent to a probability sample of 690 registered customers of an urban water utility. Regression analysis of the obtained results showed that customer perceptions of technical quality, functional quality, service value and corporate image are individually strongly related to customer satisfaction. Correspondingly, service value and customer satisfaction predict substantial variation in customer loyalty, which in turn is a predictor of bill payment behaviour. Furthermore, gender, level of education, and type of occupation of the head of household, together with tenure status and household income, moderate the satisfaction/loyalty relationship.

Findings of this research also highlighted the relative importance to customers of urban water utilities of such 'software' attributes as: (i) how interface staff relate to customers during service encounters; (ii) how easy it is to transact with the utility, and (iii) the image organisational personalities project to the public. These findings have one major implication for supply-driven managers of water utilities: Similar to other services, customer orientation will improve profitability ratios in the urban water sector of low-income countries.

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AIC	Average Incremental Costs
Co.	Company
DWD	Directorate of Water Development (Uganda)
Gov.	Government
h/h	household
MB	Marginal Benefit
MC	Marginal Cost
MWLE	Ministry of Water, Lands and Environment (Uganda)
NGOs	Non-Governmental Organisations
NWSC	National Water and Sewerage Corporation (Uganda)
Shs.	Shillings
SPSS	Statistical Package for the Social Sciences
TV	Television
UFW	Unaccounted-For-Water
Ug.	Uganda
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
US	United States
USA	United States of America
U-Shs or Ug. Shs.	Uganda Shillings
VIF	Variance Inflation Factor
WEDC	Water Engineering and Development Centre
WHO	World Health Organisation
WUP	Water Utility Partnership (for Africa)

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE PROBLEM

> **To achieve the 2015 target in Africa, Asia and Latin America and the Caribbean alone, an additional …1.5 billion will need access…this means providing water supply services to 280,000 people …everyday for the next 15 years.** WHO and UNICEF (2000, p.1.)

The above statement sums up the daunting task with which water sector policy makers, planners, managers, and their development partners in low-income countries are faced. The target referred to in the statement will half the proportion of the population without access to adequate water supply, sanitation, and hygiene by the year 2015. This statement is a highlight of the Global Water Supply and Sanitation Assessment 2000 Report (WHO & UNICEF, 2000), which was presented to the participants of the Fifth Global Forum of the Water Supply and Sanitation Collaborative Council in Foz do Iguassu in November 2000. The same report states that of an estimated 784 million people in Africa at the time of the study in 2000, only 62 percent were served by an "improved" water supply, while 60% were served by "improved" sanitation. "Improved" water supply was described as one of the following service options: household connections, public standpipes, boreholes, protected dug wells, protected springs, or rainwater collection. "Improved" sanitation included public sewer connections, septic tank connections, pour-flush latrines, simple pit latrines, and ventilated improved latrines.

One of the major impacts of inadequate water supply and sanitation coverage in low-income countries is the health hazards with which it is associated. Studies carried out in various low-income countries have shown that water supply and sanitation interventions reduce diarrhoeal diseases and trachoma by at least 26 percent, and reduce guinea worm and schistosomiasis by about 77% (Esrey, Potash, Roberts & Shiff, 1990). It is estimated that every year there are four billion cases of diarrhoea in low-income countries, causing about 2.2 million deaths annually (WHO & UNICEF, 2000). Similarly, it is estimated that about 10% of the total population in developing countries are infected with intestinal worms; six million people became blind from trachoma; and that 200 million people are infected with schistosomiasis (WHO & UNICEF, 2000). Apart from direct health benefits, improved water supply and sanitation provides benefits in terms of savings in time and effort, leading to economic benefits (Evans, 1992).

Statistics released by the Water Supply and Sanitation Collaborative Council indicate that net gains in service coverage are negligible, in spite of the substantial gains in the number of people served. In Africa, for example, water service coverage increased from about 369 million people in 1990, to about 504 million people in 2000 (WHO & UNICEF, 2000). However, Africa's population growth was almost double the global average in the last decade: the population increased from 615 million in 1990 to 794 in 2000 (United Nations Department of Economic and Social Affairs - Population Division, 2001). For water supply, therefore, the percentage increase in population coverage between 1990 and 2000 was a meagre 5 percent. Furthermore, the population in Africa is projected to grow to 1,078 million people by the year 2015. In view of these developments, The Water Supply and Sanitation Collaborative Council has identified four major challenges facing the water supply and sanitation sector in the years to come (WHO & UNICEF, 2000):

- Keeping pace with a net global population growth of more than a billion people over the next 15 years.
- Closing the coverage and the service gap, with emphasis on sanitation, which lags considerably behind the water supply coverage.
- Ensuring sustainability of existing and new services.
- Improving the quality of services.

The points listed above show that in addition to the demand for constructing new water supply systems, there is need to improve the capacities of the service institutions in order to ensure sustainability of the existing and new services. A sustainable development has been defined as development that meets the needs of the present, without compromising the ability of future generations to meet their own needs (WHO & UNDP, 2000).

One of the lessons learnt from the International Drinking Water Supply and Sanitation Decade (1981-1990) was that cost recovery leads to more efficiency and greater sustainability (Evans, 1992; Katko, 1991b). The main reasons advanced for enforcing cost recovery can be summarised as follows (Evans, 1992):

- Public funds are usually inadequate to achieve full coverage and meet recurrent costs.

- Subsidies disempower users by denying them choice which does not encourage development of low-cost solutions.
- User payments increase a sense of value and commitment which leads to improved quality and standards of service.
- Evidence of demand and willingness to pay is strong with many low-income people already paying high rates for services.
- State intervention and control has proved to be inefficient and ineffective.

The challenges for cost recovery are greater in urban areas of low-income countries, where, it is projected that 88% of all the increase in global population will live by 2015 (United Nations Department of Economic and Social Affairs - Population Division, 2001). In order to meet these challenges, urban water utilities, the institutions that are responsible for delivery of services in the urban area, will have to carry out both institutional and technological innovations. Little empirical research exists in the literature on what the water utilities can do in order to improve cost recovery for services delivered.

1.2 RESEARCH PROBLEM AND RESEARCH QUESTIONS

The research problem addressed in this research is:

What influence do customer perceptions of service attributes have on recovering costs of urban utility water services in low-income countries?

I argue in this report that, as is the case in various private service industries in developed countries, customer perceptions of various attributes of urban water services in low-income countries are strongly related to the customers' actual bill payment behaviours. I also conclude that some household variables moderate this relationship.

The specific research questions examined are:

1. How do customer perceptions of service quality, service value, corporate image, and customer satisfaction relate to customer loyalty to an urban water utility in low-income countries?

2. Do household characteristics exert moderator effects on the relationship between customer satisfaction and customer loyalty?

3. Are the self-reported levels of customer loyalty translated into actual bill payment behaviour?

From the research questions, testable hypotheses were derived that were used to examine the relationships among various customer perceptions of urban water services, and the relationships between these perceptions and the customers' actual habits of paying the water bills. Development of research hypotheses is reported in chapter four, while operational definitions of the research variables are discussed in chapter five.

1.3 JUSTIFICATION FOR THE RESEARCH

As highlighted in section 1.2, this research was a correlational study to establish relationships between customer perceptions, and actual payment behaviours. Policy makers and managers in the urban water sector may use the results of this research to improve cost recovery. No cost-benefit analysis has been carried out in this research, but empirical results of previous research (Esrey et al, 1990; Evans, 1992; Katko, 1991b; WHO & UNICEF, 2000) show a strong positive relationship between cost recovery and sustainability of water supply services, which is in turn positively related to health, social and economic benefits. Particular justifications of the research are listed below:

1. There are benefits to health associated with improved service levels of water supply and sanitation in low-income areas (Esrey, Potash, Roberts & Shiff, 1990), as highlighted in section 1.1. Furthermore, availability of adequate water service levels to a household leads to savings in time and effort, which in turn results in economic and social benefits. As already mentioned, cost recovery, which is the subject of inquiry of this research, is a major factor in sustainability of service services to a given population (Evans, 1992).

2. Availability of water services is vital to the development of agro-based industries, which are a cornerstone of national economies of many low-income countries. Ensuring cost recovery for sustainable water services is therefore important for such industries, and subsequently for national economies of many low-income countries.

3. Investments in water and sanitation services by governments and Non-Governmental Organizations (NGOs) are capital intensive. The Water Supply and Sanitation Collaborative Council estimated that for the period 1990-2000, a total of 8 billion US dollars was invested in urban water supply infrastructural projects in Africa, Asia and Latin America (WHO & UNDP, 2000). If the infrastructure is not well maintained due to inadequate cost recovery, there are far-reaching losses for the stakeholders.

4. Since the advent of the 1980s, empirical research has been carried out on service quality, customer satisfaction and purchase intentions in the services sector. This research has been reviewed in chapter three. Most of this research has been carried out in the high-income countries such as USA, Europe, Japan and Australia. Very little published research on customer perceptions has been carried out in Africa. Dr C. Perry, Professor of Marketing, University College of Queensland, Australia, pointed out that "...the topic is so under-researched that you will definitely make a contribution - and that is the key thing about a PhD" (personal communication, March 2, 1998). There is therefore need to carry out similar research in Africa, a region that is culturally different, in order to test out and extend the findings from the developed countries.

5. Most of the research referred to in the preceding paragraph was carried out in the private service sector. Few studies have attempted to establish the relationship between service quality, customer satisfaction and customer loyalty in the public sector. Even fewer studies on service quality and customer satisfaction have dealt with public service providers that seek long-term relationships with customers (Bolton, 1998). Previous research carried out in public water and sanitation services on willingness-to-pay for services, as reviewed in chapter two, has been made outside the quality/satisfaction conceptual frameworks normally utilised in the services marketing field. Consequently, the water and sanitation services sector has not benefited fully from findings of previous research on these important variables.

6. There has been limited empirical research on perceived service value and its relationship with service quality, customer satisfaction and purchase intentions in the services setting (Anderson, Fornell &Lehmann, 1994; Cronin, Brady & Hult, 2000, McDougall & Levesque, 2000). Customer perceptions of service value are considered to be a key factor in low-income countries where various basic needs at household level 'compete' for the limited household budget

(Franceys, 1994). This research has included perceived service value in the conceptual framework.

1.4 METHODOLOGY

Although a qualitative methodology was utilised in the development of a research instrument, the main study used a quantitative methodology, in which a cross-sectional survey was conducted to collect data required for testing the hypotheses. The respondents were heads of households that are registered customers of the major urban water utility in Uganda. Following a literature survey and a focus group discussion with urban water utility managers in Uganda, a summated scale questionnaire was developed and pretested with postgraduate students of Uganda Management Institute. Thereafter, the draft questionnaire was piloted in Kampala, the capital city of Uganda. After refinement, the final questionnaire was either self-administered, or was enumerated to a stratified random sample in eleven major towns of Uganda. Justification of the methodology and details of the research method are discussed in chapter five.

1.5 OUTLINE OF THIS REPORT

The contents of the rest of the research report is structured are as follows:

- Chapter two of this report provides a background to the research problem. It highlights problems faced by urban water utilities in recovering costs of services provided to customers in low-income countries.
- Chapter three provides a theoretical review of literature on the relevant research carried out in the field of services management.
- Chapter four develops a conceptual framework and finally presents research propositions.
- Chapter five reports on the methodology of the research, and provides an overview of statistical data analysis techniques used on the raw data obtained.
- Chapter six provides an overview of data analysis and presents the findings of the research.

- Chapter seven of this report presents conclusions and discussions on the findings of the research.

- Finally, chapter eight sums up the report by lists implications of the findings, limitations of the study, and suggestions for further research.

Figure 1.1 shows a flow chart diagram of how the chapters are interrelated.

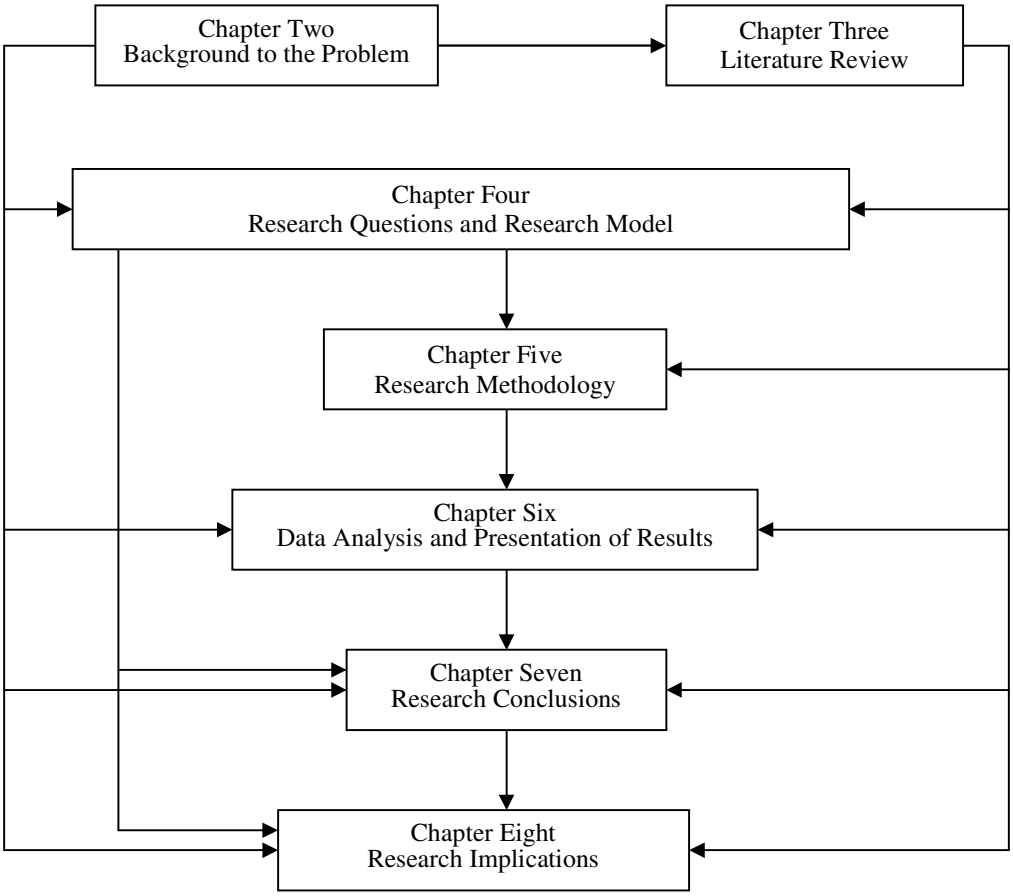


Figure 1.1: Flow-chart diagram showing the structure of the remainder of the research report and the linkages between the chapters

1.6 DEFINITIONS OF KEY VARIABLES

Definitions adopted by researchers are often not uniform, so key variables are defined to establish positions taken in this research.

- For the purpose of this report, an *urban water utility* is an institution that is either a state-owned department or corporatised enterprise, a local government institution, or a private company that is charged with the responsibility of providing water services (with or without wastewater services) to the urban population.

- *Technical Quality* refers to quality pertaining to all objective variables on which the customer will judge the technical capacity of the water utility. *Technical Quality* in this research is in most aspects the same as the construct described by Gronroos (1984).

- *Functional Quality* is the customer's perceptions of quality of the elements of interfacing environment with the organisation, which encompasses both the employees and the physical setting (Gronroos, 1984).

- *Service Value* is the customer's overall assessment of the benefits received from the service firm relative to what is paid or sacrificed (Zeithaml, 1988).

- *Corporate Image* is defined as the overall image formed by customers and potential customers about a service firm, and customers' perception of its overall attractiveness (Gronroos, 1984; Lehtinen and Lehtinen 1991).

- *Customer Satisfaction* is " … an overall evaluation based on the total purchase and consumption experience with a good or service over time", and is as a result of customers' cumulative perceptions of the organisation's past, present and future performance (Anderson, Fornell & Lehmann, 1994), as well as global impressions stemming from customers' aggregations of transactions with the organisation (Parasuraman, Zeithaml & Berry, 1994a).

- *Customer Loyalty* is the positively biased behavioural response of the customer towards the service firm (Bloemer, de Ruyter & Peeters, 1998).

- *Attitudinal Loyalty* is the customer's expressions of affection and anticipated commitment to biased behavioural response in favour of the service firm (Oliver, 1999). For the purpose of this research, it is measured by the customer's attitude towards making monthly payments for water services, as well as self-reported actions carried out by the customer to make the payments.

- *Action Loyalty* takes place when the customer converts the positive behavioural intentions into actions (Oliver, 1999). For the purpose of this research, it is measured by the customer's *Mean Bill Payment Period.*

- *Mean Bill Payment Period* is an average measure of how many days an individual customer takes to settle his/her annual water bills (Chadwick, 1991). For this research, the payment period was averaged over five years, i.e. July 1994 to June 1999.

1.7 DELIMITATIONS OF THE SCOPE OF THE STUDY

This research limited itself to urban centres in Uganda that are served by National Water and Sewerage Corporation (NWSC), the major urban water utility in the country. NWSC is the only water utility in the country that maintains an updated billing and customer register, and sends regular bills to its customers (Uganda, Consult 4 [international] [Pty] ltd et al, 1999). Consequently, it was easier to compile a sampling frame and a probability sample for urban utility customers who were served by NWSC. Furthermore, more valid responses were expected from NWSC customers than from other water utilities because NWSC has been run on a better commercial basis for a longer time than other water utilities. In limiting the organisational scope, it was assumed that NWSC customers provide a representative sample of urban water utility consumers, as NWSC has a market share of 75.5% of the total urban clientele in Uganda (Uganda, Consult 4 [international] [Pty] ltd et al, 1999).

Although NWSC deals in both water and sewerage services, the research instrument was confined to inquiring about customers' perceptions on water services. Conventional sewerage, the only sanitation service provided by NWSC is an expensive method that is beyond the reach of the majority of people in low-income countries (Reed, 1995). Consequently, only 8% of NWSC's registered customers are connected to the central municipal sewerage network (Uganda, Consult 4 [international] [Pty] ltd et al, 1999). Including sewerage services in the scope of research would therefore have affected the generalisability of the results.

Customers with suppressed accounts as of December 1998 were excluded from the research. The accounts could have been suppressed for various reasons: (i) the household could have been connected onto the water reticulation system, but with time the area where it is located could have become a dry zone due to loss of water pressure in the network; (ii) the account could have been erroneously opened;

(iii) for varied reasons the customer could have applied to be disconnected from the water supply reticulation network; (iv) the household could have been disconnected from the water supply network due to non-payment; (v) the household might have been disconnected due to illegal abstraction of water from the network. These categories of customers were excluded from the research in order to minimise bias in responses caused by possible lack of water services at the time of the survey. It was assumed that the change in the status of suppressed accounts caused by the time lag between the point of sampling and point of final survey fieldwork would be insignificant.

The research design used a cross-sectional survey to collect data. A structured questionnaire was utilised for the purpose. Although a survey method enables generalisation from a sample to a population (Babbie, 1973), and has the advantage of lower costs and rapid turnaround of data collection (Creswell, 1994), the structured questionnaire does not bring out salient issues. It was not possible to use semi-structured interviews for data collection, the preferred option, due to the enormity of resources associated with time and money required to carry out such interviews in widely geographically dispersed urban centres of the country.

1.8 CHAPTER CONCLUSION

This has chapter has laid down the foundation for the report. A background to the research was outlined, in which the necessity for cost recovery in the urban water sector was emphasized if sustainability of service delivery is to be achieved in low-income areas. After briefly highlighting gaps in the literature reviewed, this chapter introduced the research problem and research questions. Thereafter, the research was justified, the methodology was briefly described, the report was outlined, definitions of key variables were presented, and delimitations were given. On these foundations, the report will proceed with a detailed description of the research.

CHAPTER TWO

RECOVERING COSTS OF WATER SERVICES IN LOW-INCOME COUNTRIES

2.1 CHAPTER INTRODUCTION

Chapter one provided a broad introduction to the research. The research problem was briefly introduced, and justification for the research was made. As stated in chapter one, this research sought to make a contribution on how customer perceptions in an urban water industry relate to cost recovery for the services provided. This chapter provides background information on recovering costs of urban water services in low-income countries. The chapter is structured as follows:

- Section 2.2 provides a brief overview of cost recovery issues facing urban water utilities in low-income countries.
- Section 2.3 reviews current trends of cost recovery levels in low-income countries.
- Section 2.4 discusses issues concerned with willingness-to-pay for urban water services in low-income countries.
- Section 2.5 sums up the situation, pointing out the research gaps, and highlighting the need for the research..

2.2 GENERAL OVERVIEW OF COST RECOVERY OF WATER SERVICES

It is often said that water is life. Piped domestic water supply, which is the subject of this research, is necessary for drinking, cooking, washing, and bathing. In some parts of the urban areas in low-income countries, water is used for transporting domestic waste to sewage disposal plants. The use of piped water supplies for limited gardening purposes in urban areas of low-income countries is increasingly becoming recognised by urban water sector planners. Currently, it is estimated that of the 2,041 million people who live in the urban centres of Africa, Asia and Latin America, only 91% are served with basic water supply service options; for Africa alone, only 85% of the 297 million people in urban areas are served with basic water supply services (WHO/UNICEF, 2000). It is estimated that by the year 2015,

the population in the urban areas of Africa, Asia and Latin America will grow to 2,948 million people. Africa is projected to have the biggest increase in urban population, rising by almost 70% to 501 million people (WHO/UNICEF, 2000). In view of this massive task, one of the key issues in domestic water supply in low-income countries is how the supply of domestic water can be financed and managed (Franceys, 1994).

Most water supply projects in low-income areas are never subjected to economic analysis: this is mainly because water is perceived to be a fundamental right beyond economic rules; and because of the difficulty of accurately quantifying health and social benefits resulting from an improved water supply (Brookshire & Whittington, 1993; Programme Solidarite Eau, 1999). Another unique characteristic is that water can be described in two different ways: as public/merit good, meaning that those services are provided to meet the basic needs with general benefits in terms of public health; or as a private good, with "excludable benefits that are desired for convenience and commercial/industrial use as basic resources" (Franceys, 1997, p.2). Furthermore, provision of adequate water supply and good sanitation practices has important externalities, both to the general welfare of society, and globally, to the natural environment (Nickson, 1996). It is the public health considerations that justify strict supervision of quality standards by a state agency (Blokland & Braadbaart, 1997).

Another justification for involvement of state agencies is the huge sums of money required to construct sourcing/storage structures, water/sewage treatment works, and water/sewer pipe networks. In low-income countries, this type of funding is most likely to be either provided by state agencies, or outsourced from international donor agencies by state governments. Furthermore, provision of water and sanitation services in low-income countries has in the past tended to be a natural monopoly (Blokland & Braadbaart, 1997; Nickson, 1996). The large fixed investment costs required for water supply and sanitation services pre-empt the coexistence of parallel providers of watsan services.

At independence, many African countries endeavoured to provide watsan services purely as public merit goods, with virtually no cost to the users (Katko, 1990; Kayaga, 1997b). Often this was possible because populations were small and the economies were vibrant because of the high prices achieved from export of cash crops, long before the scientific discovery of synthetic, cheaper import-substitution materials by the industrialized countries. Furthermore, water demands were low, partly because of low affluence levels, and water treatment costs were even lower, due to the low levels of pollution of natural water sources. This combination of prevailing conditions led to low production costs. As time went by, however, infrastructure that had been constructed by the colonial governments began to

deteriorate, requiring higher maintenance levels, and sometimes, complete replacement. This was amidst high population growth rates, requiring expansion of services, and at higher production costs, as a result of the increasing environmental pollution (Kayaga, 1997b). With time, therefore, many state agencies could *not* fulfil their primary objective of intervention in water supply provision: that of ensuring a continuous flow of health benefits for their citizens (Franceys, 1994).

At the time of independence, the arguments raised by the national governments and their development partners in favour of providing free services, were twofold: the need to ensure realisation of public health benefits of water supply for the people; and the low affordability to pay for the services, by the majority of their citizens. These arguments were the subject of intense research and discussion before and during the International Water Supply and Sanitation Decade (1981-1990). Contrary to the prevailing opinion at the time, case studies carried out in Tanzania (Dworkin, 1980a) and Thailand (Dworkin, 1980b) showed that user payments led to more efficiency and greater sustainability. Similarly, field studies carried out in various low-income countries showed that the provision of free or heavily subsided services has limited the expansion of water supply coverage, resulting in a situation where the most vulnerable sections of society miss out (Chioke, 1995; Evans, 1992; Franceys, 1997). Briscoe & de Ferranti (1988) further pointed out that promises of free service for all, too often results, in practice, in some service for a few influential people in society and little or no service for most citizens of low-income countries. In a discussion paper, Katko (1990) summed up the existing situation on the subject as follows:

- Cost recovery, operational technology and appropriate institutions are the key requirements for any sustainable development in water supply and sanitation.

- The policy of supplying free or almost free water free water has often produced very inequitable results. Governments have been able to [provide] water supplies only to some consumers. This service benefits mainly the better-off consumers instead of the urban and rural poor. A better and more equitable method would be to collect water fees from middle-level and large consumers via progressive tariffs and cross-subsidise the poor consumers. Katko (1990, p. 93)

Both the policy makers and their development partners acknowledged the importance of cost recovery in water supply services as early as 1980s. In a study carried out by WHO in low-income countries in 1980, government officials identified severe constraints in water supply services as funding limitations, insufficiently trained professional personnel, inadequate operation and maintenance, and inadequate cost recovery from customers (Katko, 1986). These constraints were confirmed in a follow up study financed by the academy of Finland in 1984, in which a modified version of the WHO questionnaire was sent to expatriate developmental workers involved in rural water supply in Kenya, Malawi, Sri Lanka, and Tanzania (Katko, 1986).

Inadequate cost recovery does *not only* result in low investment levels, but also affects the effectiveness of operation and maintenance. A high level of investment in the water supply sector goes to waste as many systems fall into disrepair almost as quickly as they are constructed (Evans, 1992; Howe & Dixon, 1993). Katko, Hukka and Pietita (1992) submitted that if sustainable water services in low-income countries are to be attained, consumer payments are necessary, as neither governments nor external support agencies can afford to subsidise water services on a sustainable level. At the end of the International Water Supply and Sanitation Decade (1981-1990) it was estimated that between 30-40 % of water supply systems in low-income countries were inoperative due to poor operation and maintenance practices (Evans, 1992). In view of the realisation that the major constraint to service coverage in low-income countries is inadequate cost recovery, the UN Secretary's end-of-Decade (1981-90) report to the General Assembly stated thus:

> Since financial resources for the sector are extremely limited in most countries, and because radical shifts in the sector allocations are unlikely in the foreseeable future, the conclusion is increasingly being reached that project beneficiaries should participate in cost recovery if service coverage in developing countries is to be extended. (Evans 1992, p. 4)

Sensitisation on *whether* to charge user fees for water supply services seems to have borne fruit in low-income countries: ten years after the International Water Supply and Sanitation Decade (1981-1990), the debate has moved on to discuss *what level*, and *what method* of cost recovery, will ensure sustainability and social equitability of the water supply services. The progress towards sustainable cost recovery in urban water services is one of the main achievements of the International Water Supply and Sanitation Decade (Katko, 1990). The Water Supply and Sanitation Collaborative Council, in its global assessment, found that in addition to the original three constraints of funding limitations, inadequate

cost recovery, and inadequate operation and maintenance, the list for critical constraints to service coverage grew longer. The other constraints perceived as critical are :

- Institutional problems
- Inadequate human resources
- Lack of sector coordination
- Lack of political commitment
- Insufficient community involvement
- Lack of hygiene education
- Poor water quality
- Insufficient information and communication

(WHO/UNICEF, 2000, p. 15)

Section 2.3 discusses the current trends in cost recovery efforts.

2.3 LEVEL OF COST RECOVERY IN LOW-INCOME COUNTRIES

The global assessment carried out by the Water Supply and Sanitation Collaborative Council in 2000 showed that all low-income countries levied a tariff on urban water services (WHO/UNICEF, 2000). Water utilities at different autonomous levels have been formed to manage the water supply services sector in the urban areas. However, data available in the Global Water Supply and Sanitation Assessment 2000 Report show that most urban water tariffs levied do not cover the full cost of the services provided, inclusive of investment costs. figure 2.1 shows the median water supply tariff, median unit production costs, and median tariff/cost ratio across the continents. The median is the value above and below which half the cases fall.

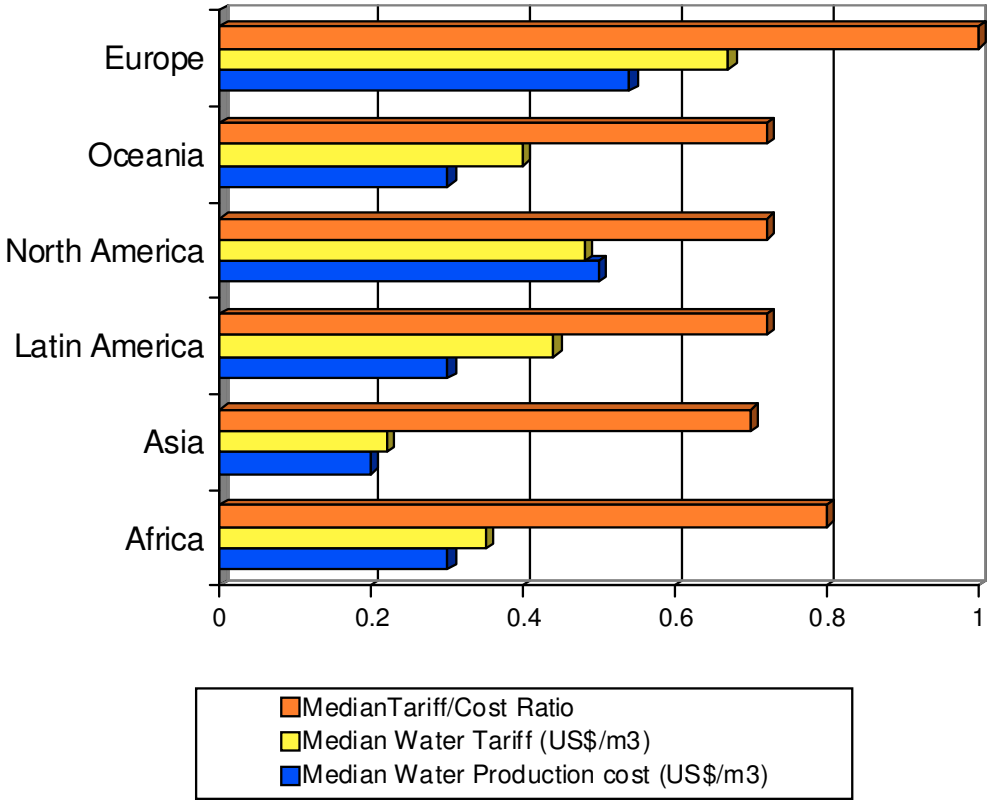


Figure 2.1: A comparison of median water production costs, median tariffs and median tariff/cost ratios in the six continents of the world.

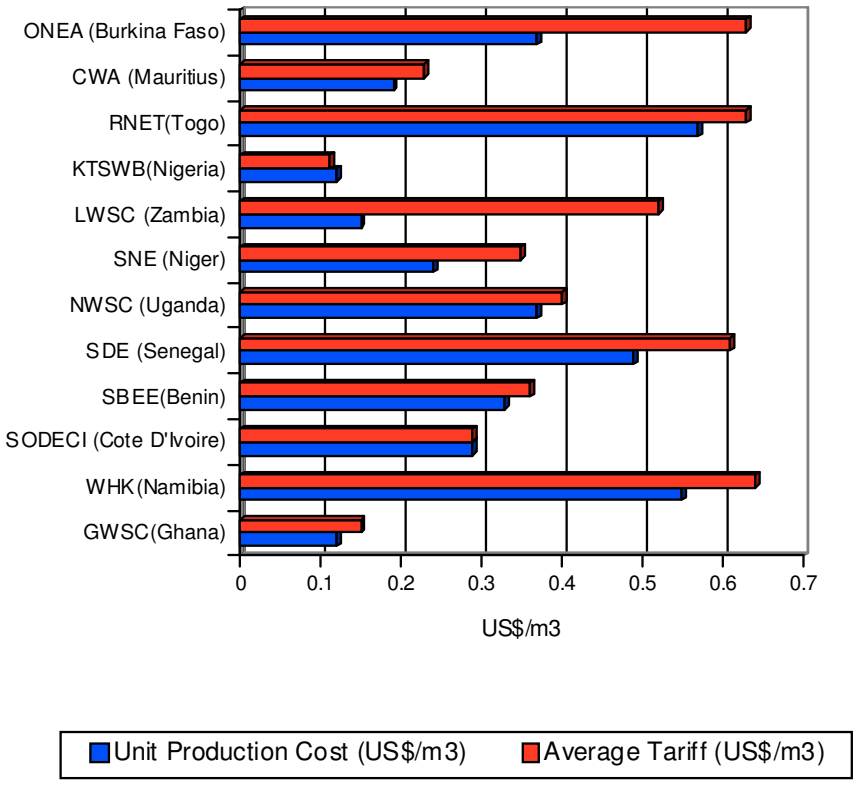
Source: (WHO/UNICEF, 2000)

The graph in figure 2.1 shows that Asia and Europe have, respectively the lowest and highest median for both production and tariff costs. Except for one continent, there is little variation in the median tariff/cost ratio in all the continents. The graph shows that apart from Europe, more than one half the countries of each region charge an urban water tariff that is less than the unit cost of production of the water. The median values can only be indicative of the global trend of cost recovery, as the data obtained have greater variations between sub-regions, and between countries (WHO/UNICEF, 2000).

The global figures are too general to reveal enough details for deeper analysis, as there is considerable variation in the level of cost recovery across the different countries. A better picture can be obtained by examining data from individual water utilities. Unfortunately, either there is no data given by water utilities in low income-countries, or data given from some water utilities is grossly inaccurate and not

useable. This problem is more severe in the Africa Region. Recognisant of the fact that if one cannot measure something, one cannot manage it, there is currently a project, under the Water Utility Partnership (WUP), with which the author is associated, whose objective is to establish a data base for African water utilities, and provide an arena for benchmarking. A draft of the first edition was produced in February 2000. On the other hand, Asian Development Bank has so far produced two editions of 'Asian water utilities data book', in which data is perceived to be more accurate. Statistics for this research have exclusively been drawn from these two regional publications.

Figure 2.2 shows unit production costs and average tariffs for urban water utilities in countries in the Africa Region. Water Utility Partnership (WUP) carried out a region-wide survey in 1998 and managed to get a response from 21 water utilities. However, some of the entries are either incomplete, or suspected to be grossly inaccurate. Figure 2.2 also shows that apart from Katsina State Water Board of Nigeria, all water utilities charged a tariff at least equal to the production costs. Lusaka Water & Sewerage Company of Zambia had the highest tariff/cost ratio at 3.5, followed by Office National de l'Eau et de l'Assainissement of Mauritius at 1.7. For Societe de Distribution d'Eau de Cote d'Ivoire, the costs balance with the set tariff.



CWA: Central Water Authority
KTSWB: Katsina State Water Board
SNE: Societe Nationale des Eaux
WHK: Windhoek Municipality
SDE: Senegalaise des Eaux
RNET: Regie Nationale des Eau du Togo
LWSC: Lusaka Water & Sewerage Company
SBEE: Societe Beninoise d'Electricite et d'Eau
GWSC: Ghana Water and Sewerage Corporation
NWSC: National Water & Sewerage Corporation
SODECI: Societe de Distribution d'Eau de Cote d'Ivoire
ONEA: Office National de l'Eau et de l'Assainissement

Figure 2.2: Unit Water Production Costs and Average Water Tariff for Selected Urban Water Utilities in Africa, for the year 1996/97.

Source: Water Utility Partnership (2000)

Figure 2.3 shows similar indicators for selected urban water utilities in Asia.

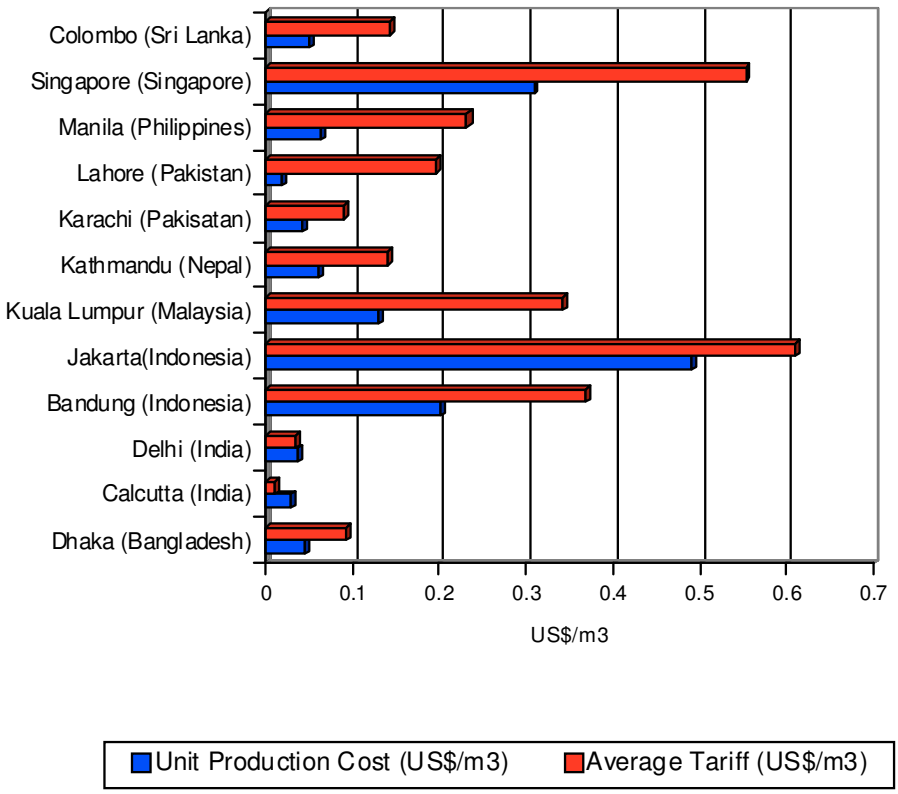


Figure 2.3: Unit Water Production Costs and Average Water Tariff for Selected Urban Water Utilities in Asia, for the year 1995/96.

Source: McIntosh & Yniguez (1997)

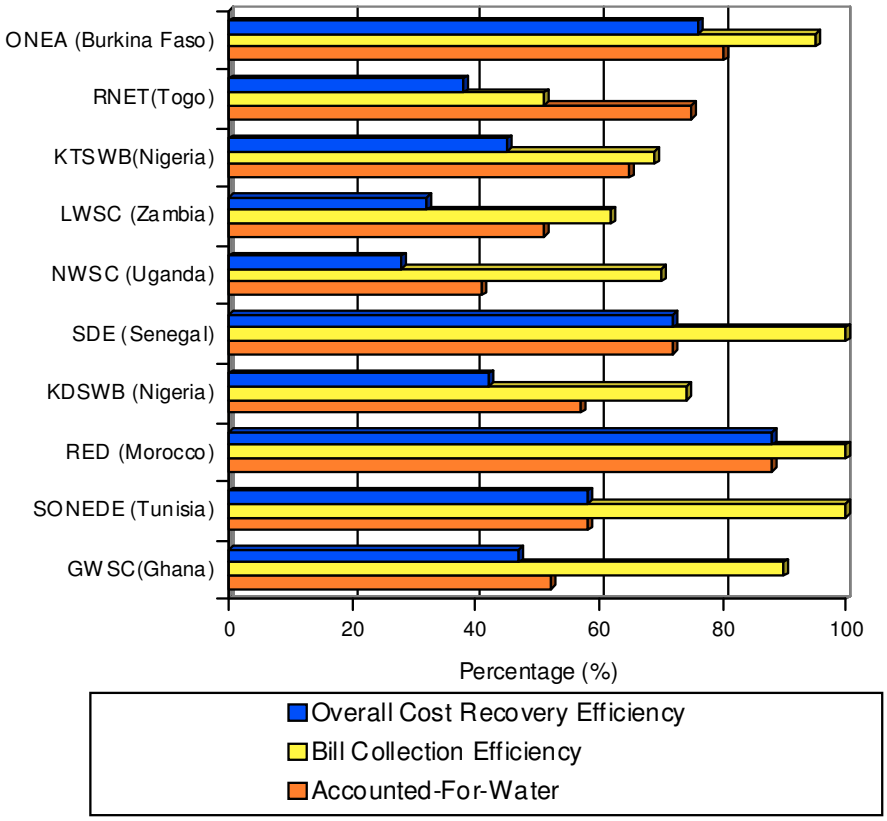
Figure 2.3 shows that apart from utilities operating in Calcutta and Delhi, the mega cities of India, all the other utilities charge a tariff that is higher than the production costs. Only two utilities, operating in Singapore and Indonesia, have unit production costs of at least 0.3 US$/ m^3. It can be noted that the production costs in most Asian cities are much lower than for cities in Africa, a fact that corroborates with the global figures obtained by WHO/UNICEF and plotted in figure 2.1. It is therefore not surprising that the tariffs charged are also generally relatively lower than in African region.

It should be noted that the tariff/cost ratio is a theoretical indicator of actual cost recovery. Although the tariff may be set to cover and/or supersede the production costs, it may not be practically possible to account, in money terms, for all the water produced. There are two performance indicators in the water service industry that measure cost recovery efficiency: Unaccounted-For-Water, and Bill Collection Efficiency. Unaccounted-For-Water (UFW) is defined as "…the difference between the volume of water delivered to the distribution system and the water sold", and is composed of physical losses and commercial losses (Yepes & Dianderas, 1996; p.11). Accounted-For-Water is water that has been billed for. UFW is caused by the following water losses:

- Overflows in reservoirs.
- Distribution network physical leakages.
- Water used to flush the network.
- Calibration errors in the customer's meter.
- Wrong meter readings.
- Underestimated flat rate bills.
- Illegal connections.
- Illegal consumption through the reversal of meters, and/or meter adulteration.
- Erroneous bills.
- Collusion between customers and staff to produce wrong bills.

- Authorised water consumption but not billed.

The first three causes of water losses are physical, while the rest of the list is composed of commercial or administrative losses. On the other hand, Bill Collection Efficiency is the ratio that compares revenue actually collected and what was billed. Figures 2.4 and 2.5 show figures of Accounted-For-Water (i.e. 1 – UFW) and Bill Collection Efficiency for selected urban water utilities in Africa and Asia, respectively.



RNET: Regie Nationale des Eau du Togo
KDSWB: Kaduna State Water Board
SDE: Senegalaise des Eaux
GWSC: Ghana Water and Sewerage Corporation
RED: Regie de Distribution d'Eau et d'Electricite -Rabat
ONEA: Office National de l'Eau et de l'Assainissement
SONEDE: Societe National de Distribution des Eaux
WHK: Windhoek Municipality
LWSC: Lusaka Water & Sewerage Company
NWSC: National Water & Sewerage Corporation

Figure 2.4: Ratios of Accounted-For-Water and Bill Collection Efficiency for Selected Urban Water Utilities in Africa, for the year 1996/97.

Source: Water Utility Partnership (2000)

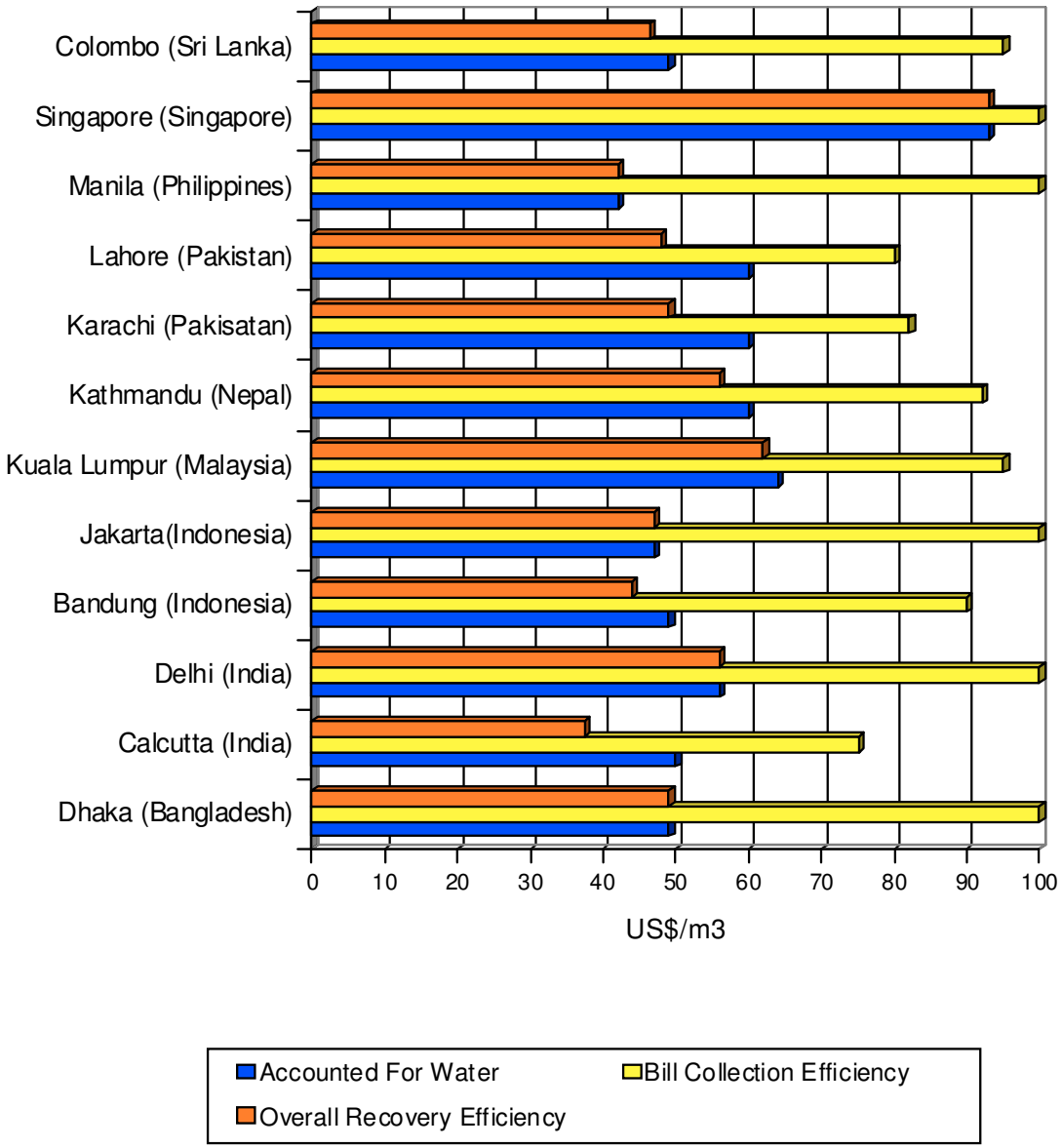


Figure 2.5: Ratios of Accounted-For-Water and Bill Collection Efficiency for Selected Urban Water Utilities in Asia, for the year 1995/96.

Source: McIntosh & Yniguez (1997)

Figure 2.4 shows that the variances for both Accounted-For-Water and Bill Collection Efficiency are high in the selected 10 water utilities of Africa. Accounted-For-Water varies from 40% for National

Water & Sewerage Corporation (Uganda), to 88% for Regie de Distribution d'Eau et d'Electricite – Rabat (Morocco). Bill Collection Efficiency is generally higher, ranging from 50% for Regie Nationale des Eau du Togo, to 100% for Regie de Distribution d'Eau et d'Electricite – Rabat (Morocco), Senegalaise des Eaux (Senegal), and Societe National de Distribution des Eaux (Tunisia). On the other hand, the data for water utilities in Asia (figure 2.5) show a smaller variance in bill collection efficiency, as all the water utilities report a figure of at least 75% in bill collection efficiency. Actually, five water utilities report an efficiency of bill collection of 100%. However, apart from the water utility in Singapore, which has an accounted-for-water ratio of 93%, the rest of the utilities in Asia shown in figure 2.5 have an accounted-for-water figure of between 40% and 65%.

A better indicator for evaluating overall cost recovery efficiency of a water utility is the product of Accounted-For-Water and Bill Collection Efficiency. Overall cost recovery efficiency can be described as the ratio of the volume of water for which payment has been received, to the volume of water that has been delivered to the distribution system. Since it is the product of two ratios, in order to have a good overall cost recovery efficiency, a water utility is required to perform highly in minimising both physical and commercial losses, and also be able to recover payment for all the bills. This indicator has been worked out for each water utility and is also plotted in figures 2.4 and 2.5. For the Africa Region (figure 2.4) it can be seen that the overall cost recovery efficiency ranges from 28% for National Water & Sewerage Corporation (Uganda), to 88% for Regie de Distribution d'Eau et d'Electricite –Rabat (Morocco). Performance is reportedly better in the Asia Region, where the minimum overall cost recovery efficiency is 38% for Calcutta, while the highest efficiency is 93% in Singapore. Singapore's reported accounted-for-water ratio is exceptionally high, with a performance better than the mean accounted-for-water ratio of 85% reported for North America (WHO/UNICEF, 2000).

Apart from unaccounted-for-water (UFW), the other component that leads to a low overall recovery efficiency is a measure of mean bill payment period. The mean bill collection period is a measure of how long it takes the organisation to collect its debts (Chadwick, 1991). Like the bill collection efficiency, it is a measure of efficiency in financial management. However, the mean bill collection period aggregates the collection efficiency over a period of time, and therefore provides a better insight into 'longitudinal' efficiency of a utility. If a utility is not able to collect all the bills that are sent out, cash flow problems set in sooner rather than later: the utility may not be able to cover its operational expenses let alone carry out extension of service coverage, even if the utility has set appropriate tariffs.

Such a situation results in low service coverage. Figure 2.6 shows a graphical presentation of the mean bill collection period and population service coverage for selected water utilities in Asia.

Figure 2.6 shows that the water utilities in Singapore and Kuala Lumpur have the highest population coverage; the utilities also have a very low bill payment period. Also, the utilities in Dhaka and Karachi have a high mean bill collection period, and a relatively low service coverage. Although there are utilities which have a low bill collection period as well as a relatively low service coverage (e.g. Jakarta, Bandung), there are no water utilities which have a high bill collection period, combined with a high service coverage. It would seem that the bill collection period is one of the major factors of service coverage. Another major factor is the capacity for a water utility to raise investment funds. In fact, when these few points of service coverage and bill collection period are correlated, a correlation coefficient of about –0.3 is obtained, although not significant at the 95% confidence levels, probably due to the extremely low number of valid cases.

In the context of community-managed water supply, Brikke and Rojas (2001) presented the following seven key factors for sustainable cost recovery:

- Set a strategy that espouses four main orientations: social equity, efficiency, participatory process, and financial viability.
- Set up mechanisms that will estimate and improve users' willingness-to-pay for the services.
- Optimise costs to the users, through choice of suitable technology.
- Establish clear financial responsibilities.
- Set up an appropriate tariff.
- Improve access for the community to alternative finances.
- Set up an effective financial management system.

One of the key factors of sustainable cost recovery is consumers' willingness-to-pay for the services provided, whether in a rural or urban setting. Section 2.4 discusses aspects of willingness to pay for urban water services in low income countries.

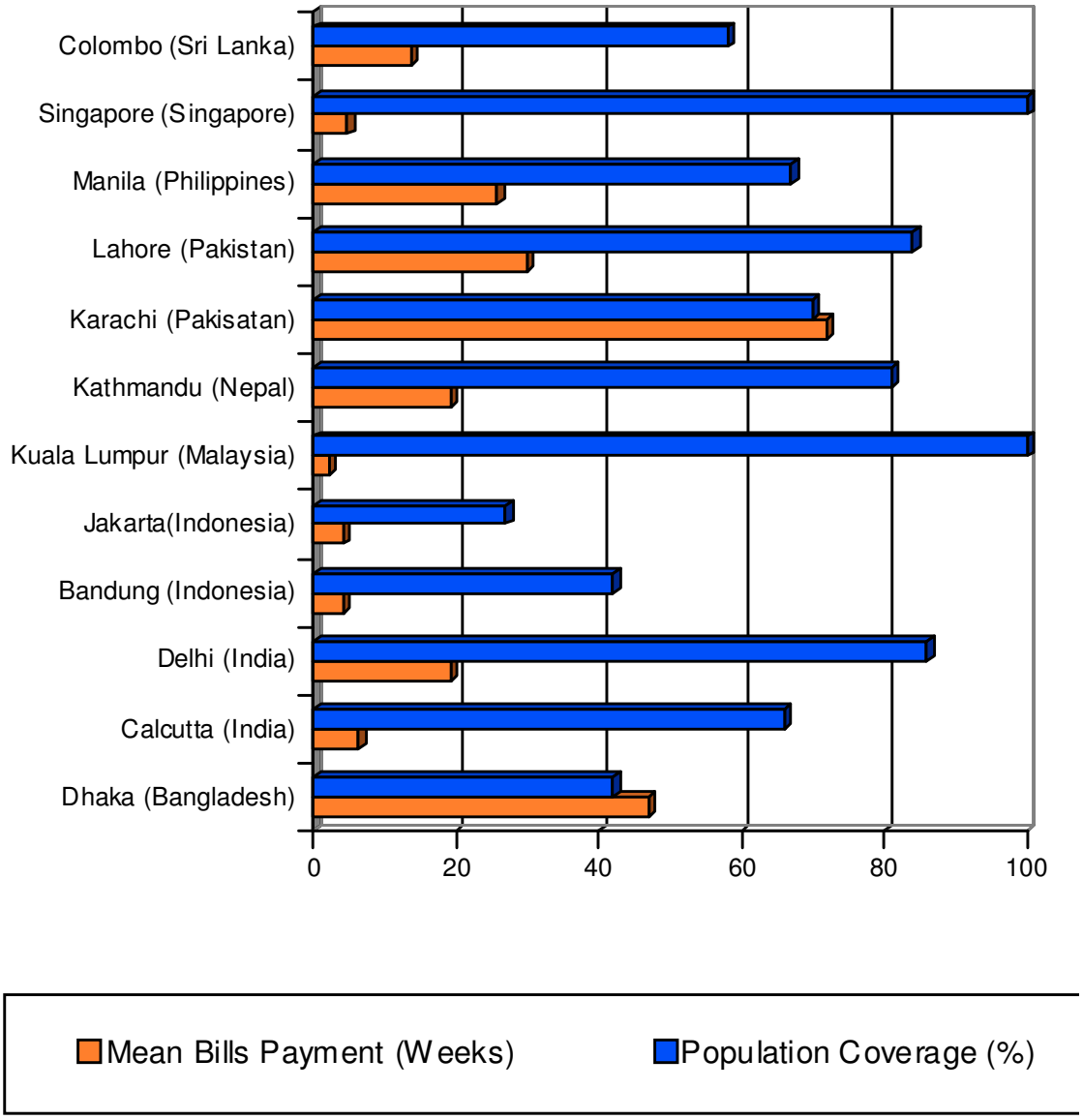


Figure 2.6: Mean Bill Payment Period (in weeks) and population coverage for Selected Urban Water Utilities in Asia, for the year 1995/96.

Source: McIntosh & Yniguez (1997)

2.4 WILLINGNESS-TO-PAY FOR URBAN WATER SERVICES

In economic terms, a consumer's Willingness-To-Pay (WTP) is defined as the maximum amount a person would be willing to pay for a service rather than doing without it (Katko, 1991). Evans (1992) defined WTP for services as effective demand, and differentiated it from felt needs, which turn into effective demand only when consumers are prepared to use their resources to obtain what is offered. Asian Development Bank (1999) defined effective demand for water as the quantity of water demanded of a given quality at a specific price, and differentiated it from actual consumption, as the latter could be constrained by the existing water supply available to the consumer. Subsection 2.4.1 presents basic economic concepts of WTP; subsection 2.4.2 provides a brief overview of methods of predicting WTP; while subsection 2.4.3 discusses factors influencing WTP for urban water services in low-income countries.

2.4.1 Basic Economic Concepts of WTP

The relationship between the quantity of water used and the price is illustrated by a demand or WTP curve for water, which normally depicts a non-linear relationship. However, Curve D in figure 2.7 is a linear curve approximating the real experience scenario. The total WTP is represented by the area under the demand curve, which is composed of the amount paid by the consumer for the service, plus the "consumer's surplus". "Consumer's surplus" is represented by the area under the demand curve that is above the horizontal line drawn through P_o (Barker, 1992; Katko, 1991).

According to economic classic theory, the price charged for water should cover the marginal cost (MC) of the product, i.e. the total cost of producing and supplying the next or last unit (Barker; 1997). The demand curve for water represents the marginal benefit (MB) of successive increments of water consumption, as it shows the maximum sum of money that would be paid for each unit of water (Barker; 1997). Figure 2.7 shows the curves for marginal cost and marginal benefit superimposed on each other. The diagram illustrates a point Qo, the optimum output where the marginal cost balances with the marginal benefit if water is sold at price Po. A net benefit is realised on output units in the range (0-Qo), but a net cost incurred on output units greater than Qo (Barker, 1997). There are two types of marginal costs (Barker, 1992; Palmer Development Group, 1998): (i) short-run marginal cost, i.e. the cost for providing the last or next unit while keeping the level of investment constant, and (ii) long-run marginal cost, i.e. the cost for providing the last or next unit when investments in supply

capacity are not fixed. Due to the difficulties in calculating marginal costs for urban water schemes, Average Incremental Cost (AIC) is an accepted approximation to marginal cost pricing (Barker, 1992; Barker, 1997; Palmer Development Group, 1998). AIC is the ratio of the sum of costs associated with investment, with the incremental output of investment, both expressed in present value terms (Barker, 1992, 1997).

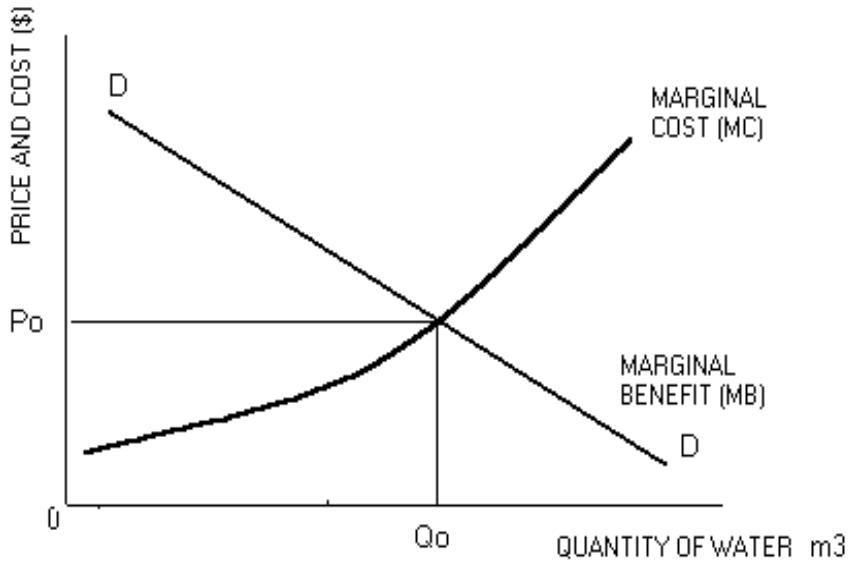


Figure 2.7: Demand Curve for Water Services, showing Marginal Costs and Benefits
Source: Barker, 1997

Another concept that is important in the determination of WTP is the Price Elasticity of Demand. It highlights the economic principle that when the price of a commodity falls, people will purchase more of it. Price Elasticity of Demand, e_p, is a measure that describes the degree of responsiveness of the quantity of water to a given price change and is computed (Asian Development Bank, 1999, p.44) as follows:

$$e_p = \frac{\text{(Percentage decrease in the quantity of water demanded)}}{\text{(Percentage increase in the price per unit of water)}}$$

If, for example a 5% increase in price causes a 10% decrease in quantity demanded, the price elasticity of demand is two. Because water supply is a 'necessity good', its price elasticity is less than one (Franceys, 1994). In other words, when the price of water is increased, the change in water consumption will be proportionately smaller.

Various case studies indicate that price elasticity varies with intended usage of water. If the water demanded is in the 'life-line' block, i.e. necessary for basic human survival, the price elasticity is close to zero: the amount of water demanded for basic health requirements of drinking, cooking and personal hygiene will not be affected by the price changes. However, when water demand is outside the 'life-line' block, price elasticity rises. Franceys (1994) mentioned price elasticity values of between 0 and 0.3 for low-income consumers whose needs are small but absolute, and between 0.3 and 0.6 for consumers of water with more 'luxurious' uses such as toilet flushing, bath-tub washing, machine-washing, car-washing, and garden irrigation. This range is collaborated by a study in Hong Kong that established an elasticity value of 0.15, where water supply was being rationed by up to a maximum of 14 hours daily (Woo, 1992). Another study in Uttar Pradesh, India found that the price elasticity was 0.31 for consumers with individual household connections, but only 0.05 for public tap users (Choe, Varley & Bijlani, 1996).

Studies carried out by the World Bank (Asian Development Bank, 1999) found that price elasticity for water typically ranges between 0.8 and 0.2, depending on the intended use. Case studies have also found that price elasticity depends on income levels. For a given use of water, households with higher income levels are prepared to pay for more water, regardless of the price increase. The Asian Development Bank (1999) reported on studies carried out in Bangladesh whose results showed that (i) households with higher incomes are able and willing to pay more for a given quantity of water, and (ii) households with higher incomes are prepared to pay smaller percentages of their incomes for water than people with lower incomes.

Concerning the practical application of marginal cost pricing, the Palmer Development Group (1998) argued that the neo-classic economic theory recommendation of setting the price of a good to be equal to the marginal cost of supply, cannot apply to public water supply pricing. The following main obstacles were highlighted (Palmer Development Group, 1998): (i) capital indivisibility common with implementation of infrastructural projects; (ii) the prevalence of sunk investments in infrastructural

projects; (iii) lack of perfect competition in the public service sector; and (iv) presence of externalities, such as consideration of social equity. Similarly, Programme Solidarite Eau (1999) pointed to the difficulty of measuring non-perceived health benefits of water supply projects. Programme Solidarite Eau (1999) argued that normally, beneficiaries of a water supply project are not aware of the extent of impact of improved water services on their health; hence the health benefits cannot accurately be computed in the economic cost benefit analysis.

The debate among scholars and managers as to whether water should be managed as an economic good, continues. Briscoe (1997) pointed out that in the urban water sector, the opportunity cost of piped water is far less than the full economic cost. This is partly due to the fact that unlike other natural monopolies, the marginal cost of water provision usually rises above average cost, depending on the 'increasing cost' input of available water resources, with the cheaper sources the first to be tapped (Collinge, 1992). The results of a study carried out in Kerala, a coastal state in south-west India (Jacob, 1992) showed that the consumers believed that water is an abundant free gift of nature. On the contrary, Jacob (1992) and Kayaga (1997b) noted that fresh water, once considered a free and never depleting gift of nature, has now become a costly and vital scarce resource, and the consumer should be made aware of the various aspects involved in purifying it. Similarly, despite the concerns raised about the anticipated impact on the poor, Briscoe (1997) argued for management of water as an economic good in the urban sector. Examples of urban water supply projects were cited where water is being managed as an economic good, with enormous benefits for the poor, such as in Santiago, Chile; Conakry, Guinea; and Buenos Aires, Argentina (Briscoe, 1997).

2.4.2 Predicting WTP for Water Services in Low-Income Countries

The predictability of consumers' payment of water user fees has two elements: consumers' ability and willingness to pay (Katko, 1991). In the past 5% of a household's income has been used as 'a rule of thumb' in determining a household's ability to pay for water services (Katko, 1990). However, income levels in low-income countries are difficult to measure, as most economic activity takes place in the informal sector, and earnings are largely undocumented. Therefore, recent research has concentrated on what households *will* pay, rather than what they *can* pay (Evans, 1992). Three basic methods have been commonly used to determine WTP for water services in low-income countries:

Parallel Surveying

This method, also referred to as the indirect method, involves analysis of what other people in similar circumstances to the target population are already paying for water services (Evans, 1992; Katko, 1989). This method has successfully been tested in Burkina Faso, Indonesia and Mauritania, and may provide valid data, depending on the circumstances for applicability (Katko, 1989). One of this method's shortcomings is that it may be difficult to match any two communities along their economic, social and cultural dimensions. Furthermore, Briscoe and de Ferranti (1988) pointed out that the service level(s) to be offered in the new water supply project may not have existed in the previously observed community; and that this method utilises a supply-driven approach.

Contingent Valuation Method

This is a direct method that involves asking consumers in advance about their own estimate on their future WTP, or their likely reaction to price changes (Katko 1989). Household surveys are carried out in which members of households are individually asked structured questions that are designed to determine the maximum amount of money their respective households are willing to pay for the service. Respondents may be asked their preferences through bidding games. The Contingent Valuation Method is considered inexpensive and fast. However, if the questionnaire is not well designed and/or well administered, the following biases may occur (Evans, 1992; Katko, 1989; Piper & Martin, 1997):

- Hypothetical bias – respondents may not understand correctly the characteristics of the improved service being explained.
- Strategic bias – the respondent may want to influence the provision of the service in his /her favour by not answering the questions truthfully.
- Compliance bias – the respondent may want to provide answers that are influenced by his/her desire to please the interviewer.

Researchers have developed techniques to minimise these biases, and to date, the WTP surveys are the most scientifically validated direct methods (Programme Solidarite Eau, 1999).

Water Vending as Evidence of WTP

Proxy measures have also been used to determine WTP. One common method is to use a case study of water vending to provide indicators of WTP (Evans, 1992, Katko, 1991). Although the service level provided by water vending does not usually correspond to the proposed service levels in the improvement schemes, the results of the study are able to indicate the value which respondents allocate to water, and what the upper limits of WTP are likely to be (Evans, 1992). Water vending practices flourish in environments where alternative water supplies are extremely limited. In extrapolating vending data into estimates of WTP, there is the need to consider the principle of price elasticity of demand.

Coping Costs as Estimation of WTP

Another proxy method of estimating WTP is evaluation of costs incurred by a household to cope with intermittent or total absence of a water supply scheme. The costs could be categorised in terms of financial and economic components (Choe, Varley & Bijlani, 1996). The financial component is composed of funds used to pay for alternative sources of water; and/or purchase such items as storage tanks and motor pumps. The economic costs include efforts expended in walking, waiting in the queue; time and energy spent boiling the unsafe water, and in management of the on-site storage sub-system. Other economic costs are the wage losses and other expenditure on health issues, as a result of sickness from poor water quality. The WTP for improved water services may be estimated by adding the financial and economic costs (Choe, Varley & Bijlani, 1996).

2.4.3 Factors Influencing WTP for Water Services in Low-Income Countries

Since the beginning of the International Water and Sanitation Decade (1980-1990), a few studies have been conducted on factors influencing WTP for water services in low-income countries. Most of these studies have been carried out on rural water supply services, and, unlike the operating environment in the urban setting, emphasize the importance of community management interventions. Nonetheless, since income levels do not vary significantly between rural and urban areas of the low-income countries, many of the concepts for rural water services also apply to urban water services as well.

Katko (1990) came up with a comprehensive list of factors of WTP for water services in rural areas of low-income countries. These factors, which were classified according to the perceived strength and direction of the effects, can be summarised as follows (Katko, 1990):

- Main factors: water reliability; better service option, i.e. house connection or yardtap; use of water for productive activities; shorter distance to travel; consumer involvement; consumer's sense of belonging to the improved water system; good community leadership; reliable fund collection; privacy of water drawing.

- Other factors: history and/or presence of "free water policy", formal education level, household income, tradition of fundraising in the community; involvement of women in financial management; religion.

Similarly, Evans (1992), looking at factors that influence community financing of water and sanitation in low-income countries, came up with a more refined list of factors influencing WTP. For an urban setting, this list can be categorised into the following groups of factors:

- Factors that can be fully influenced by a water utility: service level; service standard; reputation of service agency; policy environment; perceptions of ownership and responsibility; transparency of financial management; and institutional framework.

- Factors that can be partially influenced by a water utility: perceived benefits; community cohesion; price; opportunity cost of time; relative cost; and relationship to production.

- Factors that are beyond the scope of the water utility: level of income; characteristics of alternative sources; and socio-cultural factors.

A recent study (Brikke & Rojas, 2001) characterised the factors influencing WTP into two broad categories: community factors, and service factors. The community factors include (i) demand and participation of communities; (ii) prevailing local customs and legislation; (iii) community members' perceived benefits derived from the improved services such as convenience, social status, health, quantity of water; opportunity cost of time; and potential for income-generating activities; (iv) level of household income. The service factors include presence of alternative sources of water supply; costs of improved water supply systems; and management efficiency.

A few case studies have been carried out on factors affecting WTP for water services. A study conducted in Lugazi, a 20,000-resident town in Uganda, in 1994 on WTP for improved water services revealed that most households were willing to pay more for private connections than for accessibility to a public tap (Whittington, Davis & McClelland, 1996). Given the low-income levels of the residents, the study recommended spreading of the capital costs for the new household connection over a reasonable period of time (Whittington, Davis and McClelland, 1996). Similar results were obtained in studies carried out in the Province of Punjab of Pakistan (Altaf, Whittington, Jamal & Kerry, 1993), Anambra State of Nigeria (Whittington, Okarafor, Okore & McPhail, 1990), cities of Ahmedabad and Bangalore of India (Mani, Onishi and Kidokoro, 1997), rural villages of Phillipines (Bohm, Essenburg & Fox, 1993), and the city of Delhi in India (Zerah, 1997). Indeed, the results of a study carried out in Punjab, Pakistan showed that households were prepared to pay substantial amounts of money for private house connections, only if the service was reliable (Altaf et al., 1993).

The importance of water quality was emphasised in determining the effective demand for services. Asian Development Bank (1999) defined water quality in terms of chemical and biological composition, taste and smell, water pressure, reliability of supply, accessibility and convenience, and it was asserted that an individual is prepared to pay a relatively higher price for a product perceived to have a higher quality. The results of a study conducted in Punjab, Pakistan (Altaf et al., 1993) showed that service characteristics of most concern to households are reliability and water quality. A study carried out in rural parts of Philippines showed that households value an in-house piped water supply highly relative to other characteristics of their homes (North & Griffin, 1993).

Studies carried out in areas with water supplies that are unreliable showed that consumers use various coping strategies to respond to unreliability. Households have invested in high cost alternative private systems, the service level and associated cost depending on the income levels (Altaf et al., 1993). A study carried out in Delhi, India (Zerah, 1997) showed that (i) low-income households paid a bigger proportion of their income in coping strategies than the high income households, and (ii) consumers were willing to pay a higher price for a more reliable supply. Indeed, an empirical study conducted in the city of Bhopal in Central India (Asthana, 1997) showed that the decision to connect to a public water supply system was strongly influenced by household expectations or experiences of alternative sources.

Similarly, Mani, Onishi and Kidokoro (1997) examined factors of WTP for water and sanitation services in the Indian cities of Ahmedabad and Bangalore. The findings of the study were (Mani,

Onishi and Kidokoro, 1997): (i) high and middle-income groups in both cities use supplementary water supply sources to enhance the service, (ii) the low income households use only the services available, (iii) water quality is upgraded by filtering or boiling, (iv) where the services are supplemented with accessories, the WTP tends to be depressed, (v) respondents are unwilling to discontinue alternative sources of water supply.

A study conducted in Nsukka District, Anambra State of Nigeria (Whittington, Okarafor, Okore & McPhail, 1990) found that most of the respondents were willing to pay less for an improved public water service than what they were paying at the time of the study to unreliable private tanker vending services. Furthermore, the results of the study carried out in Punjab, Pakistan (Altaf et al., 1993) showed that the WTP for improved services among households that already had private connections was significantly lower than for households without piped water systems. The main reason could be the pessimistic perceptions of reliability of services provided by the government, as unveiled by follow-up in-depth interviews conducted in a similar study in Anambra State of Nigeria (Whittington, Okarafor, Okore & McPhail, 1990).

Other reasons for lower WTP for public utility services in Anambra State of Nigeria (Whittington, Okorafor, Okore & McPhail, 1990) are: (i) affordability and non-flexibility of monthly payment; (ii) ignorance of the magnitude of current expenditure on vended water; (iii) respondents expected free or subsided services from the government. Indeed, a study carried out in Kerala, a coastal state in India (Jacob, 1992) provided similar results, which showed that consumers considered drinking water supply as part of welfare programmes of the government. Similarly, Altaf et al. (1993) found that tariffs and connection fees were significantly negatively affecting the likelihood of households in Punjab, Pakistan connecting to public water systems. Indeed, a WTP study conducted in Kerala (India) showed if the monthly tariff was kept constant, and the connection cost reduced seven times, net revenue for the water utility would go up four times (Singh, Ramasubban, Bhatia, Briscoe, Griffin & Kim, 1993).

The World Bank Water Demand Research Team (World Bank, 1993) summarised findings of studies carried out in selected regions of Latin America, Africa, and South Asia on demand for water. The results showed the following determinants of household demand for improved water services:

- Better-educated household members are willing to pay more for improved water supplies.
- Women were willing to pay more for better water services than male respondents.

- Respondents employed in the formal sector generally displayed better WTP for improved services than those employed in informal sector.
- There was no significant effect of family size and composition on WTP for improved services.
- The more an improved water source costs in capital, recurrent monetary costs, and time, the less likely a household would be to choose it.
- A household would be more willing to pay for an improved source when the perceived water quality of the alternative sources is poorer.
- Households are willing to pay much more if the water from an improved source is reliable.
- Most households were willing to pay more for private connections than for access to a public tap.
- Respondents' sense of entitlement and equity through government services was found to be an obstacle to paying realistic prices for water services.

2.5 CHAPTER CONCLUSION

This chapter provided a brief overview of cost recovery issues in the water services industry in low income countries. The proposition that people in low-income countries are too poor to pay for water services was not supported by various case studies carried out during and after the International Water and Sanitation Decade (1980-1990). Thereafter, the debate about cost recovery issues advanced from *whether* to recover costs, to *how* to recover costs in a sustainable and socially equitable manner.

The current tariffs levied by most water utilities in low-income countries are lower than the production costs. Furthermore, a fair percentage of the bills sent to customers are never recovered, a fact that highlights the importance of Willingness-To-Pay (WTP) for the services provided. WTP is affected by a range of factors: most factors can be fully influenced by the water utility; some factors can partially be influenced; while a few factors are beyond the utility's influence.

Few empirical studies have been carried out on factors affecting WTP. Most of these studies have been carried out in the rural areas. Although some aspects of WTP are similar in rural and urban settings,

there are striking differences that may not allow direct inference from the findings in the rural areas to the urban areas. Firstly, sustainability of rural water supply relies heavily on community management; on the other hand, urban water services normally have institutionalised water utilities which may, or may not have some community management as a subsidiary management option in the peri-urban areas. Secondly, income levels of people living in the urban areas are generally higher than for their counterparts living in rural areas. Thirdly, there is a higher disparity in income levels in the urban areas, than in the rural areas. Fourthly, there are normally more service options available to residents of urban areas, than for the rural folk.

This chapter has revealed the following issues that build up the background to the research problem:

- The problem of cost recovery in water services in low-income countries is critical, given the current service coverage as compared to the projected population growth rates. This problem is even more critical in the urban areas of Africa where by 2015, the population will rise by 70% to 501 million people (WHO/UNICEF, 2000).

- Data from the Global Water Supply and Sanitation Assessment 2000 Report show that more than half of the urban water utilities in low-income countries charge a tariff that is less than the unit cost of production of water (WHO/UNICEF). However, most water utilities for which data is available and presented in this chapter are reported to be charging a tariff that is higher than the unit production cost of water.

- WTP is a vital factor for recovering costs of water services.

- A good fraction of the Unaccounted-For-Water (UFW) is composed of administrative losses that are partly due to consumers' low WTP for services provided.
- Not all the bills that are sent to consumers are recovered by the water utility, mainly due to consumers' low WTP for the services. This situation leads to an increased mean bill collection period.
- For a small sample of Asian water utilities, there seemed to be a negative relationship between service coverage and mean bill collection period.
- Many of the factors that influence consumers' WTP can be totally influenced by the water utility, while some of the factors can be partially influenced the water utility. A few factors, are however beyond the utility's influence.

- The few case studies that have been carried out on WTP for water services have been in the rural settings, from which the findings may not be directly inferred to the urban setting.
- All these case studies were hypothetical in nature. None of the case studies carried out an actual behavioural study of existing customers.

There is therefore need to carry out research on how a water utility can, through its service offering, influence WTP for urban water services in an actual customer behavioural setting. The next chapter reviews the literature on research carried out in services management, on how customer perceptions of the service offering affect customer loyalty.

CHAPTER THREE

LITERATURE REVIEW

3.1 CHAPTER INTRODUCTION

Chapter two provided a background to the research problem. The current chapter builds a theoretical foundation for the research by reviewing relevant literature to identify research issues. The specific objectives of the literature review was to:

- discover important variables relevant to improvement of profitability in services management.
- explore means of adapting principles of services management to cost recovery in the urban water utility.
- identify the main methodologies and research techniques that have been used.
- distinguish what has been done from what has not been done.

This study uses an integrative type of literature review, in line with the recommendations made for postgraduate research in various research text-books (Creswell, 1994; Hart, 1998; Neuman, 1997; Rudestam & Newton, 1992; Sekaren, 1992). A classification model, shown in figure 3.1, was developed along the concepts proposed by Rudestam and Newton (1992), and Perry (1996a, 1996b) to identify parent and immediate fields for review. Based on the objectives enumerated above, the model identifies the parent discipline as market orientation, which is narrowed down to the immediate discipline of services management. The concepts in services management that have direct relevance to the research questions are the consumer perceptions, as illustrated in figure 3.1.

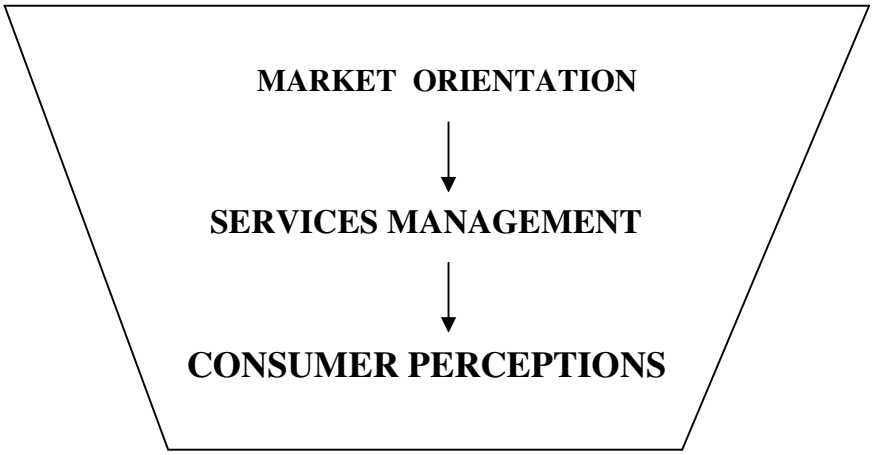


Figure 3.1: A Classification Model Used for the Literature Review.

Source: Author

This chapter is structured as follows:

- Section 3.2 provides a descriptive review of the market orientation as a parent discipline. The first subsection gives an overview on the marketing concept as a business philosophy; the second sub-section discusses the evolution and nature of services marketing.
- Section 3.3 provides an integrative review on service quality; the subsections deal with the definition of service quality, the SERVQUAL model, two modifications of the SERVQUAL model, and Technical/Functional Quality framework.
- Section 3.4 provides an integrative review on service value.
- Section 3.5 gives a review on corporate image.
- Section 3.6 provides a review of customer satisfaction.
- Section 3.7 reviews the literature on customer loyalty.
- Section 3.8 reviews the literature on the links between service quality, service value, corporate image, customer satisfaction, and customer loyalty.

- Section 3.9 summarises the literature review, and identifies the research gaps.

3.2 THE MARKETING CONCEPT

3.2.1 The Marketing Concept as a Business Philosophy

The early roots of marketing as an area for academic study can be traced back to as early as 1910, in Midwestern American land-grant universities, which was started in response to increased farm productivity that created a demand for agricultural markets and processes by which products were taken to market and prices determined (Webster, 1992). According to Webster (1992), the focus of academic activity at that time was on the commodities, and the nature and functions of the institutions moving the commodities to the market. Dibb, Lyndon, William and Ferrell (1994) traced the evolution of marketing through the stages of (i) production era during the industrial revolution in the latter half of the 19th century, which facilitated mass production; (ii) sales era, from the early 1920s, when consumer demand for products subsided, and there was need for a 'selling' effort; (iii) the marketing era, from the early 1950s, when producers realised that in order to guarantee a market, the customers' wants must be determined prior to production. The first two phases of marketing were seen as social and economic processes rather than a set of managerial activities and responsibilities. However, the managerial approach to the study of marketing started with the onset of the third phase in the early 1950s, resulting in the articulation of the marketing concept (Dibb, Lyndon, William & Ferrell, 1994).

The marketing concept has been a subject of intense research among management scholars. Deng and Dart (1994) described the marketing concept as a business philosophy, an ideal or a policy statement, while marketing orientation is the implementation of the marketing concept. According to Miles and Arnold (1991, p. 49), an organisation's business orientation "…consists of those underlying philosophies that determine the nature and scope of activities and plans", and influences the overall management's decision-making framework. Many management researchers and practitioners consider a business orientation as paramount in effective business development and strategic success. Contemporary marketing text books (Kotler, 1984; Dibb et al., 1994; Wilson & Gilligan, 1997) give the following organisational orientations, which are associated with the time series of the evolution of marketing: (i) production orientation; (ii) product orientation; (iii) sales orientation; and (iv) marketing orientation. Other researchers argued that the current orthodoxy on business orientation as propounded in the marketing texts is so brief, superficial and simplistic to an extent that the potential value of the

concept is not exploited. Pearson (1993) therefore proposed the following revised set of business orientations: (i) accounting/cost orientation; (ii) marketing/customer/competitor orientation; (iii) production/technology orientation; and (iv) research and development/innovation orientation. Alternatively, Fritz (1996) proposed the following management philosophies for corporate success: (i) market orientation; (ii) production and cost orientation; (iii) financial orientation; (iv) technology and innovation orientation; (v) employee orientation; and (vi) environmental and social orientation.

The marketing concept, on which market orientation is based, can be traced in the management and marketing literature as far back as the 1950s. Peter Drucker, one of the concept's earliest proponents, wrote thus:

> There is only one valid definition of a business purpose: to create a customer. ...It is the customer who determines what a business is. …What the customer thinks he [or she] is buying, what he [or she] considers 'value' is decisive-… (Drucker, 1955, pp. 29-30)

Drucker (1955, 1974) argued further that marketing is not at all a specialised activity, but encompasses the entire business, that is seen from the customer's point of view. The two basic entrepreneurial functions of any business enterprise (Drucker, 1955; 1974) are marketing and innovation, which, according to Deshpande`, Farley and Webster (1993), are the focus of business planning and strategy. Felton (1959, p.55) defined the marketing concept as " a corporate state of mind that insists on the integration and co-ordination of all the marketing which, in turn, are (sic) melded with all other corporate functions, for the basic purpose of producing maximum long-range corporate profits". Stressing organisational cohesion, McNamara (1972) defined the marketing concept as a philosophy of business management that is based on an organisation-wide acceptance of the need for customer focus, profit orientation, and the recognition of the important role of marketing in communicating the needs of the customer to all major corporate departments.

Various studies (Pearson, 1989; Pearson, 1993; Fritz, 1996) indicated that no single orientation is sufficient for corporate success, and that the orientations are not mutually exclusive: a business orientation is posited to be the degree to which one functional orientation dominates the way of thinking in the organisation, and consequently how decisions are taken and implemented.

On the other hand, the marketing concept has been a subject of attack by some scholars. Houston (1986), for instance, pointed out that whereas the marketing concept has been heralded as the optimal marketing management philosophy universally, it is not necessarily so in all instances. Houston (1986)

submitted that there are many circumstances under which the guiding philosophy should be something other than the marketing concept. Additionally, Arndt (1978) argued for limiting the application of the marketing concept, while Sachs and Benson (1978) wondered whether it was not wise to discard the marketing concept altogether.

Contrary to the detractors of the marketing concept the late 1980s and early 1990s saw a revival of interest in further research of the marketing concept (Deng and Dart, 1994). Research carried out in the US (Jaworski & Kohli, 1993; McDermott, Franzak & Little, 1993; Narver and Slater, 1990; Reukert, 1992; Slater & Narver, 1994) found that market orientation of an organisation is highly positively correlated to the corporate performance. The relationship between market orientation and organisational performance was supported by studies carried out in other developed countries: in Germany by Fritz (1996), in New Zealand by Gray, Matear, Boshoff and Matheson (1998), and in Japan by Deshpande`, Farley and Webster (1993). However, studies carried out on market orientation in the UK showed slightly different outcomes: Greenly (1995) found that market orientation did not have a direct relationship with business performance. These findings could have been as a result of low levels of market orientation in the UK service industries at the time (Egan & Shipley, 1995; Evans, James & Tomes, 1996; Liu, 1995).

3.2.2 Evolution and Nature of Services Marketing

As has already been mentioned, the early history of the marketing discipline initially focused on selling of agricultural goods (Bartels, 1988), and later expanded to marketing of physical goods, apparently with no reference to services (Fisk, Brown and Bitner, 1993). Up until the early 1970s, the accepted wisdom that marketing was applicable only to goods was rarely challenged (Fisk, Brown and Bitner, 1993). The growth of services marketing as a separate academic field in the United States was chronologically presented by Berry and Parasuraman (1993), where it was shown that services marketing, which did not exist as an academic field in 1970, became a fast growing sub-discipline of marketing by 1990. The contributing forces to the development of services marketing were characterised as (Berry and Parasuraman, 1993): (i) growth of the service sector, which contributed more than 75% of the U.S. Gross Domestic Product by 1990; (ii) deregulation in many of the service industries; and (iii) encouragement and sponsorship of research in services marketing. Sen (1998) pointed out that the growing importance of the service sector is not restricted to the United States: in

most industrialised nations as much as 65% of the workforce is employed in the service sector. To illustrate, the service sector in UK accounted for 63% of the GDP in 1990, up from 53% in 1970 (Palmer 1994).

There is no consistent definition of what constitutes a service, but Palmer (1994) presented the following definition:

> The production of an essentially intangible benefit, either in its own right or as a significant element of a tangible product, which through some form of exchange satisfies an identified consumer need. (Palmer 1994, p.3)

Various textbooks in services marketing (Cowell 1991, Kotler 1994, Palmer 1994) discuss the distinguishing features between goods and services in the following terms: (i) intangibility i.e. services cannot be seen, tasted, felt, heard or smelled prior to purchase; (ii) inseparability, i.e. services are produced and consumed simultaneously; (iii) variability, i.e. services are highly variable; and (iv) perishability, i.e. services cannot be stored. Cowell (1991) and Palmer (1994) also mentioned that customers have access to temporary service facilities and/or activities but not total ownership. Consequently, most marketing and management scholars argued for a separate field of services marketing (Berry and Parasuraman, 1993).

Conversely, a few scholars have argued against services being considered as a distinctive area of study in marketing (Fisk, Brown and Bitner, 1993). On the one hand, scholars have argued that a service shares many important elements with goods, which makes services marketing obsolete as a separate discipline (Palmer, 1994). On the other hand, some researchers preferred an integrative approach to marketing and felt that a separate services marketing field was unnecessary (Berry and Parasuraman, 1993). Levitt (1972), for example, argued that there is no such thing as a service industry, only industries where services components are greater.

On the basis of the distinguishing features of services, several conceptual frameworks have been advanced to define services marketing. Gronroos (1978) suggested that the unique characteristics of services require a service organisation to develop an interactive marketing function, in addition to the traditional marketing function. Interactive marketing describes the employees' skills in serving the customer (Kotler, 1994) and is concerned with what happens at the interface between production and consumption of services. Additionally, Gronroos (1978) proposed that in order to address the challenges of services marketing, a service organisation should have invisible and visible parts, the

former comprising the internal organisation that gives physical and management support to customer contact staff. The visible part focuses on the physical environment where the service is consumed; the contact personnel; and the consumer who takes part in the production process. Gronroos (1978) argued further that the services firm in addition requires internal marketing, which describes the work done by the organisation to train and motivate its employees in order to serve customers well.

The conceptual framework proposed by Gronroos (1978) resulted in the modification of the traditional marketing mix to suit services marketing, composed of the following: product, place, price, promotion, physical evidence, process and people (Cowell, 1991). Likewise, Shostack (1977) stressed the importance of intangibility as a characteristic of services and proposed a goods-service continuum ranging from 'tangible dominant' to 'intangible dominant'. Kotler (1994) mirrored the conceptual framework proposed by Shostack (1977), and argued that a firm's offer to the market place usually includes some service component, which may be a minor or a major part of the total offer. Furthermore, Kotler (1994) provided a range of five categories of an offer: a pure tangible good; a tangible good with accompanying services; a hybrid; a major service with accompanying minor goods and services; and a pure service.

Johnston and Bryan (1993) discussed the creation of a service offer and the change in the mix of goods and services that may take place in the development of the offer. Due to technological advancements, manufacturing processes are no longer a source of competitive advantages (Devlin, 1998; Johnston and Bryan, 1993). Instead, it was urged, organisations are increasingly turning to the product 'surround' such as how the goods are provided and how the customer is treated, for a competitive advantage. Johnston and Bryan (1993) developed a model with the following major propositions: (i) service firms add a combination of goods and services to the core goods to create the final offer, which adds value and may create differentiation; (ii) there is a point of 'visibility' at which the final offer becomes visible and available to the customer. Additionally, Reddy, Buskirk and Kaicker (1993) suggested "tangibilizing the intangibles" as a winning strategy for services marketing. A firm's skills and resources will however, constitute potential sources of competitive advantage only if they offer benefits desired by the customers (Bharadwaj, Varadarajan and Fahy, 1993).

Different scholars have used various criteria for classifying services. Table 3.1 shows the criteria used by Cowell (1991). Furthermore, Palmer (1994) suggested the following criteria over and above what Cowell (1991) proposed: (i) whether a service is supplied on a continuous or discrete transactions; (ii) the pattern of demand, whether constant, or varying; (iii) the significance of services to the purchaser.

On the other hand, Devlin (1998) distinguished between simple and complex services. Simple services were described as those where, on average, customers will exhibit reasonable understanding of product features and associated benefits. Conversely, complex services are those, which, on average, customers will find confusing and complicated, and therefore find it difficult to understand product features and associated benefits (Devlin, 1998).

Table 3.1: Classification of Services

CRITERIA	CLASSIFICATION	EXAMPLES
Seller-related basis	Nature of enterprise	Private or public, profit or nonprofit
	Functional	Public health, educational, consulting
	Income Source	Donor-based, market-based
Buyer-related basis	Market type	Consumer, industrial, government
	How a service is bought	Convenience, speciality
	Motives of a service	Instrumental or expressive
Service-related basis	Service form	Uniform or customer-specific
	Service delivery	Human or machine-based
	Degree of involvement	High or low levels of personal contact

Source: Cowell (1991)

3.2.3 Services Management in Public Sector

As can be seen in table 3.1, public services are one category of services. Public services are an important aspect of a society and are defined as those services commonly provided under the aegis of the state at various levels (Skelcher, 1992). Many of the services provided in the public sector are human services. Dickens (1996) described human services as a sub-class of service industries that supply products and services that concern people's welfare in the areas of social, health and educational care. Human services aim at creating a change of state in the people, usually from a lower to a higher state of personal well-being, health or competence (Dickens, 1996). Likewise, Dalley (1988) pointed

out that the general social welfare ideologies influence service provision of the human services, which in turn determines the source of finance for services in this category.

The context for provision of services presents contrasts between public and private sectors (Butler and Collins, 1995; Skelcher, 1992). In the first instance the public sector requires more accountability to the electorate and openness in decision-making than the private sector. Secondly, the nature of choice in the public and private sectors is different, involving many complex decisions in the former, whereas for the private sector, decision-making is clearer and quantifiable. Thirdly, whereas the prime purpose of the private sector is to generate profits, the public sector has a wider range of purposes, success of which cannot be so clearly evaluated.

Additionally, Palmer (1994) pointed out the following differences between private and public sectors: (i) the monopolistic nature of most public service firms; (ii) it is easier to monitor marketing activities in the private sector; (iii) a wider range of marketing mix for the private sector; (iv) more autonomy in the private sector; (v) the relative ease of identifying a customer in the private sector. Butler and Collins (1995) also pointed that evaluation of quality may involve public institutions such as a regulating body. Furthermore, the public services may contain elements of 'public goods' i.e. goods which are supposed to be consumed jointly, with no exclusion of the consumers who do not pay (Butler and Collins, 1995). Additionally, Palmer (1994) pointed out that it is difficult to carry out a uniform strategy in marketing of public sector services, as they are heterogeneous in nature, and the stakeholders may have different needs from private sector service providers. However, Butler and Collins (1995) posited that the broad principles of the marketing concept are applicable to the public sector, through frameworks and models suitably adapted for the industry and operating environment.

Although the body of knowledge on the management and marketing of services has grown tremendously since the early 1980s, most of this research has concentrated on the private sector, profit generating services: the public services have largely been neglected (Andreassen, 1995; Das, Das and Mackenzie, 1996; Redman, Mathews, Wilkinson & Snape, 1995; Roth and Bozinoff, 1989; Williams, Saunders & Staughton, 1999). It is therefore no surprise that the term 'marketing' is frequently misunderstood by those involved in the delivery of services in the public sector such as health care, and is often linked with advertising, selling profit and competition (Hullums, 1994). At the extreme end, marketing in the public sector is being considered as "…dangerous, because its commercial roots are antithetical to public service ethos of care, universality and collective good" (Butler and Collins, 1995, p.84).

The perception of public sector managers towards marketing is however changing, as many non-statutory public services are facing increasing competition, and there is demand for greater accountability, prompting many public service firms to adopt marketing orientation (Palmer, 1994; Redman, Mathews, Wilkinson & Snape, 1995; Williams, Saunders & Staughton, 1999). Walsh (1994) attributed the current growth of public service marketing to two main factors: (i) the growth of consumerism in democratic societies and (ii) the introduction of strategic marketing in public service organisations. The growth of consumerism is manifested by an increase in decentralisation, higher customer consciousness, improved communication, greater choice and availability of a system of redress (Walsh, 1994). Other factors advanced are the global movement of privatisation of public services previously run by monopolistic government-owned institutions, as well as governments' strategy of forcing expenditure reductions (Skelcher, 1992).

Minimal research in the public services has been attributed to (i) the difficulty in evaluation of services; (ii) the qualitative difference between public services and other services; and (iii) the bureaucracy in public service sector (Das, Das and Mackenzie, 1996). Similarly, constraints for adopting a customer orientation in the public sector were enumerated as follows (Skelcher, 1992): (i) lack of customer research; (ii) centralised institutional structures; (iii) performance indicators that are supply-driven; and (iv) poor organisational structures and non-conforming organisational cultures. Additionally, Das, Das and Mckenzie (1996) pointed at the complexity of service delivery in the public sector: cost constraints may lead to rationing; prices may be fixed through legislative mechanisms; public sectors goals may be diverse; there may be several stakeholders with diverse requirements; invisibility of some services such as sewerage services; and the monopolistic nature of public services, which present a high potential of dissatisfaction.

Owing to the complexity of service delivery in the public sector, the needs of the consuming public may be vastly different for some services, but not for others (Das, Das and Mackenzie, 1996). Indeed, it is not clear from the literature how evaluations of satisfaction for government services are elicited (Roth and Bozinoff, 1989). It is therefore necessary to classify public services on some dimension in order to assess customer satisfaction (Das, Das and Mackenzie, 1996; Roth and Bozinoff, 1989). Consequently, Roth and Bozinoff (1989), and Das, Das and Mackenzie (1996) proposed a framework for classifying town and municipal services according to *frequency of usage*, *directness of experience*, and *homogeneity of needs*. *Directness of experience* gauges whether or not the consumer experiences the service personally, while *homogeneity of needs* determines whether the service is meant to satisfy

similar needs or different needs. The proposed classification of municipal services is shown in table 3.2.

Table 3.2: A Framework for Classification of Municipal Services

SCOPE OF PERCEIVED NEEDS	EXPERIENCE		
	Frequent/Direct	Infrequent/Direct	Infrequent/Indirect
Heterogeneous	Postal services	Recreational facilities Library services	Police protection
Homogeneous	Garbage collection Sewerage Water supply Drainage Street lighting School services	Medical care	Fire services

Source: Roth and Bozinoff (1989), and Das, Das and Mackenzie (1996)

There has been a school of thought that has advanced a case for "new" marketing required for the public services sector (Butler and Collins, 1995). For instance, Walsh (1994) submitted that as much as marketing may be taking root in the public sector, its ideas are not constitutive of public services. Walsh (1994) urged further that the public sector and the private sector are guided by different values, and that the nature of marketing for the public sector needs to be rethought. However, Butler and Collins (1995) called for adapting the marketing concept to the context and operating environment of the specific public services, rather than developing a "different" marketing concept. Thus, Butler and Collins (1995) suggested that in order to broaden marketing application and embrace public service transactions, the concept of exchange should include considerations of duty, deference, respect and recognition.

In conclusion, evidence drawn from management and marketing literature underlines the distinction between services and goods, a fact that has led to the development of a new academic field of services marketing. Furthermore, services marketing has attracted a great deal of attention from scholars of

various academic disciplines. The services sector is growing at a higher rate than any other sector of the economy in many countries, and therefore deserves the intense research interest. According to Fisk, Brown and Bitner (1993), services marketing as a research field has attracted considerable interest, not only world-wide but also from various academic disciplines such as management, human resources, operations, social psychology and marketing. However, despite the difficult environment under which public service organisations operate, services management in the public service sector has so far received little attention in research.

3.3 SERVICE QUALITY

3.3.1 Definition of Quality

Many scholars concur that quality is a difficult construct to define. Although quality is currently a popular topic for research, there is little agreement on its definition and how to achieve it (Barcellos, 1998). Parasuraman, Zeithaml and Berry (1985) posited that quality is an elusive and indistinct construct. Reeves and Bednar (1994) pointed out that quality is a topic of intense interest today, but a search for its definition has yielded inconsistent results.

Sen (1998) described four schools of thought in definition of quality: (i) the *metaphysical approach* with origins from the Greek philosophers who defined quality as excellence; (ii) the *production management approach,* which considers quality as an objectively measurable concept, and is defined as conformance to technical specifications; (iii) the *economic approach*, which became popular in mid-1700 during the industrial revolution when there was mass production, and defines quality as value, with respect to two conditions: actual use, and the selling price of the product; (iv) the *behavioural or perceived approach* that defines quality as neither objective nor absolute: quality is meeting and/or exceeding customers' expectations. On the other hand, Forker, Vickery and Droge (1996) gave four underlying disciplines in the definition of quality: philosophy, economics, marketing, and operations management. Quality was defined as (Forker, Vickery and Droge, 1996; Mohr-Jackson, 1998): (i) inherent excellence; (ii) quantity of desired attributes (product-based); (iii) satisfaction of consumer preferences (user-based); (iv) conformance to requirements (manufacturing-based); and (v) affordable excellence (value-based).

Reeves and Bednar (1994) indicated that owing to the complexity and richness of the construct, a global definition of quality does not exist and that different definitions are appropriate in different circumstances. The definition that is most appropriate to services marketing is the *behavioural or perceived approach,* which originated out of services marketing literature in the early 1980s. Services marketing researchers argued that conformance-to-specifications definition failed to address the unique characteristics of services (Berry and Parasuraman, 1993; Brown, Churchill and Peter, 1993; Parasuraman, Zeithaml and Berry, 1985; Reeves and Bednar, 1994). Parasuraman, Zeithaml and Berry (1985) pointed out that determination of quality in services is more complex than in goods because (i) precise manufacturing specifications in connection with service quality can rarely be set; (ii) performance of services with a high labour content varies according to producers and is time dependent; and (iii) production and consumption of many services is inseparable, and cannot be easily monitored. Furthermore, quality evaluations are not made solely on the outcome of the service, but also involve evaluations of the process of service delivery.

Zeithaml (1988) and Johnston (1995) defined perceived quality as the consumer's judgement about a product's overall excellence or superiority. According to Zeithaml (1988), perceived quality is different from objective or actual quality, but (i) is a phenomenon at a higher level than a product attribute, and is linked to the consumer's emotional payoff; (ii) is a global assessment similar to attitude; (iii) its attributes have been dichotomised into intrinsic attributes that refer to physical composition of the product, and extrinsic attributes such as price, brand name, and level of advertising. Other services marketing scholars have defined service quality differently. Lewis and Booms (1983) defined service quality as a measure of how well the service delivered meets customers' expectations. Similarly, Asubonteng, McCleary & Swan (1996) defined service quality as the difference between customers' expectations for service performance before the service encounter and the perceptions of the service actually received. Johns and Tyas (1997) posited that service quality is visualised as the sum of customer perceptions of the service experience. Parasuraman, Zeithaml and Berry (1988, p.16) defined service quality as " a global judgement, or attitude, relating to superiority of the service". However, in other studies (Anderson, Fornell and Lehmann, 1994), service quality is considered to be a transaction specific attribute.

All in all, despite the conceptual differences, most of the suggested definitions focus on meeting needs and requirements of the customer (Lewis, 1991). The next sub-sections discuss how service quality has been conceptualised in order to develop valid measurement instrument for it.

3.3.2 The SERVQUAL Model: Its Development and its Application

During the 1980s, the primary focus of service quality research was the definition and development the concept of quality (Parasuraman, Zeithaml and Berry, 1985; 1988). However, given that service quality is a highly abstract construct, the confusion regarding its definition, dimensions and measurement is yet to be resolved conclusively (Cronin and Taylor, 1994; Parasuraman, Zeithaml & Berry 1994b; Sen, 1998, Teas, 1994). Parasuraman, Zeithaml and Berry (1985) was among the earliest studies to report on an elaborate service quality model. Building on the analytic framework proposed by Gronroos (1984), Parasuraman, Zeithaml and Berry (1985) carried out an exploratory qualitative study in four service businesses of retail banking, credit cards, securities brokerage, and product repair and maintenance in the US, and developed what is popularly known as the *Gap Model*. This model is built on the premises that (i) service quality is a comparison between expectations and performance; (ii) service quality evaluations involve outcomes and processes.

According to the *Gap Model,* managers of service firms are prone to gaps between (i) consumer expectations and management perceptions of those expectations; (ii) management perceptions of consumer expectations and the firm's service quality specifications; (iii) service quality specifications and actual service delivery; and (iv) actual service delivery and external communications about the service. In the *Gap Model* developed by Parasuraman, Zeithaml and Berry (1985), the quality that a consumer perceives in a service is a function of magnitude and direction of the gap between expected service and perceived service, which gap is a function of the internal organisational gaps enumerated above. The *Gap Model* was validated through studies conducted in the hotel industry in Canada (Saleh and Ryan, 1991); in the further educational sector in Strathclyde region of Scotland (Donaldson and Runciman, 1995); and in general practitioner medical services (Murfin, Schlegelmilch and Diamantopoulos; 1995).

From the exploratory study on the *Gap Model*, the determinants of service quality were developed, and were initially categorised into ten dimensions of reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles (Parasuraman, Zeithaml & Berry, 1985). A follow-up study (Parasuraman, Zeithaml and Berry, 1988) refined findings from the *Gap Model* exploratory study and developed the SERVQUAL model, a multiple-item measurement instrument for evaluating service quality. The SERVQUAL questionnaire consists of two sections: (i)

items to measure the customers' service expectations of companies within a specific industry; and (ii) corresponding items to measure customers' perceptions of the particular company being evaluated. The resultant SERVQUAL scale composed of 22 items, with dimensions labelled tangibles, reliability, responsiveness, assurance and empathy.

The SERVQUAL model was refined further by the original authors, in a study reported in Parasuraman, Berry and Zeithaml (1991), by modifying the wording of some of the items, replacing two items, and incorporating a section to solicit customers' perceptions on the relative importance of each service quality dimension. More minor modifications were effected on SERVQUAL to improve its psychometric properties (Parasuraman, Zeithaml and Berry, 1991), in accordance with criticism levelled against the measurement instrument, which is a subject of discussion in sub-section 3.3.3. Despite the criticisms, The SERVQUAL scale is the most predominant method described in service quality literature (Powpaka, 1996; Smith, 1995). The validity of SERVQUAL scale was tested in studies conducted in the hotel industry in Canada (Saleh and Ryan, 1991); in the banking industry in parts of the US and the UK (Lewis, 1991); in the catering industry in the UK (Johns and Tyas, 1996); in banking, insurance, and maintenance services in South Africa and the UK (Mels, Boshoff and Nel, 1997). In all these studies, however, the dimensions espoused by the SERVQUAL model were not confirmed. It would seem that the SERVQUAL model needs to be modified to make it industry-specific. Details of this and other shortcomings of the SERVQUAL model are discussed in Section 3.3.3.

3.3.3 Criticisms of the SERVQUAL Model

Although SERVQUAL is the most widely used service quality model, it has also attracted many criticisms (Paul, 1998; Smith, 1995). Various studies (Babakus and Boller, 1992; Carman, 1990; Smith, 1995) have not supported the proposal that SERVQUAL could be applied as a generic measure in a wide range of service industries. Smith (1995) pointed out that most researchers have not adhered to the 22-item format of SERVQUAL, resulting in the violation of the content validity of the original measurement instrument. From the articles reviewed, the following studies utilised the SERVQUAL scale without strictly adhering to the 22-item questionnaire: banking services (Avkiran, 1994; Bahia & Nantel, 2000; Johnson, Tsiros, & Lancioni, 1995; Levesque & McDougall, 1996); car service industry (Andaleeb & Basu, 1994; Bouman & Wiele, 1992); airline industry (Robledo, 2001); hospitality

industry (Akan, 1995; Mei, Dean & White, 1999; Winsted, 2000); health care services (Carman, 1990; Carman, 2000; Vandamme & Leunis, 1993; Winsted, 2000); printing services (Dabholkar, Sheperd & Thorpe, 2000); public transportation and full service restaurants (Johnson, Tsiros, & Lancioni, 1995).

Similarly, some studies in which SERVQUAL was applied to the letter, failed to identify the five underlying dimensions (Babakus & Boller, 1992; Brown, 1993; Carman, 1990; Brown, Churchhill, & Peter, 1993; Cronin & Taylor, 1992; Durvasula, Lysonski and Mehta, 1999; Lassar, Manolis & Winsor, 2000; Mels, Boshoff and Nel, 1997; Mittal & Lassar, 1998; Saleh and Ryan, 1991; Stafford, Stafford & Wells, 1998; Yavas, Bielgin & Shemwell, 1997). The lack of a uniform dimensional structure highlights the fact that customers are context-specific in the dimensions they employ to evaluate service quality (Asubonteng, McCleary & Swan, 1996; Babakus and Boller, 1992; Buttle, 1996; Carman, 1990; Smith, 1995).

Additionally, many studies adopting the SERVQUAL model do not replicate the methodology as described in Parasuraman, Zeithaml and Berry (1988). Some researchers find practical difficulties in administering two sets of statements (Asubonteng, McCleary & Swan, 1996; Bouman & Wiele, 1992; Buttle, 1996; Smith, 1995). Furthermore, the timing of administration of the two sets of scales varies: for instance, while Carman, (1990) administered the expectations statements prior to the service encounter and perceptions statements after the encounter, Fick and Ritchie (1991) asked respondents to evaluate their last encounter. However, from the conceptual framework advanced in Parasuraman, Zeithaml and Berry (1988), the two batteries should be administered at the same time, and not related to an encounter (Smith, 1995). A recent study carried out in the printing services (Dabholkar, Sheperd & Thorpe, 2000) supported the proposition that the two batteries should be administered at the same time.

Another shortcoming of SERVQUAL was highlighted by several studies (Cronin & Taylor, 1992; Lapierre, 1996; Mangold and Babakus, 1991; Teas, 1994), to the effect that the SERVQUAL instrument focuses primarily on the functional aspects of the delivery process, at the expense of the tangibles. Buttle (1996) referred to this phenomenon as process orientation, and pointed out that the outcome quality is missing from the SERVQUAL model. Additionally, other studies (Smith, 1995; Fick and Ritchie, 1991; Cronin and Taylor, 1992) have criticised SERQUAL for not encompassing price or value in the model for the consumer's expectation and consequent evaluation of services. In this respect, Parasuraman, Zeithaml and Berry (1994a) clarified that SERVQUAL was designed for use

in “intangible dominant” services and subsequently proposed a model that should incorporate product quality and price.

Other studies (Buttle, 1996; Carman, 1990; Babakus & Boller, 1992; Brown, Churchill & Peter, 1993; Smith, 1995) criticised SERVQAUL in connection with analysis of computed difference scores. These studies pointed to problems associated with reliability, discriminant validity, spurious correlations and variance restriction. Subsequently, Parasuraman, Berry and Zeithaml (1993) acknowledged the lack of congruence of the factor structure and variance restriction effects of SERVQUAL as raised in Brown, Churchill and Peter (1993). The authors of SERVQUAL pointed out that variance restriction effects are relevant only when the results are used in multivariate analyses, more especially when the difference-score measure is the dependent variable.

Teas (1993, 1994) also raised concern over the conceptual and operational issues associated with the “performance-minus-expectations” SERVQUAL model of perceived service quality. The results of an empirical study carried out with customers of discount stores in the US (Teas, 1993) showed that the SERVQUAL expectations concept is ambiguous as increasing expectations-performance difference scores may not necessarily result in continuously increasing levels of perceived quality. In a direct response to issues raised in Teas (1993), Parasuraman, Zeithaml and Berry (1994a) expressed doubts about the validity of the study and alleged severity of raised issues. It was further claimed that the interpretation of the expectations measure is problematic only for certain attributes that have classic ideal points, beyond which the performance would lead to the customer’s displeasure (Parasuraman, Zeithaml & Berry, 1994a). However Teas (1994) disagreed with submissions in Parasuraman, Zeithaml and Berry (1994a) and pointed out that the debate over the role of normative expectations, as determinants of service quality highlights the need for further theoretical and empirical research.

The common argument in the submissions made by the authors of SERVQUAL (Parasuraman, Berry & Zeithaml 1991; 1993; Parasuraman, Zeithaml & Berry, 1994a; 1994b) was SERVQUAL’s superior diagnostic value, although the perceptions-expectations scores may have inferior predictive power. Smith (1995) however questioned the diagnostic utility of the difference scores obtained by SERVQUAL and posited that other factors confound the respondents’ evaluation of the performance-expectations difference. Notable confounding variables are relative importance of elements of a service, and experience of alternative suppliers.

Another issue raised in Smith (1995) and Teas (1993; 1994) about SERVQUAL is the lack of congruence between conceptualisation and operationalisation of service quality, in the case of non-vector attributes, especially when other researchers increase the number of items onto the SERVQUAL scale. Buttle (1996) and Smith (1995) also raised the difficulties consumers could find in interpreting the mid-point of the perception scale. It could mean a neutral point, "don't know", "don't want to know", or "don't want to get involved". Smith (1995) concluded that the interpretation of the mid-point of the scale could introduce bias into the results. Furthermore, use of seven-point Likert Scales was criticized for lack of verbal labelling for points two to six (Mongold & Babakus, 1991; Buttle, 1996). The labelling of middle points, it was pointed out, would minimise measurement error resulting from overuse of extreme ends of the scale.

Several studies (Buttle, 1996; Smith, 1995; Teas, 1993; Teas, 1994) have also questioned the appropriateness of the expectations battery in the SERVQUAL model. According to Teas (1993), the vagueness of the 'expectations' scale could result in respondents interpreting it in six different ways: (i) service attribute importance; (ii) forecasted performance; (iii) ideal performance; (iv) deserved performance; (v) equitable performance; or (vi) minimum tolerable performance. In fact, Iacobucci, Grayson and Omstrom (1994) argued for dropping the 'expectations' scale in favour of 'absolute' levels such as prior standards. The nature of expectations recorded encourages responses at the extreme end of the scale, resulting in high means and low standard deviations (Smith, 1995). Furthermore, the reported high expectations values result in negative performance-expectations scores, a fact which undermines diagnostic utility and the underlying conceptual interpretation (Teas, 1993; Smith, 1995).

In a reaction to the issues raised in Cronin and Taylor (1992) about the inadequacy in the conceptualisation and operationalisation of SERVQUAL, Parasuraman, Zeithaml and Berry (1994a) questioned the adequacy and consistency of analytic premises used by Cronin and Taylor (1992). Additionally, the authors of SERVQUAL took issue with the single-items utilised by Cronin and Taylor (1992) to measure various constructs, which, it was claimed, diminishes the validity of the measurement instrument. Furthermore, Parasuraman, Zeithaml and Berry (1994a) pointed out the superior diagnostic value of SERVQUAL model, which compensates for the lower predictive power it displays compared to the perceptions alternative.

In conclusion, since its inception, there is no doubt that the SERVQUAL model has acted as an engine of research in the area of service quality. The SERVQUAL scale has been found to have high diagnostic value for service practitioners. Although the SERVQUAL scale is still the most popular

measurement instrument for service quality, in the course of its application, various researchers continue to point out its shortcomings. The controversies over the SERVQUAL model are mainly concerned with over-emphasis on service delivery, rather than outcomes of the service offer; the erratic dimensionality; the contextual stability; convergent and divergent validity; and the practical problems of administering it. Due to these shortcomings, a number of researchers have adapted the SERVQUAL scale in various ways. Some researchers have merely reworded and/or added a few more items to make it industry-specific. However, other researchers have made fundamental changes in the methodology as well. The next sub-section provides a brief overview of two major modifications of SERVQUAL model that have gained recognition amongst service quality researchers.

3.3.4 Modifications of SERVQUAL Model

The SERVPERF Scale

The major modified version of SERVQUAL is what is referred to as SERVPERF in the services marketing literature. SERVPERF is based on the argument that SERVQUAL has confounding effects on satisfaction and attitude (Cronin & Taylor, 1992). The authors of SERVPERF argued that service quality can be conceptualised as 'similar to an attitude' and can then be operationalised by an 'adequacy-importance' model. SERVPERF is therefore a scale whose items are the same as SERVQUAL, but measuring *only* performance. The SERVPERF has since been applied in various studies (Babakus & Boller, 1992; Bloemer, Ruyter & Wetzels, 1999; Brown, Churchill & Peter, 1993; Carman, 1990; Cronin & Taylor, 1992; Dabholkar, Sheperd & Thorpe, 2000; Lasser, Manolis & Winsor, 2000; Lee, Lee & Yoo, 2000; Powpaka, 1996; Robledo, 2001).

In some of the studies, a comparison was made between SERVQUAL and SERVPERF scales. In all such studies reviewed, performance-only scale (SERVPERF) had superior psychometric properties and higher explanatory variation compared to the SERVQUAL scale (Babakus & Boller, 1992; Brown, Churchill & Peter, 1993; Carman, 1990; Cronin & Taylor, 1992; Lee, Lee & Yoo, 2000; Robledo, 2001). In addition, since the SERVPERF scale reduces the number of items by 50 percent, it may be pointed out that this measure is more efficient in comparison to the SERVQUAL scale (Lee, Lee & Yoo, 2000).

Non-Difference Score Measure of SERVQUAL

Reference is made to the difficulty of analysis of computed difference values of the SERVQUAL items, which was discussed in sub-section 3.3.3. In order to minimise this problem, Brown, Churchill and Peter (1993) modified the SERVQUAL scale by combining the expectations-perceptions items into single items, in which respondents are asked to score how their perceptions matched with their expectations. This modified scale was tested with a sample of customers of financial institutions in the US, and the results showed that (i) the modified scale displayed better psychometric properties; (ii) there were no variance restriction effects; and (iii) the distribution of its scores had better normality than the original SERVQUAL scale (Brown, Churchill & Peter, 1993); Dabholkar, Sheperd & Thorpe, 2000). Other studies which have used non-difference score measure of the SERVQUAL scale have depicted good psychometric properties for the scale (Avkiran, 1994; Chang & Chen, 1998; Mei, Dean & White, 1999; Robledo, 2001). Furthermore, its fewer number of items in the scale, reduced by 50 percent, made administration of the scale much easier, and probably increased the response rate.

In conclusion, the modified SERVQUAL scales of performance-only measure (SERVPERF) proposed by Cronin & Taylor (1992), as well as the non-difference score measure proposed by Brown, Churchill and Peter (1993) have been found to be generally more superior than the original SERVQUAL in terms of psychometric properties. The modified versions of SERVQUAL also have higher explanatory variation than the original SERVQUAL. The non-difference score measure performs better than the original SERVQUAL in terms of absence of variance restriction effects. Another advantage that is applicable to both modified scales is the ease of instrument administration that is as a result of the halved number of items, which probably leads to higher response rates.

3.3.5 Alternative to SERVQUAL: The Technical/Functional Quality Framework

The pioneering studies in Europe on service quality were those reported in Gronroos (1978; 1984; 1987), Lehtinen and Lehtinen (1985), and Gummesson (1987). Their concepts of service quality has been labelled the Nordic School of Thought (Mels, Boshoff & Nel, 1997). Gronroos (1984) proposed a service quality model, and tested it using data obtained from service firm executives in Sweden. The developed model postulated that perceived service quality results from a comparison of consumer expectations with actual performance. It should be noted that the Gap Model developed by Parasuraman, Zeithaml and Berry (1985) had some of its inputs from the perceived service model

(Gronroos, 1991; Parasuraman, Zeithaml and Berry, 1985). Gronroos' (1984) model posited further that perceived service quality is composed of two primary dimensions of technical quality, i.e. the tangible outcome; and functional quality, i.e. how the service is delivered; together with a secondary dimension of corporate image, i.e. how the customer perceives the service firm. Corporate image has sometimes been referred to as a 'filtering' dimension (Brogowicz, Delene & Lyth, 1990). Other studies (Humphreys & Williams, 1996; Narver & Slater, 1990) referred to attributes related to Gronroos' (1984) dimensions of technical quality and functional quality as technical product attributes and salesperson interpersonal process attributes, respectively. Cootes (as cited in Humphreys & Williams, 1996) referred to the same attributes as hard quality and soft quality, respectively. Similarly, Lehtinen and Lehtinen (1991) developed two service quality models similar to Gronroos' (1984) model. The three-dimensional approach incorporated physical quality, interactive quality and corporate quality, while the two-dimensional approach considered process quality and output quality.

According to Gronroos (1991), the Technical/Functional Quality framework is based on previous studies carried out in the Scandinavian Countries, as early as the 1970s. In one of the earliest publications on the subject, Gronroos (1979) described service marketing as interactive in nature, and emphasized the need to focus on buyer-seller interactions. In a research report on service quality, presented to the Marketing Science Institute in 1983, Gronroos (1983) introduced the terms "technical quality" and "functional quality": "technical quality" was defined as *what* the customer receives in interaction with the service firm; "functional quality" describes *how* the customer receives the service. Technical quality and functional quality are related, but functional quality is more important to perceived service quality, as customers may not have the knowledge and/or skill to evaluate more technical-based dimensions of service quality (Gronroos, 1983; 1984; Higgins & Fergurson, 1991; Lassar, Manolis & Winsor, 2000). Building on earlier research, Gronroos (1988) defined the criteria for perceived service quality as:

- Technical Quality: professionalism and skills.
- Functional Quality: behaviour and attitudes; accessibility and flexibility; reliability and trustworthiness; recovery (i.e. corrective action when something goes wrong).
- Corporate Image: reputation and credibility.

It is worth noting that the research approaches applied in the conceptualisation of the Technical Quality/Functional Quality framework differ from those applied in the development of SERVQUAL. According to the authors of the Technical Quality/Functional Quality Framework, the two methods are different along the following aspects (Emerald Now, 2000; Gronroos, 1991,1998):

- Service quality research in the Nordic School of Thought has not been limited by previously established concepts and norms, i.e. research has been more inductive than deductive.
- The debate about whether there are differences between goods and services, and what the differences are, was avoided from the beginning.
- There has been close contact between academic researchers and practitioners.
- Research approach has been oriented towards action research and case studies, rather than statistical surveys.

Accordingly, the authors of Technical Quality/Functional Quality Framework asserted that the flexibility of the research methodology has created an enabling environment for innovation and subsequent contribution to the body of knowledge on service quality and other service management concepts (Emerald Now, 2000; Gronroos, 1998).

A number of studies on service quality have applied the Technical Quality/Functional Quality Framework. The exploratory study carried out in Sweden (Gronroos, 1984) highlighted the relative importance of functional quality compared to technical quality. Other reviewed studies that have validated the Technical Quality/Functional Quality Framework were carried in the restaurant services in Finland (Lehtinen & Lehtinen, 1991); in accountancy services in the US (Higgins & Fergurson, 1991); in pizza delivery services in the US (Richard & Allaway, 1993); in agricultural manufacturing services in the US (Humphreys & Williams, 1996); in telecommunication services in Canada (Lapierre, 1996); in the health care and car repair services in the US (Mittal & Lassar, 1998); and in an international banking service in US and Latin America (Lassar, Manolis & Winsor, 2000).

In summary, although the Technical/Functional Quality Framework of perceived service quality has not been applied in research as much as the SERVQUAL model, its service dimensions are a wealthy approach to services with substantially high components of the tangibles, or core service. Furthermore, the fact that the service quality construct is split into two conceptually distinct components makes it

easier to diagnose specific aspects of service delivery and make it more managerially actionable. Not only do urban water services have a substantial technical core component, but these services have in the past been run on a traditional engineering demand-driven approach; hence the need to make a comparison of the two conceptually distinct components of service quality in order to improve the diagnostic properties of the measuring instrument.

3.4 VALUE

Unlike service quality, value has received little attention in services management research (Cronin, Brady, Brand, Hightower & Shemwell, 1997; Cronin, Brady & Hult, 2000; Ittner & Larcker, 1996; Ravald & Gronroos, 1996). Consequently, value is a difficult concept to define and measure (de Chernatony, Harris & Riley, 2000; McDougall & Levesque, 2000; Zeithaml, 1988). Value has been defined in several distinct ways (de Chernatony, Harris & Riley, 2000; Ravald & Gronroos, 1996). According to de Chernatony, Harris & Riley (2000), different disciplines have broadly defined value as follows:

- Pricing: trade-off between customers' perceptions of benefits and sacrifices incurred.
- Consumer behaviour: what the customer needs and perceives as personally and socially desirable.
- Strategic management: what buyers are willing to pay for.

There are also a number of terms referring to value such as service value, customer-perceived value, perceived service value, added value, and value added. For the purpose of this report, all these terms are referring to the same construct.

In the pricing literature, Monroe (1991) defined customer-perceived value as the ratio of perceived benefits to perceived sacrifice. Services marketing has adopted the definition of value from the pricing literature (Ravald & Gronroos, 1996). One of the earliest definitions in services marketing is attributed to Zeithaml (1988), who defined customer-perceived value as the consumer's overall assessment of the utility of a product or service, based on the perceived benefits and perceived sacrifice. Sacrifice, otherwise known as price, consists of objective price, perceived monetary price, and perceived non-monetary price (Zeithaml, 1988). Perceived monetary price is different from objective price: it is the

price as encoded by the consumers, in a way most meaningful to them, such as the use of the terms "expensive" or "cheap" (Zeithaml, 1988). Perceived non-monetary price has also been referred to as social price, and is composed of time costs, search costs, effort costs, and psychic costs (Fine, 1981; Zeithaml;1988). In this respect, Ravald and Gronroos (1996) pointed out that while perceived benefits are some combination of physical attributes, service attributes and technical support available from the supplier, perceived sacrifice includes all the costs the buyer faces when making the purchase.

Customer-perceived value can be increased in two ways: either by increasing the benefits, or reducing the sacrifice. Benefits can be increased by adding to the core product an attribute or attributes that the customers perceive to be important, beneficial and of unique value. On the other hand, sacrifice can be reduced by lowering the objective price, or improving the convenience of the purchase, thereby reducing the perceived non-monetary and other social costs (de Chernatomy, Harris & Riley, 2000; Ravald & Gronroos; 1996). However, Ravald and Gronroos (1996) pointed out that an organisation's bid to increase the benefit for the customers may be in conflict with the objective of long-term profitability, and suggested that a better strategy is to reduce the sacrifice. Reducing customers' sacrifice requires the organisation to understand their individual needs, preferences, and the actions they undertake individually or as a household to 'produce value' on their own. Customer perceived value varies between customers, cultures, in different situations, and at different times (de Chernatomy, Harris & Riley, 2000; Jaworski & Kohli, 1993).

In the services marketing literature reviewed, customer perceived value has been conceptualised in many different ways. An additive or compensatory model for service quality has been advanced as being superior to the multiplicative model (Cronin, Brady, Brand, Hightower Jr, & Shemwell, 1997); i.e. service quality is the difference between service quality and sacrifice. Cronin et al (1997) referred to the additive model as a 'value added model'. The additive model is superior because (i) additive cognitive decision-making processes are more common in social sciences; and (ii) it seems more natural for consumers to use a simple, more familiar process such as addition in their decision-making, than a complex and involving process such as multiplication (Cronin et al, 1997). Cronin et al (1997), therefore, operationalised value as the difference between perceived quality and perceived sacrifice, which were measured using both objective figures and summated scales. Two studies (Andreassen & Lindestad, 1998; Cronin, Brady & Hult, 2000) measured value with two attitude-related items. Two different studies measured perceived quality using only one item (Caruana, Money and Berthon, 2000;

McDougall & Levesque, 2000). In most of these measurements for perceived value, it is not clear whether the conceptualisation is based on the additive or multiplicative model.

In conclusion, there is inadequate literature on the construct of perceived value. Little empirical research has been carried out on value. In fact most empirical research found in the services marketing literature dates from the mid-1990s. There is no standard measurement instrument in the reviewed literature that has been validated. There is therefore a need to carry out empirical research on the construct of service value in water utility services using an industry-specific measurement instrument.

3.5 CORPORATE IMAGE

It is claimed that the concept of corporate image was first recognised in the early 1950s when a scholar by the name of Newman drew a comparison between corporate image and human personality (Abratt, 1989; Kennedy, 1977). Thereafter, scholars from the field of retail marketing took the lead in carrying out research into the concept of image. Various types of image have been identified in the literature. The three key types of image are corporate image, product image and brand image (Abratt, 1989; Boyle, 1996; Worcester, 1997). Dowling (1993) pointed out that people will also hold images of professions, industries or even countries. Despite the wealth of literature available on the subject, the concept of image remains unclear and ambiguous as no universally accepted definition has emerged (Abratt, 1989).

The ambiguity of the concept of corporate image is manifested by the use, in the literature, of corporate image and corporate identity interchangeably. Bernstein (1984) provided definitions that seem to define the concept most clearly. Corporate image was defined as the net result of the interaction of all experiences, beliefs, feelings, knowledge, and impressions that people have about an organisation. On the other hand, corporate identity was defined as the sum of the visual cues, physical and behavioural, by which the public recognises the organisation and distinguishes it from others (Abratt, 1989; Bernstein, 1984). Additionally, corporate personality is the sum total of the characteristics of the organisation (Abratt, 1989).

There are other definitions of corporate image. Corporate image is the totality of stakeholders' perceptions of the way the service firm presents itself deliberately or accidentally (Markwick & Fill 1997). Van Rekom (1997) described corporate image as the set of meanings by which an organisation

allows itself to be known and through which it allows people to describe, remember and refer to it. Using an organisational behavioural model, Hatch and Schultz (1997) posited that corporate image, together with organisational culture and identity, form three related parts of a system of meaning and sense-making that defines an organisation for its various stakeholders. Lehtinen and Lehtinen (1991, p. 290) referred to corporate image as " …the dimension of quality developing during the history of the service organisation". Concerning the time dimensions of corporate image, Greene, Walls and Schrest (1994) proposed that image cannot be enhanced in the short term, because long-term customer perception is slow to adapt.

The formation of a corporate image is believed to be a complex process (Abratt, 1989, Bernstein, 1984; Bloemer, de Ruyter & Peeters, 1999; Kennedy, 1977). A corporate image is believed to be an overall impression made up of numerous details from many impressions formed as a direct or indirect result of a variety of formal or informal signals coming the organisation (Abratt, 1989; Andreassen & Lindestad, 1998; Bernstein, 1984). Furthermore, Dowling (1993) pointed out that an organisation does not have a single image: each member of the public holds his/her own image of an organisation. Corporate image is derived from various sources, some of which can be influenced by an organisation, while other sources are beyond the organisation's control. The controllable sources of corporate image include the employees' conduct, the organisation's products, prices, sales force, support services, distribution channels, corporate social conduct, corporate contributions conduct, and communications (Boyle, 1996). The sources of corporate image can be divided into two broad categories: 'functional' sources that include the tangible assets of the organisation, and the 'emotive' sources, which are concerned with subjective feelings (Greene, Walls & Schrest, 1994; Kennedy, 1977). Dowling (1993) pointed out that a corporate image is a function of what people are saying about an organisation, and what the organisation is saying about itself.

Kennedy (1977) argued further that corporate image has much more to do with the underlying policies of an organisation than with advertising or publicity activities, and cited employees as a decisive factor in the formation of a corporate image. In agreement with Kennedy's view, Gronroos (1994) pointed out that service offerings are the most important part of a service organisation that customers see and perceive: other less important factors of corporate quality are traditional marketing activities such as advertising, pricing and public relations, as well as tradition, ideology and word-of-mouth. Similarly, other researchers (Abratt, 1989; Bernstein, 1984; Boyle, 1996) point out that an organisation cannot control the images which the public has of it; an organisation can only control its corporate identity.

According to Olins (1989), corporate identity is organisation-wide, involving management, communication, behaviour and other organisational design issues.

Although there is a sizeable amount of literature on the concept of corporate image, there is no universally accepted measurement instrument for corporate image. This could partly be due to the fact that there is minimal empirical research on the concept of corporate image. Many of the articles reviewed concentrated on process management of corporate identity and image. Of the articles reviewed, only four of them had derived measurement instruments for corporate image. Kennedy (1977) used a five-step summated agree/disagree scale to measure the corporate image of several organisations involved in electronic and other types of engineering functions in the UK. Different versions of the questionnaire were sent to employees, suppliers and purchasers. Similarly, in an empirical study of the corporate image of a major bank in the Netherlands, Bloemer, de Ryter & Peeters (1999) used 17 four-point Likert-scale (Agree/Disagree) items. Andreassen and Lindestad (1998) used a three item Likert-scale to determine the corporate image of three tour operators in Norway. Van Heerden and Puth (1995) used five-point semantic differential scales composed of 30 items to measure the corporate image of 11 major banking institutions in South Africa.

It is evident from the literature reviewed that the concept of corporate image has not generated enough empirical research, leading to the absence of any accepted conceptualisation of the construct, as well as the lack of a universal measurement instrument for it. Furthermore, none of the articles reviewed dealt with research on corporate image in the public service sector. Therefore, there is a need to carry out research that will validate a multiple-item measurement instrument of corporate image in the water utility services.

3.6 CONSUMER SATISFACTION

Consumer satisfaction in the area of goods marketing has for long attracted considerable research attention. The most dominant model for consumer satisfaction, whether for goods or services, is the comparison standards model, which posits that consumers hold pre-consumption product standards, observe product performance, compare performance with their standards, form confirmation or disconfirmation perceptions, and combine these perceptions with standard levels to form summary satisfaction judgements (Oliver, 1980; Walker, 1995). The basic comparison standards model is shown in figure 3.2.

The model shown in figure 3.2 holds that consumer satisfaction is related to both the direction and the size of the disconfirmation, with three possible outcomes. Confirmation will lead to moderate satisfaction, positive disconfirmation will lead to high satisfaction, and negative disconfirmation will lead to dissatisfaction. (Churchill & Surprenant, 1982; Iacobucci, Ostam, Braig, & Bezjian-Avery,1996; Oliver, 1980; Walker, 1995).

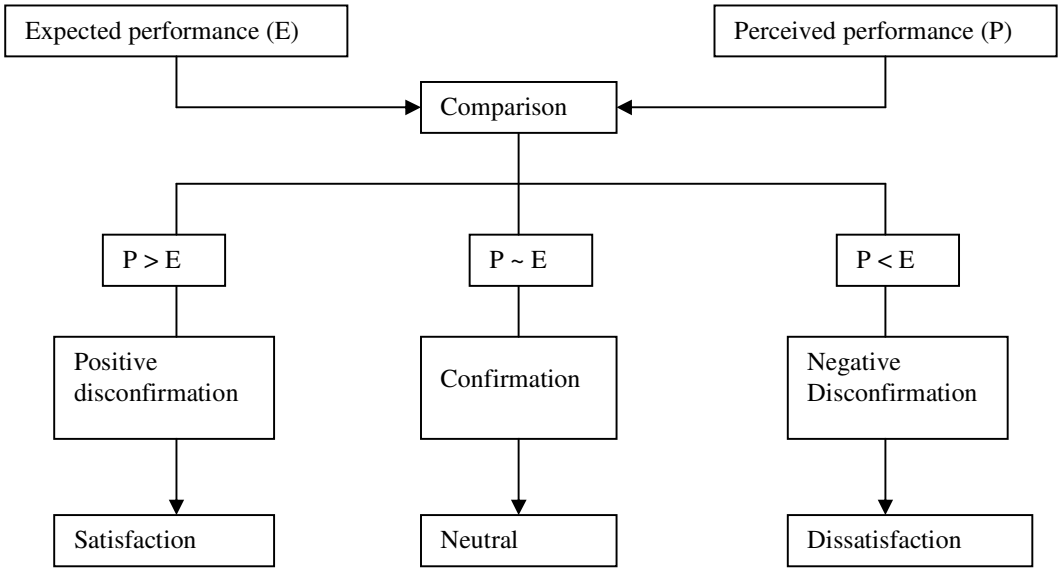


Figure 3.2: The Comparison Standards Model of Consumer Satisfaction
Source: Walker (1995)

Both service quality and consumer satisfaction are conceptualised using the comparison standards model (Iacobucci et al,1996). Consequently, there has been a great deal of discussion as to whether consumer satisfaction is not one and the same concept as service quality (Bloemer, de Ruyter & Peeters, 1998; Iacobucci et al,1996; Nicholls, Gilbert & Roslow, 1998). This controversy has been worsened by the fact that some studies refer to consumer satisfaction and service quality interchangeably (e.g. Danaher & Gallagher, 1997; Davis & Heineke, 1998). The confusion between service quality and satisfaction originates from the conceptual development of the two constructs that are derived from the expectancy-disconfirmation paradigm (Iacobucci, et al,1996).

Four major differences have been cited in the literature concerning the conceptualisation of service quality and consumer satisfaction. Firstly, satisfaction is thought to result from the comparison between *predicted* service and perceived service, whereas service quality refers to *desired* service and perceived service (Boulding, Kalra, Staelin & Zeithaml, 1993; Danaher & Mattsson, 1994; Iacobucci et al, 1996; Zeithaml, Berry & Parasuraman, 1993). Secondly, satisfaction is thought to relate to specific service transactions, whereas service quality concerns the consumer's judgement about an organisation's overall excellence or superiority (Bitner, 1990; Danaher & Mattsson, 1994; Parasuraman, Zeithaml, & Berry, 1988). Thirdly, consumer satisfaction/dissatisfaction is believed to be a higher level judgement that considers both the qualities and the benefits obtained through the transaction, as well as the sacrifice undertaken by the consumer (Bloemer, de Ruyter & Peeters, 1998; Chadee & Mattsson, 1996; Hallowell, 1996; Ostrom & Iacobucci, 1995; Voss, Parasuraman & Grewal, 1998). The two concepts are, thus, believed to be determined by different antecedents. Lastly, unlike service quality evaluations, a consumer needs to have experienced a service in order to form a satisfaction judgement (Bloemer, de Ruyter & Peeters, 1998).

Various studies in services marketing have conceptualised comparison standards in the consumer satisfaction model in different ways. One standard commonly used in satisfaction judgements is the representation of expectations as *predictions* of future events (Boulding, Kalra, Staelin & Zeithaml, 1993; Oliver, 1980; Tse & Wilton, 1988). Another standard for expectations is *experience-based norms*, which are derived from personal experiences or information received (LaTour & Peat, 1989; Cadotte, Woodruff & Jenkins, 1987; Woodruff, Cadotte & Jenkins, 1983). Other studies have used the standard of *equity expectations*, which are based on what the consumer believes should occur given the price (Oliver & Swan, 1989). Other studies have based expectations standards on *desires*, i.e. features and benefits that are considered ideal by the consumer (Westbrook & Reilly, 1983).

Furthermore, the basic comparison standards model shown in figure 3.2. conceptualises consumer satisfaction at one point in time. To obtain a better understanding of the confirmation/disconfirmation process in services marketing, other studies have modelled the evaluation process into three stages: pre-consumption, consumption, and post consumption (Boulding, Kalra, Staelin & Zeithaml, 1993; Cadotte, Woodruff & Jenkins, 1987; LaBarbera & Mazursky, 1983; Oliver, 1980; Voss, Parasuraman & Grewal, 1998; Walker, 1995). In the modified model espoused by Walker (1995), consumers encounter peripheral components and compare the performance (in terms of physical surroundings) with their 'passive' expectations at the pre-consumption stage. During the consumption stage of the

core service, perceived performance of the core attributes are compared with the more 'active' expectations. However, the evaluation in the pre-consumption period also plays a role in the second-stage core evaluation. Finally, the consumer evaluates the post-core service delivery in the third stage. Similarly, the second-stage evaluation contributes to the third-stage evaluation. The overall service encounter evaluation is a function of all the three evaluation stages (Walker, 1995). The overall service evaluation will depend on the type of service offering, i.e. the point where the offering lies on the goods/service continuum.

Another point of contention that has generated debate among service marketing researchers is whether to measure transaction-specific satisfaction, or overall satisfaction (Jones & Suh, 2000). Transaction-specific satisfaction, which is usually modelled on the comparison standards model of satisfaction/dissatisfaction (Boulding, Kalra, Staelin & Zeithaml, 1993), is the consumer's satisfaction or dissatisfaction with a discrete service encounter. On the other hand, overall satisfaction refers to the consumer's cumulative satisfaction or dissatisfaction with the organisation based on all encounters and experiences with the particular organisation (Jones & Suh, 2000). Overall satisfaction is updated after each transaction (Boulding, Kalra, Staelin & Zeithaml, 1993). A number of studies have advocated the use of overall consumer satisfaction, arguing that it may be a better predictor of behavioural intentions (Anderson Fornell & Lehmann, 1994; Anderson & Sullivan 1993; Iacobucci, Grayson & Ostrom, 1994; Jones & Suh, 2000; Spreng, Harrell & Mackoy, 1995; Watson 1998).

A similar issue of controversy in the conceptualisation of consumer satisfaction is whether to use a single-item summary measure, or a combination of attributes (LaBarbera & Mazursky, 1983). While some studies have used summation scales to measure consumer satisfaction, other studies advocate a single item measure because it represents a summary of subjective responses to several different issues (LaBarbera & Mazursky, 1983).

In summary, although research into consumer satisfaction has been ongoing for many years, conceptualisation of consumer satisfaction has generated several debates. Most of the concepts used in services marketing are adopted from consumer marketing. There are no reported empirical studies on low-income countries. There is virtually no literature which discusses the formation of customer satisfaction evaluations of continuously provided services, where customers enter into long-term contracts with the service providers, as is the case with many public utilities. There is, therefore, a need to validate the consumer marketing concepts in urban water utility services and hence provide a better understanding of customer satisfaction in public sector services.

3.7 CUSTOMER LOYALTY

In the past, researchers within the area of services management have placed considerable emphasis on customer satisfaction as the leading business strategy. This continued emphasis on satisfaction occurs despite the fact that satisfied customers that have freedom to make choices are not necessarily always loyal to the organisation (Gould, 1995; Jones & Sasser, 1995). Furthermore, the minimal research into customer loyalty has focused primarily on product-related or brand loyalty, whereas loyalty to service organisations has remained underexposed (Bloemer, de Ruyter & Peeters, 1998). Consequently, calls for a shift to the pursuit of loyalty as a strategic business goal are becoming prominent (Oliver, 1999).

There are various but converging definitions of loyalty in the services marketing literature. Hallowell (1996) pointed out that the definition of customer loyalty may either be attitudinal or behavioural, the latter being more dominant in services management and marketing. Loyalty is one of the components of behavioural intentions; behavioural intentions may be described as indicators that signal whether customers will remain with or desert the firm (Zeithaml, Berry & Parasuraman, 1996). Customer loyalty generally expresses an intended behaviour related to the service or the organisation (Andreassen & Lindestad, 1998; Bloemer, de Ruyter & Peeters, 1998). Gremler and Brown (1999, p.273) specifically defined customer loyalty as "the degree to which a customer exhibits repeat purchasing behaviour from a service provider; possesses a positive attitudinal disposition towards the provider; and considers using only this provider when a need for this service arises". For bank services, Bloemer, de Ruyter & Peeters (1998) defined bank loyalty as a biased behavioural response, expressed by a customer over time, with respect to one bank out of a set of banks, which is a function of decision-making and evaluative processes, resulting in commitment. Similarly, Andreassen &Lindestad (1998) pointed out that customers may be loyal for three main reasons: due to high switching barriers, because of lack of alternatives, or because they are satisfied.

Loyalty has also been conceptualised differently in the reviewed literature. Oliver (1999) conceptualised brand loyalty as a four-phase concept: (i) *cognitive loyalty,* where the consumer holds the belief that one brand is preferable to alternatives; (ii) *affective loyalty*, where a liking or attitude towards the brand has developed following cumulatively satisfying service encounters; (iii) *conative (behavioural intention) loyalty*, where the consumer develops a brand-specific commitment to repurchase, which may be anticipated, but unrealised action; and (iv) *action loyalty*, where intentions

are converted to actions. The first three phases depicted above are similar sequential components of an attitude (Assael, 1995; Heylen, Dawson & Sampson, 1995; Kinnear & Taylor, 1996; Schiffman & Kanuk, 1994). Although the behavioural component has frequently been treated as the consumer's *intention to buy* in consumer research (Asseal, 1995), research evidence indicates that the link between attitude and behaviour is not simplistic (Kinnear & Taylor, 1996). Attitude is only one of the influences on behaviour, and depending on a given decision situation, other factors such as affordability-to-pay, could be more influential (Asseal, 1995; Kinnear & Taylor, 1996).

Loyalty may be manifested by expressing a preference for an organisation, by continuing to purchase from it, or by increasing business with it in the future (Hallowell, 1996; Zeithaml, Berry & Parasuraman, 1996). Conversely, other studies have included positive word-of-mouth as an indicator of loyalty, over and above re-purchase intentions (Andreassen & Lindestad,1998; Bloemer, de Ruyter & Peeters, 1998; Boulding, Kalra, Staelin & Zeithaml, 1993; Cronin, Brady & Hult, 2000; Cronin & Taylor, 1992; Gremler & Brown, 1999; McDougall & Levesque, 2000).

In the reviewed literature, loyalty has been measured using single or multi-item instruments. The few studies carried out in the early 1990s conceptualised loyalty either by a single-item measure (Cronin & Taylor; 1992), or as a two-item measure (Boulding, Kalra, Staelin & Zeithaml, 1993). However, most studies carried out afterwards used multiple item measures of loyalty (Andreassen & Lindestad,1998; Bloemer, de Ruyter & Peeters, 1998; Bloemer, de Ruyter & Wetzels, 1999; Cronin, Brady & Hult, 2000; Gremler & Brown, 1999; Hallowell, 1996; Sirohi, Mclaughlin & Wittink, 1998; Zeithaml, Berry & Parasuraman, 1996).

The reviewed literature enumerated above shows that the concept of customer loyalty has not received enough attention in the field of services marketing. Accumulated research on customer loyalty in the product domain cannot automatically be generalised to services, as interpersonal relationships play a more significant role in the creation of loyalty with services than with tangible products (Bloemer & de Ruyter, 1999). Furthermore, from the reviewed literature, no empirical study was identified which examined service loyalty for a continuously provided service where customers sign a long-term contract with the service provider, such as public utilities. Hence, this research is needed to gain more understanding of consumer loyalty in urban water services.

3.8 RELATIONSHIPS BETWEEN CUSTOMER PERCEPTIONS

This section reports on empirical studies carried out in services marketing to determine relationships between customer perceptions discussed in Sections 3.2 to 3.6. The reviews have been categorised according to the patterns of relationships elicited in the various studies.

3.8.1 Service Quality, Customer Satisfaction and Loyalty

Although there is still disagreement among researchers about the conceptualisation, relationship and operationalisation of service quality and customer satisfaction, it is generally agreed that the two constructs have a large impact on the behavioural intentions of customers (Anderson, Fornell & Lehman, 1994; Anderson & Sullivan, 1993; Cronin & Taylor, 1992). Since the early 1980s, empirical research has been carried out into the relationship between service quality, customer satisfaction and loyalty.

There has been disagreement in the services marketing literature about the causal order of service quality and customer satisfaction (Lee, Lee & Yoo, 2000). A few studies have asserted that customer satisfaction is an antecedent to service quality. Studies reviewed which predicted a satisfaction-quality causal link were carried out in the airlines service industry (Bitner, 1990); in telephone services (Bolton & Drew, 1991); in the telephone, securities brokerage, insurance, banking and maintenance/repair services (Parasuraman, Zeithaml, & Berry, 1988); in university education (Athiyaman, 1997). However, more recent studies have produced evidence which shows that service quality leads to satisfaction.

The reviewed studies with a quality-satisfaction causal link were conducted in the banking, pest control, dry cleaning and restaurant services (Cronin & Taylor, 1992;); photographic services (Dabholkar, Sheperd & Thorpe, 2000); a variety of consumer service firms in Sweden (Anderson, Fornell & Lehmann 1994; Anderson & Sullivan, 1993; Fornell, 1992); entertainment park, aerobic school, and investment consulting services (Lee, Lee & Yoo, 2000); health care and car repair services (Mittal & Lassar, 1998); marketing research services (Nowak & Washburn, 1998); educational services (Spreng & Mckoy, 1996); agricultural services (Humphreys & Williams, 1996); auto insurance services (Stafford, Stafford & Wells, 1998); leisure services (Wakefield & Blodgett, 1996); leisure industry (Wakefield & Blodgett, 1996), and in banking services (Levesque & McDougall, 1996; Yavas,

Bilgin & Shemwell, 1997). In all these studies the results showed that service quality either had strong correlations with, or explained substantial variation in, customer satisfaction.

Besides the research attention on the relationship between customer satisfaction and service quality as a construct, a few studies have also examined the contributions of individual attributes of service quality and other variables, to overall customer satisfaction. A study carried out in the insurance industry used SERVQUAL dimensions as predictors of both overall service quality and overall customer satisfaction (Stafford, Stafford & Wells, 1998). The results of the study showed that reliability explained the biggest variation in both quality and satisfaction, while assurance, tangibles and empathy explained statistically significant variations in overall customer satisfaction (Stafford, Stafford & Wells, 1998). Similarly, a study carried out into private banking services found that of the five dimensions of SERVQUAL, only empathy contributed significantly to overall customer satisfaction (Lasser, Manolis & Winsor, 2000). In the same study, however, both technical and functional quality contributed significantly to the variation in overall customer satisfaction (Lassar, Manolis & Winsor, 2000). In the hotel industry, it was evident that the service delivery process can be broken down into distinct encounters such as check-in, room, restaurant, and check-out encounters (Chadee & Mattsson, 1996; Danaher & Mattsson, 1994), which individually contribute to overall satisfaction.

Several other studies have measured customer satisfaction without necessarily aggregating antecedent attributes into a measure of service quality. In the household moving services, various attributes of the service recovery process were strong predictors of overall customer satisfaction (Spreng, Harrell & Mackoy, 1995). A study conducted with customers of marketing research firms showed the variances explained in overall customer satisfaction by individual attributes of product quality and cost management/timeliness were bigger than the variance explained by service quality (Nowak & Washburn, 1998). In the health care services, patient satisfaction ratings varied only when they perceived the outcome of the treatment as ‘bad’ (Amyx, Mowen & Hamm, 2000). In a study by Nicholls, Gilbert and Roslow (1998), a parsimonious instrument for overall customer satisfaction was validated with customers of selected public and private services, in which the instrument separated into two dimensions, namely satisfaction with personal service, and satisfaction with service setting. Selnes (1998) found that communication, commitment and conflict handling were strong predictors of satisfaction in Norwegian restaurant food supplier services. A study carried out with university students in connection with the medical and restaurant services showed three dimensions of antecedents of customer satisfaction: concern, courteousness, and friendliness of the service provider (Winsted, 2000).

For theatre services, actor satisfaction, actor familiarity, play attitudes and theatre attitudes were found to explain substantial variation in overall customer satisfaction (Garbarino & Johnson, 1999).

A few reviewed studies have examined the relationship between service quality and customer loyalty, without including customer satisfaction in the research model. A multi-dimensional study involving customers from supermarkets, fast food restaurants, amusement parks and health care services in Belgium showed that different service industries displayed unique predictive variation patterns between SERVQUAL dimensions and service loyalty dimensions (Bloemer, Ruyter & Wetzels, 1999). Similarly, an experimental study carried out in the hotel industry found that overall service quality explains substantial variation in service loyalty (Boulding, Kalra, Staelin & Zeithaml, 1993). Another study carried out in service industries of computer manufacturing, retail chain, automobile, and life insurance, showed that perceived service quality explained substantial variations in each of the components of service loyalty (Zeithaml, Berry & Parasuraman, 1996).

Conversely, several studies have looked at the relationship between customer satisfaction and service loyalty, without the involvement of service quality. A study conducted within retail banking services found that different customer satisfaction attributes had varying levels of impact on customer retention rates and market share (Rust & Zahorik, 1993). Another study conducted within restaurant food supply services showed that customer satisfaction is strongly related to relationship continuity (Selnes, 1998). Hallowell (1996) conducted a study among retail banking customers, which showed that overall satisfaction is a major predictor of customer loyalty. In a study conducted among car owners in the four biggest cities of Korea, negative disconfirmed expectation was found to exert a greater impact on overall satisfaction and customer loyalty, compared to positive disconfirmed expectation (Yoon & Kim, 2000).

On the other hand, several studies have conceptualised the relationship of customer satisfaction and loyalty within a dynamic model. A field study on a flu vaccination program showed that intentions prior to a purchase, post purchase satisfaction, and revised post purchase attitude are antecedents of future behavioural intentions (Oliver, 1980). Similarly, a study conducted with supermarket customers found significant relations between pre-purchase intentions, post-purchase satisfaction and post-purchase intentions (LaBarbera & Mazursky, 1983). For a continuous cell phone service provider, customers who have higher prior cumulative satisfaction have longer relationships with the organisation (Bolton, 1998). In a similar study carried out with customers of a television entertainment and a cellular phone service provider showed that payment equity, cumulative satisfaction, and prior

usage are strong antecedents of future usage (Bolton & Lemon, 1999). In the automotive service industry, the relationship between attribute level evaluations and overall satisfaction was shown to be dynamic in nature: initially, satisfaction with the service is more important, but satisfaction with the product becomes more important during later consumption periods (Mittal, Kumar & Tsiros, 1999).

A number of studies that have examined the relationship between service quality, customer satisfaction and loyalty concurrently have found larger and more significant regression coefficients of loyalty with customer satisfaction than with service quality (Anderson & Sullivan, 1993; Cronin & Taylor, 1992; Mittal & Lasser, 1998; Taylor & Baker, 1994). In fact a study conducted in three service industries, specifically to determine the causal order of service quality, customer satisfaction and loyalty, found that customer satisfaction is a mediating variable between service quality and customer loyalty (Lee, Lee & Yoo, 2000). Additionally, interactions between service quality and customer satisfaction have been found to explain substantial variation in customer loyalty in some service industries such as communication services, transportation services, and recreation services (Taylor & Baker, 1994).

3.8.2 Service Quality, Value, Image, Customer Satisfaction and Loyalty

Most studies into customer perceptions conducted earlier than the mid-1990s concentrated on the relationship between service quality, customer satisfaction and loyalty (Cronin, Brady & Hult, 2000). Of the literature reviewed, only a few studies have included either service value, or corporate image or both in their conceptual framework. A study carried out with customers of various service firms in the US identified drivers of customer satisfaction as perceived quality, customer expectations, and perceived value (Ittner & Larker, 1996). A similar study carried out with customers of an auditing firm showed that service value exerts significant interaction effects on the relationship between service quality and customer satisfaction (Caruana, Money & Berthon, 2000). A study carried out with customers of dental, automobile maintenance, restaurant, and hairstyling services showed that core service quality, relational service quality, and perceived value are directly related to customer satisfaction, which is in turn directly related to customer loyalty (McDougall & Levesque, 2000).

Two similar studies on service quality, sacrifice, value and purchase intentions were carried out with customers of discretionary recreational/entertainment services, and continuous service providers of health care, communication and fast food, respectively (Cronin, Brady, Brand, Hightower & Shemwell, 1997). The results of the study showed that the inclusion of value in the conceptual model explained

more variation in behavioural intentions than merely service quality and sacrifice (Cronin et al, 1997). Using the same results as obtained by Cronin et al (1997), separate data analysis carried out indicated that service quality, value and customer satisfaction are all antecedents of behavioural intentions; service quality is an antecedent of both value and satisfaction; and service value is an antecedent of customer satisfaction (Cronin, Brady & Hult, 2000).

Of the literature reviewed, only two studies included corporate image in the conceptual model predicting customer loyalty. A study carried out with customers of a major bank in the Netherlands showed that bank image is a strong predictor of service quality, which in turn is directly related to customer satisfaction and loyalty (Bloemer, de Ruyter & Peeters, 1998). In the same study, customer satisfaction was found to be a strong predictor of customer loyalty (Bloemer, de Ruyter & Peeters, 1998). Similarly, results of a study carried out with customers of three package tour operating services in Norway showed that corporate image is positively and directly related to service quality, customer satisfaction and loyalty, but indirectly related to value through service quality (Andreassen & Lindestad, 1998). In the same study, customer satisfaction did not have a directly significant relationship with customer loyalty (Andreassen & Lindestad, 1998).

A few studies carried out among customers experiencing service failures have examined the impact of recovery efforts on customer loyalty. In a study involving customers of an interstate hauling company, satisfaction with service recovery efforts was found to have a bigger impact on service loyalty than any of the specific attributes of original service delivery (Spreng, Harrell & Mackoy, 1995). The results of a similar study carried out with restaurant customers showed that (i) recovery from failures can be effected through different strategies such as compensation, managerial intervention, corrections, and apologies; and (ii) failures connected with facilities and employee behaviour have more serious negative impacts on customer loyalty compared to failures concerned with products, service timing, policies, or wrong/lost orders (Hoffman, Kelley & Rotalsky, 1995).

The literature reviewed above shows that although extensive research has been carried out into the constructs of service quality, service value, customer satisfaction and customer loyalty, few studies have examined the relationship between these constructs simultaneously. Worse still, there is virtually no literature that has examined the contribution of corporate image to service loyalty. Furthermore, evaluation of existing literature reveals a myriad of conflicting results over the relative influence of these constructs on service loyalty, a fact which has generated a need for further research (Cronin, Brady & Hult, 2000).

3.9 CHAPTER CONCLUSION

This chapter reported on a literature review carried out on the general field of marketing of services, and on the immediate topic areas of service quality, service value, corporate image, customer satisfaction and customer loyalty. The literature review revealed the following research gaps:

- Unlike services in the private sector, services management in the public sector has received minimal attention from researchers.
- Most of the research on services management has been conducted in high-income countries. Minimal research has been carried out into low-income countries.
- Although there has been a great deal of research into the constructs of service quality and customer satisfaction, the definitions and conceptualisation of these constructs have varied from one study to another. This situation has led to disagreement among scholars about the antecedents, consequences and causal order of these constructs.
- Limited research has been carried out into the constructs of value, image and loyalty in the services sector. Furthermore, there is disagreement among scholars on the conceptualisation of service value, corporate image and customer loyalty.
- There is virtually no research that has simultaneously examined the relationship between service quality, service value, corporate image, customer satisfaction and customer loyalty.
- Most of the literature reviewed about customer loyalty has dealt with the first three phases of loyalty, i.e. cognitive, affective, and behavioural intention loyalty, the descriptions of which are presented in Section 3.7. Of the reviewed literature, only Hoffman, Kelley and Rotalsky (1995) examined action loyalty, in which behavioural intentions are converted to actions.

By highlighting research gaps, this chapter has laid a theoretical foundation upon which the current research is based. Using the existing situation in the urban water services in low-income areas, chapter four builds on the research gaps revealed in this chapter to develop research questions and a conceptual framework for the current research.

CHAPTER FOUR

CONCEPTUAL FRAMEWORK

4.1 CHAPTER INTRODUCTION

Chapter two identified the background to the research problem as being the low level of cost recovery experienced by managers of most urban water utilities in low-income countries. Chapter three reported on the results of a literature review conducted in the field of services marketing on two issues: (i) the effect of adapting a marketing orientation on business performance in the service industry, and (ii) the effect of customer perceptions on customer loyalty. This chapter combines the findings of chapters two and three, in order to develop a conceptual framework for the research. Chapter four is structured as follows:

- Section 4.2 develops the research problem and research questions
- Section 4.3 discusses the research model, provides conceptual definitions of the variables, and concludes by listing research hypotheses.

4.2 RESEARCH PROBLEM AND RESEARCH QUESTIONS

As already discussed in chapter two, many urban water utilities in low-income countries do not recover the production costs incurred in the delivery of services. Through national government policies, the tariffs for some water utilities are lower than the production costs However, for some other water utilities whose tariffs are higher than production costs, the billing efficiency (i.e. accounted-for-water) and the bill collection efficiency are low. Research has shown that in spite of the disparity in income levels in low-income countries, urban water utilities in these countries need to recover full costs for water services rendered to the public, in order to manage the services in a sustainable manner.

Cost recovery by urban water utilities in low-income countries has been an uphill task partly because of the general low income levels among the consumers. Often, the design and construction of water supply projects in low-income countries is copied from the developed countries, regardless of economic, socio-cultural and technological factors in the operating business environment. Many projects are over-designed due to unreliable and/or insufficient data (Katko, 1989), and inadequate

institutional capacity for management of operation and maintenance also raises the cost of water and sanitation services beyond the affordability of many consumers in low-income countries (Franceys, 1994; Franceys, 1997; Kayaga, 1997b).

Conversely, various scholars have attributed the low bill collection efficiency of water utilities in many low-income countries to the traditional supply-driven approach adopted by many managers in the water industry (Franceys, 1997; Mani, Onishi & Kidokoro, 1997). There is a growing belief among researchers that despite the level of poverty prevailing in low-income countries, many households are able and willing to pay for water/sanitation services if water utilities become market oriented (Estache, 1994; Franceys, 1997; Kayaga & Franceys, 1998). As discussed in detail in section 3.2 of chapter three, market orientation has been defined as an organisational culture that most effectively and efficiently creates the behaviour necessary for the provision of superior value for consumers (Narver & Slater, 1990). Research carried out in private sector services, as presented in section 3.2 of chapter three, shows that adaptation to market orientation by service firms has improved their business performance. Furthermore, despite differences in the definition, conceptualisation and measurement of variables by different researchers, empirical research in the field of services marketing, presented and discussed in chapter three, shows that consumer perceptions of service quality, service value, corporate image and customer satisfaction have substantial influence on customer loyalty.

From the literature reviewed and reported in chapter three, there is no evidence of empirical research that has been carried out into the influence of consumer perceptions on corporate performance of water utility services. Furthermore, few studies have been carried out into consumer perceptions in the services sector of low-income countries. In view of the situation existing in urban water utilities in low-income countries, the business problem has been translated into the following research problem:

> **What influence do customer perceptions of service attributes have on recovering costs of urban utility water services in low-income countries?**

Specifically, this research intends to investigate the following research questions:

1. How do customer perceptions of service quality, service value, corporate image, and customer satisfaction relate to customer loyalty to an urban water utility in low-income countries?

2. Do household characteristics exert moderator effects on the relationship between customer satisfaction and customer loyalty?

3. Is the self-reported customer loyalty translated into favourable bill payment behaviour?

Section 4.3 presents the research model, as well as the research hypotheses that have been advanced to examine the research questions.

4.3 RESEARCH MODEL AND RESEARCH HYPOTHESES

The key variable of interest to this study is the dependent variable of action loyalty, i.e. actual water services bill payment habits.

The primary variables are customer perceptions of:

- Service quality.
- Service value.
- Corporate image.
- Customer satisfaction.
- Customer loyalty.

The following household characteristics are also of interest to the research:

- Gender of head of household.
- Number of years spent by the head of household in formal education.
- Occupation of head of household.
- Size of household.
- Type of premises occupied by household.
- Ownership status of the premises occupied by household.
- Estimated monthly expenditure of household.

- Availability of alternative sources of water to household.

The variables enumerated above are hypothesized to be related to each other as shown in the schematic diagram in figure 4.1.

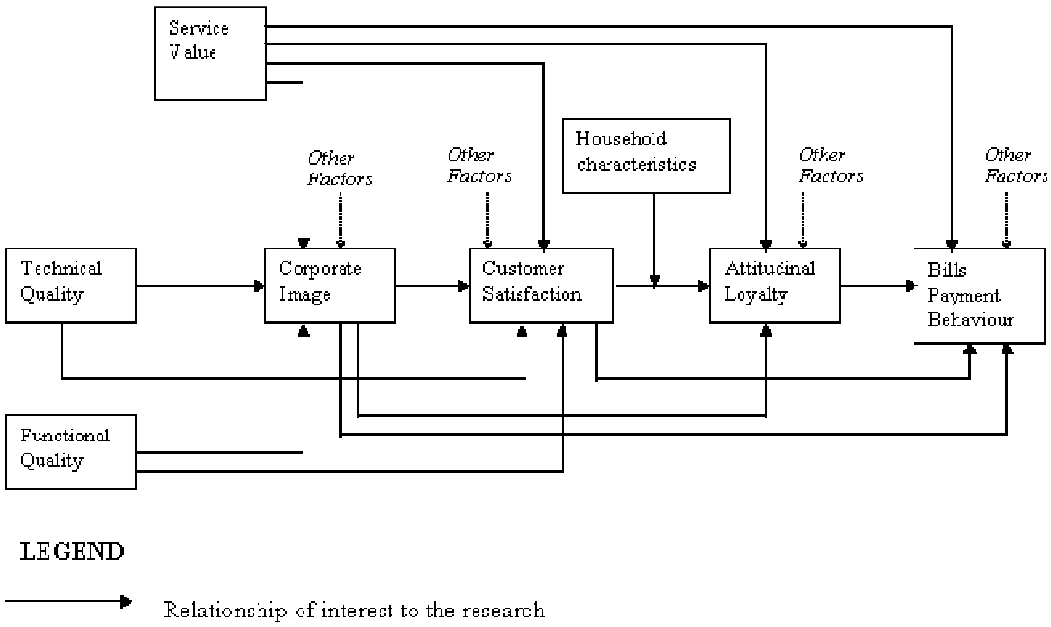


Figure 4.1:Schematic Diagram of the Research Model

As shown in figure 4.1, the conceptualisation of service quality is based on the Technical Quality/Functional Quality framework, described in sub-section 3.3.5, and as espoused by most researchers in Nordic countries (Gronroos 1984; Lehtinen & Lehtinen 1991; Anderson, Fornell & Lehmann 1994). As pointed out by Lapierre (1996), the SERVQUAL model may not be suitable for utility services that are technically oriented, because the SERVQUAL measurement instrument stresses the importance of functional or process quality dimensions at the expense of core services (McDougall & Levesque, 2000). This position was confirmed by the authors of the SERVQUAL model, who stated that it is only suitable for services which are "intangible dominant", and consequently proposed a model for services with a significant component of tangibles, that would also encompass product quality and price (Parasuraman, Zeithaml and Berry, 1994a).

Because water utility services are predominantly technical in nature, with a substantial tangible component, it is presumed that the Technical Quality/Functional Quality Framework is more suitable compared to the SERVQUAL model. Additionally, water utility services in low-income countries are distinctly different from the services that have been discussed in the literature review where SERVQUAL has been successfully applied. In water utility services, conditions of poor coverage of population have to be dealt with as a top priority, before service quality is considered (de Faria and Alegre, 1996). Hence, the tangibles take a dominant role in evaluation of satisfaction with water supply services.

The superiority of the Technical/Functional Quality Framework over the SERVQUAL model was recently tested empirically. A study carried out in the international banking services sector, that used the two conceptual frameworks concurrently, produced results which indicated that the Technical/Functional Quality dimensions predicted customer satisfaction more reliably compared to the SERVQUAL model (Lasser, Manolis & Winsor, 2000).

Previous studies (Bharadwaj, Varadarajan & Fahy, 1993; Devlin, 1998; Humpreys and Williams, 1996; Narver & Slater, 1990) have shown that both technical product attributes and interpersonal process attributes can provide a basis for service differentiation and competitive advantage. Other terms used for technical product attributes and interpersonal process attributes, respectively, are (i) hard quality product elements and soft quality attributes (Humphreys & Williams, 1996); (ii) physical elements and interactive process elements (Lehtinen & Lehtinen 1991); or (iii) core quality and relational quality (McDougall & Levesque, 2000). In the past, water utility managers in low-income countries have concentrated organisational resources on the quality of core product, at the expense of the relational services (Kayaga, 1997a). Skelcher (1992) pointed out that managers of public sector institutions are almost universally recruited from the specialist professions, bringing with them a supply-driven approach to customers' requirements. Indeed, Franceys (1997, p.3) pointed out that the supply-driven water utility services in low income countries inevitably deliver "…poor quality services from high cost infrastructure which is just about sufficient to meet the needs of decision-makers and the higher income consumers."

In this study, the term *Technical Quality* has been proposed to represent the customers' perceptions of technically and objectively verifiable variables of the service offering. A customer receiving services from a water utility will be able to objectively judge verifiable attributes of the service, which Gronroos (1984) referred to as instrumental performance or the technical outcome. *Technical Quality* is similar to

what Murfin, Schlegelmilch and Diamantopoulos (1995) referred to as objective quality in connection with medical services. *Technical Quality* in this study is concerned with attributes consistent with what de Faria and Alegre (1996, p.2) termed the "quantity stage, where the bare satisfaction of biophysical needs is the main task". The quantity stage is the first of the stages that correspond to degrees of socio-economical and cultural development, followed by the "quality stage" and the "excellence stage", in that order (de Faria and Alegre, 1996). *Technical Quality* is similar to what Tritsmans-Sprengers (1996) referred to as material service, i.e. quick technical and administrative response, correct information, and easy procedures.

Technical Quality in this study refers to all objective variables upon which the customer will judge the technical capacity of the water utility. These include (i) variables of the water service elements at the individual household level, (ii) technical efficiency and effectiveness in delivery of services, and (iii) the efficiency of the organisation in recovering from service mishaps. *Technical Quality* is postulated to be the most important quality dimension, and highly correlated with the other quality dimensions.

On the other hand, *Functional Quality* refers to how a service provider's contact staff relate with customers. This construct relates to the human elements of interactive quality or personal service (Tritsmans-Sprengers, 1996) and physical support environment proposed by Lehtinen and Lehtinen (1991). The physical setting affects both customers and employees in a service organisation, and is one of the ways in which customers can be attracted and/or satisfied (Bitner 1992). *Functional Quality* encompasses the human interactive related dimensions of reliability, responsiveness, assurance, and empathy (Parasuraman, Zeithaml and Berry, 1988).

Functional Quality in this study is similar to the construct of functional quality as proposed by Lapierre (1996), and examines staff attitudes and behaviour, accessibility and flexibility, reliability and trustworthiness, and recovery. It is also a measure of service orientation of the interface staff. Cran (1994, p36) describes service orientation as "a set of basic individual predispositions and an inclination to provide service, to be courteous and helpful in dealing with customers and associates". Because of the inter-relationships between staff, personal capacity and technical efficiency of the organisation, some service attributes are expected to intersect *Technical Quality* and *Functional Quality*.

Consistent with Zeithmal (1988), the construct of *Service Value* in the research model describes the consumer's overall assessment of the utility of the service offering, based on what is received compared to what is given up. *Service Value* is the customer's perception of the fairness of the total

price or sacrifice, in exchange for the service received. As discussed in section 3.4, sacrifice as perceived by the consumer includes both objective price, perceived monetary price, and social price, such as time costs, search costs, effort costs and psychic costs (Fine, 1981; Zeithmal, 1988). It has already been mentioned in section 2.2 that in the past, urban water services in many low-income countries were being delivered to the consumer at no monetary cost. The history of 'free' water services, compounded with a low level of affordability for many households to pay for services, makes consumers' evaluations of *Service Value* important in the conceptual model. Previous research has shown that many respondents expected free or subsided services from the government. Indeed, a study carried out in Nigeria (Whittington, Okarafor, Okore and McPhail, 1990), and in India (Jacobs, 1992) showed that consumers considered drinking water supply as part of the government welfare programmes, and were therefore reluctant to pay for water utility services.

Another construct presumed to be important in the utility service sector is *Corporate Image*. In a business environment where too many demands are put upon limited household resources, it is deemed necessary for a water utility to improve its image as a way of keeping customers loyal. Consistent with the Technical Quality/Functional Quality framework (Gronroos, 1984; Lehtinen & Lehtinen; 1991), *Corporate Image* is defined as the overall image formed by customers and potential customers about a service firm, and is customers' perception of its overall attractiveness. This conceptualisation is also in line with the position taken by various scholars that *Corporate Image* is the totality of stakeholders' perceptions of a way a service firm presents itself deliberately or accidentally (Markwick & Fill; 1997), and that it is a set of meanings by which an organisation allows itself to be known and through which it allows people to describe, remember and refer to it (van Rekom; 1997).

In this research, *Corporate Image* is conceptualised as an accumulated attitude. Similarly, this research model adopts the position espoused by Gronroos (1984), that *Corporate Image* acts as a filter, which influences customer perceptions of the operation of the service firm. Furthermore, owing to the fact that it is difficult for most customers to evaluate the quality of many technical attributes of water services such as bacteriological quality, chemical quality, pressure etc., it is presumed that customers also use other simpler criteria such as *Corporate Image* to evaluate performance of water utilities (Andreassen & Lindestad, 1998).

As already discussed in section 3.6, two schools of thought dominate in the debate on conceptualisation of customer satisfaction: transaction-specific satisfaction, and a cumulative construct. Many of the current researchers have concentrated on customer satisfaction as a cumulative construct, because

cumulative satisfaction is a better indicator of a firm's current and long-term performance (Watson 1998). Similarly, the research model shown in figure 4.1 is based on the premise that *Customer Satisfaction* is a cumulative construct that describes a customer's total consumption experience with a product or a service. It is presumed that cumulative *Customer Satisfaction* is updated after each transaction with the service firm (Boulding, Kalra, Staelin & Zeithaml, 1993).

In the research model shown in figure 4.1, customer loyalty is conceptualised as a two-sequence construct. *Attitudinal Loyalty* is the customer's expressions of affection and anticipated commitment to biased behavioural response in favour of the service firm (Oliver, 1999). On the other hand, action loyalty takes place when the customer converts the positive behavioural intentions into actions (Oliver, 1999). In this research model, action loyalty is represented by the customer's *Bill Payment Behaviour*. As discussed in section 3.7, customer loyalty may be as a result of high switching barriers, lack of alternatives, or customer satisfaction. Furthermore, attitude is presumed to be only one of the many influences on behaviour.

As shown in figure 4.1, *Technical Quality*, *Functional Quality* and *Service Value* are all hypothesized to be positively related to *Corporate Image*. It is presumed that these three constructs make a substantial contribution to *Corporate Image*, as service offerings are the most important part of a service organisation that customers see and perceive (Gronroos, 1984). Other factors of *Corporate Image* are traditional marketing activities such as advertising, pricing and public relations, as well as tradition, ideology and word-of-mouth. Furthermore, there is a time lag such that even if the three predictor variables are deteriorating, *Corporate Image* would continue to be more highly rated for a somewhat longer time (Lehtinen and Lehtinen 1991).

In the research model, *Technical Quality*, *Functional Quality*, *Service Value* and *Corporate Image* are presumed to be positively related to *Customer Satisfaction*. The predictor variables of *Technical Quality*, *Functional Quality* and *Service Value* are hypothesized to be directly related with *Customer Satisfaction*, as well as indirectly related through *Corporate Image*.

Customer Satisfaction is expected to have a large influence on *Attitudinal Loyalty*, which in turn is expected to have a large influence on *Bill Payment Behaviour*. However, *Customer Satisfaction* is also expected to have a direct influence on *Bill Payment Behaviour*, as some customers may not form favourable attitudes towards the service firm, although they may be satisfied. Additionally, owing to the difficulty experienced by customers in evaluating technical attributes of water utility services,

Corporate Image is expected to have a significant direct impact on both *Attitudinal Loyalty* and *Bill Payment Behaviour*. Similarly, owing to the general low levels of disposable household income in low-income countries, coupled by a history of 'free' water services, *Service Value* is expected to have a significant direct influence on both *Attitudinal Loyalty* and *Bill Payment Behaviour*. In this model, *Technical Quality* and *Functional Quality* are hypothesized to influence *Attitudinal Loyalty*, only indirectly, through *Customer Satisfaction*, with no direct influence. This is consistent with findings of various studies that have examined the relationship between service quality, customer satisfaction and loyalty concurrently, and have found larger and more significant regression coefficients of loyalty with customer satisfaction than with service quality (Anderson & Sullivan, 1993; Cronin & Taylor, 1992; Mittal & Lasser, 1998; Taylor and Baker, 1994).

This research model also proposes that a number of household characteristics have moderator effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*. A moderating variable affects the degree or form of the relationship between a criterion variable and a predictor variable in one or more of the following ways: (i) whether the relationship will exist or not; (iii) the strength of the relationship; and/or (iii) the direction of the relationship (Baron & Kenny, 1986; Kervin, 1992; Sekaran, 1992). Women in low-income countries traditionally play a greater role in the provision of water in households (Jamal, 1998). It is proposed that the gender of the head of family will affect the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*. Women, with the help of their children, are usually the primary collectors, users and managers of water in the household (Halvorson, Aziz and Alibhoy, 1998; Jamal, 1998). It is, therefore, proposed that if a female is in charge of making decisions about water services to a household, she will have a more favourable attitude towards the service provider, than a male counterpart. This proposition is consistent with the findings of case studies carried out by The World Bank Water Demand Research Team (World Bank, 1993) in selected regions of Latin America, Africa, and Southern Asia on demand for water.

Another household characteristic which expected to have moderating effects is the size of household. It is expected that for a given level of satisfaction, a household with more people will have a more favourable attitude towards payment of water bills than a household of a smaller size. This is because absence of water in a homestead would cause more inconvenience for a larger household than for a smaller household. Furthermore, it would be easier for a smaller family to receive household water from a neighbour at a smaller or zero cost than for a larger family.

It is also anticipated that the level of education of the decision maker(s) in the household will have moderator effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty* towards the water utility. Similar results were obtained in a series of global case studies carried out by The World Bank Water Demand Research Team (World Bank, 1993). More educated heads of households are expected to be conversant with the economic value of water services, and therefore appreciate the importance of payment for the sustainability of service delivery.

Two variables concerned with premises being occupied by the household are hypothesized to have moderator effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*: ownership status of the tenure of the residential house, and whether or not the house is being shared by more than one family. Nearly 55% of people living in urban centres of Uganda live in rented premises (Uganda Statistics Department, 1994). Furthermore, change of occupancy for tenants is a common occurrence, for economic, social, security and other similar reasons. Therefore, in order to establish more reliable responsibility for water bills sent out, the urban water utility in Uganda sends the bills to the landlords and/or owner of the premises. The same provision applies for households sharing one residential house. In the research model, such third party dealings are hypothesized to dampen the *Attitudinal Loyalty*. Similarly, the relationship between *Customer Satisfaction* and *Attitudinal Loyalty* will most likely be affected if the house is being shared by more than one family, because there will be lack of agreement on shared responsibility for the bills.

Given the same level of satisfaction, households with a higher disposable income are more likely to react more favourably to water bills than households with lower income levels. This moderator effect was confirmed in case studies carried out in Uganda (Whittington, Davis & McClelland, 1996); in Nigeria (Whittington, Okarafor, Okore & McPhail, 1990); and various research carried out in other parts of the world by The World Bank Water Demand Research Team (World Bank, 1993).

Finally, the use of alternative sources of water for households, is expected to have significant moderator effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*. If a household has an alternative source of water that is perceived by the consumers to be cheaper, the tendency to pay is reduced, regardless of the level of customer satisfaction. A study carried out in India found that households with alternative sources of water supply had a lower willingness to pay for the services compared to households with no other alternative (Mani, Onishi & Kidokoro, 1997).

The research hypotheses concerning delivery of urban water services may be summarised as follows:

1. The three variables of *Technical Quality*, *Functional Quality*, and *Service Value* of the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in *Corporate Image*.

2. The four variables of *Technical Quality*, *Functional Quality*, *Service Value,* and *Corporate Image* of the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in *Customer Satisfaction*.

3. The three variables of *Service Value*, *Corporate Image*, and *Customer Satisfaction* of the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in *Attitudinal Loyalty* towards the urban water utility.

4. The four variables of *Service Value*, *Corporate Image*, *Customer Satisfaction,* and *Attitudinal Loyalty* for the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in the customer's *Bill Payment Behaviour*.

5. The following household characteristics will have significant moderator effects on the relationship between *Customer Satisfaction* and the customer's *Attitudinal Loyalty* towards the urban water utility*:*

    a. Gender of head of household.

    b. Number of years spent in formal education by head of household.

    c. Type of occupation of head of household.

    d. Number of people in household.

    e. Ownership status of the residence occupied by household.

    f. Type of premises occupied by household.

    g. Household income.

    h. Use of alternative water supply by household.

4.4 CHAPTER CONCLUSION

This chapter has presented the statement of the problem in some detail. At the beginning of the chapter, the research problem and research questions were discussed. A schematic diagram of the research model was then presented in figure 4.1, which was followed by the conceptual definitions of the variables relevant to the study. The relationships shown in the research model were discussed, followed by a summary of the research hypotheses. Table 4.1 shows a summary of the research model and the configuration of the variables therein.

Table 4.1: Summary of the Research Model Indicating the Configuration of the Variables

Hypothesis	Criterion Variable	Predictor Variables	Moderator Variables
1	Corporate Image	Technical Quality Functional Quality Service Value	
2	Customer Satisfaction	Technical Quality Functional Quality Service Value Corporate Image	
3	Attitudinal Loyalty	Corporate Image Service Value Customer Satisfaction	
4	Bill Payment Behaviour	Attitudinal Loyalty Customer Satisfaction Corporate Image Service Value	
5	Attitudinal Loyalty	Customer Satisfaction	Various Household characteristics

Chapter five reports on the development of operational hypotheses, and on the research design. The same chapter also presents an account of the process of developing the measurement instrument, carrying out the pilot study, as well as data collection procedures.

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 CHAPTER INTRODUCTION

In chapter four, a conceptual framework was developed, which culminated in a listing of research propositions. In order to investigate the research hypotheses, this study utilised a cross-sectional survey design to investigate the influence of perceptions of urban water utility customers on their bill payment behaviour. This chapter describes the methodology used to collect relevant data. An introduction to the methodology was provided in section 1.4 of chapter one; this chapter aims to build on that introduction and to provide assurance that appropriate procedures were followed.

Chapter five is organised around seven sections which are enumerated below:

- Justification for the methodology
- Report on major elements of research design
- Procedures in the development of the research instrument
- Procedures and results of a pilot study
- Ethical considerations of the research
- Data collection procedures and non-response analysis
- Techniques used in data analysis

5.2 JUSTIFICATION FOR THE METHODOLOGY

After the selection of a topic of interest, the next step in the design of a study is to provide for selection of the research methodology (Creswell, 1994). Research methodology is described as the procedural framework within which the research is conducted (Remenyi, Williams, Money & Swartz, 1998). This study utilised a qualitative methodology during the development of the research instrument. However, the main research applied the quantitative methodology in which the study is "…based on testing a

theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true." (Creswell 1994, p.2). Consistent with the quantitative paradigm, this study utilised the positivist methodology, by using a deductive form of logic wherein concepts, variables, and hypothesis are chosen a priori and remain fairly fixed throughout the study (Creswell, 1994; Neuman, 1997).

The main reasons for choosing the positivist methodology for the main part of the research are:

- The nature of the problem for this study has attracted attention in previous studies, and so a substantial body of literature exists on the area upon which this study was built. Consequently, explanatory and predictive methods were deemed most suitable for the study.
- Most studies reviewed and presented in chapter three, which examined customer perceptions and behavioural intentions, adopted the positivist methodology.
- The quantitative methodology provides for sampling of a wide range of research elements. This methodology is considered more suitable for the research problem, as sampling will ensure collection and analysis of data from many towns of Uganda, a country with a heterogeneous society.
- It is anticipated that engineers, who are physical scientists by training, and who predominantly manage urban water utilities in low-income countries (Franceys, 1997), would find results from a positivist study easier to interpret and implement.
- Other approaches to research require more resources (Creswell, 1994) than were available for the study.

5.3 RESEARCH DESIGN

5.3.1 The Research Setting

The study was conducted in the urban areas of Uganda. Urban areas in Uganda are defined as cities, municipalities, towns, town boards, and trading centres with a population of at least 5,000 persons (Uganda, Statistics Department, 1994). A survey carried out in 1996 revealed that Uganda's household population was 19,335,000 million people, of which 2,673,000 (13.8%) lived in the urban centres

(Uganda, Statistics Department, 1998). Table 5.1 shows key socio-economic characteristics of the urban population in Uganda. There are a total of 64 gazetted urban centres of Uganda that require services from the urban water sector (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999). The Directorate of Water Development (DWD) under Uganda's Ministry of Water, Lands and Environment (MWLE) is the leading central government agency for water supply services, and is responsible for monitoring, assessing and managing water resources. In addition, DWD is responsible for overall planning and supervision of urban and rural water and sanitation programmes in liaison with relevant agencies (Uganda, The Waterworks Statute, 1995). Indeed, until the onset of the Local Government Act (1997), DWD, in addition to playing the roles of policy-making, and regulating, was also directly involved in provision of services to 45 urban centres. Subsequent to the Local Government Act (1997), the role of service provision reverted to local government institutions (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999).

The major player in provision of services to Uganda's urban centres is the National Water and Sewerage Corporation (NWSC), which, as of January 2000, is responsible for providing water services to urban centres with an estimated population of 2,035,000 (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999). The responsibility for serving the remaining population (24.5%) in the urban centres lies with local authorities such as municipal councils, town councils and town boards. Both NWSC and local councils involved in the provision of urban water services are public agencies.

The performance of local councils in the provision of urban water services in Uganda was rated as dismal, as exemplified by one municipal council which closed the sole waterworks in the town due to lack of funds (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999). Such a phenomenon is consistent with findings of an international study (Blokland, Braadbaart & Schwartz, 1999) which found that municipal waterworks in many developing countries were under-performing, mainly because of the following factors: (i) water provision is often used as a vote-winning tool by elected councillors, who set the tariff below cost recovery levels, or burden the utility with excess staff; (ii) water sales could be used to plug holes in the municipal budget to the detriment of the operations and maintenance of the water system, and (iii) water supply systems are mainly managed as design-and-construction civil works agencies, with little or no interest in providing adequate water services, or recovering costs from consumers.

Table 5.1: Key Socio-economic Characteristics of the Urban Population in Uganda

ATTRIBUTE	VARIABLE	PERCENTAGE
Gender	Male	48.5
	Female	51.5
Age structure	Less than 20 years old	60.9
	Between 20-50 years old	33.9
	Over 50 years old	5.2
Household size	1-2 people	27.9
	3-5 people	38.5
	6-10 people	29.7
	Over 10 people	3.9
Access to education	Literate, aged 10 years and above	81.4
	Aged 15 years or more, completed primary school	56.8*
	Aged 20 years or more, completed O Level	27.1*
Income levels	Monthly per capita income of U-Shs. 0-10,000	16
	Monthly per capita income of U-Shs. 10,000-20,000	24
	Monthly per capita income of over U-Shs. 20,000	60
Household expenditure (*Mean monthly expend. = U-Shs 167,900*)	Expenditure on food, drink, tobacco	43
	Expenditure on clothing, footwear, and h/hold equipment	11
	Expenditure on rent, fuel, and power	19
	Expenditure on transport, health care and education	17
	Expenditure on others	10
Type of dwellings	Independent house	37
	Tenement (*Muzigo*)	51
	Others	12
Type of tenure	Owned by household	36
	Rented by household	53
	Others	11
Water supply	Households that use piped water as main source	36*
	Households that use boreholes as main source	10.4*
	Households that use protected spring/tube wells as main source	26.9*
	Households that use unprotected wells, springs or streams as main source	19*
Toilet facility	Flush toilet	9.2
	Pit latrine	87.7
	Others	3.7

(Only data marked with * extracted from Uganda Statistics Department, 1994)

(Exchange rate in 1995/1996 was 1 US dollar equivalent to about 1,000 Uganda Shillings).

Sources: Uganda Statistics Department (1994; 1998).

On the other hand, water services provided by NWSC were rated as above average (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999). NWSC was declared a corporatised water utility in 1972 by a presidential decree, legally strengthened by NWSC Statute (Uganda, The NWSC Statute, 1995), and was charged with responsibility for providing water and sewerage services to urban centres of Uganda on a self-sustaining basis. However, like many other corporatised water utilities in developing countries, the performance of NWSC is downgraded by frequent interference from the central government, cross-subsidisation in favour of poorer service areas, and low willingness-to-pay for services (Blokland, Braadbaart & Schwartz, 1999). NWSC has a total water distribution network length of 1560 kilometres, serving 53% of the urban population in the services areas in which it operates (Uganda, NWSC, 2000). Nonetheless, in addition to improving the technical capacity, NWSC has made good progress in customer care programmes, as well as in the integration of data and management information systems (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999).

5.3.2 Research Method

As mentioned in the introductory section of this chapter, this study utilised a cross-sectional survey to collect data from households that receive water services from urban water utilities in Uganda. A cross-sectional survey was preferred mainly because of its advantages over other data collection methods in terms of the economy of the design, the rapid turn-around in data collection, and the ability to identify attributes of a population from a sample (Babbie, 1973; Creswell, 1994, Sekaran, 1992). The survey used a self-administered questionnaire for collecting data on all primary variables and household characteristics. *Bill Payment Behaviour*, the key variable, was measured using corresponding data obtained from the billing database of the water utility.

Two modes of questionnaire administration were used: unsupervised administration for respondents who were literate and who claimed they understood all the contents of the questionnaire; and semi-supervised administration for respondents who were illiterate and/or who claimed they did not understand some/all of the contents of the questionnaire. Self-administered questionnaires were preferred to other types of research instruments mainly because (Babbie, 1973; Bourque & Fielder, 1995; Fink, 1995a; Neuman, 1997) (i) there are comparatively lower costs associated with their

administration; (ii) they allow for wider geographic coverage; and (iii) self-administered questionnaires are easier to implement than other kinds of questionnaire.

5.3.3 Sample Design

This study utilised a stratified random sample design. The target population in the study included all households that are customers of National Water and Sewerage Corporation (NWSC), the major urban water utility in Uganda. NWSC has 57,566 registered consumers, located in eleven geographically scattered towns of the country, of which 44% are households (Uganda, NWSC, 2000). Only customers of NWSC were included because (Uganda, Consult 4 [International] [Pty] Ltd et al, 1999) (i) it is only NWSC that carries out consistent cost recovery in the urban water sector in Uganda; (ii) only NWSC keeps a computerised and well documented database to enable extraction of relevant variables and facilitate computer-aided sampling; and (iii) NWSC is responsible for providing water services for about 75.5% of the urban population in Uganda, a factor that enhances the external validity of the sample. Furthermore, limiting the study to only one organisation controlled many organisational-based variables.

Access was made to the database for all registered customers of NWSC as of December 1998. The criteria for inclusion in the sampling frame were (i) a household located in one of the urban centres in Uganda; (ii) a registered customer with NWSC; and (iii) an active customer, i.e. a household which had water services at the time of sampling. A household was, therefore, the sampling unit as well as the unit of analysis. As already mentioned, the method of sampling adopted was stratified random sampling, using the eleven NWSC operational areas as strata.

The sample size was arrived at using a rule of thumb method. Fink (1995b) and Neuman (1997) recommended consideration of the nature and size of the study population, the degree of accuracy required, the diversity in the population, and the number of variables to be examined simultaneously in data analysis. Using the rules of thumb for PhD cross-sectional survey research, suggested by Perry (1996b), the study aimed for a useable response rate of at least 350. Vital factors that were considered in the determination of sample size for self-administered questionnaires are bad addresses and non-response (Bourque & Fielder, 1995; Fink, 1995b). Previous research with customers of an urban water utility in Uganda (Kayaga, 1997a) registered a response rate of 58% in a hand delivered, self-administered questionnaire. Fink (1995b, p.54) recommended a “survey over-sample in the hope that

the desired number of respondents will participate". Consequently, the study targeted an effective sample size of about 800. Furthermore, to cater for inaccuracies in the water utility's billing databases (Onek, 1997), as well as bad addresses due to the high residential mobility (Bourque & Fielder, 1995), the theoretical sample size was estimated at about 1000. Considering a target population of 32,114, this figure translated into a random sample size of about 3%.

A computer program, 'Excel', was utilised to extract the category of "domestic consumers" for each of the NWSC operational areas as at December 1998. For each operational area, the customers' accounts were arranged in ascending order of "Property Reference Numbers". The spreadsheet entries also showed (i) customer reference number, (ii) customer's reference, and (iii) customer's physical address. The sampling frames for each operational area were saved as SPSS data, from which probability samples of approximately 3% were extracted using the SPSS Random Sampling facility. The theoretical stratified samples were refined by excluding sample elements (i) which, by virtue of the address, corresponded to households that were consumers but not direct customers of the water utility; (ii) that did not have clear customers' names; (iii) that had double/multiple entries due to typographical errors; (iv) that did not have clear physical addresses. Table 5.2 shows the sampling criteria used in the study.

Table 5.2 shows that a theoretical sample size of 1051 subjects was arrived at using a 3% sample size. Of the theoretical sample size, 205 subjects were omitted, due to various reasons enumerated in the previous paragraph.

Table 5.2: Sampling Criterion for the Main Study

SERVICE AREA	TOTAL NUMBER OF CONNECTIONS (All categories)	SAMPLING FRAME SIZE (House Connections)	THEORETICAL SAMPLE SIZE	EFFECTIVE SAMPLE SIZE
Kampala	30457	15425	467	439
Jinja	5573	4177	131	88
Entebbe	3185	2756	96	52
Mbarara	2987	2070	64	44
Mbale	2926	1617	56	39
Masaka	1852	1142	48	37
Tororo	1680	1120	44	32
Gulu	1414	1077	41	31
FortPortal	1192	972	38	28
Lira	1095	894	34	24
Kasese	1039	864	32	32
TOTAL	53400	32114	1051	846

Source for Column 1-3: Uganda, National Water and Sewerage Corporation, 1998.

5.4 DEVELOPMENT OF THE MEASUREMENT INSTRUMENT

It is normally advisable to use a standard measurement instrument the validity and reliability of which have already been established (Rudestam & Newton, 1992). However, as discussed in chapter four, of the reviewed literature, no similar empirical study has been carried out in the urban water utility service sector. In the reviewed literature, the study closest to the research topic was conducted in the telecommunication utility services (Lapierre, 1996), from which a few elements of the research instrument were adapted. Therefore, a measurement instrument was developed for the study by modifying some elements of various research instruments encountered in the literature review, to adapt them to urban water utility services.

This study used a questionnaire with multi-item scales. A scales is defined as a "…combination of individual measures of the same variable, each measure reflecting a different aspect of the variable" (Kervin, 1992, p. 291). Multi-item scales were preferred to single-item scales because single-item measures (i) may not fully represent complex theoretical constructs; (ii) lack precision and can not discriminate among fine degrees of attributes; (iii) are usually less reliable than multi-item measures (Babbie, 1973; Kervin, 1992; McIver & Carmines, 1981; Neuman, 1997; Nunnally, 1978; Oppenheim, 1992; Spector, 1992).

The procedure for the development of a measurement instrument closely followed the recommendations of several scholars in the social sciences (Babbie, 1973; Bourque & Fielder, 1995; Fink, 1995a; 1995b; 1995c; 1995d; Kervin, 1992; McIver & Carmines, 1981; Oppenheim, 1992; Seraken, 1992; Spector, 1992). The first task was to provide operational definitions of the study variables. The second task was to identify and quantify response choices appropriate for each construct. Using focus group discussions, pools of items were generated to operationalise each construct. From the generated items, item stems were carefully written. Thereafter, instructions for the respondents, as well as a cover letter, were designed. The first draft of the questionnaire was sent out to management students for pre-testing. The results of the pre-test were analysed, and changes made in the wording and structure of the questionnaire. The modified instrument was sent out to a pilot sample. Using the results of the pilot study, item/reliability analysis and factor analysis were carried out. Reports on each of these activities are presented in sub-sections 5.4.1 to 5.4.5.

5.4.1 Operational Definitions and Proposed Dimensionality of Constructs

The quantitative research methodology requires that development of a research instrument should begin with the definitions of constructs (Babbie, 1973; Creswell, 1994; McIver & Carmines, 1981; Seraken, 1992; Spector, 1992). The operational definitions developed for constructs in the research model are outlined below:

a) *Technical Quality:* This construct is comprised of the technically and objectively verifiable variables of the service offering. The technical variables can further be subdivided into (1) variables judged individually, which may vary from one household to another, and which may affect the household individually, hereafter called *Household Variables*; (2) technical efficiency of a service provider manifested by minimal complaints from consumers, which demonstrates professionalism

and skills (Lapierre, 1996), hereafter called *Technical Efficiency*; (3) technical efficiency exhibited by the service provider in taking corrective action when something goes wrong in service delivery, hereafter called *Recovery Efficiency*.

b) *Functional Quality:* This is the dimension of quality originating in interaction between the customer and the interactive elements of the service provider (Lehtinen and Lehtinen, 1991). It is concerned with the interpersonal skills of the interface staff, as well as the accessibility of services in terms of the physical setting that affect both customers and staff (Bitner, 1992). The dimension is sub-divided into (1) the quality related to interactive staff, hereafter called the *Staff Interactive Quality*; and (2) quality related to the physical surroundings of the interactive environment, hereafter called *Interfacing Environment.*

c) *Service Value*: This construct is similar but not synonymous with "payment equity" proposed by Bolton and Lemon (1999) and concerns the customer's perception of the fairness of the total price compared to the benefits from the services received. This construct is hypothesized to have three dimensions: (i) consumer evaluations of benefits, in comparison with actual monetary payment forfeited by the customer in terms of connection fees, water rates, and reconnection fees (in the case when water supply has been disconnected), hereafter termed *Monetary Value*; (ii) consumer evaluations of benefits, in comparison with the customer's price of changing attitudes towards payment for water services, given the history of free water services in low income countries, coupled with the people's perception that government should pay for the services (Kayaga, 1997b), hereafter called *Psychological Value*; and (iii) consumer evaluations of benefits, in comparison with the customer's efforts expended into other tasks undertaken to ensure continued water services to the household such as receiving and understanding the bills; forwarding complaints in the case of service failure; and making journeys to pay for bills, hereafter referred to as *Effort Value.*

d) *Corporate Image* is presumed to be a single-dimensional construct that looks at the overall attractiveness of a service firm in terms of its services and overall image.

e) In this study, *Customer Satisfaction* is conceptualised as overall satisfaction or cumulative satisfaction. Cumulative satisfaction is "an overall evaluation based on the total purchase and consumption experience with a good or a service over time" (Anderson, Fornell and Lehmann, 1994; p.54). Cumulative satisfaction is differentiated from transaction-specific customer satisfaction, in that the later is an immediate post-purchase evaluative judgement of the most recent

transactional experience with the service firm. The construct of interest to this study is global satisfaction, summing satisfaction with specific products, services and other facets of the service firm, such as physical facilities (Garbarino and Johnson, 1999).

f) *Attitudinal Loyalty* towards the water utility is a measure of concrete steps put in place by the customer to make payment for water services. *Attitudinal Loyalty* examines the customer's tendency to budget for water; the frequency of payment; the reaction to the disconnections; as well as the household's priority to pay for water bills compared to other utilities. *Attitudinal Loyalty* also examines the customer's attitude towards paying for services in a lump sum, at the end of the month, compared to paying for vended services, on a retail basis.

g) *Bill Payment Behaviour* is assessed using the objective measure of how the customer reacts to water bills, using the mean collection period, a credit control ratio. The mean collection period is a measure of how long it takes the organisation to collect its debts (Chadwick, 1991). The individual customer's *Mean Bill Payment Period* is a measure that aggregates into the organisational mean collection period (Yepes & Dianderas, 1996), and is a measure of how many days an individual customer takes on average to settle his/her water bills.

5.4.2 Design of Scale Format

In scale construction, the design of the scale format is paramount in order to improve the response rates (Babbie, 1973; Bourque and Fielder, 1995; Fink, 1995a; McIver & Carmines, 1981; Neuman, 1997; Oppenheim, 1992; Seraken, 1992; Spector, 1992). Likert scales or summated rating scales were chosen for the questionnaire because (Babbie, 1973; Bourque and Fielder, 1995; Spector, 1992) they: (i) normally have better reliability and validity; (ii) are cheaper and easier to develop; (iii) are usually quicker and easier to fill in by respondents. Additionally, multi-item scales have been found to communicate interval properties to the respondents, and, therefore, produce data that can be assumed to be interval scales (Bryman & Cramer, 1997; Cramer, 1998; Oppenheim, 1992). Furthermore, most reviewed literature in services marketing, which was reported in chapter three, treated Likert scales as interval scales. Table 5.3 shows the response choice for each of the constructs.

There is controversy among survey researchers as to whether or not to use a non-attitude and/or middle position in the Likert scales (Neuman, 1997). Several scholars in the social sciences have

recommended the use of a middle position (Babbie, 1973; Bourque and Fielder, 1995; McIver & Carmines, 1981; Neuman, 1997; Oppenheim, 1992; Spector, 1992). In the design of the scale for this study, an odd number of scale steps incorporating a middle point was adopted, so that neutral reactions espoused by some respondents could be tapped (Nunnaly, 1978). Five to nine choices are considered optimal, depending on the measurement sensitivity of respondents (Nunnally, 1978; Spector, 1992). In choosing the number of choices, consideration was made for conditions prevailing in the research setting. The national literacy level of Uganda in 1991 was estimated at 54% (Uganda Statistics Department, 1994). The five-step scale was, therefore, chosen to avoid confusion in differentiation of scale intensity in case of need for interpretation in the local languages best understood by potential respondents. The five steps used for attitude statements were "Strongly Agree", "Agree", "Uncertain/Undecided", "Disagree", and "Strongly Disagree", as recommended by Babbie (1973) and Oppenheim (1992).

Table 5.3: Response Choice for Various Constructs for the Study

CONSTRUCT	TYPE OF VARIABLE	RESPONSE CHOICE
Household Variables	Technical data	Evaluation
Technical Efficiency	Frequency of complaints	Frequency
Recovery Efficiency	Handling of complaints	Evaluation
Interfacing Environment	Various attributes	Evaluation
Staff Interactive Quality	Attitude statements	Agreement
Psychological Value	Attitude statements	Agreement
Monetary Value	Attitude statements	Agreement
Effort Value	Attitude statements	Agreement
Corporate Image	Attitude statements	Agreement
Customer Satisfaction	Various attributes	Evaluation
Attitudinal Loyalty	Factual/Affective Questions	
Bill Payment Behaviour	Mean Bill Payment Period	Ratio measurement

5.4.3 Questionnaire Items Generation

Following a review of service quality literature, as reported in chapter three, questionnaire items were identified that could be utilized in the water utility industry, in respect of the dimensions specified a priori in section 5.4.1. A list of items, largely based on an earlier descriptive survey carried out by the author (Kayaga, 1997a), was noted down for each dimension. This list formed the nucleus for a focus group discussion that involved fifteen senior managers of NWSC, which was held on 15 December 1998. Most participants held the post of Area Managers, the most senior staff in constant touch with the various customers in the service areas.

The first task of organizing a focus group discussion was to identify a suitable moderator. The main function of the moderator is to establish a rapport with participants and guide the group discussion through specific topics of the research (Burns & Bush, 1995). The Principal Public Relations Officer at NWSC was requested to act as a moderator.

The focus group discussion proceeded in the following step-by-step way:

1. Introduce the topic:
    - purpose of the discussion.
    - introduction of the research project.
    - objectives of the research.
    - the conceptual framework and the hypotheses.
    - the research design.
    - the sampling frame.
    - the measuring instrument.
2. The measuring Instrument:
    - stages of design.
    - the different variables being measured.
    - filling in the unstructured questionnaire.

3. Discussions and suggestions.

The following objectives were introduced for the focus group discussion:

1. To draw out ideas and experiences about customers' perceptions of the utility's products and services.
2. To generate ideas on how to measure customers' perceptions and attitudes.
3. To design quantitative measurement of customers' perceptions and attitudes.

The discussion lasted for approximately three hours. A draft framework of the item stems for scale formation was generated. A total of 148 items were suggested for all the constructs under study. Appendix A shows the pool of items generated during the focus group discussion.

5.4.4 Design of Questionnaire Format

The items suggested by the focus group discussions were refined further into item stems for the questionnaire. In drafting the item stems, the following guidelines were adapted from various textbooks on social science research (Bourque & Fielder, 1995; Creswell, 1994; McIver & Carmines, 1981; Oppenheim, 1992; Neuman, 1997; Spector, 1992):

- Items should be as short and as specific as possible.
- Questions should be as neutral as possible.
- Questions should be as user-friendly as possible.
- Each item should be designed to express one idea as far as possible.
- Colloquial expressions and jargon should be avoided as far as possible.
- The language used should be as simple as possible to match the literacy level of the general population.

- An exhaustive range of response categories should be provided.

Furthermore, in line with findings of a study reported by Garg (1996), a balanced set of positively as well as negatively worded statements were employed in the Likert-type questionnaires.

In order to improve response rates, care was taken to start with the easy questions and proceed to the more complex or sensitive questions. Closed-ended questions were preferred to open-ended questions because of the low education level attained by most people in the research setting; only 27% of the residents above 20 years of age in urban centres in Uganda are reported to have completed ordinary level education (Uganda Statistics Department, 1998). Furthermore, data coding and entry is easier for closed-ended questionnaires than open-ended questionnaires (Bourque & Fielder, 1995; Creswell, 1994; McIver & Carmines, 1981; Oppenheim, 1992; Neuman, 1997; Spector, 1992).

In order to make the questionnaire user-friendly, questions were ordered in a logical manner. Similarly, a matrix question format was adopted for most of the questions, mainly because it makes the questionnaire shorter, maximizes the order and clarity of the questions, and is easier for data entry (Bourque & Fielder, 1995; Neuman, 1997). Questions were divided into sections. Detailed clear and unbiased instructions were designed for each section. Finally, the demographic classification questions were put at the end of the questionnaire, as they are considered too sensitive to be filled in at an earlier stage.

5.4.5 Instrument Pretesting

Preparations were made to get the first draft of the questionnaire pretested. There seems to be a lack of clarity in the reviewed literature between the terms ‘pretests’ and ‘pilot studies’. Some scholars use these terms interchangeably. In the context of this report, a pretest refers (Babbie, 1973, p.205) “…to initial testing of one or more aspects of the study design: the questionnaire, the sample design…” while pilot studies refer to “… miniaturised walkthroughs of the entire study design.” (Babbie, 1973, p.205). In this study, only the draft questionnaire was pretested, during the month of February 1999. The respondents for the pretest were postgraduate management students at the Uganda Management Institute, Kampala, Uganda. These were graduate students that had been in service for a period of at least five years, and were attending postgraduate diploma or masters programmes.

The pretest would normally have been conducted using an open-ended format of questions, the responses to which would have to be coded by the researcher, in order to create standardised response categories (Babbie, 1973; Oppenheim, 1992). Owing to time and budget constraints, a draft questionnaire with closed questions was designed on the basis of findings from the literature review and subsequent focus group discussions with senior managers of the water utility.

For pretest purposes, an extra part of the questionnaire was designed to solicit comments on the suitability of the questionnaire for use by water supply services customers. In this part, inquiries were made about the clarity of the cover letter, instructions, as well as the questions. Other inquiries were concerned with whether questions were user-friendly and relevant to the topic introduced; whether the response categories were clear and exhaustive; and whether the structure of the questionnaire was convenient for filling in. Comments were also solicited on any other aspects of the questionnaire.

A suitable cover letter was attached to the questionnaire, in which the following information was passed on to the respondent: (i) sponsorship of the study; (ii) objectives of the main study; (iii) objective of the second part of the questionnaire; (iv) intention of revising the questionnaire based on their comments; and (v) when and how to return the questionnaire. Following a screening exercise to identify those students who were also customers of the urban water utility, the questionnaires were administered to 54 students who qualified. Twenty-nine useable responses were returned.

Twenty-one of the respondents gave good comments on the general structure of the questionnaire. The most dominant comment was about the unfavourable length of the questionnaire. Other significant comments were concerned with the need to provide space for respondents to give extra information; and the apparent repetition of some items.

5.5 PILOT STUDY

Researchers are unanimous on the need to carry out a pilot study for any research design (Babbie, 1973; Bourque & Fielder, 1995; Oppenheim, 1992; Remenyi, Williams, Money & Swartz, 1998; Rudestam & Newton, 1992; Sekaran, 1992). Pilot studies are more important in the case of studies utilising a new research instrument. Consequently a pilot study was carried out with a smaller random sample of part of the target population. In order to cut down on costs, however, the pilot study was conducted in only one urban centre, i.e. Kampala, the capital city of Uganda.

The following major changes were made to the first draft of the questionnaire used for pre-testing, in accordance with suggestions from postgraduate management students:

- The section on "frequency of complaints" was completely eliminated to reduce the length of the questionnaire.
- Some of the item stems were re-worded to make them specific, to remove vague qualifiers and abstract terms, and make the items mutually exclusive.
- Space was provided for respondents to give open-ended comments and/or suggestions.
- The cover letter was improved in terms of the use of an attractive letterhead, a clearer explanation of when and how the questionnaire would be returned, and was duly signed by the Principal Public Relations Officer.

Details of the pilot study procedures and results are presented in sub-sections 5.5.1 to 5.5.4

5.5.1 Pilot Study Sampling and Questionnaire Administration

The samples for the pilot study and the main study were selected at the same time to avoid overlap of respondents in the two studies. After selecting the sample for the main study, the remaining customer reference numbers corresponding to domestic supply customers in Kampala were fed into an Excel spreadsheet. Using the "Advanced Filtering" facility of the Excel programme, and customer reference numbers which ended with numbers "50" and "00" were selected. A total of 244 account numbers were picked for the pilot study.

In order to improve response rates, the improved questionnaires were placed in A4 envelopes, and addressed with the following identification information:

- Customer Name
- Property Reference Number
- Customer Reference Number
- Physical Address

C5 return envelopes were enclosed in the A4 envelopes. The return envelopes were labelled as follows:

PRIVATE & CONFIDENTIAL

QUESTIONNAIRE RESULTS

RETURN TO:
SAM KAYAGA

NWSC HEADQUARTERS

The processed questionnaires were sorted according to the operational zones in the service area. NWSC field staff delivered the questionnaires at the time when February 1999 bills were being dispatched to the customers in the first week of March 1999. A total of 12 questionnaires were not delivered to the intended respondents because the addressees could not be traced.

By the end of April 1999, a total number of 106 filled questionnaires were returned, of which 99 questionnaires were useable, providing an effective response rate of 42%. The Kitintale operational zone in the east of Kampala City had the lowest response rate, where, of 27 questionnaires sent out, only six useable responses (22%) were received. Follow-up interviews with 12 non-respondents in Kitintale carried out in the first week of May 1999, revealed the following major obstacles:

- Some of the non-responding addressees had a low literacy level, and could not, therefore, understand the contents of questionnaire, which was written in English.
- For some household properties, the names appearing on the address were mainly for absentee landlords. The tenants for these properties, who were customers with NWSC, could not commit themselves to answering the questionnaires that were addressed to a different person.

5.5.2 Item/Reliability Analysis of Pilot Study Data

An important step in scale construction is item analysis (Babbie, 1973; Bourque & Fielder, 1995; McIver & Carmines, 1981; Nunally, 1978; Oppenheim, 1992; Spector, 1992). Reliability is defined as

"the degree to which measures are free from error and therefore yield consistent results" (Peter, 1979, p.6). Peterson (1994) further pointed out that the reliability of a scale places a limit on its construct validity. The internal consistency method is preferred to the retest method and alternative form methods because of practical problems in administering the latter reliability measures (Deng and Dart, 1994).

Additionally, Cronbach's coefficient alpha is more frequently used in management research than the split-half test because Cronbach's coefficient alpha provides a direct estimate of all the means of possible split half tests (Deng and Dart, 1994). Furthermore, Spector (1992) proposed that Cronbach's coefficient alpha is a good measure for conducting item analysis because it is a direct function of both the number of items and their magnitude of inter-correlation. Various studies (Babbie, 1973; McIver & Carmines, Oppenheim, 1992; Spector, 1992) have recommended the use of both item-reminder correlation coefficients and coefficient alpha in choosing items for a scale.

Consequently, obtained data were fed into the computer using SPSS Version 7.5 program (SPSS Inc., 1996). The items that had been negatively worded were reverse-scored using the "Decode" facility on the SPSS 7.5 program (SPSS Inc., 1996). The included final items of the item/reliability analysis were obtained following iterations which: (1) reverse-scored items with negative corrected item-to-total correlations; (2) eliminated corrected item-to-total correlations of less than 0.15; and (3) optimised Cronbach's coefficient alpha. With regard to internal consistency, this study adopted the minimum value for Cronbach's coefficient alpha of 0.7, as recommended by Nunnally (1978). Table 5.4 shows a summary of iterations made for each scale.

It is evident from table 5.4 that apart from the item under *Customer Satisfaction*, all items that were dropped on account of low item-to-total correlations were negatively worded. The inconsistency caused by the negative items could be caused by misinterpretation (Babbie, 1973).

Table 5.4: Summarised Results of Item/Reliability Analysis for the Pilot Study

SCALE	INITIAL COEFF. α	NO. OF ITERA-TIONS	NO. OF ITEMS REMOVED	NO. OF ITEMS RETAINED	FINAL COEFF. α
Technical Quality	0.84	2	1	16	0.86
Functional Quality	0.82	1	NIL	11	0.84
Service Value	0.63	6	4	14	0.72
Corporate Image	0.79	3	2	9	0.83
Customer Satisfaction	0.74	2	1	12	0.75

5.5.3 Factor Analysis of Pilot Study Data

Items that remained after conducting the item/reliability analysis were subjected to an exploratory factor analysis to validate the scales. Although at least 100 responses are recommended in order to obtain significant results (Bryman & Cramer, 1997), factor analysis was carried out on the matrix of results, which provided list-wise responses ranging from 75 to 88. Consequently, the results of factor analysis are merely indicative of the factor structure of scales, and do not pre-empt the need to carry out factor analysis in the main study.

Factor analysis was utilised to examine whether the indicators aggregate as proposed by a priori specification of dimensions (Bryman & Cramer, 1997). Principal component analysis was preferred to principal-axis factoring, as recommended by various studies (Bryman & Cramer, 1997; Cramer, 1998; McIver & Carmines, 1981; Nunnally, 1978; Spector, 1992, StatSoft, Inc., 1995). Rotation of factors was carried out to make interpretation of the factor structure easier and provide a simple structure (Bryman & Cramer, 1997; Cramer, 1998; McIver & Carmines, 1981; Nunnally, 1978; Spector, 1992,). Additionally, Nunnally (1978, p.377) emphasised the criteria for rotation and pointed out that "Rotation should be performed so that each variable loads on one and only one factor". Orthogonal rotation was

preferred to oblique rotation because the latter changes some of the essential characteristics of the original matrix of factor loadings, and is more difficult to use for analysis (Nunnally, 1978).

Only variables with loadings of 0.3 and higher were considered for retention (Bryman & Cramer, 1997; Cramer, 1998; Nunnally, 1978; Spector, 1992). Various rotated solutions were scrutinised to determine whether the solution results in factors that make conceptual sense. Table 5.5 shows a summary of the most interpretable factors extracted.

Table 5.5:Summarised Results of Factor Analysis for the Pilot Study

DIMENSION	FACTORS PROPOSED A PRIORI	MOST INTERPRETABLE FACTORS EXTRACTED
Technical Quality	Household variables Recovery efficiency	Household variables Recovery efficiency
Functional Quality	Staff interactive quality Interactive environment	Staff interactive quality Interactive environment
Service Value	Monetary value Effort Value Psychological Value	Monetary value Non-monetary value
Corporate Image	Corporate Image	Corporate Image
Customer Satisfaction	Customer Satisfaction	*Not easily interpretable*

The factorial structure for the dimensions of *Technical Quality* and *Functional Quality* was as predicted a priori. The structure for *Service Value* segregated into only two sub-dimensions: *Monetary value* and *Non-Monetary value*. However, the four factors displayed by *Customer Satisfaction* could not easily be interpreted in the context of the conceptual framework. Very few items loaded on some of these factors, a situation which is not recommended (Spector, 1992). This could be because of the complexity of the construct of *Customer Satisfaction*, which might not have been properly internalised in a self-administered questionnaire.

5.5.4 Instrument Purification

Based on the results of the pilot study, the following changes were made to the questionnaire:

- Some aspects of instructions were re-worded to make them simpler and clearer to the respondents.
- The middle step of the agreement response set was reworded to 'Uncertain/Undecided' to consolidate the neutral response.
- Sections were labelled with headings.
- The period for observation of the *Household Variables* by the respondents was increased from six months to one year.
- The factual questions on household variables were rephrased using simpler words, avoiding technical terms, and giving more details.
- The question about the taste of water was discarded, as most respondents pointed out that they boiled water for drinking.
- The question on the appearance of water was rephrased, so as to tap the respondents' observations over a period of time.
- The items under the sub-dimension of interactive environment were increased from five to seven and some items were reworded to make them clearer.
- The sub-scale on *Technical Efficiency* was re-introduced into the questionnaire. This sub-scale had been dropped following complaints by pre-test respondents about the length of the questionnaire. However, the results of the pilot study pointed to a need to strengthen the dimension of *Technical Quality*.
- Three more items were included in the sub-scale of *Staff Interactive Quality*, and some item stems were reworded to make them more comprehensive to the respondents.
- The items that were negatively worded in the pilot study were re-written to be positive.

- The section heading on "price" was re-written to reflect a comparative evaluation of price and benefits, in accordance with the definition of *Service Value*.
- The sub-section on *Psychological Value* was consolidated with the main section on other aspects of *Service Value*.
- A few items in the dimension of *Service Value* were deleted and substituted with new items that cropped up in comments and suggestions made by the respondents.
- The section on "importance of water services to the household" was improved upon to include three attitude items and five behavioural questions, creating a scale on *Attitudinal Loyalty* towards water services utility. The questions on alternative water supply were reworded and consolidated into one multiple-variable question.
- Two more items were added to the dimension of *Corporate Image.*
- Two items were deleted from the dimension of *Customer Satisfaction.*
- The classification question on estimation of household income was rephrased. Earlier survey studies carried out in Uganda show that expenditure is reported more accurately than income (Uganda Statistics Department, 1998). Hence, household expenditure was used as a proxy for household income. The question on income was therefore replaced by two questions: rent payment and other household expenditure.

5.6 ETHICAL CONSIDERATIONS

Ethical issues are concerns, dilemmas and conflicts that arise over the proper way to conduct research (Neuman, 1997). The most important ethical consideration is the requirement that scientific researchers should take precautionary measures to minimise risk factors that respondents might encounter as participants in the study (Sedlack & Stanley, 1992). In the current study, the following ethical issues were considered:

- Informed consent of the respondents was solicited using a letter sent to them two weeks before the survey was carried out. A copy of the questionnaire was also sent, at the same time, to enable the respondents to understand what the questionnaire is about well in advance.

- In order to fulfil the ethical principle of voluntary consent (Bourque & Fielder, 1995; Neuman, 1997), the purpose of the study was explained clearly in the cover letter.

- The respondents were assured of the confidentiality of their responses in the cover letter, and that their responses would be published only in summary, statistical form.

- Return envelopes were provided so that respondents who preferred confidentiality could send the filled questionnaires in sealed envelopes.

- In order to cause minimal psychological stress to respondents who could not understand the contents of the questionnaire, which was written in English, translators were hired to interpret and/or explain the contents of the questionnaire to those respondents who required those services.

- Undergraduate social science students, were hired as translators, to reduce bias in translation or interpretation, and limit psychological fears for respondents. Students were considered to be naïve in the research topic, and non-threatening in appearance.

5.7 PROCEDURES OF DATA COLLECTION

5.7.1 Production of the Final Questionnaire and Cover Letters

After the changes, as discussed in sub-section 5.6.4, were incorporated in the measurement instrument, the format of the questionnaire was improved, with the intention of enhancing the response rate (Bourque & Fielder, 1995). The instructions were put in text boxes, and shaded with a light grey colour, to make them look distinctive. A spacing of 1 cm was used within each set of answer categories, with spaces between the various items. Times New Roman font of 12 cm was used. The items were pre-coded and variables labelled with a small font of 6 cm, at the extreme right hand margin, to make the process of data-inputting easy. Although the inclusion of pre-coded variables has previously been viewed as confusing respondents, recent studies have not shown any evidence to that effect (Bourque & Fielder, 1995).

The first page of the questionnaire, which was written on headed paper for the NWSC, contained a general introduction to the study. Since studies (Kalafatis & Blankson, 1996; McKee, 1992) have

shown that the use of identification numbers on a questionnaire significantly increased response rates, identification numbers for respondents were indicated on the first page. For those who could not personally fill in the questionnaire, the translator was required to interpret and/or read to the respondent the contents of the general introduction to the study. For this category of respondents, translators were required to note, in the spaces provided at the end of the questionnaire, the time taken to trace the respondents, as well as the time taken to administer the questionnaire. Translators were provided with space to make any comments pertaining to the administration of the questionnaire.

In accordance with recommendations to provide "ventilation" questions (Bourque & Fielder, 1995), space was made available at the end of the questionnaire, and respondents were invited to make suggestions and/or specific comments about water services delivered to them. Respondents were also encouraged to make specific complaints, as a method of establishing construct validity of the measurement instrument (Parasuraman, Berry & Zeithaml, 1991; Parasuraman, Zeithaml & Berry, 1994b; Spector, 1992). Furthermore, care was made to ensure that (i) instructions, questions and associated responses were not split between pages; (ii) each section started on a fresh page; and (iii) there was consistency in the formatting of the questionnaire. Finally, the questionnaire ended by expressing appreciation for the time and effort the respondent had spared to answer the questionnaire. A separate introductory letter, which also used the water utility's letterhead, was written for the benefit of respondents who could fill the questionnaires without the help of translators. The separate letter and the first page of the questionnaire contained information on (i) sponsorship; (ii) purpose of the study; (iii) reasons why individual's participation is important; (iv) how and why the respondent was chosen; (v) explanation of confidentiality and how the data was to be handled; and (vi) when and how to return the completed questionnaire. The Principal Public Relations Officer of NWSC duly signed the cover letter.

The questionnaire was proofread several times and thereafter set up for offset printing using commercial printers. In accordance with recommendations for increasing the response rate (Bourque & Fielder, 1995; Babbie, 1973), 1000 copies of the questionnaire were printed and bound into a booklet form, comprising a total of 12 pages, including the cover page. A final copy of the questionnaire for the main study is shown in Appendix B.

During the first week of August 1999, undergraduate engineering students who were doing industrial training were utilised to transfer identification particulars for each respondent, from the sample lists, to the blank questionnaires. The information put on the first page of the questionnaire was (i) service

area/zone; (ii) property reference number; (iii) customer reference number; and (iv) physical address of the respondent.

As in the pilot study, computer-printed stickers were affixed to A4 envelopes. The stickers showed identification information appearing on the first page of the questionnaire. Names of respondents were left out, after consideration of results of a non-response study carried out in one of the zones in Kampala, and as reported in section 3.6.1. The policy of NWSC to register consumer accounts in the landlord's name was found to be a negative factor in non-response, as tenant respondents displayed reluctance to answer questionnaires that were addressed to their landlords. C5 return envelopes were enclosed in the A4 envelopes, as was done in the Pilot Study. In order to make the survey appear official to respondents, the label on the return envelopes was altered to show the Principal Public Relations Officer of NWSC as the recipient of the filled questionnaires. Questionnaires were inserted in the corresponding envelopes, sorted according to service areas/zones and packed, along with a list of respondents, showing all the identification particulars included on the cover page of the questionnaire.

5.7.2 Recruitment and Training of Translators

The questionnaire was written in English, which, in the view of the author, requires school training to be at least Ordinary Level in Uganda in order to comprehend the contents. However, according to a national census conducted in 1991 (Uganda Statistics Department, 1994), only 27.1% of all residents in urban centres of Uganda had completed Ordinary Level education. Consequently, as already pointed out in section 3.7, there was a need to hire and train translators to interpret and/or administer the questionnaire to the group of customers who were unable to understand the contents of the survey instrument. With the help of a survey researcher, Ms Betty Changa of the Department of Gender Studies, Makerere University, Kampala, a total of 102 undergraduate students from the Faculty of Social Sciences, Makerere University in Kampala were recruited and trained to work as translators in 11 urban areas of Uganda. The number of translators for each urban area depended on the size of stratified sample.

The criteria for the selection of translators included (i) knowledge of the predominant local language spoken in the specific service area; (ii) previous experience in interviewing; and (iii) the personality of individuals in terms of pleasantness, honesty, accuracy, stability, motivation and appearance (Neuman, 1997). The survey researcher from Makerere University conducted a two day training session with the

translators, from August 10, 1999 at the NWSC Human Resource Centre. During the training session, the objectives of the study were outlined, definitions and instructions reviewed, and all items in the questionnaire discussed. It was made clear to the translators that they were being hired to facilitate understanding of the questionnaire items to the respondents, but not to carry out probing interviews.

Translators were given copies of blank questionnaires for training purposes. Translators were briefed on the intended meanings of various questions/statements, and discussions made on possible ambiguities in the wording. In-depth discussions were held on interpretations of various items and response categories in local languages. It was noted during the discussions that various local languages do not have single-word equivalents of a few English words. Consequently, descriptive words in local languages were identified such that there was as little distortion of the meaning, as possible. During the briefing session, the translators who showed leadership skills, a high sense of motivation and prior experience in survey research were earmarked and appointed as supervisors. The supervisors were responsible for co-ordinating the survey activities in the different geographical locations. Because of its large geographical coverage, the service area of Kampala was allocated six supervisors, while each of the smaller service areas got one supervisor.

5.7.3 Main Study Questionnaire Administration

Supervisors, with the assistance of field staff from NWSC distributed the questionnaires to the sample households, during the week commencing Monday August 16, 1999. The supervisors also noted details of rejection of the questionnaire and reasons for non-delivery, if applicable. Letters of introduction to the study specified the exact date when translators were to explain the contents of the questionnaire that were unclear to the respondents, and/or collect the filled questionnaires. Translators followed up the questionnaires on the weekends of 5/6th September and 11/12th September 1999. Follow-up was planned for weekends in order to target heads of households who are normally away at places of work during the weekdays.

NWSC field staff directed the translators to the location of the sampled households. NWSC staff were however asked to keep away from the premises during the interview, in order to minimise bias from utility field staff. Translators were instructed to arrange further follow-ups during the weekdays if agreed with potential respondents, as and when deemed necessary. Translators were also required to

note reasons for non-response by the sample customers, which was confirmed during visits to the households by supervisors.

5.7.4 Non -Response Rate

Non-response happens when individuals selected for the sample do not participate in the study (Babbie, 1973; Neuman, 1997). A bias is created when the non-respondents' would-be responses differ from the responses of those who participate in the study, and the magnitude of the bias depends on the study response rates (Chen, 1996; Martin, 1994). Furthermore, Babbie (1973) pointed out that overall response rate is one guide to the representativeness of the sample respondents and recommended response rates of 50%, 60% and 70% as adequate, good and very good, respectively. On the other hand, Nueman (1997) recommended a minimum of 75% response rate in order to ensure representativeness of the sample results. Table 5.6 shows the results of a non-response analysis of the study.

The total number of filled questionnaires returned was 542. According to Babbie (1973), the accepted practice is to compute the response rate based on only those questionnaires that were delivered. Response rate is "…a measure of the researcher's success in persuading sample members to participate, and he [or she] does not count against himself [or herself] those whom he [or she] could not even contact" (Babbie, 1973, p.165). Categories of questionnaires that were not delivered for various reasons are highlighted in table 5.6, and add up to 156. Consequently, the net sample size is 690. Five questionnaires were excluded from the analysis because less than half of the questions were answered, leaving an effective response number of 537, and therefore giving a response rate of 78%.

Table 5.6: Computation of Non-response Rates for the Main Study

SERIAL NO.	CATEGORY	NUMBER OF NON-RESPONDENTS
1	*Household has never been connected to the utility water supply reticulation system*	*33*
2	*Water supply was disconnected a long time ago; the questionnaire was rejected*	*18*
3	*Household was sent two copies of the questionnaire due to poor records*	*5*
4	*Questionnaire not delivered, as the premises were vacant on several trials*	*42*
5	Questionnaire delivered but there were no people at the premises during follow-up visits	9
6	*Household could not be traced*	*16*
7	*Customer's premise not updated in the utility's billing records.*	*17*
8	*Owner of premises died*	*4*
9	*The premises are not occupied by a household*	*8*
10	The occupants do not understand any of the local languages	2
11	*The respondent too ill to respond to the questionnaire*	*2*
12	Household head not willing to answer the questionnaire	7
13	Household head unable to answer the questionnaire due to time limitations	2
14	*Household head not willing to answer the questionnaire because it is the landlord's account*	*11*
15	Questionnaires not returned	176
TOTAL NUMBER OF QUESTIONNAIRES NOT DELIVERED		*156*
TOTAL NUMBER OF NON-RESPONDENTS		304
TOTAL NUMBER OF RESPODENTS		542

Note: Categories in italics are for questionnaires not delivered.

Source: Survey data from this study

5.8 TECHNIQUES FOR DATA ANALYSIS

The main computer software used for statistical analysis of the obtained data was SPSS for Windows Release 7.5.1 (SPSS Inc., 1996). An SPSS data file was opened up, to which raw data was directly entered with the help of the pre-codes on the questionnaire. The variables were arranged in a logical order, according to the pre-code numbers, to make the process of data entry easier. For each response, a classification number was allocated according to the sequence of data entry. Preliminary analysis was carried out to do "possible-punch" data cleaning. Babbie (1973) described "possible-punch" cleaning as correction of data entries that are, for each variable, out of the range of a specifiable set of legitimate responses. Using iteration methods, summaries of frequencies were obtained, showing minimum and maximum scores. Using the "Search For" facility, the abnormal scores were tracked down to individual cases, and corrected accordingly. Thereafter, contingency cleaning was accomplished by the use of the "Transform" facility of the SPSS program, whereby the logical structure of individual customer responses was checked and confirmed.

Inferential statistical methods were utilised in the analysis. The major requirement for applying inferential statistical analysis is random sampling (Bohrnstedt & Knoke, 1982; Bryman & Cramer, 1997; Cramer, 1998; Girden, 1996; Neuman, 1997; Oppenheim, 1992). As presented in sub-section 5.3.3, the study design used a computer-based programme to select a random sample from a well-defined sampling frame using a computer database. In particular, the following statistical analyses were carried out:

- Descriptive analysis.
- Item-to-scale correlation and Cronbach's alpha analyses for examination of reliability for various summated scales.
- Exploratory principal component factor analysis for establishing the dimensionality and validity of the summated scales.
- Residual analysis to review various statistical assumptions.
- Linear correlation analysis.
- Multiple regression analysis to examine the relative importance of individual independent variables on dependent variables in each of the models.

- Moderated regression analysis to determine the presence of moderator effects on the hypothesized satisfaction/loyalty relationship.

- Non-parametric correlation analysis to determine degree of association between household characteristics and predictor/criterion variables in the moderated regression analysis.

- Analysis of partial F-statistics for determining the significance of the moderator effects of hypothesized moderator variables on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*.

5.9 CHAPTER CONCLUSION

This chapter operationalised the conceptual framework and research hypotheses presented in chapter four. The qualitative methodology was applied to design a measurement instrument, while a quantitative methodology was used for the collection of data for the study. Justification for the adoption of the positivist methodology for the main study was largely related to the explanatory nature of the research problem; the nature of training associated with engineers who dominate in the field of water resource management; and the comparative costs. The cross-sectional survey study utilised a semi-supervised self-administered questionnaire to collect data. The research instrument was developed, pretested among postgraduate management students, and pilot-tested with a small sample from the study population in one of the towns.

On the basis of the results of reliability analysis and factor analysis of pilot study data, which are presented in appendices G and H, respectively, the questionnaire was refined and sent to a stratified random sample. The procedures for sampling, pretesting, pilot-testing and main study questionnaire administration have all been presented in the preceding sections. 537 questionnaires were returned duly filled, giving an effective response rate of 78%. Finally, the techniques used for analysing the obtained data were enumerated, together with the computer programmes used. Chapter six presents the patterns of results and analyses them for their relevance to the research hypotheses.

CHAPTER SIX

DATA ANALYSIS AND PRESENTATION OF FINDINGS

6.1 CHAPTER INTRODUCTION

Chapter five described the methodology utilised and the procedures followed in collecting data used to answer the research hypotheses formulated for the study. Towards the end, chapter five listed statistical methods utilised in analysing the collected data, and provided justification for the choices of methods made. Chapter six is restricted to the presentation and analysis of collected data, and is structured along patterns of results that are relevant to the research hypotheses. Discussions and implications of these findings in the context of the reviewed literature are presented in chapter seven.

Significance of test results is reported at three levels as suggested by Coolican (1994), based on the p probability level as follows:

- 'Significant': $0.05 > p \geq 0.01$
- 'Highly significant': $0.01 > p \geq 0.001$
- 'Very highly significant': $p < 0.001$

All probabilities reported are based on two-tailed tests, as the hypotheses for both the regression models and interaction effects did not specify the direction of the relationships.

Chapter six is structured according to the following sections:

- Presentation of classification data.
- Determination of psychometric properties of the measurement instrument

- Procedures taken in data preparation.
- Multiple regression analysis for each of the models presented in section 5.9.
- Review of assumptions for application of linear regression analysis.
- Analysis of moderator effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty* to urban water utility.

6.2 CLASSIFICATION DATA

6.2.1 Simple Categorical Data on the Household Unit

As pointed out in section 5.8.4, a total of 537 useable questionnaires were received back. Respondents were requested to provide the following information on the following household characteristics: (i) gender of head of household; (ii) number of years spent by head of household in formal education; (iii) size of household; (iv) type of employment for household head; (v) type of premises occupied by household; and (vi) ownership status of premises occupied by household. Table 6.1 is a summary of the categorical data on the classification variables listed above.

Results displayed in table 6.1 show that more men (61.4%) than women filled in the questionnaire. Since it is hoped that only heads of households filled the questionnaire, this figure is fairly consistent with the results of Uganda National Household Survey 1995/96 (Uganda Statistics Department, 1998), which found that males head 75 percent of the households in Uganda. The questionnaire was carried out in only the urban centres of the country, where, it is assumed, more working women would take up the role of heading the household. The table also shows that 70% of the respondents completed post ordinary level education, of which 40% have postgraduate qualifications. The reported level of education is in dispute with the government census and survey results that report a lower level of education for members of the households in urban areas: results of a survey carried out in 1996 put the percentage of those who have completed at least seven years of formal education at 48%. It is possible that respondents could have exaggerated the number of years they have attended formal education. It is also possible that the respondents could have included the time they had spent attending short courses, which should not have counted as formal education.

Table 6.1 also shows that 43% of the sampled household heads are employed in the formal sector, while 34% are employed in the business sector. Furthermore, sample results show the mode for household size was 6-10 people, a category which was chosen by 44% of the sample. The household size modal statistic for the study is similar to the one obtained in Uganda National Household Survey 1995/96 (Uganda Statistics Department, 1998), which found that 40% of households in urban areas of Uganda have a household size of 5-10 people.

The sample results indicate that 48% of households live in un-detached dwellings. This result is consistent with data obtained through the Uganda National Household Survey 1995/96 (Uganda Statistics Department, 1998), whereby 51% of households in the urban areas of Uganda are reported to be living in tenement houses. However, whereas 21% of this study sample reported that they live in rented dwellings, results of a national survey carried out in 1995/96 showed that 53% of households in the urban areas of Uganda live in rented premises (Uganda Statistics Department, 1998). The discrepancy in the data could be as a result of overlap of water services into the rural and peri-urban areas in which 90% of households live in family-owned, albeit poorer quality dwellings (Uganda Statistics Department, 1998).

Table 6.1: Household Characteristics as Reported by the Respondents.

	VALID CASES (N)	CLASSIFICATION	
		CATEGORY	FREQ. (%)
Gender	523	Male	61
		Female	39
Years of formal education by household head	508	Less than 7 years	9
		7-12 years	21
		13-16 years	36
		Over 16 years	34
Type of employment for household head	522	Civil Servant	17
		Gov. Parastatal/Co.	17
		Private Company	9
		Business	34
		Other (housewife etc.)	11
Size of household	522	1-2 people	4
		3-5 people	37
		6-10 people	44
		Over 10 people	15
Type of dwellings occupied by household	513	Shared bungalow	10
		Unshared bungalow	45
		Shared flats	7
		Semi-detached house	31
		Unshared flat	4
		Other	2
Type of tenure of dwellings	520	Owned by Household	70
		Institutional owned	8
		Rented	21
		Other	1

Source: Survey Data

6.2.2 Estimation of Household Income

In order to estimate the income level of households, the research utilised average household expenditures. The proxy variables utilised were average expenditure on other services and facilities to the household, as well as on house rent and food. Respondents were asked to mention other services that were available to the household. A total of 443 respondents (85%) reported to have a main power supply, while only 39 (8%) reported to have standby power facilities as a coping strategy in case of main power supply breakdown. 228 respondents (44%) reported ownership of flushing toilets in the house. However, only 92 respondents (39%) claimed to have telephone services in the household. While 467 respondents (90%) reported that they had a radio in the house, 337 (65%) said they had a TV in the household. On the other hand, 252 respondents (49%) reported to have regular access to newspapers.

Only 121 respondents (23%) reported on the amount of rent they were paying, while 368 respondents (69%) said they were not paying any rent, a figure that tallies with what was reported for households residing in privately owned dwellings (70%), as recorded in table 6.1. The rent reportedly varied from less than 50,000 Uganda Shillings per month (22%), to over 300,000 Uganda Shillings per month (10%). Furthermore, respondents were asked about their weekly household expenditure on general subsistence of the family. A total of 428 people responded to the question. Figure 6.1 shows the proportion of expenditure categories.

The monthly household expenditure shown in figure 6.1 covers day-to-day purchase of items such as food, drinks, transport, and medical care. It does not include house rent, monthly bills, schools, or any other non-consumption expenses. The values given in figure 6.1 are not consistent with what was reported in the 1995/96 National Household Survey, in which the average monthly household expenditure in Uganda's urban centres was 167,900 per month. The two figures do not compare even if the 10% inflation rate is considered. The reason for this discrepancy could be two-fold: (i) respondents for the national survey could have under-specified the expenditure level, with a suspicion that the government would use the information for taxation levying; or (ii) households with a water connection generally have incomes that are higher than average in society.

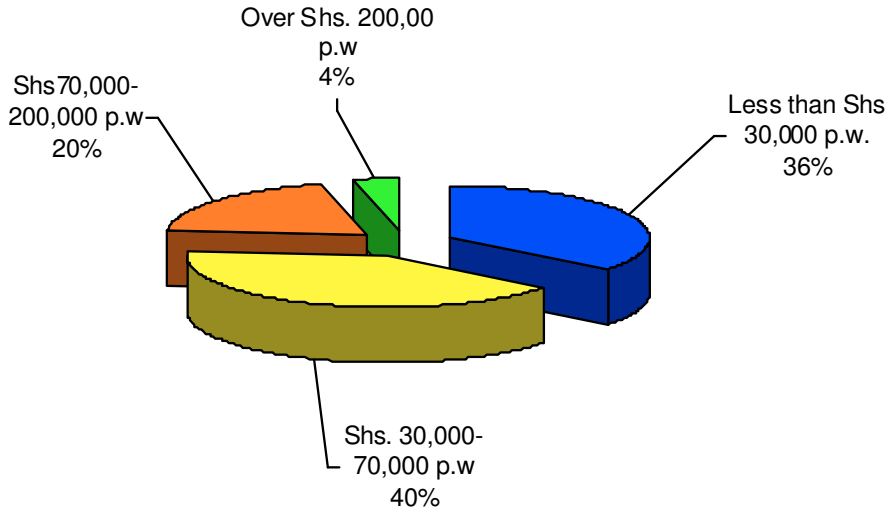


Figure 6.1: Weekly Household Expenditure on Consumption Goods as Reported by Respondents

Source: Survey Data from This Research

Total household expenditure was estimated using data obtained on available amenities in the household and basic household expenditure. Appendix C shows assumptions used to estimate the household expenditure, as well as the computation details. Figure 6.2 shows a graphical presentation of the results. The box-and-whiskers plot in figure 6.2 shows that the sample (N=414) has estimated monthly income with the following attributes: minimum score of 85,000 Uganda Shillings; a maximum score of 1,335,000 Uganda Shillings; a mean of 595,903 Uganda Shillings; and a standard deviation of 251,652 Uganda Shillings. The results show that there is a wide disparity in income levels among the respondents. The data on estimated monthly household income were categorized into three groups: low-income bracket with less than 450,000Uganda Shillings per month; middle income bracket ranging 450,001 to 750,000 Uganda Shillings per month; and high income bracket of over 750,000 Uganda Shillings per month. Figure 6.3 shows a pie chart showing the income distribution according to this categorisation. Please note that at the time of the survey, 1,500 Uganda Shillings were equivalent to 1 United States dollar.

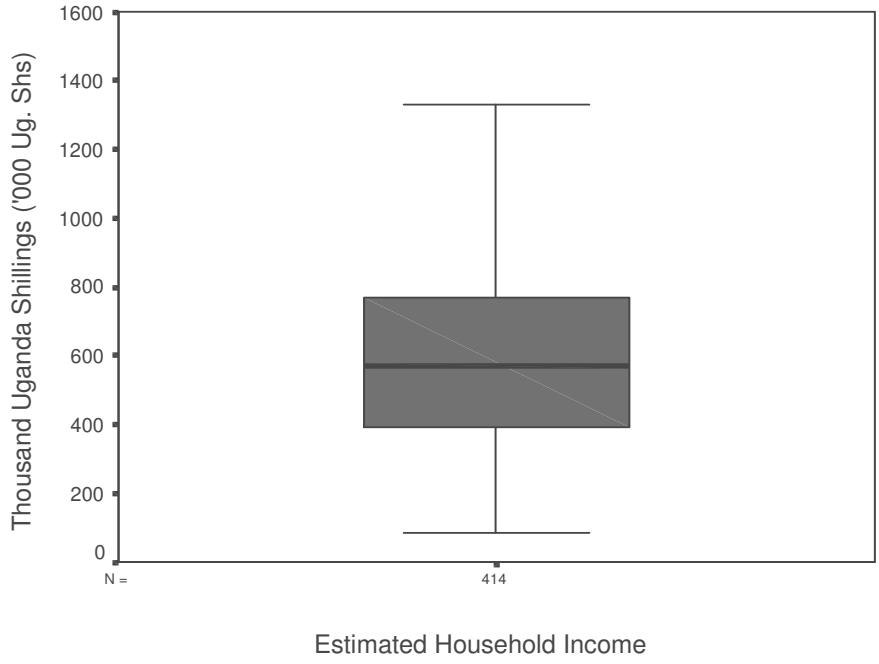


Figure 6.2: Box-and-Whiskers Plot Showing Estimated Household Income for the Sample

Source: Survey Data from This Research

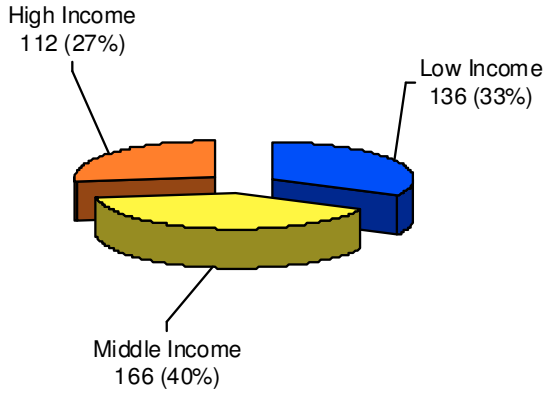


Figure 6.3: Estimated Income Distribution of Respondents According to their Reported Expenditure Patterns

Source: Survey Data from This Research

6.2.3 Service Levels and Use of Alternative Sources of Water

A total of 253 respondents (48.4%) said that they receive water services through a house connection, of which 103 claimed to have a yard tap as well. However 225 respondents (43%) receive the water services through the basic yard tap service level. 44 respondents said they receive services through a public tap. It is worthwhile mentioning that registered customers who reported to be receiving services through public taps were either the registered operators of the public taps, or were customers with private connections that had been disconnected for reasons such as non-payment. Only six respondents reported having their water supply disconnected at the time of the survey.

Respondents were asked whether they used alternative sources of water concurrently with water from the utility. Rainwater was excluded, as it is normally not paid for. Of 521 people who answered the question, 268 respondents (51.4%) answered in the negative. Table 6.2 shows what respondents reported as supplementary sources of water supply.

Table 6.2: Supplementary Sources Used by Households

SERVICE OPTION	TOTAL RESPONSES (N)	FREQUENCY
Protected spring/borehole	521	114 (22%)
Utility tap elsewhere	521	93 (18%)
Water vendors[a]	520	51 (10%)
Tanker water[b]	521	24 (5%)
Other sources	521	12 (2%)

[a] *Many water vendors obtain water from Utility taps*

[b] *Most water tankers draw water from Utility fire hydrants and specified hard stands*

Source: Survey Data from This Research

The results in table 6.2 indicate that the main alternative water supply sources are protected springs and boreholes, since off-plot utility taps, water vendors, and tanker water are, to a great extent, mere service levels of utility water services.

6.3 PSYCHOMETRIC PROPERTIES OF MEASUREMENT INSTRUMENT

6.3.1 Item/Reliability Analysis

For reasons reviewed in section 5.5.2, internal consistency of various scales in the measurement instrument was appraised using Cronbach's coefficient alpha (Coolican, 1994; Nunnally, 1978; Peter, 1979). As recommended by Spector (1992), both item and reliability analyses were conducted concurrently in order to obtain an optimum value of Cronbach's coefficient alpha. Details of results of item/reliability analysis are presented in Appendix D. A summary of the analysis, showing standardised Cronbach's coefficient alpha for each scale, and item-total correlation coefficient, are presented in table 6.3.

Item-total coefficients are a measure of correlations between individual items and the sum of the remaining items and are indicators of the same underlying composite variable (Spector, 1992). The range of item-total correlation coefficients for *Technical Quality* and *Service Value* scales are high, compared to the range of item-total coefficients for *Functional Quality*, *Corporate Image*, *Customer Satisfaction* and *Attitudinal Loyalty*. The high level of dispersion is an indication of heterogeneity of the dimensions of *Technical Quality* and *Service Value* (Spector, 1992).

Table 6.3 indicates that changes made in the questionnaire content following results of the pilot study improved internal consistency of the research instrument. Apart from the scale of "Corporate Image" which retained its level of reliability, all the other scales improved their levels of Cronbach's reliability coefficient. Additionally, Cronbach's reliability coefficient for each of the scales is above 0.7, a level recommended for preliminary research (Litwin, 1995; Nunnally, 1978). Furthermore, Cronbach's alpha coefficients obtained for each scale and displayed in table 6.3 compare favourably with the results of a study (Peterson, 1994) that reported on coefficients obtained in various studies carried out in different settings measuring similar composite variables of: (i) attitude (mean α =0.76), (ii) satisfaction (mean α =0.79), (iii) reported behaviour (mean α =0.71), and (iv) perception (mean α =0.77).

Table 6.3: Standardised Cronbach's Coefficient Alpha for Scales in the Main Study Data

SCALE	NO. OF CASES (N)	NO. OF ITEMS DELETED	NO. OF ITEMS RETAINED	CRONBACH α FOR PILOT STUDY	CRONBACH α FOR MAIN STUDY	RANGE OF ITEM-TOTAL CORRELATION
Technical Quality	136	Nil	24	0.86	0.90	0.16 – 0.70
Functional Quality	376	Nil	23	0.84	0.89	0.32 – 0.67
Service Value	458	2	15	0.72	0.79	0.19 – 0.53
Corporate Image	445	1	12	0.83	0.83	0.41- 0.59
Customer Satisfaction	441	Nil	11	0.75	0.82	0.41 – 0.59
Attitudinal Loyalty	460	Nil	07	Not computed	0.72	0.30 – 0.52

Data in the shaded column are for the pilot study results

Source: Survey Data from This Research

6.3.2 Construct Validity: Factor Structure of Scales

Factor analysis was used to validate the scales of the measurement instrument used in the main study. Factor analysis is a superior methodology for establishing the construct validity of a specific scale (Coolican, 1994; Miles & Arnold, 1991; Stewart, 1981). Since the scales were assumed to be one-dimensional, exploratory factor analysis was used to explore possible sub-dimensions within the group of items (Spector, 1992). Nunnally (1978) pointed out that the principal-components method represents an optimum approach to condensation of items into sub-scales, as each "…principal-components factor explains more variance than would the loadings obtained from any other method of factoring" (Nunnally, 1978, p.357). The original factor matrices were subjected to orthogonal rotations in order to produce simpler interpretable structures (Nunnally, 1978). To ensure that highly significant loadings were considered, the variables for a factor were selected only when the size of their factor loading was at least 0.4, a level more stringent than that normally used in management research (Bryman & Cramer,

1997; Cramer, 1998; Nunnally, 1978; Spector, 1992; Stewart, 1981). The details of the final iterations are shown in Appendix E. The summary of factor analysis results is presented in table 6.4.

The initial solution for *Technical Quality* extracted seven factors that accounted for 66.8% of the variance. However, even after performing an orthogonal rotation using the "Varimax" method, the extracted factors could not be easily interpreted. Stepwise restriction to five and six factors did not yield any easily interpretable structure. Restriction to three factors yielded results that segregated variables into sub-dimensions that were specified a priori in the conceptual model. However the following variables were found to have substantial and almost equal loadings across factors: (i) the frequency of *complaints on a leaking meter* (ii) the frequency of *complaints on re-connections taking too long*, (iii) the efficiency of handling complaints *on a leaking meter*, and (iv) the efficiency of handling *service interruptions such as lack of water or loss of pressure at your premises*. In order to get a purer measure of the attributes, these variables were omitted in accordance with recommendation by Nunnally (1978) and Bryman and Cramer (1997). The three resultant factors extracted account for about 50% of the total variance, of which the sub-dimension of *Recovery Efficiency* explains the largest variance (70% of the variance extracted). The internal reliability of the improved scale as measured by Cronbach's alpha coefficient was 0.89.

The scale for *Functional Quality* displayed five factors at the initial solution of the condensation, which could not be easily interpreted even after orthogonal rotation using the "varimax" method. When restricted to what was hypothesized in the conceptual framework, the variables clearly clustered onto the two a priori factors of *Interactive Environment* and *Staff Interactions*. The factor of *Staff Interactions* accounted for about 75% of the total variance explained. Although the variable *NWSC staff are arrogant and impolite* was retained in reliability analysis, it was eliminated in factor analysis, as its loading onto either factors was below the specified minimum level of 0.4. This variable was the only item in the scale that was negatively worded. The negatively worded item did not cluster on either factor, probably because the direction of statement might have confused the respondents (Parasuraman, Berry & Zeithmal, 1991). Cronbach's alpha coefficient for the refined scale is 0.89.

Table 6.4: Summary of Results of Exploratory Factor Analysis for Main Study

PROPOSED DIMENSION	FACTORS PROPOSED A PRIORI		MOST INTERPRETABLE FACTORS EXTRACTED		COEFF. α FOR FINAL ITEMS
	LABEL	VARIABLES	LABEL	VARIABLES EXCLUDED	
Technical Quality	Household Variables	V4-7 (4)	Household Variables	Nil	0.89
	Technical Efficiency	V22-30 (9)	Technical Efficiency	V24 , 27 (2)	
	Recovery Efficiency	V31-41 (11)	Recovery Efficiency	V34, 40 (2)	
Functional Quality	Interactive Environment	V15-21 (7)	Interactive Environment	Nil	0.89
	Staff Interaction	V42-57 (16)	Staff Interaction	V47 (1)	
Service Value	Psychological Value	V58-61, 69 (5) V62-66, 68 (6)	Psychological Value	Nil	0.79
	Monetary Value	V67, 70-75 (7)	Monetary Value	V64, 65 (2)	
	Effort Value		Effort Value	Nil	
Corporate Image	Corporate Image	V89-101 (13)	Internal process perceptions	V90 (1)	0.81
			External evaluation	V101 (1)	
Customer Satisfaction	Customer Satisfaction	V102-112	Hard quality attributes	Nil	0.80
			Soft quality attributes	V110 (1)	
Attitudinal Loyalty	Attitudinal Loyalty	V82-88 (7)	Behavioural Intentions	Nil	0.71
			Action Loyalty		

Source: Survey Data from This Research

Factor analysis of variables that were retained after a reliability analysis for the dimension of *Service Value* resulted in three factors that accounted for 46% of the total variance. After orthogonal rotation,

the variables loaded on the factors representing the sub-dimensions of *Psychological Value*, *Monetary Value* and *Effort Value*, as predicted a priori. The factor of *Effort Value* accounted for the biggest share of variance (57% of the variance explained). Since all the variables were retained, Cronbach's alpha coefficient remained at 0.79.

For the dimension of *Corporate Image*, the variable *NWSC is indifferent to customers' needs and wants* was deleted during reliability analysis. As mentioned in Section 6.3.1, the respondents could have misinterpreted the negatively worded item. When the items under *Corporate Image* were condensed using principal components analysis, two factors that accounted for 46% of total variance were extracted. After orthogonal rotation using the 'varimax' method, the variables clustered into two distinct factors: (i) variables that are concerned with customers' perceptions of management efforts to create competitive advantage in institutionalising market orientation (Day, 1990), labelled *Internal Process Perceptions*, and (ii) variables that measure performance of the utility in the "corporate environment" (Piercy & Morgan, 1995), labelled *External Evaluations*. The variable *Generally the public image of NWSC staff is quite favourable to the type of service they render* was omitted because it was loading highly on both factors (Bryman & Cramer, 1997; Cramer, 1998; Nunnally, 1978). Cronbach's alpha coefficient of the remaining items reduced to 0.81, a level higher than the recommended value for preliminary research (Litwin, 1995; Nunnally, 1978).

In a similar manner, the variables under the dimension of *Customer Satisfaction* segregated into two factors when condensed using component factor analysis. The two factors accounted for 46.7% of the total variance. When they were rotated using the "varimax" orthogonal method, the variables clustered into sub-dimensions concerned with customer satisfaction towards "hardware" and "software" quality attributes, respectively. "Hardware" quality attributes refer to utility outputs that largely require funds, while "software" quality attributes concern outputs that largely depend on organisational policy and procedures. The variable *The quality of customer care provided by NWSC contact staff e.g. field staff, receptionists* was found to load highly on both factors and was accordingly omitted. The factor associated with "hardware" quality attributes explained most of the variance (36.4%). The resultant Conbrach's coefficient alpha changed to 0.80.

Condensation of variables for the dimension *Attitudinal Loyalty* for water services extracted only one factor with an eigenvalue greater than one, which extracted only 37% of the variance. All the seven variables were retained, as the factor loadings for all of them were higher than the threshold level of 0.4. However, in order to increase the amount of explained variance, two factors were specified in the

factor solution. The two factors extracted clustered into 'behavioural intentions loyalty', and 'action loyalty', which are consistent with the conceptual position presented in section 4.3. This dimension had the lowest Conbach's coefficient alpha of 0.71, which barely conform to the minimum level of 0.7 recommended by Litwin (1995) and Nunnally (1978). The relatively low internal consistency could be because of (i) the low number of items in the scale (Peterson, 1994) and/or (ii) the fact that the scale combined items on perceptions and reported behaviour, making the scale highly heterogeneous (Oppenheim, 1992; Peterson, 1994).

A guideline exists that factor analysis should result into extraction of at least 50% of the variance, in order to ensure convergent validity (Fornell & Larcker, 1981). Most of the composite variables had close to 50% of the variances extracted. This guideline was however not followed to the letter, as the principle of parsimony advocated by several researchers (Bryman & Cramer, 1997; Litwin, 1995; Nunnally, 1978; Spector, 1992; Stewart, 1981) was the cornerstone of the procedures followed in the extraction of the factors. The conceptual framework played a leading role in the determination of the number of factors, in order to create easily interpretable structures (Bryman & Cramer, 1997; Litwin, 1995; Nunnally, 1978; Spector, 1992; Stewart, 1981).

6.3.3 Construct Validity: Analysis of Inter-Factor Correlations

Evidence of construct validity is present when patterns of correlations among variables conform to what is predicted by theory (Coolican, 1994; Drucker-Godard, Ehlinger & Grenier, 2001; Kervin, 1992; Narver & Slater, 1990). Further evidence of construct validity is provided by strong correlations between factors of a scale, as these inter-relations indicate that they are converging on a common underlying construct (Coolican, 1994; Cronin & Taylor, 1992; Deng & Dart, 1994; Drucker-Godard, Ehlinger & Grenier, 2001; Kervin, 1992; Narver & Slater, 1990). Therefore, as a way of assessing construct validity of the scales, correlation analysis of factors obtained for scales and presented in Section 4.3.2, was carried out. Table 6.5 shows the summary of results of the inter-factor correlation analysis.

Table 6.5: Inter-factor Correlation Analysis for the Scales of the Main Study Results

	INTER-FACTOR CORRELATION MATRIX			
Technical Quality	H/Hold variables	H/H variables	Technical Efficiency	Recovery Efficiency
	Technical Efficiency	1.0000		
	Recovery Efficiency	0.254***	1.0000	
		0.174***	0.543***	1.0000
Functional Quality	Interfacing Environment		Staff Interactions	
			0.386***	
Service Value		Psychological Value	Monetary Value	Effort Value
	Psychological Value	1.0000		
	Monetary Value	0.254***	1.0000	
	Effort Value	0.318***	0.248***	1.0000
Corporate Image	Internal process perceptions		External Evaluation	
			0.576***	
Customer Satisfaction	Satisfaction with 'hardware' attributes		Satisfaction with 'software' attributes	
			0.537***	
Attitudinal Loyalty	Action Loyalty		Behavioural Intentions Loyalty	
			0.425***	

***Correlations are significant at 0.001 level

Source: Survey Data from This Research

The results displayed in table 6.5 show that the factors for each dimension correlate with each other highly significantly ($p<0.001$). The relatively low correlation between *Household Variables* and other components of *Technical Quality* could be attributed to the heterogeneous nature of the construct (Spector, 1992).

6.3.4. Nomological Validity

A new scale is said to have nomological validity if it correlates with other constructs to which it is supposed to be related theoretically (Bahia & Nantel, 2000; Peter, 1981). Nomological validity is one method of assessing construct validity (Drucker-Godard, Ehlinger & Grenier, 2001; Peter, 1981). Monitoring of complaints and compliments is the traditional means of gauging the reaction of customers (Cook, 1992). Although the number of complaints is usually used as a subjective measure of dissatisfaction, it may present inaccurate results (Cook, 1992; Roth & Bozinoff, 1989). Some customers who are dissatisfied may not complain, while a small fraction of customers may generate a high complaint rate (Roth & Bozinoff, 1989). Notwithstanding these shortcomings, complaints and/or compliments are a fair indicator of satisfaction or dissatisfaction in the absence of a direct measure (Cook, 1992; Roth & Bozinoff, 1989). In this research, nomological validity was assessed by the strength of relationship between the major composite variables and the associated number of complaints or compliments. A similar qualitative measure was used to the validate SERVQUAL measurement instrument (Parasuraman, Berry & Zeithaml, 1991; Parasuraman, Zeithaml & Berry, 1994b).

An open-ended question was placed at the end of the questionnaire in which respondents were asked (i) whether they had specific comments or suggestions that could be useful in the improvement of service delivery by the utility, and (ii) whether they had any specific complaints about water services. The following respondents provided complaints, compliments and/or other comments on the various constructs: *Technical Quality*, 199 respondents (37%); *Functional Quality*, 167 respondents (31%); *Service Value*, 210 respondents (39%); *Corporate Image*, 89 respondents (16%); and overall *Customer Satisfaction*, 81 respondents (15%). The responses were coded such that each complaint earned one positive point while a compliment earned one negative point. Respondents who did not make any complaint, compliment or any other comment were given a zero score for the construct in question. Pairwise correlation coefficients between the composite variables and their respective qualitative measures are shown in table 6.6.

As shown in table 6.6, correlation coefficients for the composite variable of *Technical Quality*, *Service Value* and *Customer Satisfaction* are very highly significant ($p<0.001$), while the rest of the composite variables produce a highly significant correlation ($p<0.01$). The significant correlation coefficients provide evidence of nomological validity, hence construct validity, of the measurement instrument

(Drucker-Godard, Ehlinger & Grenier, 2001; Parasuraman, Berry & Zeithaml, 1991; Peter, 1991; Parasuraman, Zeithaml & Berry, 1994b; Spector, 1992).

Table 6.6: Correlations Between Composite Variables and Qualitative Measures of Associated Complaints/Compliments

COMPOSITE VARIABLE	CORRELATION COEFFICIENT	LEVEL OF SIGNIFICANT
Technical Quality	-0.183	p< 0.001
Interactive Quality	-0.161	p< 0.01
Service Value	-0.195	p< 0.001
Corporate Image	-0.141	p< 0.01
Customer Satisfaction	-0.237	p< 0.001

Source: Survey Data from This Research

6.4 PRELIMINARY ANALYSIS

After the psychometric procedures were established, composite measures for independent and dependent variables were created. Prior to carrying out hypothesis testing, there was a need to carry out data preparation. Trochim (1999) describes data preparation as procedures that involve transforming the data, as well as developing and documenting a database that integrates various measures.

Raw data for *Bill Payment Behaviour*, the main dependent variable, was obtained from the utility's billing database for the period July 1994 to June 1999, spanning five financial years. Billings and payments made by respondents for each financial year were extracted. The "bill payment period" at the end of each financial year was calculated for each respondent. The "bill payment period" for the year is a ratio of outstanding arrears at the end of the financial year, to the total billings done in the year. By multiplying the obtained figures by 365, the payment period was converted into days. The *Mean Bill Payment Period* was subsequently obtained for the five year period. Owing to the fact that the utility has been carrying out a stepwise computerisation of billing database since November 1993, errors in

the billing data were discovered. Many entries were also found blank. Discovery of errors was crosschecked and confirmed with the Computer Data Manager, who advised that such suspicious entries should be left out, in order to minimise measurement bias. Out of a total of 470 respondents whose billing data was complete, 16 entries for *Mean Bill Payment Period* were suspected to be erroneous and were omitted altogether.

Table 6.7 shows a summary of descriptive data for the composite variables after completion of the data preparation procedures. The descriptive data displayed in figure 6.7 show that the variables that were operationalised using summated scales have a low dispersion, as measured by the range and standard deviation. However, the variable *Mean Bill Payment Period* has a high dispersion (range = 1,206 days, standard deviation = 151 days). On the basis of the mean scores, customers think that the water utility performed best in Technical Quality attributes, and worst in Service Value and Corporate Image attributes. All composite variables received scores that could be described as average.

Table 6.7: Descriptive Statistics for Final Composite Variables

Composite Variable	Valid Frequency (N)	Minimum Score	Maximum Score	Mean	Standard Deviation
Technical Quality	463	1.97	5.00	3.76[a]	0.51
Functional Quality	516	1.95	4.95	3.50[b]	0.53
Service Value	510	1.90	4.50	3.39[c]	0.47
Corporate Image	406	2.20	4.70	3.39[b]	0.40
Customer Satisfaction	442	1.40	5.00	3.54[d]	0.63
Attitudinal Loyalty	466	2.00	4.50	3.54[e]	0.49
Mean Bill Payment Period (days)	454	-86.14	1119.90	136.88	151.03

a. A 5-point summated scale of perceptions of technical quality (1= very poor; 5= very good)

b. A 5-point summated scale of agreement with statements about superiority of the Utility services or corporate image (1= strongly disagree; 5= strongly agree)

c. A 5-point summated scale of agreement about service value for money of the Utility services (1= strongly disagree; 5= strongly agree)

d. A 5-point summated scale of level of satisfaction with different aspects of services provided by the Utility (1= very dissatisfied; 5= strongly satisfied)

e. Factual/Affective Responses showing a tendency of paying for water services, scored on a 5-point scale, with a larger tendency scoring higher points.

Source: Survey Data from This Research

As with most other multivariate analyses, a major assumption for linear regression analysis is significant pairwise correlations between the dependent variable and the independent variables (Bohrnstedt & Knoke, 1982; Girden, 1996; Thapalia, 1997). Bohrnstedt and Knoke (1982) pointed out that regression analysis depends on correlations for estimating the regression coefficients. SPSS data outputs of pairwise correlations for the major composite variables are displayed in table 6.8.

Table 6.8: Pairwise Correlation Matrix for the Main Composite Variables of the Research

	Technical Quality	Functional Quality	Service Value	Corporate Image	Customer Satisfaction	Attitudinal Loyalty	Mean Bill Payment Period
Technical Quality	1.00						
Functional Quality	0.52***	1.00					
Service Value	0.55***	0.43***	1.00				
Corporate Image	0.56***	0.72***	0.57***	1.00			
Customer Satisfaction	0.55***	0.64***	0.47***	0.61***	1.00		
Attitudinal Loyalty	0.25***	0.19***	0.32***	0.24**	0.40***	1.00	
Mean Bill Payment Period	-0.10*	-0.51^{ns}	-0.03^{ns}	-0.00^{ns}	-0.10*	-0.16**	1.00

*** - Significant at $p < 0.001$;
** - Significant at $p < 0.01$;
* - Significant at $p < 0.05$;

ns - Not significant at $p < 0.05$

Source: Survey Data from This Research

Table 6.8 shows that all pairwise correlations between the composite variables of *Technical Quality*, *Functional Quality*, *Service Value*, *Corporate Image*, *Customer Satisfaction*, and *Attitudinal Loyalty* are substantial and statistically significant at $p < 0.001$. Similarly, the variables *Technical Quality* ($r = -0.1$, $p < 0.05$), *Customer Satisfaction* ($r = -0.1$, $p < 0.05$) and *Attitudinal Loyalty* ($r = -0.15$, $p < 0.01$) have statistically significant but mild correlations with the objectively measured variable of *Means Bill Payment Period*. Though statistically insignificant, all the other correlation coefficients between *Mean Bill Payment Period* and the composite variables have the expected negative sign.

6.5 LINEAR REGRESSION ANALYSIS

Linear regression analysis was conducted using the SPSS for Windows Statistical Programme. The preferred regression procedure was the "enter" method, in which all independent variables are entered into the equation simultaneously. This method was preferred because the study was correlational in nature, and its objective was to determine which of the independent variables contribute most to the variation in the dependent variables (Girden, 1996). Concerning missing data, listwise deletion was the adopted method, as it is recommended if the sample size is large enough (Bohrnstedt & Knoke, 1982).

The null hypothesis (H_o) tested for four regression models is $H_o: \beta_1 = \beta_2 = \ldots = \beta_n = 0$, where β_1, β_2 ,β_1 $\ldots\beta_n$ are the standardised regression coefficients, and n is the number of predetermined independent variables for the regression model. The alternative hypothesis for each of the regression models is that at least one of the regression coefficients is not equal to zero. The four regression models, whose variables are identified by the SPSS input labels, are summarised as follows:

Model 1: $\text{Corp\_Im} = \alpha + \beta_1\text{Tech\_Qua} + \beta_2\text{Func\_Qua} + \beta_3\text{Serv\_Val} + e$

Model 2: $\text{Cust\_Sat} = \alpha + \beta_1\text{Tech\_Qua} + \beta_2\text{Func\_Qua} + \beta_3\text{Serv\_Val} + \beta_4\text{Corp\_Im} + e$

Model 3: $\text{Att\_Loy} = \alpha + \beta_1\text{Serv\_Val} + \beta_2\text{Corp\_Im} + \beta_3\text{Cust\_Sat} + e$

Model 4: $M\_Bil\_Pa = \alpha + \beta_1 Serv\_Val + \beta_2 Corp\_Im + \beta_3 Cust\_Sat + \beta_4 Att\_Loy + e$

Where Tech_Qua is Technical Quality

Func_Qual is Functional Quality

Serv_Val is Service Value

Corp_Im is Corporate Image

Cust_Sat is Customer Satisfaction

Att_Loy is Attitudinal Loyalty

M-Bil_Pa is Mean Bill Payment Period.

Hypothesis testing using regression analysis is based on a number of important assumptions (Achen, 1982; Berry, 1993; Dielman, 1991; Lewis_Beck, 1993; Pedhazur, 1982; Schroeder, Sjoquist &Stephan, 1986). These assumptions with respect to each regression model have been assessed and reported in Section 6.6. Details of the SPSS data outputs for the regression analyses are shown in Appendix F. Results of the regression analyses for all the regression models listed above are summarised in table 6.9.

For Model 1, the results show that all the three predictor variables of *Technical Quality*, *Functional Quality* and *Service Value* are statistically significantly related to Corporate Image. *Technical Quality* has the smallest Beta coefficient ($\beta = 0.11$, $p < 0.05$). The variation in *Corporate Image* explained by all the three variables as predicted by the coefficient of determination is 58% ($F = 164.7$, $p < 0.001$). Therefore, the null hypothesis that H_o: $\beta_1 = \beta_2 = \ldots = \beta_n = 0$ is rejected at $p < 0.001$, with respect to Regression Model 1.

Table 6.9: Summary of Results of Multiple Regression Analysis for Regression Models in which the Criterion Variables are Corporate Image, Customer Satisfaction, Attitudinal Loyalty, and Mean Bill Payment Period, respectively.

Model No.	Criterion Variable	Predictor Variable	Standardised Beta Coefficient, β	t-Ratio
1	Corporate Image	Technical Quality	0.11	2.42*
		Functional Quality	0.52	12.30***
		Service Value	0.28	6.61***
		Adjusted R-square = 0.583, F = 164.7***		
		Valid Number of Observations, N (Listwise) = 348		
2	Customer Satisfaction	Technical Quality	0.20	3.75***
		Functional Quality	0.34	5.54***
		Service Value	0.13	2.52*
		Corporate Image	0.18	2.94**
		Adjusted R-square = 0.496, F = 76.6***		
		Valid Number of Observations, N (Listwise) = 303		
3	Attitudinal Loyalty	Service Value	0.28	4.36***
		Corporate Image	-0.07	-0.94^{ns}
		Customer Satisfaction	0.30	4.57***
		Adjusted R-square = 0.212, F = 28.1***		
		Valid Number of Observations, N (Listwise) = 299		
4	Mean Bill Payment	Service Value	-0.04	-0.52^{ns}
		Corporate Image	0.08	0.87^{ns}
		Customer Satisfaction	-0.09	-1.1^{ns}
		Attitudinal Loyalty	-0.25	-3.61***
		Adjusted R-square = 0.071, F = 5.69***		
		Valid Number of Observations, N (Listwise) = 242		

^{ns} - Not significant at $p < 0.05$ * - Significant at $p < 0.05$

** - Significant at $p < 0.01$ *** - Significant at $p < 0.001$

Source: Survey Data from This Research

A summary of the results for Regression Model 2 (displayed in table 6.9), in which *Customer Satisfaction* is the dependent variable show that all the four hypothesized variables of *Technical Quality*, *Functional Quality*, *Service Value*, and *Corporate Image* have statistically significant regression coefficients. About 50% of the variation in *Customer Satisfaction* is explained by the three variables. Judging from the size of the regression coefficients, *Functional Quality* explains the biggest variation in Customer *Satisfaction*. With F-statistic of 76.6, the null hypothesis that H_o: $\beta_1 = \beta_2 = \ldots = \beta_n = 0$ is rejected at $p < 0.001$, with respect to Regression Model 2.

For Regression Model 3, the results (shown in table 6.9) indicate that *Service Value* and *Customer Satisfaction* explain a substantial variation in the dependent variable Attitudinal Loyalty. However, the regression coefficient for *Corporate Image* is not significant at the 95% significance level. Furthermore, *Corporate Image* has a negative regression coefficient, contrary to what was hypothesized. This unexpected sign will be further discussed in Section 7.2.3. Nonetheless, the model shows a good fit (R-square = 0.212, F=28.1 at $p < 0.001$). Therefore, the null hypothesis that H_o: $\beta_1 = \beta_2 = \ldots = \beta_n = 0$ is rejected at $p < 0.001$, with respect to Regression Model 3.

The summary of regression results for Model 4 (shown in table 6.9) show that although the obtained R-square value (Adjusted $R^2 = 0.071$) is lower compared to the regression models whose results were presented in the preceding paragraphs, its overall model fit as given by the F-statistic ($F = 5.69$, $p < 0.001$) is very highly significant. However, only one predictor variable, *Attitudinal Loyalty*, has a significant regression coefficient ($\beta = -0.25$, $p < 0.001$). On the basis of the F-statistic, the null hypothesis H_o: $\beta_1 = \beta_2 = \ldots = \beta_n = 0$ is rejected at $p < 0.001$. Apart from *Corporate Image*, all the other predictor variables have regression coefficients with the negative sign, as predicted in the conceptual framework in chapter 4. A similar result concerning the direction of the regression coefficient for *Corporate Image* was obtained in the Regression Model 3.

6.6 TESTS FOR ASSUMPTIONS FOR LINEAR REGRESSION ANALYSIS

Numerous assumptions are made whenever least square regression analysis is used in the behavioural sciences (Berry, 1993; Berry & Feldman, 1993; Dielman, 1991; Fox, 1993; Lewis-Beck, 1993; Pedhazur; 1982). This section assesses whether basic assumptions for application of multiple least

square regression analysis are satisfied in this research. The following assumptions are discussed in the proceeding sub-sections:

- Measurement without error
- Absence of non-response bias
- Linearity of residual errors
- Normality of residual error terms
- Homoskedastic residual errors
- Absence of Multicollinearity

The assumption that the disturbances are independent, or that there is no auto correlation, has not been assessed in this report: the problems of autocorrelation are restricted to error terms associated with time series data (Berry, 1993; Berry & Feldman, 1993; Dielman, 1991; Schroeder, Sjoquist & Stephan, 1986)

6.6.1 Measurement Error: Level of Measurement

One of the basic assumptions for application of linear regression analysis is that both the dependent and independent variables are measured at a numerical, continuous level (Bohrnstedt & Knoke, 1982; Bryman & Cramer, 1994; Bryman & Cramer, 1997; Cramer, 1998; Fink, 1995c; Girden, 1996; Oppenheim, 1992). In this study, the main dependent variable of customer's *Mean Bill Payment Period* was measured at ratio level. The other dependent and independent variables were summated Likert composite variables measured at ordinal level, which are considered as interval variables in the Social Sciences (Bryman & Cramer, 1994; Bryman & Cramer, 1997; Cramer, 1998; Oppenheim, 1992). Additionally, similar studies carried out in field of service quality, customer satisfaction and behavioural intentions have treated summated Likert scales as interval variables (Anderson, Fornell & Lehmann, 1994; Anderson & Sullivan, 1993; Cronin & Taylor, 1992; Garbarino & Johnson, 1999; Humphreys & Williams, 1996; Lapierre, 1996; Parasuraman, Zeithaml & Berry, 1988; Parasuraman, Berry & Zeithaml, 1991; Parasuraman, Zeithaml & Berry, 1994a; Parasuraman, Zeithaml & Berry, 1994b; Rust & Zahorik, 1993; Taylor & Baker, 1994).

One of the causes of non-random measurement error is when the measurement instrument taps some other variable(s) in addition to the true variable of interest (Berry, 1993; Berry & Feldman, 1993). Pedhazur (1982) refers to such errors as consistent, or systematic errors, which are common in the application of summated scales (Berry & Feldman, 1993; Schroeder, Sjoquist & Stephan, 1986). Non-random measurement error in this research was minimised by use of composite variables whose validity was ensured, through a careful development of the measurement instrument that involved pretesting and piloting processes. In line with recommended procedures for application of multiple regression analysis (Bryman & Cramer, 1997; Cramer, 1998; Girden, 1996; Litwin, 1995; Nunnally, 1978; Oppenheim; 1992; Thapalia, 1997), the composite variables were assessed for both construct validity and concurrent validity, prior to analysis, as presented in Sections 6.3.3 and 6.3.4 respectively.

Another type of measurement error is the random measurement error, which occurs, among other things, as a result of temporary fluctuations in respondents, enumerator, interviewers, settings and the like (Berry, 1993; Berry & Feldman, 1993; Pedhazur, 1982). Use of summated scales for all attitudinal measures minimised occurrence of random measurement errors. Furthermore, prior to carrying out linear regression analysis, the summated scales were assessed for internal reliability, the results of which were presented in Section 6.3.2. Ensuring high internal reliability of a scale is one way of minimising random measurement error (Berry, 1993; Berry & Feldman, 1993; Bryman & Cramer, 1997; Cramer, 1998; Girden, 1996; Litwin, 1995; McIver & Carmines, 1981; Nunnally, 1978; Oppenheim; 1992; Pedhazur, 1982; Thapalia, 1997).

6.6.2. Measurement Error: Bias in Questionnaire Administration

Another source of random measurement error is non-sampling bias, which occurs because of imprecision in the definition of the study population and errors in survey design and measurement (Fink, 1995b). Measures taken to minimise bias inherent in the design of the measurement instrument were discussed in Chapter Five. This section specifically discusses measures taken in minimising errors during the process of the administration of the measurement instrument.

As discussed in Section 5.8.2, in order to reduce variability of conditions of questionnaire administration, the cross-sectional survey in various urban areas of the country was carried out at the same time (Fink, 1995a, Girden, 1996). Furthermore, as a strategy to increase the conclusion validity of the study (Trochim, 1999), enumerators were hired to translate the English edition of the

questionnaire into local languages, for those respondents who did not understand English. To reduce interviewer bias, respondents who understood English were encouraged to fill in the questionnaire by themselves. Questionnaires were sent to sampled households at least a week ahead of the enumerators' fieldwork. A two day training session for the enumerators, facilitated by an experienced social science researcher, covered the following topics (Neuman, 1997; Oppenheim, 1992):

- Verbatim translation, not in-depth interviews
- Good maintenance of rapport
- Translation and/or rephrasing of some questions
- Avoidance of careless prompting
- Reliable response category ticking/circling
- Unbiased recording of respondents' complaints, compliments, suggestions and/or comments
- Careful soliciting of responses to classification questions

Additionally, the undergraduate students who administered the questionnaire were "…naïve with respect to crucial bits of information so as not to influence the testees" (Girden, 1996, p.93). A total of 348 respondents (65%) opted to self-administer the questionnaire. Of 185 respondents to whom the enumerators administered the questionnaire, the interviews for 105 respondents (20%) were carried out in English, while the enumerators had to interpret questionnaire items for 84 respondents (15%). A t-test was performed to find out whether there were any significant differences in mean response scores of respondents who self-administered the questionnaire, and those to whom the questionnaire was administered by enumerators, for all the major summed composite variables and the objectively measured variable of *Mean Bill Payment Period*. Details of results of the independent t-tests are shown in Appendix G. A summary of the t-tests is presented in table 6.10.

As shown in table 6.10, only two variables have significant F-values for the Levene's test for equality of variances: *Corporate Image* ($F = 4.02$, $p < 0.05$), and *Mean Bill Payment Period* ($F = 7.5$, $p < 0.01$). For these two variables, therefore, the t-values were based on separate variance estimates, as the homogeneity of variance assumption has been violated (Bryman and Cramer, 1994; Kinnear & Gray, 1994). For the rest of the variables, the variables have been assumed to be homogeneous, and the t-

values are based on the equal variances line of values (Bryman and Cramer, 1994; Kinnear & Gray, 1994). The results displayed in table 6. indicate that there is no significant difference (at $p < 0.05$) in means of the main variables for respondents who self-administered the questionnaire and those to whom the questionnaire was enumerated. From these results, based on the 95% confidence levels, there is therefore no evidence of a non-sampling bias caused by the method of questionnaire administration.

Table 6.10: Summary of T-test Results for Differences in Responses According to Questionnaire Administration Methods

TEST VARIABLE	MODE OF QUESTIONNAIRE ADMINISTRATION	VALID CASES (N)	MEAN	t-VALUE	SIGNIFICANCE
Technical Quality	Self-administered	302	3.74	0.52	0.61
	Enumerated	161	3.77		
Functional Quality	Self-administered	333	3.47	1.74	0.08
	Enumerated	183	3.55		
Service Value	Self-administered	332	3.38	0.18	0.86
	Enumerated	178	3.39		
Corporate Image	Self-administered	262	3.36	1.95	0.051
	Enumerated	144	3.44		
Customer Satisfaction	Self-administered	292	3.52	0.732	0.47
	Enumerated	150	3.57		
Attitudinal Loyalty	Self-administered	298	3.58	1.30	0.193
	Enumerated	168	3.52		
Mean Bill Payment Period	Self-administered	307	132.96	0.711	0.48
	Enumerated	147	145.07		

Source: Survey Data from This Research

6.6.3 Measurement Error: Non-Response Bias

Despite increasing sophistication in the approach to respondents, non-response in a survey has to be anticipated, a situation which leads to non-response bias (Chen, 1996; Opppenheim, 1992). Non-response bias represents the deviation of a true sample mean from the observed sample mean, and previous studies conducted have shown that non-respondents differ from respondents in demographics and in life-style (Chen, 1996). To reduce the possibility of non-response bias in this research, a pilot study was undertaken so that response rates for the main study could be maximised. The results of the pilot study and the recommendations generated were presented in Section 5.6. As a result of the improvement in the questionnaire content and method of administration, the response rate improved from 42% for the pilot study, to 78% for the main study.

Despite the relatively high response rates obtained in this research, it was considered necessary to evaluate whether non-respondents significantly affected the research data. Non-response bias was assessed using an extrapolation method that assumes that "late" respondents in a sample are similar to "theoretical" non-respondents (Armstrong and Overton, 1977; Hildebrand and Ott, 1989). The method of t-test analysis for "early" and "late" responses for classification and other principal variables have been used in various marketing studies (Atuahene-Gima, 1996; Miles and Arnold, 1991; Tadepalli, 1995) to assess non-response bias. In this study, questionnaires that were received one week after the enumerators completed fieldwork were considered to be "late" responses. A total of 59 filled questionnaires were received after September 19, 1999, one week after the enumerators completed the fieldwork.

Independent t-tests were performed to determine if there were any significant differences in mean response scores for the main demographic variables of household income (*est-inc*), household size (*hh-size*) and years of formal education by household heads (*educyrs*), as well as the main dependent variable of customer's mean bill payment period (*m_bil_pa*). Details of results of the independent t-tests are shown in Appendix H , a summary of which is displayed in table 6.11.

Results shown in table 6.11 indicate that only the variable "Estimated household income" has a significant F-value for Levene's test for equality of variances ($F= 44.904$, $p < 0.0001$). For this variable, therefore, the t-value was based on separate variable estimates (Bryman & Cramer, 1994; Kinnear & Gray, 1994). For the remaining variables, the F-test provides evidence of homogeneity (Bryman & Cramer, 1994; Kinnear & Gray, 1994); therefore the t-values were based on equal

variances of values. The t-values displayed in table 6.11 indicate that there are no significant differences, at $p < 0.05$, in the mean scores for all the variables considered, between responses received from "early" and "late" respondents. The results therefore show that non-response bias may not be a major problem (Armstrong and Overton, 1997; Hildebrand and Ott, 1989).

Table 6.11: Summary of T-test Results for Non-response Bias Using "Early" and "Late" Respondents

TEST VARIABLE	SEQUENCE OF DATA ENTRY	VALID CASES (N)	MEAN	t-VALUE	p VALUE
Years of formal education	By Sept. 19	494	14.57	0.235	0.815
	After Sept. 19	42	14.43		
Estimated household income	By Sept. 19	388	597.83	1.777	0.078
	After Sept. 19	27	568.15		
Household size	By Sept. 19	494	6.96	0.308	0.758
	After Sept. 19	42	6.81		
Mean Bill Payment Period	By Sept. 19	432	166.25	0.897	0.370
	After Sept. 19	40	137.02		

Source: Survey Data from This Research

6.6.4 Residual Analysis: Test for Linearity, Normality, and Homoscedasticity

The differences between the true and fitted values of the criterion variable for the points in the sample are called residuals (Dielman, 1991). Residual plots are a good indicator of violations of assumptions for linearity, normality and homoscedasticity (Dielman, 1991; Kinnear & Gray, 1994; Fox, 1993; Lewis-Beck, 1993; Pedhazur, 1982). Linearity is the requirement that the functional form of the relationship is a straight line. Normality is the condition that the residuals are normally distributed. The assumption for homoscedasticity requires that the residuals have a constant variance around the regression line. Figures 6.4 to 6.6 show three types of residual plots for the four regression models whose results were presented in Section 6.5.

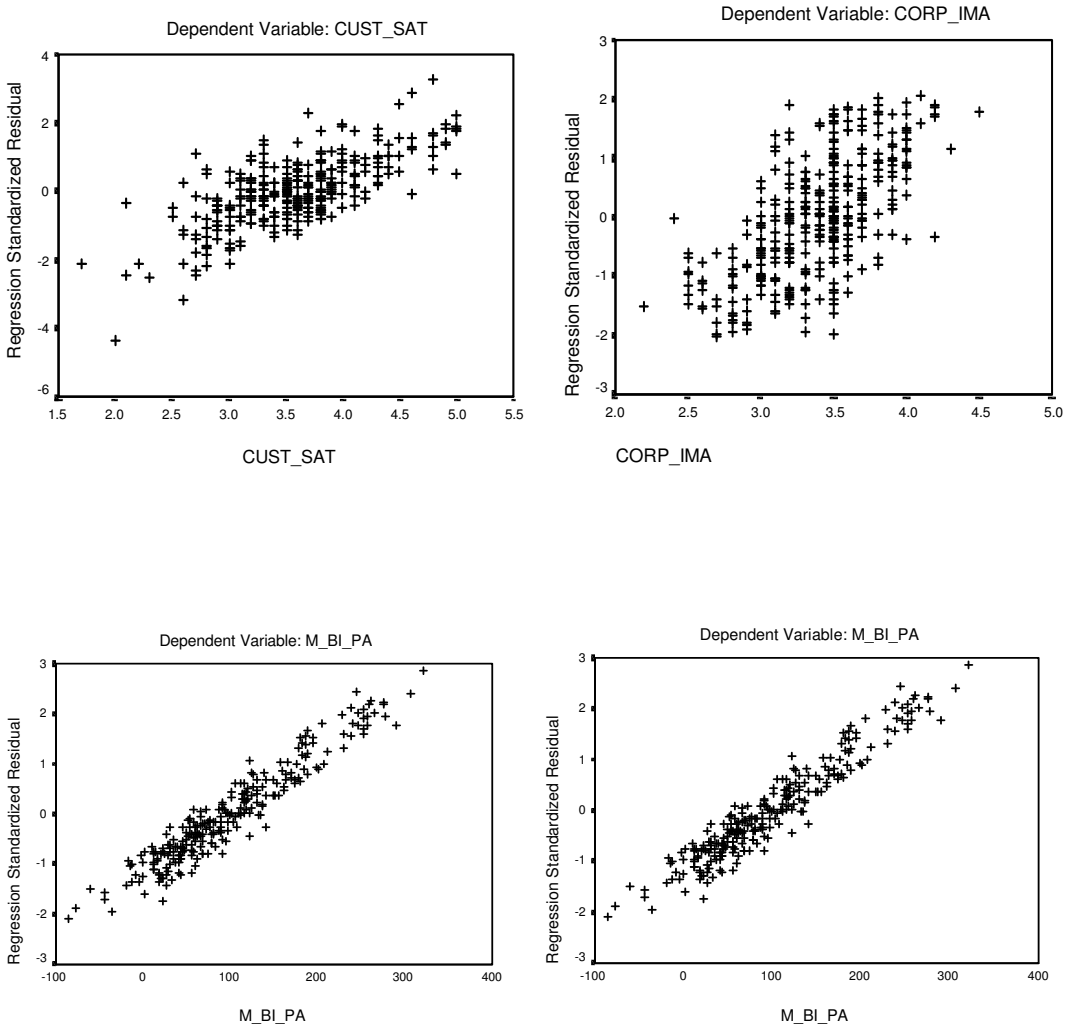


Figure 6.4: Scatterplots of Regression Standardised Residuals Against Fitted Values for the Four Dependent Variables of *Corporate Image*, *Customer Satisfaction*, *Attitudinal Loyalty*, and *Mean Bill Payment Period*.

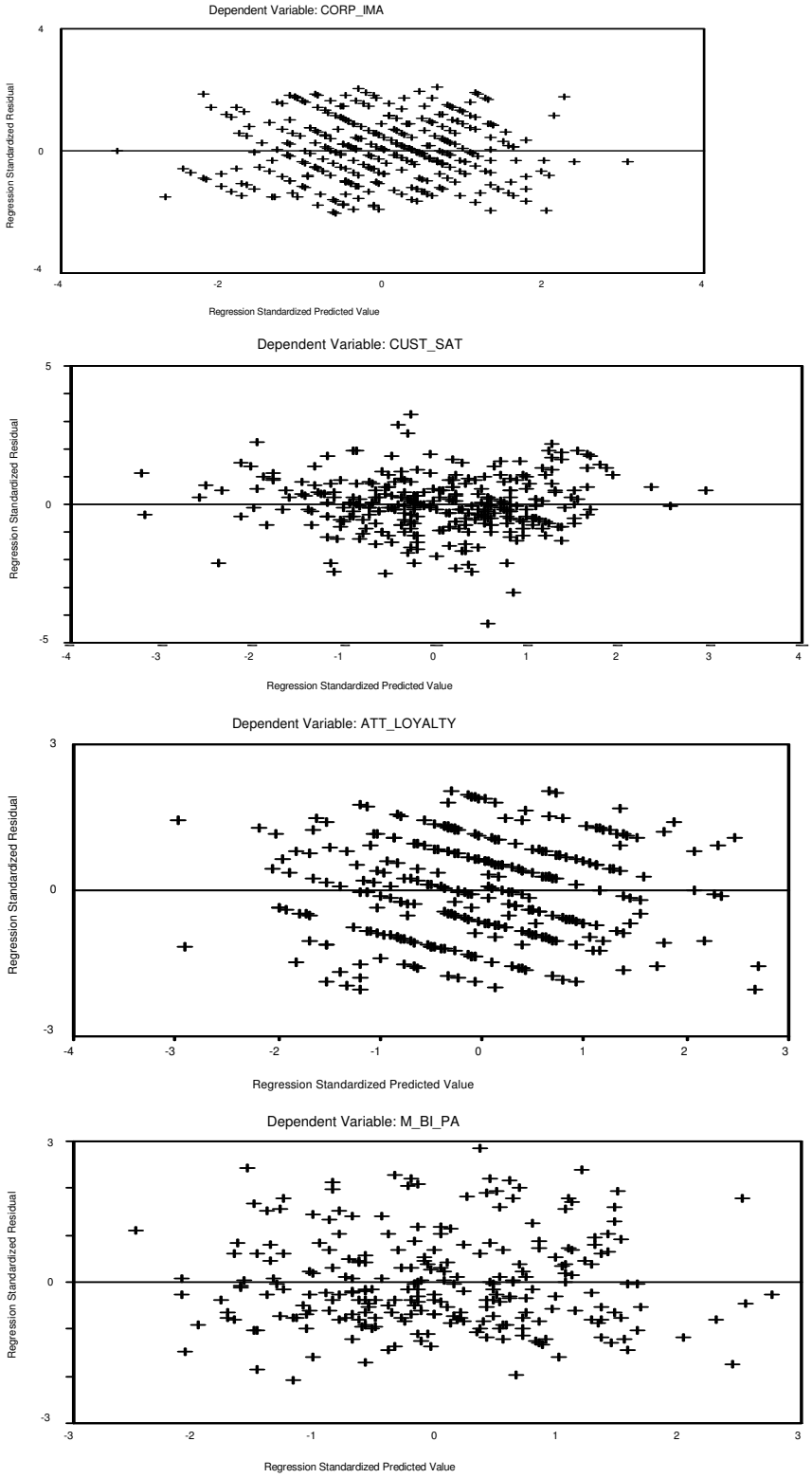


Figure 6.5: Scatter plots of Regression Standardised Residuals versus Standardised Predicted Values for the Four Dependent Variables of *Corporate Image*, *Customer Satisfaction*, *Attitudinal Loyalty*, and *Mean Bill Payment Period*.

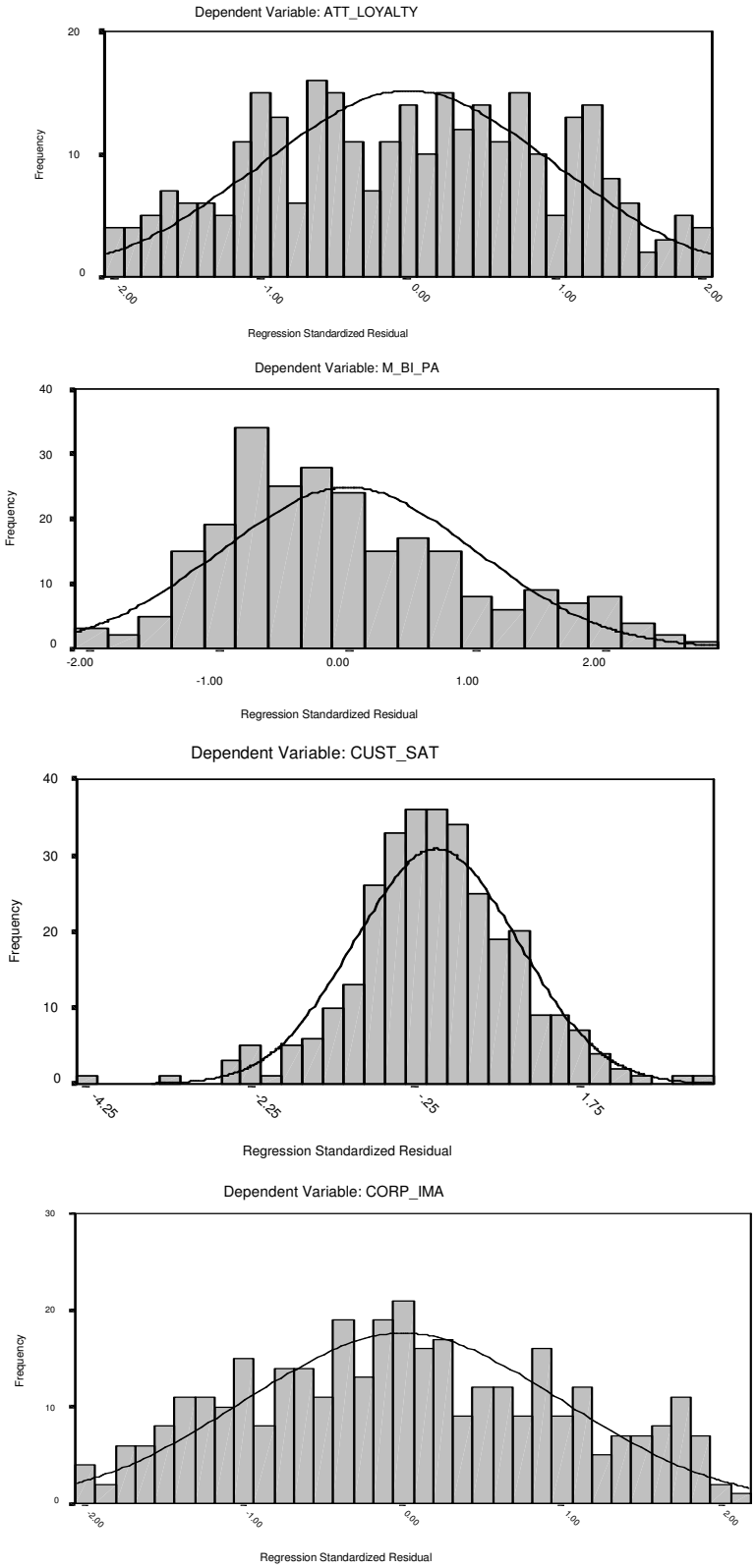


Figure 6.6: Plots of Histograms of Regression Standardised Residuals for the Four Dependent Variables of *Corporate Image*, *Customer Satisfaction*, *Attitudinal Loyalty*, and *Mean Bill Payment Period*.

Linearity

Scatterplots of fitted values against standardised residuals for all regression models, as presented in figure 6.4, show approximate linear patterns. The best curve that be fitted onto each of the plots is a straight line. Furthermore, visual inspection of scatterplots of standardised predicted scores against standardised residuals (figure 6.5) are characterised by the following properties:

1. The points are scattered randomly around the lines drawn through the respective means of the residuals.

2. The points appear to be forming rectangular shapes.

The characteristics listed above support the assumption that the regressions lines for Models 1, 2, 3, and 4 are linear (Dielman, 1991; Kinnear & Gray, 1994; Pedhazur, 1982). However, a few residual outliers were identified for all the regression models. When a re-examination of these data was done, there was no reason to drop them from the analysis (Fox, 1993; Pedhazur, 1982). Therefore all the scores were retained in the data analysis.

Normality

Plots of histograms of regression standardised residuals for all the four regression models are shown in figure 6.6. The histograms for all the plots approximate normal distribution curves. For further assessment of the assumption of normality, Dielman (1991) suggested a working out of the structure of the distribution of the standardised residuals: about 68% of the standardised residuals should lie between -1 and +1; about 95% should be between -2 and +2; and about 99% should be between -3 and +3. Table 6.12 shows the distribution of standardised residuals for the four regression models. The results displayed in table 6.12 show that all models approximate normal curves. From these results, the model in which Mean Bill Payment Period is the criterion variable is a perfect normal curve. This perfect normality could be because the data for Mean Bill Payment Period was objectively measured.

Table 6.12: Test for Normality: Distribution of Standardised Residual Scores in the Standard Deviations for the Four Regression Models

Model No.	Criterion Variable	DISTRIBUTION OF STANDARDISED RESIDUAL SCORES		
		1st Standard Deviation (-1≤ σ ≤1)	2nd Standard Deviation (-2≤ σ ≤2)	3rd Standard Deviation (-3≤ σ ≤3)
1	Corporate Image	64%	99.5%	100%
2	Customer Satisfaction	73%	94%	99.2%
3	Attitudinal Loyalty	61%	98%	100%
4	Mean Bill Payment Period	70%	95%	100%

Source: Survey Data from This Research

Homoscedasticity

Scatterplots of regression standardised residuals against standardised predicted values displayed in figure 6.5 indicate the following properties for all the criterion variables:

1. The residuals are scattered randomly about the zero lines, with no differences in the amount of variation in the residuals, regardless of the size of the predicted values.

2. There is no systematic pattern in the residuals.

3. The residuals are loosely arranged to form a rectangular shape.

The characteristics listed above support the assumption in all the regression models that the variances of the residuals around the respective regression lines are constant, i.e. homoscedasticity exists (Dielman, 1991; Kinnear & Gray, 1994; Pedhazur, 1982; Schroeder, Sjoquist, & Stephan, 1986).

6.6.5 Tests for Multicollinearity

The problem of multicollinearity is said to exist when predictor variables are correlated with each other. Low correlations among the criterion variables will not result in serious deterioration of the quality of least square estimates; however, high correlations may result in unstable least squares estimates of the regression coefficients (Berry, 1993; Berry & Feldman, 1993; Dielman, 1991; Fox, 1993; Lewis-Beck, 1993; Pedhazur; 1982). One method of detecting multicollinearity is computation of variance inflation factors for each criterion variable (VIF). Table 6.13 shows the computed VIF as extracted from SPSS data outputs displayed in appendices O1, O2, O3 and O4.

One of the most commonly used guidelines is that any individual VIF larger than 10 indicates a serious problem with multicollinearity (Dielman, 1991; Pedhazur, 1982; Schroeder, Sjoquist, & Stephan, 1986). According to this guideline, the results of tests for VIF displayed in table 6.13 indicate no threat of multicollinearity to the four regression models.

Table 6.13: Tests for Multicollinearity: Variance-Inflation Factor (VIF) for Predictor Variables in Each of the Regression Models

Model No.	Criterion Variable	Predictor Variable	Variance-Inflation Factor (VIF)
1	Corporate Image	Technical Quality	1.66
		Functional Quality	1.53
		Service Value	1.46
2	Customer Satisfaction	Technical Quality	1.70
		Functional Quality	2.24
		Service Value	1.65
		Corporate Image	2.36
3	Attitudinal Loyalty	Service Value	1.61
		Corporate Image	1.88
		Customer Satisfaction	1.70
4	Bill Payment Period	Service Value	1.69
		Corporate Image	1.99
		Customer Satisfaction	1.92
		Attitudinal Loyalty	1.2

Source: Survey Data from This Research

6.7 TESTS FOR MODERATOR EFFECTS

Moderator effects were tested using the moderated regression analysis framework advanced by Baron and Kenny (1986), and recommended by Taylor and Baker (1994); Caruana, Money and Berthon (2000); and Lasser, Manolis and Winsor (2000). Moderated regression analysis seeks to examine the change in R-square values that results during a hierarchical test of three regression equations involving the criterion variable, predictor variable, moderator variable, and the interaction term. The moderator hypothesis is supported if the interaction term is significant. Although there may be significant main effects of the predictor and moderator variable, these regression coefficients are not relevant in the examination of moderator effects (Baron and Kenny, 1986, p.1174).

One assumption for getting clear interpretable and robust moderator terms is the requirement that the moderator variable is uncorrelated with both the predictor variable and the criterion variable (Baron & Kenny, 1986). Appendix I shows details of a correlation matrix for the all the variables included in the moderator effect tests. Table 6.14 shows the correlations between household variables and *Attitudinal Loyalty*, and *Customer Satisfaction*.

The correlations displayed in table 6.14 show that there are no significant relations between the hypothesized moderator variables and both the criterion variable as well as the predictor variable. Hence, moderated regression analysis may proceed without anticipating effects of multicollinearity.

The analytic procedure described in the first paragraph of this section was applied for eight regression models using the household characteristics as the moderator variables. The criterion and predictor variables were *Attitudinal Loyalty* and *Customer Satisfaction*, respectively. All the household variables were measured on categorical level for which dummy variables were created. For each household characteristic, two regression equations were examined in the final analysis: a full model with *Customer Satisfaction,* dummy variable(s) of the household variable and interaction term(s); and a reduced model without the interaction term(s). In order to determine statistical significance of interaction effects, partial F-tests were performed for the full and reduced regression models (Bohrnstedt and Knoke, 1982; Caruana, Money & Berthon, 2000; Dielman, 1991; Hardy, 1993; Pedhazur, 1982).

Table 6.14: Non-parametric Correlations Between Hypothesized Moderator Variables (i.e. Household Characteristics) and the Predictor/Criterion Variables in the Moderated Regression Models

	Measure of Association Used	Strength of Relationship	
		Criterion Variable: *Attitudinal Loyalty*	Predictor Variable: *Customer Satisfaction*
Household Characteristics			
Gender	Eta	0.044^{ns}	0.075^{ns}
Level of formal education by household head	Gamma	0.098^{ns}	0.069^{ns}
Size of household	Gamma	0.098^{ns}	0.069^{ns}
Type of occupation	Eta	0.004^{ns}	0.086^{ns}
Premise type	Eta	0.057^{ns}	0.051^{ns}
Tenure type	Eta	0.003^{ns}	0.066^{ns}
Estimated household income	Gamma	0.228^{ns}	0.081^{ns}
Use of alternative water source	Eta	0.080^{ns}	0.045^{ns}

^{ns} : Correlations are not significant at $\alpha = 0.05$.

Source: Survey Data from This Research

Assuming a test variable with three categorical levels, the pair of regression equations appears in this format:

$Att\_Loy = A_1 + b_1(Cust\text{-}Sat) + b_2H_1 + b_3H_2$ …….…… Reduced model

$Att\_Loy = A_2 + b_4(cust\text{-}sat) + b_5H_1 + b_6H_2 + b_7H_1*(cust\text{-}sat) + b_8H_2*(cust\text{-}sat)$...Full model

where b_7 and b_8 are the interaction terms in the full model.

The null hypothesis to be tested for each test variable is as follows:

$$H_o : b_7 = b_8 = 0$$

The alternative hypothesis is as follows:

$$H_a : b_7 = b_8 \neq 0$$

SPSS data outputs for the hierarchical regressions for each moderator variable are shown in Appendix J . Details of the computations for the partial F-tests are presented in Appendix K . A summary of the comparative regression analysis and partial F-tests are displayed in table 6.15. As can be seen in the summary of results, regression coefficients for the interaction terms have been ignored in tests for interaction effects because this hypothesis seeks to examine whether the interaction terms are important as a group (Dielman, 1991; Hardy, 1993).

Table 6.15: Summary of Analysis of Partial F-statistic for Determining the Level of Significance of the Interaction Effects of Household Variables on the Relationship between *Customer Satisfaction* and *Attitudinal Loyalty*.

Test variables	Valid number of respondents N (listwise)	R-square for full model	R-square for reduced model	Partial F-statistic
Gender	379	0.240	0.160	39.47***
Education years	381	0.216	0.164	8.25***
Occupation	378	0.181	0.160	4.77**
Household size	375	0.184	0.173	2.49^{ns}
Premise type	365	0.172	0.166	2.62^{ns}
Tenure type	373	0.185	0.164	4.73**
Estimated household income	348	0.182	0.157	5.23**
Use of alternative water source	379	0.161	0.157	1.79^{ns}

^{ns} - Not significant at $p < 0.05$

** - Significant at $p < 0.01$ *** - Significant at $p < 0.001$

Source: Survey Data from This Research

Results displayed in table 6.15 indicate that five of the eight test variables exert significant interaction effects (at $p< 0.01$) on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty* towards the water utility. Gender had the most significant interaction effect ($F=39.47$, $p<0.001$), while "Use of alternative water", "Household size", and "Premise type" did not have significant effects at $\alpha =0.05$. However, it can be noted that the test variables "Household size" and "Premise type" exert interaction effects that are significant at $\alpha =0.1$.

6.8 CHAPTER CONCLUSION

This chapter merely presented patterns of results, without discussing the findings. Examination of psychometric properties of the primary variables indicated that the measurement instrument has good levels of reliability and validity. The research hypotheses were tested by use of multiple linear regression analysis. All the correlational hypotheses were confirmed, whereas five out of eight test variables were found to exert significant interaction effects on the relationship between *Customer Satisfaction* and *Attitudinal Loyalty*. Tests carried out on the processed data revealed no evidence of violations of assumptions for linear regression analysis.

The next chapter deals with discussions, conclusions and implications of the findings pertaining to the research hypotheses and questions.

CHAPTER SEVEN

RESEARCH CONCLUSIONS

7.1 CHAPTER INTRODUCTION

As presented in chapter one and explained in chapter four, this research has been aimed at solving the following research problem:

> **What influence do customer perceptions of service attributes have on recovering costs of urban utility water services in low-income countries?**

Chapter two reviewed the management problem of cost recovery faced by managers of urban water utilities in low-income areas. As part of a process to answer this management question, a literature review was carried out in the field of services management, and details of the findings are presented in chapter three. Section 3.9 lists the major research gaps, which mainly point to limited research carried out on customer perceptions in the public sector services, particularly in low-income countries. Furthermore, despite the vast amounts of research carried out in high-income countries on customer perceptions in the service industry, researchers have failed to agree on uniform conceptualisation and measurement of most variables.

The literature reviewed and reported in chapter three led to the modification of the management problem into a research problem, as reported in chapter four. Consequently, research questions, a research model, and research hypotheses were developed. The research questions were listed as follows:

1. How do customer perceptions of service quality, service value, corporate image, and customer satisfaction relate to customer loyalty to an urban water utility in low-income countries?

2. Do household characteristics exert moderator effects on the relationship between Is the self-reported customer loyalty translated into favourable bill payment behaviour?

3. Is the self-reported customer loyalty translated into favourable bill payment behaviour?

From the research questions, five testable hypotheses were derived, which are listed at the end of chapter four, and are repeated in the proceeding section. Chapter five justified the methodology

adopted to collect data for testing the hypotheses, and presented details of procedures taken in the research process. Chapter six presented and analysed the data obtained. This chapter discusses the findings presented in chapter six. The remainder of the chapter is structured as follows:

- Section 7.2 summarises findings of each hypothesis and discusses them within the context of this research and the literature reviewed in chapter three.
- Section 7.3 discusses implications of the research for further understanding of the research problem.

7.2 CONCLUSIONS ABOUT THE RESEARCH HYPOTHESES

7.2.1 Predictors of Corporate Image

Hypothesis one states:

> The three variables of technical quality, functional quality, and service value of the urban water service offering, as perceived by the customer, will significantly predict, either individually or as part of a group of variables, some of the variation in a customer's perception of corporate image.

The results displayed in table 6.9 of section 6.5 indicate that the three predictor variables of technical quality, functional quality and service value explained 58% of the variation in corporate image, with a very highly significant overall fit to the regression model ($F = 164.7$, $p < 0.001$). These results provide strong evidence for support of the research hypothesis that a combination of three predictor variables mentioned above significantly contribute to corporate image. Furthermore, examination of the regression coefficients reveal that all the predictor variables make significant individual contribution to corporate image: functional quality contributes the highest proportion ($\beta = 0.52$, $t = 12.3$, $p < 0.001$), followed by service value ($\beta = 0.28$, $t = 6.6$, $p < 0.001$), and technical quality ($\beta = 0.11$, $t = 2.4$, $p < 0.05$), respectively.

The findings of this research support the proposition made by Gronroos (1984) and Lehtinen and Lehtinen (1991) that service offerings are the most important part of a service firm that customers see and perceive, in order to form a corporate image. Furthermore, the fact that the service offerings of

technical quality, functional quality and service value could explain almost 60% of the variance in corporate image supports the concept held by Kennedy (1977) and Gronroos (1994) that traditional marketing activities such as advertising and public relations are less important factors in relation to corporate image.

The results obtained in this study, which show that more variation in corporate quality is explained by functional quality than technical quality, are consistent with the relationship marketing theoretical framework proposed by Ravald and Gronroos (1996). One of the most effective methods of increasing a customer's overall rating of the water utility, and therefore its corporate image, is to improve the customer's relationship benefits, and/or reduce his/her relationship sacrifice with the service firm (Ravald & Gronroos; 1996). Relationship benefits/sacrifice are influenced mainly by the functional quality dimension, and to a lesser extent, by the technical quality dimension. The results of this study also show that service value, compared to technical quality, plays a larger role in the customer's evaluation of a water utility's corporate image. On the basis of these findings, it appears that the pricing attributes of the urban water utility play an important role in evaluation of the overall attractiveness of the utility. This is not surprising considering the history of the provision of water services in low-income countries, whereby services were being provided without recovering any costs from the consumers.

7.2.2 Predictors of Customer Satisfaction

Hypothesis two states:

> The four variables of technical quality, functional quality, service value, and corporate image of the urban water service offering, as perceived by the customer, will significantly predict, either individually or as part of a group of variables, some of the variation in customer satisfaction.

As shown in table 6.9, 50% of the variation in customer satisfaction is predicted by functional quality ($\beta = 0.34$, $t = 5.54$, $p < 0.001$), technical quality ($\beta = 0.2$, $t = 3.75$, $p < 0.001$), corporate image ($\beta = 0.18$, $t = 2.94$, $p < 0.01$), and service value ($\beta = 0.13$, $t = 2.52$, $p < 0.05$). The regression model has a very highly significant fit ($F = 76.6$, $p < 0.001$). The findings in this study support the research hypothesis that the four predictor variables mentioned in the hypothesis will significantly, either individually or as part of a group of variables, predict some of the variation in customer satisfaction.

The findings of this research highlight the importance of functional quality relative to technical quality, in the formation of customer evaluations of overall satisfaction with the water utility's service delivery. Although, as discussed in section 3.3., only a few studies have been conducted to predict customer satisfaction using the Technical/Functional Quality Framework, the findings of this research are in agreement with most previous studies based on a similar conceptual framework, and cited in the literature review presented in chapter three. Similar results on the relative importance of functional quality compared to technical quality were obtained in the following studies: an exploratory study with company executives in Sweden (Gronroos, 1984); a study with clients of an accountancy service (Higgins & Furguson, 1991); a study conducted in agricultural manufacturing services (Humphreys & Williams, 1996); a study conducted in the health care services (Mittal & Lasser, 1998); and a study of customers of international banking services (Lasser, Manolis & Winsor, 2000). However, in the pizza delivery service, functional quality and technical quality were equally important (Richard & Allaway, 1993), while technical quality was more important than functional quality in car repair services (Mittal & Lasser, 1998).

The findings of this research, together with results of earlier studies enumerated in the previous paragraph, appear to support the theoretical concept that when customers do not have enough knowledge and/or skills to evaluate more technical-based dimensions, they rely primarily on simpler dimensions such as functional quality in the evaluation of satisfaction (Andreassen & Lindestad, 1998; Gronroos, 1984; Lasser, Manolis & Winsor, 2000). This author believes that most consumers without a background in physical sciences training, would find it difficult to evaluate attributes of water and sanitation services in terms of quality. Attributes such as pressure, turbidity, bacteriological quality, total dissolved solids, biochemical oxygen demand are not only difficult to understand, but are also difficult to evaluate without the right instrumentation.

The importance of functional quality compared to technical quality, in customer evaluations of overall satisfaction for urban water services, could also be linked to the time-dependent stages of socio-economic and cultural development in the utility's operating environment. According to de Faria and Alegre (1996), society goes through three stages of socio-economic and cultural development, to which customers' expectations are pegged: the 'quantity' stage, where the bare satisfaction of biophysical needs is the major goal; the 'quality 'stage; and the 'excellence' stage, in order of sophistication. Using this model, consumers will attach more importance to technical quality if society is in the 'quantity' stage, but will shift importance to functional quality in the later stages of socio-economic and cultural

development. Basing the findings of this research on this conceptual theory, it would seem that customers of the urban water utility in Uganda are progressing beyond the 'quantity' stage of socio-economic and cultural development. This conclusion is consistent with a presentation given by the former managing director of the water utility at an international workshop, in which he pointed out that since massive rehabilitation of the water supply infrastructure in the late 1980s, customer attitudes had changed: from begging for continuity of services to demanding for a quality service (Onek, 1997).

This research has shown that service value makes a significant contribution ($\beta = 0.13$, $t = 2.52$, $p < 0.05$) to the variation in customer satisfaction. These findings are consistent with results of similar studies carried out with customers of various service firms in the US (Ittner & Larker, 1996); of dental, automobile maintenance, restaurant, and hairstyling services (McDougall & Levesque, 2000); as well as customers of discretionary recreational/entertainment services, and of continuous service providers of health care, communication and fast food (Cronin, Brady, Brand, Hightower & Shemwell, 1997). However, results of a similar study carried out with customers of an auditing firm showed that service value does not have a significant direct relationship with customer satisfaction, rather it moderates the relationship between service quality and customer satisfaction (Caruana, Money & Berthon, 2000). The findings of the latter study appear to have been unexpected even to the authors, who did not even hypothesize the moderating effect of service value in the conceptual framework. As advanced in the discussion section of the report (Caruana, Money & Berthon, 2000) , several limitations may have affected the outcome of the research: (i) the exploratory nature of the research; (ii) the questionable reliability and validity of the one-item measurement of service value; (iii) the relatively low number of respondents; and (iv) the multicollinearity effects between service value and service quality.

The findings of this research highlight the importance of corporate image ($\beta = 0.18$, $t = 2.94$, $p < 0.01$) in customers' evaluation of overall satisfaction in the urban water services sector. Although in the past a great deal of research has been carried out on the predictors of customer satisfaction, very few studies have included corporate image in their conceptual models. These findings show that, even after controlling for technical quality, functional quality, and service value, corporate image still makes a highly significant contribution to the variation in customer satisfaction. This contribution may not be surprising, as corporate image in this research has been conceptualised as a function of traditional marketing activities such as advertising, and public relations, in addition to contributions of technical quality, functional quality, and service value.

It is worthwhile comparing the findings of this research with the results obtained by Andreassen and Lindestad (1998) in a study conducted among customers of tour operating service firms in Norway. The results of the study showed that compared to service quality and service value, corporate image has a bigger influence on customer satisfaction. However, for respondents who considered themselves as having a high service expertise in tour operating services, both service value and service quality have bigger impacts than corporate image. In view of the findings from Andreassen and Lindestad (1998), it appears that corporate image plays an important role in overall satisfaction evaluations among customers of an urban water utility, mainly because other types of quality evaluations may be complex and difficult for the customers. More support for this conceptual position can be drawn from results of a study carried out with customers of a major bank in the Netherlands (Bloemer, de Ruyter & Peeters, 1998), a type of service that is considered simpler in terms of quality evaluations. This study found no significant direct impact of corporate quality on customer satisfaction (Bloemer, de Ruyter & Peeters, 1998).

7.2.3 Predictors of Attitudinal Loyalty

Hypothesis three states:

> Customer perceptions of service value, corporate image, together with customer satisfaction with the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in the customer's attitudinal loyalty towards the urban water utility.

The results displayed in table 6.9 show that service value ($\beta = 0.28$, $t = 4.36$, $p < 0.001$) and customer satisfaction ($\beta = 0.30$, $t = 4.57$, $p < 0.001$) predict about 20% of the variation in the customers' attitudinal loyalty towards the urban water utility (Adjusted R-square = 0.212, F=28.1, $p < 0.001$). Although the coefficient of determination for the regression model is medium, the results display a highly significant overall model fit, as evidenced by a high value of the F-statistic. The highly significant F-statistic provides support for the hypothesis that service value, corporate image and customer satisfaction, either individually or as a group of variables, predicts a significant variation in attitudinal loyalty. Contrary to the conceptual framework, however, the contribution of corporate image to the variation in customer satisfaction in the regression model is not statistically significant ($\beta = -0.07$, $t = -0.94$, ns), and the direction of the regression coefficient is negative.

Concerning the substantial contribution of customer satisfaction to service loyalty, the findings of this research are consistent with the results of similar studies conducted in various other service settings such as fast food services in the US (Cronin & Taylor, 1992); service firms in Sweden (Anderson & Sullivan, 1993; Anderson, Fornell & Lehmann, 1994); telecommunication, airline travel, recreation and health care services in the US (Taylor & Baker, 1994); and entertainment park, aerobic school and investment consulting services (Lee, Lee & Yoo, 2000). These findings extend the generalisation, to urban water services in low-income countries such as Uganda, about the dominant conceptual theory in services management that customer satisfaction is a strong predictor of customer loyalty.

The findings of this research also show that evaluations of service value and customer satisfaction in the urban water services sector in Uganda are almost equally important in predicting attitudinal loyalty. These findings are in agreement with the position taken by the author, as discussed in the conceptual framework in chapter four, that service value plays a vital role in customers' attitude towards payment of water bills. In the first instance, since Uganda is a low-income country, most households have little disposable income. As of 1997, Uganda's per capita gross national product was estimated at 333 US dollars, compared to the world per capita gross product of 5,257 US dollars (United Nations Development Program, 1999). According to a human development index compiled in 1997, Uganda was ranked as the 17th poorest country in the world (United Nations Development Program, 1999). It is, therefore, not surprising that the mean total household expenditure in Uganda's urban centres in 1996 was slightly lower than 170 US dollars per month (Uganda, Statistics Department, 1998), as shown in table 5.1 of chapter five. With such a small household disposable income lined up for a host of requirements, it makes economic sense for customers to make serious evaluations about the value of services being paid for.

The history of 'free water services' is another important factor in customer evaluations of service quality in the formation of customers' attitudes towards bill payment. As already discussed in section 2.2, in the past the national governments in most low-income countries, including Uganda, strived to offer their customers urban water services that were fully subsidized by the state, until the welfare programmes could no longer be sustained. Some customers still feel that 'water is a gift from heaven' and should, therefore, not be paid for. Such an attitude, which is part of evaluations of service value, has a direct influence on the customers' willingness to pay for water bills. These results are consistent with findings of case studies conducted in Nigeria (Whittington, Okarafor, Okore & McPhail, 1990); in

coastal provinces of India (Jacob, 1992); and in various other case studies carried out worldwide by The World Bank Water Demand Research Team (World Bank, 1993).

As already pointed out, the findings of this research showed that corporate image does not make a significant contribution on attitudinal loyalty towards payment of water bills. Furthermore, its regression coefficient displayed a negative sign, contrary to the hypothesized relationship. According to Lee, Lee and Yoo (2000), who obtained similar unexpected results, the direction of the relationship does not make any sense, more especially as it is far from being statistically significant, and should, therefore, be ignored. However, the unexpected direction of the relationship could also be a misinterpretation of the construct of corporate image by the respondents to mean that an organisation should strive to keep good relationships with its customers, at all costs. In such a case, customers would expect no tough action against customers who have not kept their obligations, such as disconnection of services in the case of non-payment of bills, or the taking of legal action against customers who use water services illegally. Such a misinterpretation amongst few respondents could result in a small negative regression coefficient for corporate quality.

Two previous studies that were reviewed in the literature also sought to establish the influence of corporate image on customer loyalty. A study conducted amongst customers of a touring services firm in Norway showed that corporate image, compared to customer satisfaction, predicted more variation in customers loyalty (Andreassen & Lindestad, 1998) . Conversely, a study carried out with the customer of retail banking services did not a find significant influence of corporate image on customer loyalty (Bloemer, de Ruyter & Peeters, 1998). From a comparison of the two studies with the current research, it is likely that the role of corporate image within customer evaluations depends on the degree of complexity of the service attributes. It appears that quality attributes of water services are more difficult to evaluate than banking services, but less complex than those of package tour services.

7.2.4 Predictors of Bill Payment Behaviour

Hypothesis four states:

> The four variables of service value, corporate image, customer satisfaction, and attitudinal loyalty for the urban water service offering will significantly predict, either individually or as part of a group of variables, some of the variation in the customer's bill payment behaviour.

The results displayed in table 6.9 indicate that only attitudinal loyalty makes a significant contribution to the customers' mean bill payment period (β = -0.25, t = -3.61, $p < 0.001$). As expected, the regression coefficient of attitudinal loyalty is negative, implying an inverse relationship. Although customer satisfaction and service value display the correct direction of relationship, none of them make a significant contribution to mean bill payment period. Nevertheless, the fact that the four predictor variables display a highly significant regression model with the criterion variable of bill payment behaviour (Adjusted R-square = 0.071, F=5.69, $p < 0.0010$), provides evidence of support for the research hypothesis, that service value, corporate image, customer satisfaction, and attitudinal loyalty predict either individually, or as part of a group of variables, a statistically significant portion of variation in bill payment behaviour.

As in the regression model, where attitudinal loyalty is the criterion variable, corporate image has displayed a regression coefficient which is opposite in direction to what was expected. As discussed in sub-section 7.2.3, the respondents could have 'overstretched' the implications of a good corporate image, and, since the size of the coefficient is very small, it should be ignored. Concerning customer satisfaction however, it is surprising that its regression coefficient is not significant. This non-significant regression coefficient is contrary to results, displayed in table 6.8, which show a significant pairwise correlation coefficient ($r = -0.1$, $p < 0.05$) between customer satisfaction and bill payment period. The regression analysis results could have been adversely affected by several inaccuracies encountered in the billing registers maintained by the water utility, reportedly as a result of the process of transition from manual records to computerised data bases.

The size of the variation in bill payment behaviour explained by the regression model in this sample is small, which is not entirely surprising. As already discussed in section 3.7, the link between attitude and actual behaviour is complex, and influenced by many other factors (Asseal, 1995; Kinnear & Taylor, 1996; Oliver, 1999). In the case of urban water services in low-income countries such as Uganda, one of the most important factors is the customer's ability to pay for the bills. Another factor that could influence bill payment behaviour is the temptation of getting the same services at a seemingly cheaper rate, through connivance with field staff, as pointed out by the former managing director of NWSC, the water utility (Onek, 1997). Irregular bill delivery, or non-billing, given the depressed income levels in most Uganda households, could also lead to the accumulation of water bills.

7.2.5 Moderator Effects on the Satisfaction-Loyalty Relationship

Hypothesis five states:

> The following household characteristics will have significant interaction effects on the relationship between customer satisfaction and the customer's attitudinal loyalty towards the urban water utility:
>
> a. Gender of the head of the household.
> b. Number of years spent by the head of the household in formal education.
> c. Type of employment held by the head of household.
> d. Number of people in the household.
> e. Ownership status of the residence occupied by the household.
> f. Type of premises occupied by the household.
> g. Household income.
> h. Use of alternative water supply by the household.

The results shown in table 6.9 indicate that five of the eight test variables have significant moderator effects on the relationship between customer satisfaction and attitudinal loyalty. The test variables with significant moderator effects are gender of the head of the household (partial $F = 39.5$, $p < 0.001$); level of education of the head of household (partial $F = 8.3$, $p < 0.001$); type of occupation of head of household (partial $F = 4.8$, $p < 0.01$); ownership status of premises occupied by the household (partial $F = 4.9$, $p < 0.01$); and estimated household income (partial $F = 5.3$, $p < 0.001$). Though not statistically significant at $\alpha = 0.05$, household size (partial $F = 2.5$, $p < 0.1$) and type of house (partial $F = 2.6$, $p < 0.1$) have substantial moderator effects on the relationship in question. However, the moderator effects exerted by use of alternative water by the household, are neither statistically significant nor are they substantial. From these findings, the research hypothesis that the eight household variables exert significant moderator effects on the satisfaction-loyalty relationship, is partially supported.

The author did not come across documented empirical research that has examined moderator effects of similar variables on the satisfaction-loyalty relationship in a public services setting. The closest studies

to the subject have been carried out on the effect of household variables on the willingness to pay for piped water services, which were done mainly through contingent valuation studies, prior to the provision of services. It is important to contrast the two cases. In the current research, the objective is to examine the moderator effect of the household variables on an existing business relationship, hence the term 'customer loyalty to the service firm'. In the willingness-to-pay studies, which have been discussed in section 2.4 of chapter two, the moderator effect of these variables was evaluated for prospective customers of a water service provider, which was being developed. Clearly, the issue of customer loyalty did not arise in the latter case. Notwithstanding the differences in the research objectives, it is important to compare the results, as both types of research work are intended to address the same research problem. A comparison of these results follows in the proceeding paragraphs.

The findings of this research support some of the results of similar case studies conducted in low-income communities of selected regions of Africa, Latin America and Asia, on the willingness-to-pay for improved water services (World Bank, 1993). A comparison of results between the two studies is shown in table 7.1.

Table 7.1: Comparison of Results of Two Studies on Effects of Household Characteristics on Paying for Water Services

Household characteristics	Current Research Research question: Do household characteristics moderate the relationship between satisfaction and customer loyalty?	Case studies by the World Bank Water Demand Team (World Bank, 1993) Research question: Do the household characteristics affect WTP for improved water service?
Gender of head of household	Highly significant moderator effects.	Women are willing to pay more for better water services than men.
Level of education of head of household	Highly significant moderator effects.	Highly educated household members are willing to pay more for improved water services than the poorly educated.
Type of employment of head of household	Highly significant moderator effects.	Respondents employed in the formal sector have a higher WTP for improved water services than those employed in the informal sector.
Family size	No significant moderator effects.	No significant effect

(WTP: Willingness-to-pay)

As can be seen from table 7.1, the two studies have similar results in relation to all the common characteristics that were examined by both studies. In both studies hypotheses about moderator effects of gender, education level, and type of employment, all concerned with the head of household, were supported. Conversely, both results show that family size does not have significant moderator effects on the relationships examined. The similarity of the patterns in results from the two studies conducted in diverse places, at different times, strengthens the validity and reliability of the research instrument utilised in the current study.

For five out of eight sub-hypotheses, the findings of this research are consistent with the conceptual theory that was proposed in chapter four. The findings show that for a given level of satisfaction, women are more likely to pay for their water bills, than men. This is in line with the conceptual reasoning presented in chapter four that in most households in Uganda, women have the responsibility for provision of basic necessities that require water, such as preparation of food and general hygiene in the home. It is not surprising, therefore, that women are more keen on payment of water bills, so that provision of services is ensured.

The role of level of education of the head of the household on the satisfaction/loyalty relationship was confirmed, as hypothesized in the conceptual framework. It appears that education improves the awareness of decision-makers in the home, such that they attach more value to a better quality water source. Furthermore, compared to the poorly educated people, those with higher education are more likely to gain better access to global economic trends through electronic and print media, as well as the internet. This exposure to global economic trends results in increase in the 'psychological value' of water services, through appreciation of the economic value of potable water.

The results of this study show that heads of households who are engaged in formal employment, have a higher willingness to pay for water bills, than heads of households in informal employment. These moderator effects seem to stem from the fact that people employed in formal employment get monthly wages/salaries at the end of the month, which period coincides with the billing cycle of the water utility. Conversely, people employed in informal employment get their wages in discrete bits, almost on a daily basis; when the water bills are delivered at the end of the month, these households are most likely to have spent all the money on other necessities of life, and cannot pay the bills in time.

Consistent with the discussion on the conceptual framework, ownership status of the house being occupied has significant moderator effects on the satisfaction/loyalty relationship. Since water service connections in Uganda are registered in the name of the landlords, the water bills are also dispatched in the names of landlords. Due to various reasons mentioned in section 4.3, change of occupancy is a common occurrence for tenants in urban areas of Uganda. The results of this study show that for a given satisfaction level, families staying in houses owned by the household have a higher willingness to pay for water bills, than those staying in rented premises. Since households which stay in rented premises do not enter into a legal contract with the water utility, they have a lower willingness to pay for water bills, as they feel no legal obligation to the water utility.

The findings of this study show that estimated income levels moderate the satisfaction/loyalty relationship. As hypothesized in the conceptual framework, households with a higher estimated income have a higher willingness to pay than those households with a lower estimated income. Not only do families with a higher income have a higher affordability to pay, but are also those households most likely to live in family-owned premises, as well as to have heads of families who are highly educated. The results of this study support the relationship of household income with the level of education of the head of house hold ($\rho = 0.24$, $p < 0.01$); and with ownership status of the premises ($\rho = 0.20$, $p < 0.01$).

For the three sub-hypotheses about household size, type of premises, and use of alternative water sources, the results may not have been significant due to inaccuracies in the data for various reasons. For the household size, a number of African cultures consider it to be taboo to 'count' the number of children in a home. Consequently, some respondents may have falsified the household size intentionally. Another cause of inaccuracies in the size of household could be under-declaration of the numbers, just in case the water utility needs to use a flat tariff rate based on household size, as in the case of a meter failure. For the type of premises, respondents may not want to tell the truth if families are sharing the same building, as it is considered socially demeaning.

In the case of alternative water sources, probable inaccuracies are confounded by the confusion about the conceptual definition of 'alternative water sources'. According to the results, 253 respondents (48%) reportedly use alternative sources. However, of that number, 168 respondents use either "a utility tap elsewhere", "water vendors", and/or "tanker water", sources which are, to a great extent, mere service options of the utility water supply. It would seem that most consumers use alternative service options as a coping strategy in the event of non-availability of piped water in the home, for one

reason or another. The reasons for non-availability of tap water in the home could be either disconnection due to non-payment, or water supply shortage. Other economic reasons, which are particularly applicable to household using off-plot utility water taps, could be either (i) owners of private connections opting for cheaper water services at public taps in certain circumstances; or (ii) customers who opt for services which are perceived as 'free', such as illegal connections, or connections paid by government institutions with limited control.

7.3 CONCLUSIONS ABOUT THE RESEARCH PROBLEM

To reaffirm, the research question this study has sought to investigate is:

> **What influence do customer perceptions of service attributes have on recovering costs of urban utility water services in low-income countries?**

The findings of this research provide strong evidence that customer perceptions of service attributes highly influence the customers' bill payment behaviour, hence the cost recovery levels of urban utility water services. Based on the empirical research findings, the prediction research model proposed in chapter 4 could be modified as shown in figure 7.1.

Figure 7.1 indicates the links that are supported by the research findings. Using standardised regression coefficients, the direction and strength of the associational relationships are also indicated within the revised prediction research model. The patterns of influence are similar to those which services marketing researchers in other parts of the world have found in the private sector service industry.

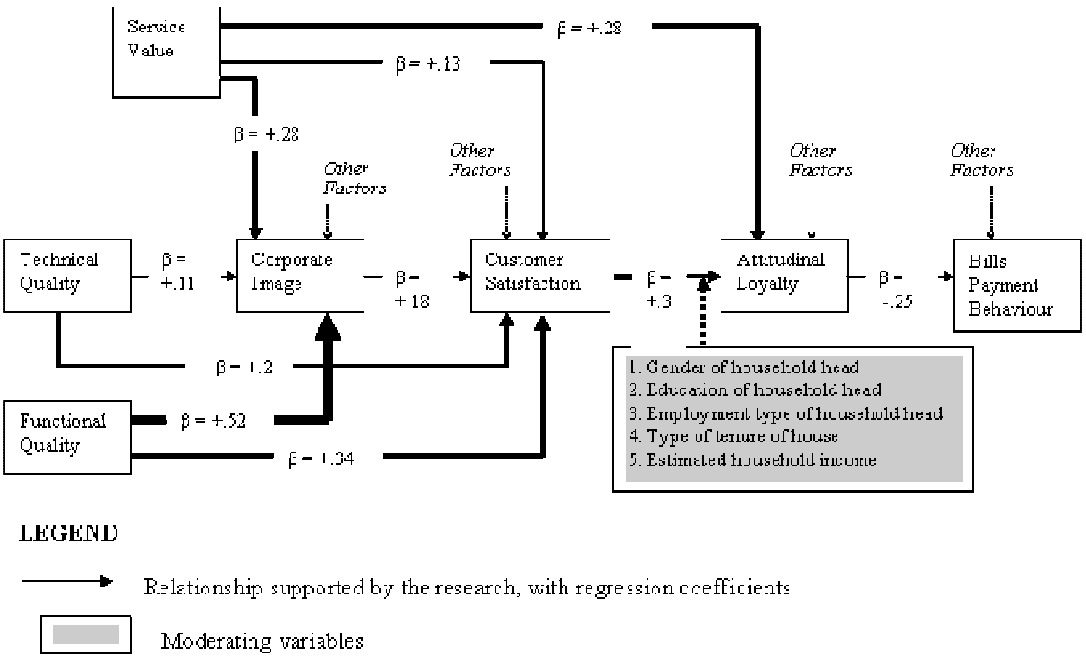


Figure 7.1: The Revised Prediction Research Model Based on the Results of This Study

As discussed in Section 7.2, the revised model shows that the primary variables of technical quality, functional quality, service value, and corporate image are positively related to customer satisfaction. Customer satisfaction, together with perceptions of service value, are in turn directly positively related to the customers' self-reported attitudinal loyalty towards payment of water bills. The empirical results of this research also provide evidence of a negative relationship between customers' self-reported (subjective) attitudinal loyalty, and the key variable of an objectively verifiable mean bill payment period. Furthermore, the study provides evidence that some household characteristics, shown in a shaded box in figure 7.1, moderate the relationship between satisfaction and customer loyalty.

The findings of this research show that customers' evaluations of service value contribute directly to the variation in corporate image, customer satisfaction, and customer loyalty, as can be seen in the schematic diagram in figure 7.1. These empirical data are consistent with the conceptual position taken by the author that evaluations of the benefits, compared to the price, are expected to play a vital role in a business environment where, (i) water services were in the past being provided at no cost to the consumer; and (ii) income levels for most households are low, compared to the global average.

What is surprising, though, is the discovery that 'effort value' explains the largest variation in the variable of service value, i.e. 55% of the total variance explained. In the survey questionnaire, 'effort value' was tapped by the following constructs: (i) the simplicity and clarity of the bills to the customer; (ii) the accuracy of the bills; (iii) the convenience of the billing cycle; (iv) the timeliness of bills delivery to the household; (v) the method of bill delivery to the household; and (vi) the convenience of options and processes of making payments to the water utility. These findings seem to underline the relative importance of sacrifice, as a result of poor process quality, in the customers' evaluation of service value, as to compared the monetary sacrifice.

It worthwhile re-examining the results of factor analysis in order to gain more insight into the composition of the primary research variables. This analysis in turn increases understanding of the research problem. From the results of exploratory factor analysis presented in subsection 6.3.2, the service attributes that explained the largest variance in technical quality were related to recovery of service. Service recovery processes are those activities that a service organisation undertakes to address customer complaints regarding service failures (Spreng, Harrell & Mackoy, 1995). The variance in functional quality was mainly explained by the attributes of staff personal skills, similar to the SERVQUAL dimensions of reliability, responsiveness, assurance and empathy. As indicated in the previous paragraph, 'effort value' explained 55% of the total variance, and was tapped by items concerned with customers' efforts expended on tasks to ensure continued water services to the households, which is inversely related to efficiency and effectiveness of utility staff. On the basis of these results, it can be noted that attributes of service which customers perceived to be important are those concerned with staff skills and personality characteristics, i.e. 'software' quality attributes, rather than the 'hardware' quality attributes.

The relative importance customers attach to 'software' quality attributes of the utility water services is evidence of inferior performance in this set of attributes. Indeed this is further supported by the mean scores on the primary variables: out of a maximum Likert scale score of 5, technical quality scored the highest, with a mean of 3.76, followed by functional quality with a mean of 3.5, and service value and corporate image, both with scores of 3.39 (refer to table 6.7 for more details). These results are consistent with findings of a previous descriptive study carried out by the author, which established that this particular water utility is not only technically biased, but also largely supply-driven (Kayaga, 1997a; Kayaga & Franceys, 1998). These results seem to be advancing a case that in order for water utilities to improve their business performance, management should adopt a marketing orientation as

their business philosophy (Kayaga & Franceys, 1998). There is a growing consensus among development workers that despite the levels of poverty prevailing in low-income countries, many households are able and willing to pay for watsan services if urban water utilities are customer orientated (Estache, 1994).

In summary, this research project has fulfilled the tasks it set out to achieve, thus:

Data obtained by the research were able to adequately show that customer perceptions of technical quality, functional quality, service value, corporate image and customer satisfaction influence the customers' attitudes towards paying for water services, which in turn directly affect the bill payment behaviour. As discussed in chapter two, promptness of bill payment is the one of the main ways to ensure sustainable cost recovery. Furthermore, the research showed that the following household characteristics have moderator effects on the relationship between satisfaction and customer loyalty: gender, level of education, and type of employment of the head of household; type of tenure occupied by the household; and estimated household income.

This research has contributed to two main bodies of knowledge, as follows:

1. <u>Urban water services management:</u>

    a. The application of services marketing and behavioural science principles to study cost recovery has supplemented the economics-based knowledge that is dominant in the urban water services management discipline.

    b. Minimal empirical data is available on the influence of customer perceptions on Willingness-To-Pay for urban water services in low-income countries.

    c. Most of the Willingness-To-Pay surveys have used a contingent valuation method, for new water sources, or for different characteristics. This research used the conventional cross-sectional survey to solicit consumers' perceptions and attitudes.

d. Literature reviewed shows that most of previous research on Willingness-To-pay surveys has been carried out in rural areas. This research provides data on customers of an urban water utility.

e. This research provides an extensive conceptual model linking various customer perceptions that can be utilised by utility managers for predictive and diagnostic purposes.

f. This research also extends knowledge on household characteristics that moderate the relationship between customer satisfaction and willingness-to-pay for water services.

2. Services Marketing/Management

a. This research extends knowledge on service quality/satisfaction/loyalty models in the public sector services.

b. The findings also add to the existing knowledge by extending generalisations to Uganda, and probably to low-income countries.

c. This research extends the knowledge on the use of performance-only perceptions of service quality.

d. The research findings adds to the knowledge on the use of Gronroos' (1984) Technical Quality/Functional Quality framework.

e. This is one of the few studies that has empirically tested the influence of service quality, service value, corporate image, and customer satisfaction on customer loyalty, simultaneously.

f. This is one of the few studies that have empirically examined the moderator effects of household characteristics on the relationship between customer satisfaction and customer loyalty.

g. This is one of the few studies that have studied the link between attitudinal loyalty and actual behaviour.

CHAPTER EIGHT

RESEARCH IMPLICATIONS

8.1 CHAPTER INTRODUCTION

This chapter concludes the research report by drawing important implications from the research findings, based on the conclusions presented in chapter seven. The reminder of chapter eight is structured as follows:

- Section 8.2 lists implications for policy and practice
- Section 8.3 describes limitations of the research
- Section 8.4 gives suggestions for further research.

8.2 IMPLICATIONS FOR POLICY AND PRACTICE

Based on the findings of this research, below is a list of implications for policy-makers and managers of urban water services utilities in low-income countries. The implications are presented under two classifications: the broad issues derived from the research problem, and specific issues derived from the individual research questions.

A. Broad issues derived from the research problem

1. Water utility managers should adopt a business philosophy that is customer oriented, in order to not only increase their cost recovery levels, but improve general business performance. Customer orientation is defined as an organisational culture that puts the customers' interests first, while not excluding the interests of other stakeholders, in order to ensure sustainability of service provision (Deshpande, Farley & Webster, 1993).

2. While not neglecting the core, 'hard', or technical quality attributes, water service utilities should put more emphasis on the quality of service originating in the interaction between the customers and the organisational elements like staff and the service environment. Service orientation of staff can best be developed through introduction of an internal customer

orientation philosophy in the organisation. Through this philosophy, top management is able to get every member of the organisational team focused towards customer needs.

3. The major organisation-controlled factor of service loyalty is customer satisfaction. Therefore, in order to improve bill payment behaviour, managers should not only measure customer satisfaction regularly, but should also manage customer satisfaction. Figure 8.1 provides a schematic diagram of an example of a practical methodology for customer satisfaction management.

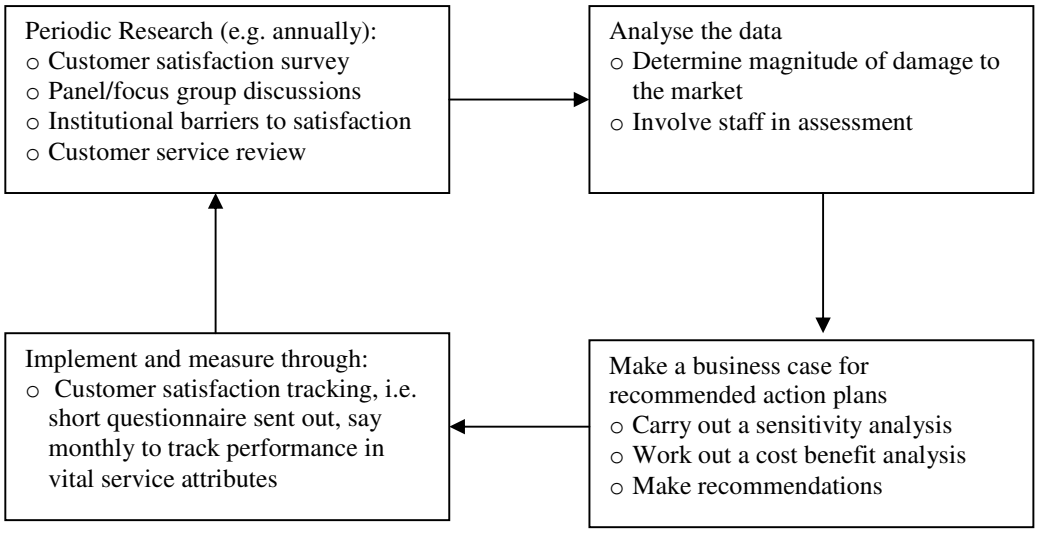


Figure 8.1: An Example of a Practical Methodology for Managing Customer Satisfaction

Source: Adapted from Broetzmann, Kemp, Rossano and Marweha, (1995).

B. Specific Issues derived from individual research questions

1. Water utility managers should influence customers' evaluation of the value of water services provided, if customer satisfaction and customer loyalty are to be increased. This can be accomplished through the following measures:

a. Reducing the customers' monetary sacrifice by increasing efficiency in production, distribution and other management costs.

b. Increasing the perceived benefits obtainable from objectively verifiable end products of the service, through increasing the physical-chemical/biological quality of the product, and increasing continuity and reliability of services.

c. Increasing the psychological value through sensitisation programmes so that customers are aware that not only are water services cost-intensive in terms of capital costs, treatment and distribution cost, but that water is an economic good that should be paid for in order to preserve it for future generations.

d. Reducing the effort costs or sacrifice customers undergo through difficulties experienced in getting their complaints attended to; efforts in getting bills corrected; inconveniences experienced in payment procedures and processes, etc.

2. In order to improve the corporate image, water utility managers should provide high service quality (with more emphasis on the functional quality), rather than relying on *mainly* the traditional promotional tools such as advertising and public relations management.

3. Water utility managers should set up a continuous information service system to its customers to enable them to gain more knowledge on the process of water and sanitation provision and how to evaluate the technical quality of the end products. Apart from appreciating the value of water services, a more informed clientele will be able to evaluate the quality of services based more on objective indicators, than relying on other non-technical subjective indicators, such as functional quality and corporate image.

4. Water utility managers should take advantage of the higher loyalty exhibited by women to improve cost recovery. With the gender mainstreaming movement sweeping many low-income countries, women are increasingly becoming major equal partners on household budgetary issues. It is anticipated that media messages and other types of information targeted at the women in the households will yield more positive payment behaviour for water bills.

5. Water utility managers should devise means of creating legal contracts directly with the consumers, to get them contractually liable for bills sent on account of water services supplied to them, other than creating contracts with only the landlords.

6. Based on the finding that the level of formal education positively modifies the satisfaction/loyalty relationship, the water utility managers should sponsor school programmes aimed at educating the young generation on the basic principles of the need for cost recovery for water services. The pupils and students will, in addition to gaining knowledge for their benefit, also work as change agents with the older members of the households.

7. The fact that 'type of tenure of house occupied', 'estimated income level' , and to some extent 'employment type of household head' have moderator effects on the satisfaction/loyalty relationship calls for the water utility to carry out market segmentation, possibly along these geo-demographic characteristics (Wilson & Gilligan, 1997). Subsequently, different service levels, at differentiated prices, can be designed and targeted at the appropriate market segments, for the benefit of all stakeholders.

8.3 LIMITATIONS OF THIS RESEARCH

The following limitations to the research have been noted:

- The survey questionnaire was sent under the sponsorship of the NWSC, the urban water utility whose customers participated in the research. This could have created 'strategic biases' within some respondents. A strategic bias might occur when a respondent does not answer the question(s) truthfully in order to influence the provision of the service in his/her favour (Evans, 1992). However, the results of psychometric analysis of obtained data for show that this bias did not significantly affect the outcome of the research.

- The non-attitude and middle position (i.e. neutral answer) used in the Likert scales in the questionnaire could have affected the strength of the relationships, as a fair number of respondents who selected the 'neutral' score could have been non-committal on their actual position.

- There was some loss of data due to missing entries in the data. This could have been due to the low literacy rates in Uganda. However, the achieved response rate (78%) was high enough to counteract effects due to missing values.

- Because of the low literacy levels in Uganda, the questionnaires had to be interpreted to a portion of the sample who indicated preference for that method of questionnaire administration. Furthermore, it is likely that some respondents might not have understood all the questions, although they did not opt for questionnaire enumeration. However, even for those respondents for whom the questionnaire was interpreted in local languages, there could have been a loss of precision in the meaning of the constructs, due to a lack of corresponding terminologies. Nonetheless, the results of the psychometric analysis showed that respondents showed a high level of consistency in their answers.

- There could have been some inaccuracies in the data collected on household characteristics, because respondents may not have provided truthful data. According to the culture of most nationalities in Uganda, and many low-income countries, family information should not be easily divulged to strangers. However, these few inaccuracies could only have slightly affected the strengths of the moderator relationships, as the results were consistent with the findings of previous case studies.

- There were some inaccuracies in the water utility's billing data bank, reportedly as a result of the process of transition from manual records to a computerised data base. Although some outlying values were identified, cross-checked and doubtful entries omitted from the data analysis, inaccurate entries which were within the acceptable range, and were therefore not influential to the regression line could not be spotted as outliers. The inclusion of such observations in the analysis could have affected the stability of the findings. However, the fact that the regression model displayed a very highly significant regression model fit ($F= 5.69$, $p < 0.001$) provides evidence that the inaccuracies in the data did not have a large effect on the regression fit, but could have had effects on the R-square value.

8.4 SUGGESTIONS FOR FURTHER RESEARCH

- Because this research was a cross-sectional survey, it could only derive correlational relationships between the variables. It would be more beneficial to water utility managers if causal research was carried out using a longitudinal and/or experimental research design.

- In order to gain a better understanding of the subject, further research should utilise a quantitative methodology, combined with more elements of qualitative methodology.

- Owing to the structure of the urban water sector in Uganda, only customers of a monopolistic water utility were sampled. It is suggested that this study be replicated within the urban water services sector in other low-income countries in order to generalise the findings.

REFERENCES

AAKER, D.A., AND JACOBSON, R., 1994. The Financial Information Content of Perceived Quality. *Journal of Marketing Research*, 31(May 1994), 191-201.

ABRATT, R., 1989. A New Approach to the Corporate Management Process. *Journal of Marketing Management*, 5(1), 63-76.

ACHEN, C.H., 1982. *Interpreting and Using Regression*. Quantitative Applications in Social Sciences. London: Sage Publications, Inc.

AKAN, P., 1995. Dimensions of Service Quality: A study in Istanbul. *Managing Service Quality,* 5(6), 39-43.

ALTAF, M.A., WHITTINGTON, D., JAMAL, H., AND KERRY, V.K., 1993. Rethinking Rural Water Supply Policy in Punjab, Pakistan. *Water Resources Research*, 29(7), 1943-1954.

AMYX, D., MOWEN, J.C., AND HAMM, R., 2000. Patient Satisfaction: A matter of Choice. *Journal of Services Marketing*, 14(7), 557-572.

ANDALEEB, S.S., AND BASU, A.K., 1994. Technical Complexity and Consumer Knowledge as Moderators of Service Quality Evaluation in the Automobile Service Industry. *Journal of Retailing*, 70(4), 367-381.

ANDERSON, E.W., AND SULLIVAN, M.W., 1993. The Antecedents and Consequences of Customer Satisfaction for Firms. *Marketing Science*, 12(2), 125-143.

ANDERSON, E.W., FORNELL, C. AND LEHMANN, D.R., 1994. Customer Satisfaction, Market Share, and Profitability. *Journal of Marketing*, 58(July 1994), 53-66.

ANDREASSEN, T.W., 1994. Satisfaction, Loyalty and Reputation as Indicators of Customer Orientation in the Public Sector. *International Journal of Public Sector Management*, 7(2), 16-34.

ANDREASSEN, T.W., 1995. (Dis)satisfaction with Public Services: The Case of Public Transportation. *Journal of Services Marketing*, 9(5), 30-41.

References

ANDREASSEN, T.W., AND LINDESTAD, B., 1998. Customer Loyalty and Complex Services: The Impact of Corporate Image on Quality, Customer Satisfaction and Loyalty for Customers with Varying Degrees of Service Expertise. *International Journal of Service Industry Management,* 9(1), 7-23.

ARMSTRONG, J., AND OVERTON, T.S., 1977. Estimating Non-response Bias in Mail Surveys. *Journal of Marketing Research*, 16(August 1977), 396-402.

ARNDT, J., 1978. How Broad Should the Marketing Concept Be? *Journal of Marketing*, 42(January 1978), 101-103.

ARSHAM, H., 1999. *Statistical Data Analysis: Prove it with Data* [online]. Available at http://ubmail.ubalt.edu/~harsham/stat-data/opre330.htm [accessed on July 2, 2000].

ASIAN DEVELOPMENT BANK, 1999. *Handbook for the Economic Analysis of Water Supply Projects.* [online]. Available at <URL:http://www.adb.org/publications/online/water/> [accessed 03 January 2000].

ASSAEL, H., 1995. *Consumer Behaviour and Marketing Action*, 5th ed. New York (USA): South-College Publishing.

ASTHANA, A.N., Household Choice of Water Supply Systems. In: Pickford, J., ed. *23rd WEDC Conference on Water and Sanitation for All: Partnerships and Innovations,* pp 259-262, , 1-4 September 1997, Durban, South Africa. Loughborough: Loughborough University.

ASUBONTENG, P., MCCLEARY, K.J., AND SWAN, J.E., 1996. SERVQUAL Revisited: A Critical Review of Service Quality. *The Journal of Services Marketing*, 10(6), 62-81.

ATHIYAMAN, A., 1997. Linking Student Satisfaction and Service Quality Perceptions: The Case of University Education. *European Journal of Marketing*, 31(7), 528-540.

ATUAHENE-GIMA, K., 1996. Market Orientation and Innovation. *Journal of Business Research*, 35, 93-103.

AVKIRAN, N.K., 1994. Developing an Instrument to Measure Customer Service in Branch Banking. *International Journal of Bank Marketing*, 12(6), 10-18.

References

BABAKUS, E., AND BOLLER, G.W., 1992. An Empirical Assessment of the SERVQUAL Scale. *Journal of Business Research*, 24, 253-268.

BABBIE, E. AND HALLEY, F., 1995. *Adventures in Social Research: Data Analysis Using SPSS for Windows*. Thousand Oaks (USA): Pine Forge Press.

BABBIE, E.R., 1973. *Survey Research Methods*. Belmont (USA): Wadsworth Publishing Company, Inc.

BAHIA, K., AND NANTEL, J. 2000. A Reliable and Valid Measurement Scale for Perceived Service Quality of Banks. *International Journal of Bank Marketing*, 18(2), 84-91.

BARCELLOS, P.F.P, 1998. *Quality and Customer Satisfaction: A Case Study in Brazil (Electric Utilities)* [online]. Ph.D. dissertation preview, Marquette University. Available at <URL:http://wwwlib.umi.com/dissertations/preview_all?9904998> [accessed 20 November 1999].

BARKER, P., 1997. Cost-based water prices. In: Pickford, J., ed. *23rd WEDC Conference on Water and Sanitation for All: Partnerships and Innovations,* pp. 222-225*,* 1-4 September 1997, Durban, South Africa. Loughborough: WEDC, Loughborough University.

BARKER, P.J, 1992. Cost Recovery, Charges and Efficiency. In: Pickford, J., ed. *18th WEDC Conference on Water, Environment and Management,* pp. 81-84, 30 August -3 September 1992*,* Kathmandu, Nepal. Loughborough: WEDC, Loughborough University of Technology.

BARON, R.M., AND KENNY, D.A., 1986. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.

BARTELS, R., 1988. *The History of Marketing Thought*, 3rd ed. Columbus OH: Publishing Horizons, Inc.

BEDRICK, E., 1999. *Handouts for Data Analysis I and II* [online]. Available at http://www.math.unm.edu/~bedrick/ma347/folder.html [Accessed on June 28, 2000].

BERNSTEIN, D., 1984. *Company Image and Reality: A Critique of Corporate Communications.* Eastbourne: Rinehart and Winston Ltd.

References

BERRY W.D., 1993. Understanding Regression Assumptions. In: Lewis-Beck, M.S., ed. *Regression Analysis, International Handbooks of Quantitative Applications in the Social Sciences, Vol. 2*, pp.335-424. London: Sage Publications, Inc.

BERRY, L.L., AND PARASURAMAN, A., 1993. Building a New Academic Field – The Case of Services Marketing. *Journal of Retailing*, 69(1), 13-59.

BERRY, W.D., AND FELDMAN, S. 1993. Multiple Regression in Practice. In: Lewis-Beck, ed. *Regression Analysis, International Handbooks of Quantitative Applications in the Social Sciences, Vol. 2*, pp. 159-244. London: Sage Publications, Inc.

BHARADWAJ, S.G., VARADARAJAN, P.R., AND FAHY, J., 1993. Sustainable Competitive Advantage in Service Industries: A Conceptual Model and Research Propositions. *Journal of Marketing*, 57(October 1993), 83-99.

BITNER, J.M., BOOMS, B.H., AND TETREAULT, M.S., 1990. The Service Encounter: Diagnosing Favourable and Unfavourable Incidents. *Journal of Marketing*, 54(January 1992), 71-84..

BITNER, M.J., 1990. Evaluating Service Encounters: The Effects of Physical Surroundings and Employee Responses. *Journal of Marketing*, 54(April 1990), 69-82.

BITNER, M.J., 1992. Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing*, 56(April 1992), 57-71.

BLOEMER, J., de RUYTER, K., AND PEETERS, P., 1998. Investigating Drivers of Bank Loyalty: The Complex Relationship Between Image, Service Quality and Satisfaction. *International Journal of Bank Marketing,* 16(7), 276-286.

BLOEMER, J., AND de RUYTER, K., 1999. Customer Loyalty in High and Low Involvement Service Settings: The Moderating Impact of Positive Emotions. *Journal of Marketing Management*, 15, 315-330.

BLOEMER, J., de RUYTER, K., AND WETZELS, 1999. Linking Perceived Service Quality and Service Loyalty: A Multi-dimensional Perspective. *European Journal of Marketing*, 33(11/12), 1082-1106.

BLOKLAND, M., AND BRAADBAART, O., 1997. *An Overview of the Urban Water Industry: Governance, Public verses Private, and Performance*. Unpublished paper presented to a workshop, Water Utility Partnership (WUP) for Capacity Building, Kampala, Uganda; 13-17 October 1997.

BLOKLAND, M., BRAADBAART, O., AND SCHWARTZ, K., eds. 1999. *Private Business, Public Owners: Government Shareholdings in Water Enterprises*. The Hague: Water Supply and Sanitation Collaborative Council.

BOHM, R.A., ESSENBURG, T.J., AND FOX, W.F., 1993. Sustainability of Potable Water Services in the Philippines. *Water Resources Research*, 29(7), 1955-1963.

BOHRNSTEDT, G.W., AND KNOKE, D., 1982. *Statistics for Social Data Analysis*. Illinois: F.E. Peacock Publishers, Inc.

BOLTON , R.N., AND LEMON, K.N., 1999. A dynamic Model of Customers' Usage of Services: Usages as an Antecedent and Consequence of Satisfaction. *Journal of Marketing Research*, 36(May 1999), 171-186.

BOLTON, R.N., 1998. A dynamic Model of the Duration of the Customer's Relationship with a Continuous Service Provider: The Role of Satisfaction. *Marketing Science,* 17(1), 45-65.

BOLTON, R.N., AND DREW, J.H., 1991. A Longitudinal Analysis of the Impact of Service Changes on Customer Attitudes. *Journal of Marketing*, 55(January 1991), 1-9.

BOULDING, W., KALRA, A., STAELIN, R., AND ZEITHAML, V., 1993. A Dynamic Process Model of Service Quality: From Expectations to Behavioural Intentions. *Journal of Marketing Research,* 30(February 1993), 7-27.

BOUMAN, M., AND WIELE, T., 1992. Measuring Service Quality in the Car Service Industry: Building and Testing an Instrument. *International Journal of Service Industry Management*, 3(4), 4-16.

BOURBQUE, L.B. AND FIELDER, E.P., 1995. *How to Conduct Self-administered and Mail Surveys*, The Survey Kit No. 3, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

BOYLE, E., 1996. An Experiment in Changing Corporate Image in the Financial Services Industry in the UK. *The Journal of Services Marketing*, 10(4), 56-69.

BRIKKE, F.,AND ROJAS, J., 2001. *Seven Key Factors for Sustainable Cost Recovery in the Context of Community Managed Water Supply*. Draft IRC occasional paper presented at 1st expert meeting on "Towards Sustainable Cost Recovery of Low-Income Urban and Rural Water Supply and Sanitation Services", 1-2 February, 2001, IRC, Delft, Holland.

BRISCOE, J. AND DE FERRANTI, D., 1988. *Water for Rural Communities: Helping people Help Themselves*. Washington DC: World Bank.

BRISCOE, J., 1997. Managing Water as an Economic Good: Rules for the Reformers. *Water Supply*, 15(4), 153-172.

BROETZMANN, S.M., KEMP, J., ROSSANO, M., AND MARWAHA, J., 1995. Customer Satisfaction – Lip Service or Management Tool? *Managing Service Quality*, 5(2), 13-18.

BROGOWICZ, A.A., DELENE, L.M., AND LYTH, D.M., 1990. A Synthesised Service Quality Model with Managerial Implications. *International Journal of Service Industry Management*, 1(1), 27-45.

BROOKSHIRE, D.S., AND WHITTINGTON, D., 1993. Water Resources Issues in the Developing Countries. *Water Resources Research*, 29(7), 1883-1888.

BROWN, M.G., 1993. Why Does Total Quality Fail in Two of Three Ties? *Journal of Quality and Participation*, 16(2), 80-89.

BROWN, T.J, CHURCHHILL, JR., G.A., AND PETER, J.P., 1993. Improving the Measurement of Service Quality. *Journal of Retailing*, 69(1), 127-139.

BRYMAN, A. AND CRAMER, D. 1997. *Quantitative Data Analysis with SPSS for Windows*. London: Routledge.

BURNS, A.C, AND BUSH, R.R., 1995. *Marketing Research*. New Jersey: Prentice-Hall.

BUTLER, P., AND COLLINS, N., 1995. Marketing Public Sector Services: Concepts and Characteristics. *Journal of Marketing Management*, 11, 83-96.

BUTTLE, F., 1996. SERVQUAL: Review, Critique, Research Agenda. *European Journal of Marketing*, 30(1), 8-32.

CADOTTE, E.E., WOODRUFF, R.B., AND JENKINS, R.L., 1987. Expectations and Norms in Models of Consumer Satisfaction. *Journal of Marketing Research*, 24(August 1987), 305-314.

CARMAN, J.M., 1990. Consumer Perceptions of Service Quality: An Assessment of the SERVQUAL Dimensions. *Journal of Retailing*, 66(1), 33-55.

CARMAN, J.M., 2000. Patient Perceptions of Service Quality: Combining the Dimensions. *Journal of Retailing*, 66(1), 33-55.

CARUANA, A., MONEY, A.H., BERTHON, P.R., 2000. Service Quality and Satisfaction – The Moderating Role of Value. *European Journal of Marketing*, 34(11/12), 1338-1352.

CHADEE, D.D., AND MATTSSON, J., 1996. An Empirical Assessment of Customer Satisfaction in Tourism. *The Service Industries Journal*, 16(3), 305-320.

CHADWICK, L., 1991. *The Essence of Financial Management, The Essence of Management Series*, Buckley, A., Series Editor. London: Prentice Hall.

CHANG, T., AND CHEN, S., 1998. Market Orientation, Service Quality and Business Profitability: A Conceptual Model and Empirical Evidence. *The Journal of Services Marketing*, 12(4), 246-264.

CHEN, H.C.K., 1996. Direction, Magnitude and Implications of Non-response Bias in Mail Surveys. *Journal of the Market Research Society*, 38(3), 267-275.

CHIOKE, U.P., 1995. *Proposals for Water Supply Improvements for Enugu Metropolis, Nigeria*. Unpublished MSc Thesis, Loughborough University of Technology, UK.

CHOE, K., VARLEY, R.C.G., AND BIJLANI, H.U., 1996. *Coping With Intermittent Water Supply: Problems and Prospects*. Environmental Health Project, Activity Report No. 26. Washington: U.S. Agency for International Development (USAID).

CHURCHILL, G.A., JR., AND SURPRENANT, C., 1982. An Investigation into Determinants of Customer Satisfaction. *Journal of Marketing Research*, 19, 491-504.

COLLINGE, R.A., 1992. Revenue Neutral Water Conservation: Marginal Cost Pricing with Discount Coupons. *Water Resources Research*, 28(3), 617-622.

References

COOK, S., 1992. *Implementing Total Quality Management in Today's Service-driven Organisation.* London: Clays Ltd, St Ives p/c.

COOLICAN, H., 1994. *Research Methods and Statistics in Psychology*, 2nd ed. London: Hodder & Stoughton.

COWELL, D.W., 1991. *The Marketing of Services*, 2nd ed. London: Butterworth Heinmann.

CRAMER, D., 1994. *Fundamental Statistics for Social Research: Step-by-step Calculations and Computer Techniques using SPSS for Windows*. London: Routledge.

CRAN, D.J., 1994. Towards Validation of the Service Orientation Construct. *The Services Industries Journal*, 14(1), 34-44.

CRESWELL, J.W., 1994. *Research Design Qualitative and Quantitative Approaches*, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

CRONIN, JR. J.J., BRADY, M., AND HULT, G.T.M., 2000. Assessing the Effect of Quality, Value, and Customer Satisfaction on Consumer Behavioural Intentions in Service Environments. *The Journal of Services Mar*keting, 11(6), 375-391.

CRONIN, JR. J.J., BRADY, M., BRAND, R.R., HIGHTOWER, JR., R., AND SHEMWELL, D.J., 1997. A Cross-sectional Test of the Effect and Conceptualisation of Service Value. *Journal of Retailing*, 11(6), 375-391.

CRONIN, JR., J.J., AND TAYLOR, 1992. Measuring Service Quality: A Re-Examination and Extension. *Journal of Marketing*, 56(July 1992), 55-68.

CRONIN, JR., J.J., AND TAYLOR, 1994. SERVPERF Versus SERVQUAL: Reconciling Performance-Based and Performance-Minus-Expectations Measurement of Service Quality. *Journal of Marketing*, 58(January 1994), 125-131.

DABHOLKAR, P.A., SHEPERD, C.D., AND THORPE, D.I., 2000. A Comprehensive Framework for Service Quality: An Investigation of Critical Conceptual and Measurement Issues Through a Longitudinal Study. *Journal of Retailing*. 76(2), 139-173.

DALLEY, G., 1988. *Ideologies of Caring: Rethinking Community and Collectivism*. London: Macmillan.

DANAHER, P., AND MATTSSON, J., 1994. Customer Satisfaction During the Service Delivery Process. *European Journal of Marketing*, 28(5), 5-16.

DANAHER, P.J., AND GALLAGHER, R.W., 1997. Modelling Customer Satisfaction in Telecom New Zealand. *European Journal of Marketing*, 31(2), 122-133.

DAS, M., DAS, S., AND MACKENZIE, F., 1996. Satisfaction with Town Services: Do User Experience and Satisfaction Count? *The Service Industries Journal*, 16(2), 191-206.

DAVIS, M.M., AND HEINEKE, J., 1998. How Disconfirmation, Perception and Actual Waiting Times Impact Customer Satisfaction. *International Journal of Service Industry Management,* 9(1), 64-73.

DAY, G.S., 1990. *Market-Driven Strategy: Processes for Creating Value*. New York: Free Press.

DAY, G.S., 1994. The Capabilities of Market-driven Organisations. *Journal of Marketing*, 58(October 1994), 23-37.

de CHERNATONY, L., HARRIS, F., AND RILEY, F.D., 2000. Added Value: Its Nature, Roles and Sustainability. *European Journal of Marketing*, 34(1/2), 39-56.

de FARIA, A.L., AND ALEGRE, H., 1996. Paving the Way to Excellence in Water Supply Systems. A National Framework for Levels of Service Assessment Based on Consumer Satisfaction. *Journal of Water Supply Research and Technology*, 45(1), 1-12.

DENG, S. AND DART, J., 1994. Measuring Market Orientation: A Multi-factor, Multi-item Approach. *Journal of Marketing Management*, 10, 725-742.

DESHPANDE`, R., AND WEBSTER, F.E. Jr, 1989. Organisational Culture and Marketing: Defining the Research Agenda. *Journal of Marketing*, 53(January 1989), 3-15.

DESHPANDE`, R., FARLEY, J.U. AND WEBSTER, F.E. Jr, 1993. Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: A Quadrad Analysis. *Journal of Marketing*, 57(January 1993), 23-27.

DEVLIN, J.F., 1998. Adding Value to Service Offerings: the Case of UK Retail Financial Services. *European Journal of Marketing*, 32(11/12), 1091-1109.

DIBB, S., LYNDON, S., WILLIAM, P., AND FERRELL, O.C., 1994. *Marketing: Concepts and Strategies*, 2nd ed. London: Houghton Mifflin Company.

DICKENS, P., 1996. Human Services as Service Industries. *The Services Industries Journal*, 16(1), 82-91.

DIELMAN, T.E., 1991. *Applied Regression Analysis for Business and Economics*. Boston: PWS-KENT Publishing Company.

DONALDSON, B., AND RUNCIMAN, F., 1995. Service Quality in Further Education: an Insight into Management Perceptions of Service Quality and Those of the Actual Service Provider. *Journal of Marketing Management*, 11, 245-256.

DOWLING, G.R., 1993. Developing Your Company Image Into a Corporate Asset. *Long Range Planning*, 26(2), 101-110.

DRUCKER, P.F, 1955. *The Practice of Management*. London: William Heineman Ltd.

DRUCKER, P.F, 1974. *Management*. London: Butterworth-Heineman Ltd.

DRUCKER-GODARD, C., EHLINGER, S., AND GRENIER, C., 2001. Validity and Reliability. In Thietart, R.A., ed. *Doing Management Research: A comprehensive Guide,* pp. 196-220. London: SAGE Publications.

DURVASULA, S., LYSONSKI, S., AND MEHTA, S.C., 1999. Testing the SERVQUAL Scale in the Business-to-Business Sector: The Case of Ocean Freight Shipping Service. *The Journal of Services Marketing*, 13(2), 132-150.

DWORKIN, D. 1980a. *Rural Water Projects in Tanzania: Technical, Social, and Administrative Issues*. AID Evaluation Special Study No. 3. Washington: USAID.

DWORKIN, D. 1980b. *The Portable Water Project in Rural Thailand*. AID Evaluation Special Study No. 3. Washington: USAID.

References

EGAN, C., AND SHIPLEY, D., 1995. Dimensions of Customer Orientation: An Empirical Investigation of the UK Financial Services Sector. *Journal of Marketing Management*, 11, 807-816.

EMERALD NOW. 2000. *Spotlight on Dr. Christian Gronroos*. [online]. Available at http://www.mcb.co.uk/emrld/now/archive/feb2000/sportlight.htm [Accessed on May 28, 2000].

ESREY, S.A., POTASH, J.B., ROBERTS, L., AND SHIFF, C., 1990. *Health Benefits from Improvements in Water Supply and Sanitation: Survey and Analysis of the Literature of Selected Diseases*. Water and Sanitation for Health (WASH) Project Technical Report No. 66, Washington: USAID.

ESTACHE, A. 1994. Making Public Infrastructure Entities Commercial. *Finance and Development,* September 1994, 22-25.

EVANS, A., JAMES, T., AND TOMES, A., 1996. Marketing in UK Sports Associations. *The Service Industries Journal*, 16(2), 207-222.

EVANS, P., 1992. *Paying the Piper: An Overview of Community Financing of Water and Sanitation*. Occasional Paper 18. The Hague: IRC International Water and Sanitation Centre.

FELTON, A.P.,1959. Making the Marketing Concept Work. *Harvard Business Review,* 37(July-August), 55-65.

FICK, G.R., AND RITCHIE, J.R.B., 1991. Measuring Service Quality in the Travel and Tourism Industry. *Journal of Travel Research*, 30(2) 2-9.

FINE, S.H., 1981. Beyond Money: the Concept of Social Price. *In*: DONNELLY, J.H., AND GEORGE, W.R., Eds. *American Marketing Association's special conference on Services Marketing, Orlando, 1981,* pp.113-116. Chicago: American Marketing Association.

FINK, A., 1995a. *How to Design Surveys*, The Survey Kit No. 5, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

FINK, A., 1995b. *How to Sample in Surveys*, The Survey Kit No. 6, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

FINK, A., 1995c. *How to Analyse Survey Data*, The Survey Kit No. 8, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

FINK, A., 1995d. *How to Report on Surveys*, The Survey Kit No. 9, Thousand Oaks, London and New Delhi: Sage Publications, Inc.

FISK, R.P, BROWN, S.W., AND BITNER, M.J.,1993. Tracking the Evolution of the Services Marketing Literature. *Journal of Retailing*, 69(1), 61-103.

FORNELL, C. 1992. A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56(January 1992), 6-21.

FORNELL, C. AND LARCKER, D.F., 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(February 1981), 39-50.

FOX, J., 1993. Regression Diagnostics. In: Lewis-Beck, ed. *Regression Analysis*: *International Handbooks of Quantitative Applications in the Social Sciences, Vol. 2*, London: Sage Publications, Inc.

FRANCEYS, R., 1994. *Management of Water Utilities in Low-Income Countries: India and Uganda.* Unpublished MBA Thesis. Loughborough University Business School, UK.

FRANCEYS, R., 1997. *Private Waters? - A Bias Towards the Poor*. Unpublished Position Paper on Private Sector Participation in the Water and Sanitation Sector: Issues for the Department for International Development, United Kingdom – July 1997.

FRITZ, W., 1996. Market Orientation and Corporate Success: Findings from Germany. *European Journal of Marketing*, 30(8), 59-74.

GARBARINO, E., AND JOHNSON, M.S., 1999. The Different Role of Satisfaction, Trust, and Commitment in Customer Relationships. *Journal of Marketing*, 63(April 1999), 70-87.

GARG, R.K., 1996. The Influence of Positive and Negative Wording and the Issue Involvement on Responses to Likert Scales in Marketing Research. *Journal of the Market Research Society*, 38(3), 235-246.

GIRDEN, E.R., 1996. *Evaluating Research Articles from Start to Finish*. London: Sage Publications, Inc.

GLEENLEY, G.E., 1995. Market Orientation and Company Performance: Empirical Evidence From UK Companies. *British Journal of Management*, 6, 1-13.

GOULD, G., 1995. Why It Is Customer Loyalty That Counts (and How To Measure It). *Managing Service Quality*. 5(1), 15-19.

GRAY, B., MATEAR, S., BOSHOFF, C., AND MATHESON, P. Developing a Better Measure of Market Orientation. *European Journal of Marketing*, 32(9/10), 884-903.

GREENE, W.E., WALLS, G.A., AND SCHREST, L.J., 1994. Internal Marketing: The Key to External Marketing Success. *Journal of Services Marketing*, 8(4), 5-13.

GREMLER, D.D., AND BROWN, S.W., 1999. The Loyalty Ripple Effect: Appreciating the Full Value of Customers. *International Journal of Service Industry Management,* 10(3), 271-291.

GRONROOS, C., 1978. A Service Oriented Approach to Marketing Services. *European Journal of Marketing*, 12(8), 588-601.

GRONROOS, C., 1979. An Applied Theory for Marketing Industrial Services. *Industrial Marketing Management*, 8(January), 1-9.

GRONROOS, C., 1983. *Strategic Management and Marketing in the Service Sector*, unpublished report to Marketing Science Institute, Cambridge, MA.

GRONROOS, C., 1984. A Service Quality Model and its Marketing Implications. *European Journal of Marketing*, 18(4), 36-44.

GRONROOS, C., 1987. Developing the Service Offering: A Source of Competitive Advantage. In: Surprenant, C., ed. *Add Value to Your Service*, pp. 81-85. Chicago: American Marketing Association.

GRONROOS, C., 1991. Scandinavian Management and the Nordic School of Services – Contributions to Service Management and Quality. *International Journal of Service Industry Management*, 2(3), 17-25.

GRONROOS, C., 1998. Marketing Services: The Case of a Missing Product. *Journal of Business and Industrial Marketing*, 13(4/5), 322-338.

GUMMESSON, E., 1987.*Quality – The Ericsson Approach*. Stockholm: Ericsson.

HALLOWELL, R., 1996. The Relationships of Customer Satisfaction, Customer Loyalty, and Profitability: An Empirical Study. *International Journal of Service Industry Management,* 7(4), 27-42.

HALVORSON, S.J., AZIZ, N., AND ALIBHOY, K., 1998. Strategies to Involve Women in Water Supply and Sanitation. In: Pickford, J., ed. *24th WEDC Conference on Sanitation and Water for All,* pp. 233-236, 30 August - 3 September 1998, Islamabad, Pakistan. Loughborough: WEDC, Loughborough University.

HARARI, O., 1993. Ten Reasons Why TQM Does Not Work. *Management Review*, 82(1), 87-98.

HARDY, M.A., 1993. Regression with Dummy Variables. In: Lewis-Beck, M.S., ed. *Regression Analysis: International Handbooks of Quantitative Applications in the Social Sciences, Vol. 2*, pp. 69-158. London: Sage Publications, Inc.

HART, C. 1998. *Doing a Literature Review: Releasing the Social Science Imagination.* London: SAGE Publication.

HATCH, M.J., AND SCHULTZ, M., 1997. Relations Between Organisational Culture, Identity and Image. *European Journal of Marketing*, 31(5/6), 356-365.

HAYLEN, J.P., DAWSON, B., SAMPSON, P., 1995. An Implicit Model of Consumer Behaviour. *Journal of Market Research Society*, 37(1), 51-68.

HIGGINS, L.F., AND FERGUSON, J.M., 1991. Practical Approaches for Evaluating the Quality Dimensions of Professional Accounting Services. *Journal of Professional Marketing,* 7(1), 3-17.

HILDEBRAND, D.K., AND OTT, L., 1989. *Statistical Thinking for Managers*. 2nd ed. Boston, MA: PWS-Kent.

HOFFMAN, K.D., KELLEY, S.W., AND ROTALSKY, H.M., 1995. Tracking Service Failures and Employee Recovery Efforts. *Journal of Services Marketing*, 9(2), 49-61.

HOLT, G., 1998. *A Guide to Successful Dissertation Study for Students of the Built Environment.* 2nd ed. Wolverhampton: Built Environment Research Unit, University of Wolverhampton (UK).

HOUSTON, F.S., 1986. The Marketing Concept: What It Is and What It Is Not. *Journal of Marketing*, 50(April 1986), 81-87.

HOWE, C.W., AND DIXON, J.A., 1993. Inefficiencies in Water Project Design and Operation in the Third World: An Economic Perspective. *Water Resources Research*, 29(7), 1888-1894.

HULLUMS, A., 1994. Developing a Market Orientation. *Journal of Nursing Management,* 2, 87-92.

HUMPHREYS, M.A., AND WILLIAMS, M.R., 1996. Exploring the Relative Effects of Salesperson Interpersonal Process Attributes and Technical Product Attributes on Customer Satisfaction. *Journal of Personal Selling and Sales Management,*16(3), 47-57.

IACOBUCCI, D., OSTRAM, A.M., BRAIG, B.M., AND BEZJIAN-AVERY, A., 1996. A Canonical Model of Consumer Evaluations and Theoretical Bases of Expectations. In Swartz, T.A, Bowen, D.E., and Brown, S.W., (eds), *Advances in Services Marketing and Management*, Vol. 5, pp.1-44. London: JAI Press Inc.

IACOBUCCU, D., GRAYSON, K.A., AND OMSTROM, A.L., 1994. The Calculus of Service Satisfaction: Theoretical and Empirical Differentiation and Integration. In Swartz, T.A, Bowen, D.E., and Brown, S.W., (eds), *Advances in Services Marketing and Management*, Vol. 3, pp.1-68. London: JAI Press Inc.

ITTNER, C.D., AND LARCKER, D.F., 1996. Measuring the Impact of Quality Initiatives on Firm Financial Performance. *Advances in the Management of Organisational Quality*, 1, 1-37.

JACOB, T.V., 1992. Sustainability of Drinking Water Supply Schemes. In: Pickford, J., ed. *18th WEDC Conference on Water, Environment and Management,* pp. 95-103, 30 August - 3 September 1992*,* Kathmandu, Nepal. Loughborough: WEDC, Loughborough University of Technology.

JAMAL, K., 1998. Water and Environmental Sanitation – Why Women? In: Pickford, J., ed. *24th WEDC Conference on Sanitation and Water for All,* pp. 237-240, 30 August - 3 September 1998, Islamabad, Pakistan. Loughborough: WEDC, Loughborough University.

JAWORSKI, B.J., AND KOHLI, A.K., 1993. Market Orientation: Antecedents and Consequences. *Journal of Marketing*, 57(July 1993), 53-70.

JOHNS, N., AND TYAS, P., 1996. Use of Quality Gap Theory to Differentiate between Foodservice Outlets. *The Service Industries Journal*, 16(3), 321-346.

JOHNS, N., AND TYAS, P., 1997. Customer Perceptions of Service Operations: Gestalt, Incident or Mythology? *The Service Industries Journal*, 17(3), 474-488.

JOHNSON, R.L., TSIROS, M., LANCIONI, R.A., 1995. Measuring Service Quality: A Systems Approach. *Journal of Services Marketing*, 9(5), 6-19.

JOHNSTON, R. AND BRYAN, R., 1993. Products and Services – A Question of Visibility. *The Services Industries Journal*, 13(3), 125-136.

JOHNSTON, R., 1995. The Determinants of Service Quality: Satisfiers and Dissatisfies. *International Journal of Service Industry Management*, 6(5), 57-71.

JONES, M.A., AND SUH, J., 2000. Transaction-specific Satisfaction and Overall Satisfaction: An Empirical Analysis. *Journal of Services Marketing*, 14(2), 147-159.

JONES, T.O., AND SASSER, JR., W.E., 1995. Why Satisfied Customers Defect. *Harvard Business Review*, 73(November/December), 88-99.

KALAFATIS, S.P., AND BLANKSON, C., 1996. An Investigation into the Effect of Questionnaire Identification Numbers in Consumer Mail Surveys. *Journal of Market Research Society,* 38(3), 277-284.

KATKO, T., 1986. Major Constraints in Water Supply in Developing Countries. *Aqua Fennica*, 16(2), 231-244.

KATKO, T., 1989. *The Role of Cost Recovery in Water Supply in Developing Countries*. Publications A41. Tampere: Tampere University of Technology.

KATKO, T., 1990. Cost Recovery in Water Supply in Developing Countries. *Water Resources Development*, 6(2), 86-94.

KATKO, T., 1991. *Paying for Water in Developing Countries*. Publications 74. Tampere: Tampere University of Technology.

KATKO, T.S., HUKKA, J.J., AND PIETITA, P., 1992. Paying for Water Services is a Must. . In: Pickford, J., ed. *18th WEDC Conference on Water, Environment and Management,* pp. 99-101, 30 August - 3 September 1992*,* Kathmandu, Nepal. Loughborough: WEDC, Loughborough University of Technology.

KAYAGA, S.M. AND FRANCEYS, R.W.A., 1998. Market orientation for Water Utilities. In: In: Pickford, J., ed. *24th WEDC Conference on Sanitation and Water for All,* pp. 183-186, 30 August - 3 September 1998, Islamabad, Pakistan. Loughborough: WEDC, Loughborough University.

KAYAGA, S.M., 1997a. *Marketing of Watsan Services: NWSC, Uganda*. Franceys, R.W.F., Series Ed., WEDC Institutional Development Series. Loughborough: WEDC, Loughborough University.

KAYAGA, S.M., 1997b. Why Pay for Water? In: I.CARTER ed. *Footsteps No. 30*, pp. 18-19. Teddington: Tear Fund.

KENNEDY, S.H., 1977. Nurturing Corporate Images: Total Communication Or Ego Trip? *European Journal of Marketing*, 11(2), 119-164.

KERVIN, J.B., 1992. *Methods for Business Research*. New York: HarperCollinsPublishers.

KINNEAR, T.C., AND TAYLOR, J.R., 1996. *Marketing Research: An Applied Approach.* 5th ed. New York: McGraw-Hill, Inc.

KINNEAR, T.R., AND GRAY, C.D., 1994. *SPSS for Windows Made Simple*. East Sussex: Erlbaum (UK) Taylor & Francis Publishers.

KOTLER, P., 1984. *Marketing for Nonprofit Organisations*. New Jersey: Prentice-Hall International, Inc

KOTLER, P., 1994. *Marketing Management: Analysis, Planning, Implementation, and Control.* 8th ed. New Jersey: Prentice-Hall International, Inc.

LABARBERA, P.A., AND MAZURSKY, D., A Longitudinal Assessment of Consumer Satisfaction/Dissatisfaction: The Dynamic Aspect of the Cognitive Process. *Journal of Marketing Research,* 20(November 1983), 393-404.

LAPIERRE, J., 1996. Service Quality: The Construct, its Dimensionality and its Measurement. In Swartz, T.A, Bowen, D.E., and Brown, S.W., (eds) *Advances in Services Marketing and Management*, *Vol. 5*, pp45-70. London: JAI Press Inc.,.

LASSAR, W.M., MANOLIS, C., AND WINSOR, R.D., 2000. Service Quality Perspectives and Satisfaction in Private Banking. *Journal of Services Marketing*, 14(3), 244-271.

LATOUR, S.A., AND PEAT, N.C., 1979. Conceptual Framework and Methodological Issues in Consumer Satisfaction Research. In Olsen, J.C., ed., *Advances in Consumer Research*, *Vol. 6*, pp31-37. Ann Arbour, MI: Association of Consumer Research.

LEE, H., LEE, Y., AND YOO, D., 2000. The Determinants of Perceived Service Quality and its Relationship with Satisfaction. *Journal of Services Marketing*, 14(3), 217-231.

LEHTINEN, U., AND LEHTINEN, J.R., 1985. Service Quality: A Study of Quality Dimensions. In *Proceedings of the II World Marketing Conference,* Sterling: University of Sterling.

LEHTINEN, U., AND LEHTINEN, J.R., 1991. Two Approaches to Service Quality Dimension. *The Services Industries Journal*, 11(3), 287-303.

LEVESQUE, T., AND MCDOUGALL, G.H.H., 1996. Determinants of Customer Satisfaction in Retail Banking. *International Journal of Bank Marketing*, 14(7), 12-20.

LEVITT, T., 1972. Production-line Approach to Service. *Harvard Business Review*, (September-October 1972), 41-52.

LEWIS, B.R., 1991. Service Quality: An International Comparison of Bank Customers' Expectations and Perceptions. *Journal of Marketing Management*, 7, 47-62.

LEWIS, B.R., AND BOOMS, B.H., 1983. The Marketing Aspects of Service Quality. *In*: Berry, L., Shostack, G.L., and Upah, G., Eds. *Emerging Perspectives on Services Marketing*, pp. 99-104. Chicago: American Marketing Association.

LEWIS-BECK, M.S., 1993. Applied Regression: An Introduction. In: Lewis-Beck, ed. *Regression Analysis, International Handbooks of Quantitative Applications in the Social Sciences, Vol. 2*, pp.1-68. London: Sage Publications, Inc.

LITWIN, M.S., 1995. *How to Measure Survey Reliability and Validity*, The Survey Kit 7. London: Sage Publications.

LIU, H., 1995. Market Orientation and Firm Size: an Empirical Examination in UK Firms. *European Journal of Marketing*, 29(1), 57-71.

MANGOLD ,W.G., AND BABAKUS, E., 1991. Service Quality: The Front-stage vs. the Back-stage Perspective. *Journal of Services Marketing*, 5(Fall), 59-70.

MANI, D., ONISHI, T., AND KIDOKORO, T., 1997. Estimating Willingness To pay for WATSAN In: Pickford, J., ed. *23rd WEDC Conference on Water and Sanitation for All: Partnerships and Innovations,* pp. 242-245*,* 1-4 September 1997, Durban, South Africa. Loughborough: WEDC, Loughborough University.

MANSFIELD, E., 1991. *Microeconomics: Theory and Applications*. 7th ed., New York: Norton Publishers.

MARKWICK, N., AND FILL, C., 1997. Towards a Framework for Managing Corporate Identity. *European Journal of Marketing*, 31(5/6), 396-409.

MARTIN, C.L., 1994. The Impact of Topic Interest on Mail Survey Response Behaviour. *Journal of the Market Research Society*, 36(4), 327-338.

McDERMOTT, D.R., FRANZAK F.J., AND LITTLE M.W., 1993. Does Marketing Relate to Hospital Profitability? *Journal of Health Care Marketing*, 13(2), 18-25.

McDOUGALL, G.H.G., AND LEVESQUE, T., 2000. Customer Satisfaction with Services: Putting Perceived Value in the Equation. *Journal of Services Marketing*, 14(5), 392-410.

McINTOSH, A.C. AND YNIGUEZ, C.E., Eds., 1997. *Second Water Utilities Data Book: Asian and Pacific Region*. Manilla: Asian Development Bank.

McIVER, J.P., AND CARMINES, E.G., 1981. *Unidimensional Scaling*. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series No. 07-024. Beverly Hills and London: Sage Publications, Inc.

McKEE, D.O., 1992. The Effect of Using a Questionnaire Identification Code and Message about Non-Response Follow-Up Plans on Mail Survey Response Characteristics. *Journal of Market Research Society,* 34(2), 179-191.

McNAMARA, C.P., 1972. The Present Status of the Marketing Concept. *Journal of Marketing*, 36(January 1972), 50-57.

MEI, A.W.O., DEAN, A.M., AND WHITE C.J., 1999. Analysing Service Quality in the Hospitality Industry. *Managing Service Quality*, 9(2), 136-143.

MELS, G., BOSHOFF, C., AND NEL, D., 1997. The Dimensions of Service Quality: The Original European Perspective Revisited. *The Service Industries Journal*, 17(1), 173-189.

MILES, P.M., AND ARNOLD, D.R., 1991. The Relationship Between Marketing Orientation and Entrepreneurial Orientation. *Entrepreneurship Theory and Practice*, 15(Summer 1991), 49-65.

MILES, R.E., AND SNOW, C.C., 1978. *Organisational Strategy, Structure, and Process.* New York: McGraw-Hill Book Company.

MITTAL, B., AND LASSAR, W.M., 1998. Why Do Customers Switch? The Dynamics of Satisfaction versus Loyalty. *The Journal of Services Marketing*, 12(3), 177-194.

MITTAL, V., KUMAR, P., AND TSIROS, M., 1999. Attribute-Level Performance, Satisfaction, and Behavioural Intentions over Time: A consumption-System Approach. *Journal of Marketing*, 63(April 1999), 88-101.

MOHR-JACKSON, I, 1998. Conceptualising Total Quality Orientation. *European Journal of Marketing*, 32(1/2), 13-22.

MONGOLD, W.G., AND BABAKUS, E., 1991. Service Quality: The Front Stage vs. the Back Stage Perspective. *Journal of Services Marketing*, 5(4), 59-70.

MONROE, K.B., 1991. *Pricing – Making Profitable Decisions*. New York: McGraw-Hill.

MURFIN, D.E., SCHLEGELMILCH, B.B., AND DIAMANTOPOULOS, A., 1995. Perceived Service Quality and Medical Outcome: An Interdisciplinary Review and Suggestions for Future Research. *Journal of Marketing Management*, 11, 97-117.

NARVER, C.N., AND SLATER, S.F., 1990. The Effect of a Market Orientation on Business Profitability. *Journal of Marketing*. 54(4), 20-35.

NEUMAN, W.M., 1997; *Social Research Methods: Qualitative and Quantitative Approaches*. 3rd ed. London: Allyn and Bacon.

NICHOLLS, J.A.F., GILBERT, G.R., ROSLOW, S., 1998. Parsimonious Measurement of Customer Satisfaction with Personal Service and the Service Setting. *Journal of Consumer Marketing*, 15(3), 239-253.

NICKSON, A., 1996. *The Role of Government in Adjusting Economies: Paper 7 – Urban Water Supply Sector Review.* London: The Overseas Development Administration.

NORTH, J.H., AND GRIFFIN, C.C., 1993. Water Source as a Housing Characteristic: Hedonic Property Valuation and Willingness to Pay for Water. *Water Resources Research*, 29(7), 1923-1929.

NOWAK, L.I., AND WASHBURN, J.H., 1998. Antecedents to Client Satisfaction in Business Services. *Journal of Services Marketing*, 12(6), 441-452.

NUNNALLY, J.C., 1978; Psychometric Theory. 2nd ed. New York: MacGraw-Hill, Inc.

OLINS, W., 1989. *Corporate Identity*. London: Thames and Hudson.

OLIVER, O.L., AND SWAN, J.E., 1989. Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach. *Journal of Marketing,* 53(April 1989), 21-35.

OLIVER, R.L., 1980. A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17(November 1980), 460-468.

OLIVER, R.L., 1999. Whence Consumer Loyalty? *Journal of Marketing*, 63(Special Issue 1999), 33-44.

ONEK, H.O., 1997. *Public Private Partnership in Improving Revenue Collection: The Kampala Case Study.* Unpublished paper presented to a conference, "Public-Private Partnership for African Water Utilities", Kampala, Uganda, 6-17 October 1997.

OPPENHEIM, A.N., 1992. *Questionnaire Design, Interviewing and Attitude Measurement*. 2nd ed. London: Pinter.

OSTROM, A., AND IACOBUCCI, D., 1995. Consumer Trade-Offs and the Evaluation of Services. *Journal of Marketing*, 59(January 1995), 17-28.

PALMER DEVELOPMENT GROUP, 1998. *Supply Pricing of Urban Water in South Africa.* Unpublished report to the Water Research Commission.

PALMER, A., 1994. *Principles of Services Marketing*, London: McGraw-Hill Book Company.

PARASURAMAN, A., BERRY, L.L., AND ZEITHAML, V.A., 1993. More on Improving Service Quality Measurement. *Journal of Retailing*, 69(1), 140-147.

PARASURAMAN, A., BERRY, L.L., AND ZEITHAML,V.A., 1991. Refinement and Reassessment of the SERVQUAL Scale. *Journal of Retailing*, 67(4), 420-449.

PARASURAMAN, A., ZEITHAML, V.A., AND BERRY, L.L., 1985. A Conceptual Model of Service Quality and its Implications for Future Research. *Journal of Marketing*, 49(Fall 1985), 41-50.

PARASURAMAN, A., ZEITHAML, V.A., AND BERRY, L.L., 1988. SERVQUAL: A Multiple-Item Scale for Measuring Customer Perceptions of Service Quality. *Journal of Retailing*, 64(Spring), 12-40.

PARASURAMAN, A., ZEITHAML, V.A., AND BERRY, L.L., 1994a. Reassessment of Expectations as a Comparison Standard in Measuring Service Quality: Implications for Further Research. *Journal of Marketing*, 58(January 1994), 111-124.

PARASURAMAN, A., ZEITHAML, V.A., AND BERRY, L.L., 1994b. Alternative Scales for Measuring Service Quality: A Comparative Assessment Based on Psychometric and Diagnostic Criteria. *Journal of Retailing*, 70(3), 201-230.

PAUL, D.P., III, 1998. *Measurement of Perceived Service Quality of Selected Dental Specialists (Prosthodontists, Periodontists, Endodonteists)* [online]. Ph.D. dissertation preview, Old Dominion

University. Available at <URL:http://wwwlib.umi.com/dissertations/preview_all?9828953> [accessed 20 November 1999].

PEARSON, G.J, 1989. *Factors which Facilitate and Inhibit Innovation in a Mature Industry*. Ph.D. Thesis, Manchester Business School, University of Manchester.

PEARSON, G.J., 1993. Business Orientation: Cliché or Substance? *Journal of Marketing Management*, 9, 233-243.

PEDHAZUR, E.J., 1982. *Multiple Regression in Behavioural Research: Explanation and Prediction*, 2nd ed., New York: Holt, Rinehart and Winston, Inc.

PERRY, C., 1996a. *Structured Approach to Presenting PhD Theses: Basics of Structure and Style*. [online]. Available at <URL:http://www.imc.org.uk/imc/news/occpaper/cp2> [accessed 9 July 1997].

PERRY, C., 1996b. *Structured Approach to Presenting PhD Theses: Chapters and their Sections*. [online]. Available at <URL:http://www.imc.org.uk/imc/news/occpaper/cp3> [accessed 9 July 1997].

PETER, J.P., 1979. Reliability: A Review of Psychometric Basics and Recent Marketing Practices. *Journal of Marketing Research*, 16(February), 6-17.

PETER, J.P., 1981. Construct Validity: A review of Basic Issues and Marketing Practices. *Journal of Marketing Research*, 18(May 1981), 133-145.

PETERSON, R.A., 1994. A Meta-analysis of Cronbach's Coefficient Alpha. *Journal of Consumer Research,* 21 (September), 381-391.

PIERCY, N.F., AND MORGAN, N.A., 1995. Customer Satisfaction Measurement and Management: A Processual Analysis. *Journal of Marketing Management*, 11, 817-834.

PIPER, S., AND MARTIN, W.E., 1997. Household Willingness to Pay for Improved Rural Water Supplies: A Comparison of Four Sites. *Water Resources Research*, 33(9), 2153-2163.

POWPAKA, S. 1996. The Role of Outcome Quality as a Determinant of Overall Service Quality in Different Categories of Service Industries: An Empirical Investigation. *The Journal of Services Marketing*, 10(2), 5-25.

PROGRAMME SOLIDARITE` EAU. 1999. *Water Supply and Sanitation in Peri-Urban Areas and Small Centres*. Paris: Cooperation Francaise.

RAVALD, A., AND GRONROOS, C., 1996. The Value Concept and Relationship Marketing. *European Journal of Marketing*, 30(2), 19-30.

REDDY, A.C., BUSKIRK, B.D., AND KAICKER, A., 1993. Tangibilizing the Intangibles: Some Strategies for Services Marketing, *Journal of Services Marketing,* 7(3), 13-17.

REDMAN, T., MATHEWS, B., WILKINSON, A., AND SNAPE, E., 1995. Quality Management in Services: Is the Public Sector Keeping Pace? *International Journal of Public Sector Management,* 8(7), 21-34.

REED, R.A., 1995. *Sustainable Sewerage: Guidelines for Community Schemes*. London: Intermediate Technology Publications.

REEVES, C.A., AND BEDNAR, D.A., 1994. Defining Quality: Alternatives and Implications. *Academy of Management Review*, 19(3), 419-445.

REMENYI, D, WILLIAMS, B., MONEY, A. AND SWARTZ, E. 1998. *Doing Research in Business and Management: An Introduction to Process and Method.* London: SAGE Publications.

RICHARD, M.D., AND ALLAWAY, A.W., 1993. Service Quality Attributes and Choice Behaviour. *Journal of Services Marketing*, 7(1), 59-68.

ROBLEDO, M.A., 2001. Measuring and Managing Service Quality: Integrating Customer Expectations. *Managing Service Quality*, 11(1), 22-31.

ROTH, V.J., AND BOZINOFF, L., 1989. Consumer Satisfaction with Government Services. *Service Industries Journal*, 9(4), 29-43.

RUDESTAM, K.E., AND NEWTON, R.R., 1992. *Surviving Your Dissertation: A Comprehensive Guide to Content and Process.* London: SAGE Publications.

RUEKERT, R.W., 1992. Developing a Market Orientation: An Organisational Strategy Perspective. *International Journal of Research in Marketing*, 9(4), 225-245.

RUST, R.T., AND ZAHORIK, A.J., 1993. Customer Satisfaction, Customer Retention and Market Share. *Journal of Retailing*, 69(2), 193-215.

SACHS, W.S., AND BENSON, G., 1978. Is It Not Time to Discard the Marketing Concept? *Business Horizons*, 21(August 1978), 68-74.

SALEH, F., AND RYAN, C., 1991. Analysing Service Quality in the Hospitality Industry Using the SERVQUAL Model. *The Service Industries Journal*, 11(3), 324-343.

SCHIFFMAN, L.G., AND KANUK, L.L., 1994. *Consumer Behaviour*. 5th ed. New Jersey: Prentice-Hall.

SCHROEDER, L.D., SJOQUIST, D.L., AND STEPHAN, P.E., 1986. *Understanding Regression Analysis: An Introductory guide*. Quantitative Applications in the Social Sciences. London: Sage Publications, Inc.

SEDLACK, R.G., AND STANLEY, J., 1992. *Social Research: Theory and Methods.* London: Allyn and Bacon.

SEKERAN, U., 1992. *Research Methods for Business: A Skill-Building Approach*. 2nd ed. New York: John Wiley & Sons, Inc.

SELNES, F., 1998. Antecedents and Consequences of Trust and Satisfaction in Buyer-Seller Relationships. *European Journal of Marketing*, 32(3/4), 305-322.

SEN, A., 1998. *Determining the Relationship Between Cost and Service Quality in the Hospitality Industry* [online]. Ph.D. dissertation preview, University of Arkansas. Available at <URL:http://wwwlib.umi.com/dissertations/preview_all?9838312> [accessed 20 November 1999].

SHOSTACK, G.L., 1977. Breaking Free from Product Marketing. *Journal of Marketing*, 41(April 1977), 73-80.

SHU, T., 1998. *Testing the Efficacy of an Attitudinal Process Model of the Relationship Between Service Quality and Visitor Satisfaction in a Tourism Context* [online]. Ph.D. dissertation preview, Texas A&M University. Available at <URL:http://wwwlib.umi.com/dissertations/preview_all?9915331> [accessed 20 November 1999].

SINGH, B., RAMASUBBAN, R., BHATIA, R., BRISCOE, J., GRIFFIN, C.C. & KIM, C., 1993. Rural Water Supply in Kerala, India: How to Emerge From a Low-level Equilibrium Trap. *Water Resources Research*, 29(7), 1931-1942.

SIROHI, N., MCLAUGHLIN, E.W., AND WITTINK, D.R., 1998. A Model of Consumer Perceptions and Store Loyalty Intentions for a Supermarket Retailer. *Journal of Retailing*, 74(2), 223-245.

SKELCHER, C., 1992. Improving the Quality of Local Public Services. *The Services Industries Journal*, 12(4), 465-477.

SLATER, S.F., AND NARVER, J.C., 1994. Does Competitive Environment Moderate the Market Orientation-Performance Relationship? *Journal of Marketing*, 58(January 1994), 46-55.

SMITH, A.M., 1995. Measuring Service Quality: is SERVQUAL now Redundant? *Journal of Marketing Management,* 11, 255-276.

SPECTOR, P.E., 1992. *Summated Rating Scale Construction: An Introduction*. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series. London: Sage Publications, Inc.

SPRENG, R.A., AND MCKOY, R.D., 1996. An Empirical Examination of A Model of Perceived Service Quality and Satisfaction. *Journal of Retailing*, 72(2), 201-214.

SPRENG, R.A., HARRELL, G.D., AND MACKOY, R.D., 1995. Service Recovery: Impact on Satisfaction and Intentions. *Journal of Services Marketing*, 9(1), 15-23.

SPSS, INC., 1996. *SPSS for Windows (Computer Program).*

STAFFORD, M.R., STAFFORD, T.F., AND WELLS, B.P., 1998. Determinants of Service Quality and Satisfaction in the Auto Casualty Claims Process. *The Journal of Services Marketing*, 12(6), 426-440.

STATSOFT, INC., 1995. *STATISTICA for Windows (Computer Program)*, Tulsa OK.

STEWART, D.W., 1981. The Application and Misapplication of Factor Analysis in Marketing Research. *Journal of Marketing Research*, 18(February 1981), 51-62.

TADEPALLI, R., 1995. Measuring Customer Orientation of a Salesperson: Modification of the Soco Scale, *Psychology & Marketing*, 12(3), 177-187.

TAYLOR, S.A., AND BAKER, T.L., 1994. An Assessment of the Relationship Between Service Quality and Customer Satisfaction in the Formation of Consumers' Purchase Intentions. *Journal of Retailing*. 70(2), 163-178.

TEAS, R.K., 1993. Expectations, Performance, Evaluation, and Consumers' perceptions of Quality. *Journal of Marketing*, 57(October 1993), 18-34.

TEAS, R.K., 1994. Expectations as a Comparison Standard in Measuring Service Quality: An Assessment of a Reassessment. *Journal of Marketing*, 58(January 1994), 132-139.

THAPALIA, C.F., 1997. *Multivariate Statistics: Introduction* [online]. Available at http://trochim.human.cornell.edu/tutorial/flynn/multivar.htm [accessed on March 23, 1997]

TRITSMANS-SPRENGERS, M., 1996. The quality of customer service. *Water Supply,* 14(1), 1-10.

TROCHIM, W.M.K, 1999. Research Methods Knowledge Base [online]. 2nd ed. Available at http://trochim.human.cornell.edu/kb/contents.htm

TSE, D.K., AND WILTON, P.C., 1988. Models of Consumer Satisfaction Formation: An Extension. *Journal of Marketing Research*, 25, 204-212.

UGANDA. Consult 4 (International) (Pty) Ltd et al, 1999. *Reform of the Uganda Water Sector: The Urban Water Supply and Sanitation Sub-sector, Interim Report Vol. 1: Main Report December 1999.* Unpublished report to The Republic of Uganda, Ministry of Water, Lands and Environment.

UGANDA. National Water and Sewerage Corporation, 1998. *Existing Water Supply Service Coverage –1998/99.* Unpublished corporate planning paper.

UGANDA. National Water and Sewerage Corporation, 2000. *Corporate Planning Process 2000/2001: Situational Analysis, March 2000.* Unpublished corporate planning paper.

UGANDA. Statistics Department Ministry of Finance and Economic Planning, 1994. *The 1991 Population and Housing Census (National Summary).* Entebbe: Author.

UGANDA. Statistics Department Ministry of Finance and Economic Planning, 1998. *Uganda National Household Survey 1995/96, Volume 2: Summary Analytical Report.* Entebbe: Author.

UGANDA. Statutory Instruments 1995. *The Water Statute, 1995 Statute No. 9 of 1995.* Entebbe: Uganda Public Printing Corporation.

UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS – POPULATION DIVISION, 2001. World Population Prospects: The 2000 Revision. Available at http//www.un.org/esa/population/wpp2000h [accessed on July 17, 2001].

UNITED NATIONS DEVELOPMENT PROGRAM (UNDP), 1999. The Human Development Report 1999. Available at http//www.undp.org/hdro/Backmatter.pdf [accessed on July 17, 2001]

VAN HEERDEN, C.H., AND PUTH, G., 1995. Factors that Determine the Corporate Image of South African Banking Institutions: An Exploratory Investigation. *International Journal of Bank Marketing*, 13(3), 12-17.

VAN REKOM, J., 1997. Deriving an operational measure of corporate identity. *European Journal of Marketing*, 31(5/6), 410-422.

VANDAMME, R., AND LEUNIS, J., 1993. Development of a Multiple-item Scale for Measuring Hospital Service Quality. *International Journal of Service Industry Management*, 4(3), 30-49.

VOSS, G.B., PARASURAMAN, A., AND GREWAL, G. 1998. The Roles of Price, Performance, and Expectations in Determining Satisfaction in Service Exchanges. *Journal of Marketing*, 62(October 1998), 46-61.

WAKEFIELD, K.L., AND BLODGETT, J.G., 1996. The Effect of the Servicescape on Customers' Behavioural Intentions in Leisure Service Setting. *The Journal of Services Marketing,* 10(6), 45-61.

WALKER, J.L., 1995. Service Encounter Satisfaction: Conceptualised. *Journal of Services Marketing,* 9(1), 5-14.

WALSH, K., 1994. Marketing and Public Sector Management, *European Journal of Marketing*, 28(3), 63-71.

WASH TECHNICAL REPORT 94, 1994. *The Sustainability of Donor Assisted Rural Water Supply Projects*. Washington: USAID.

WATER UTILITY PARTNERSHIP, 2000. *Performance Indicators of Some African Utilities, Draft Edition*. Abidjan: Author.

WATSON, A.P., 1998. *Customer satisfaction, product quality, service quality and image: Findings in a commodity industry* [online]. Ph.D. dissertation preview, Nova South-eastern University. Available at URL:http://wwwlib.umi.com/dissertations/preview_all?9902550 [accessed 20 November 1999].

WEBSTER, F.E., Jr., 1992. The Changing Role of Marketing in the Corporation. *Journal of Marketing*, 56(October 1992), 1-17.

WESTBROOK, R.A., AND REILLEY, M.D., Value Percept Disparity: An Alternative to the Disconfirmation of Expectations Theory of Consumer Satisfaction. In Bagozzi, R., and Tybout, A., eds., *Advances in Consumer Research*, *Vol. 10*, pp. 256-61. Ann Arbor, MI: Association for Consumer Research.

WHITTINGTON, D., DAVIS, J., AND MCCLELLAND, 1996. *Implementing a Demand-driven Approach to Community Water Supply Planning: A Case Study of Lugazi, Uganda.* Unpublished report to the World Bank.

WHITTINGTON, D., OKORAFOR, A., OKORE, A., AND MCPHAIL, A., 1990. Strategy for Cost Recovery in the Rural Water Sector: A Case Study of Nsukka District, Anambra State, Nigeria. *Water Resources Research*, 26(9), 1899-1913.

WILLIAMS, C.S., SAUNDERS, M.N.K., AND STAUGHTON, R.V.W., 1999. Understanding Service Quality in the New Public Sector: An explanation of Relationships in the Process of Funding Social Housing. *The International Journal of Public Sector Management,* 12(4), 366-379.

WILSON, R.M.S., GILLIGAN, C., 1997. *Strategic Marketing Management: Planning, implementation and control.* 2nd ed. London: Buttenworth-Heinemann.

WINSTED, K.F., 2000. Service Behaviours That Lead to Satisfied Customers. *European Journal of Marketing*, 34(3/4), 399-417.

WOO, C.K., 1992. Drought Management, Service Interruption, and Water Pricing: Evidence From Hong Kong. *Water Resources Research*, 28(10), 2591-2595.

WOODRUFF, R.B., CADOTTE, E.R., AND JENKINS, R.L., 1983. Modelling Consumer Satisfaction Processes Using Experience-Based Norms. *Journal of Marketing Research,* 20(August 1983), 296-304.

WORCESTER, R.M., 1997. Managing the Image of Your Bank: The Glue that Binds. *International Journal of Bank Marketing*, 15(5),146-152.

WORLD BANK, THE, 1993. The Demand for Water in Rural Areas: Determinants and Policy Implications. *The World Bank Research Observer*, 8(1), 47-70.

WORLD HEALTH ORGANISATION (WHO), AND UNITED NATIONS CHILDREN'S FUND (UNICEF), 2000. *Global Water Supply and Sanitation Assessment 2000 Report.* New York: Author

YAVAS, U., BILGIN, Z., AND SHEMWELL, D.J., 1997. Service Quality in the Banking Sector in an Emerging Economy: A consumer Survey. *International Journal of Bank Marketing*, 15(6), 217-223.

YEPES, G., AND DIANDERAS, A., 1996. *Water & Wastewater Utilities: Indicators 2nd Edition*. Washington: International Bank for Reconstruction and Development, The World Bank.

YOON, S., AND KIM, J., 2000. An Empirical Validation of a Loyalty Model based on Expectation Disconfirmation. *Journal of Consumer Market*ing, 17(2), 120-136.

ZEITHAML, V.A., 1988. Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52(July 1988), 2-22.

ZEITHAML, V.A., BERRY, L., AND PARASURAMAN, A., 1993. The Nature and Determinants of Customer Expectations of Service. *Journal of Academy of Marketing Science,* 21(1), 1-12.

ZERAH, M., 1997. Some Issues in Urban Water Management: Household Response to Water Supply Unreliability in Delhi. *Contributions CSH97/6*, New Delhi: Centre De Sciences Humanes.

References

APPENDICES

Appendices

Appendix A: Pool of Items Generated by Area Managers of NWSC During a Focus Group Discussion Held on December 15, 1998 in Kampala

DIMENSION	ITEMS/sub-dimensions		
TECHNICAL QUALITY	HOUSEHOLD VARIABLES Connection type Water pressure Flowing time Water Quality Storage system Colour of water Taste of water Smell of water Meter reading Water appearance Water safety Softness of water	TECHNICAL EFFICIENCY Frequency of leaks and/or burst Bill delivery Staff misbehaviour Unfair disconnections Service interruptions Over-billing Information dissemination Meter reading Leaking meter Overdue reconnections Accuracy of meter	RECOVERY EFFICIENCY Reaction to complaints on: Over-billing Bill delivery frequency Meter reading accuracy Conduct of staff Unfair disconnections Service interruptions Leaks/bursts Delays in reconnections Disconnection warnings Application procedures New connection delays
FUNCTIONAL QUALITY	INTERFACING ENVIRONMENT Distance to Office Location of office The surroundings of office Opening and closing times of office Cleanliness of office Office space and arrangement Suitability of languages used in office Parking facilities for cars Customers' sitting/queuing facilities Labelling and directions to right office Telephone communication	STAFF INTERACTIVE QUALITY Staff sympathy Staff reassurance Keeping of promises Staff empathy Staff kindness Giving personal attention Staff politeness Knowledge and skills Appropriate solutions Soliciting for suggestions Use given suggestions Admit mistakes Apologise for mistakes made React to problems in time Resolve conflicts amicably Confidence in services rendered	
SERVICE VALUE	PSYCHOLOGICAL VALUE Water God-given Pay costs for treatment Water an economic good Water is life Utility water is valuable Utility water is safe	MONETARY VALUE New connection fee Monthly water rates Minimum charge Reconnection fee Metered/flat rates Increase in bills	EFFORT VALUE Accuracy of bills Clarity of bills Bill delivery method Bill delivery interval Making payments Lump-sum payment
CORPORATE IMAGE	Technical competence, Responsive to customer needs, Financial accountability, Social equity, Employee-oriented, Committed to customer satisfaction, Customer focused, Efficiency, Effectiveness, Service-expansion oriented, Good public relations, Well projected by public media, Customers involvement		
CUSTOMER SATISFACTION	Technical efficiency, Water Quality, Water safety, Response time to leaks/bursts, Cost of being connected, Overall pricing of water services, Complaints monitoring system, Response time to complaints on bills, Accessibility of services, Customer care quality, Payment options, Customer involvement level		
ATTITUDINAL LOYALTY	Whether water is budgeted for, Who clears water bills, Ease of paying for monthly bills, Last payment of water bills, Average frequency of bill payment, Whether supply ever disconnected due to non-payment, Post-disconnection action, Ranking in importance of utility services		

Appendix B: Questionnaire for the Final Study Carried Out in Aug/Sept 1999

-1-

NATIONAL WATER & SEWERAGE CORPORATION

*SERVICE & REVENUE ENHANCEMENT PROGRAMME (**SEREP**)*

CUSTOMER SURVEY ON QUALITY OF SERVICES PROVIDED BY NWSC

Questionnaire S/No: _____ Area/Zone:_____ ____

Property Ref. No. _____ Customer Ref. No. _____

Address _____

***To the translator**: Please read the following statement to each customer before you ask the questions. Please request to interview the head of the household or his/her spouse, NOT the children or dependants. Circle the choice(s) as indicated by the respondent.*

My name is ……, and I am conducting a survey study on behalf of National Water & Sewerage Corporation, Headquarters. This study is part of a program (SEREP) launched in early August 1999, with the objective of improving the quality of service being provided to NWSC customers.

You are one of the few customers who have been randomly selected from NWSC database to participate in this survey. Your observations, experiences and opinions are very important. The results of this study will be used to improve the service quality being provided by NWSC to its customers.

Questions and statements will be read to you. To make your response a lot easier, and use as little of your time as possible, numbered multiple answers have been provided for each of the question/statement. I shall read or show you the multiple answers on several showcards. You are requested to chose one of the responses that corresponds to your answer/opinion.

Please note that there are no right or wrong answers! Each individual is entitled to his/her observation and opinion. Your responses are confidential. All information you provide will be published ONLY in summary, statistical form.

Thank you for your cooperation.

The language being used for the interview is ……
Survey date ……

Appendix B: Questionnaire for the Final Study ….continued

-2-

SECTION I: PHYSICAL PROPERTIES OF WATER SUPPLIED BY NWSC

The first set of questions asks about your observation of the physical features of water delivered to you by NWSC in the past one year. The features could have been varying over time. In answering these questions, could you please indicate the most common features observed.

1. How is water supplied by NWSC delivered to your household? {V1}
[1] From a public tap [2] From a tap in my compound (yardtap)
[3] From tap(s) in the house only (house connection) [4] From tap(s) in the house and a tap in the compound
[5] Other (*specify*)_____

2. If your water source is fitted with a meter, how often does NWSC staff read the meter? {V2-3}
[1] Never ever [2] Less frequently than three months
[3] About once every three months [4] About once every two months
[5] Every month [6] Not sure/I don't know
[7] Not applicable to me, as my water source is not fitted with a meter.

3. Does the water you receive have enough pressure to reach and enter a roof tank or an elevated tank? {V4}
[1] Not ever [2] Rarely
[3] About half the times [4] Most of the time
[5] Always [6] I am not sure/I don't know
[7] Not applicable, as I draw water from a public tap or a yard tap

4. On average, for how many hours in a day does water flow in NWSC water tap that supplies you? The answer should be for normal days when there is no interruption due to water pipe bursts/leakages. {V5}
[1] Less than one hour [2] Between 1 hour and 4 hours
[3] Between 4 hours and 12 hours [4] Over 12 hours but less than 24 hours
[5] It is a 24-hour service
[6] Other (*specify*)_____

5. You may have had service interruptions at your premises either due to pipe leakages and/or bursts. This could have sometimes led to only pressure reduction, or complete lack of water in your premises. Which phrase best describes how frequently you have had such problems? {V6}
[1] Always [2] Regularly (too commonly but not always)
[3] Fairly often [4] Rarely
[5] Never

6. Which of these phrases best describes the appearance of your tap water? {V7}
[1] Unclear and colored all the time [2] Unclear and colored most of the time
[3] Clear and colorless for about half the time [4] Clear and colorless most of the time
[5] Clear and colorless all the time [6] No opinion/I don't know
[7] Other (*specify*)_____

7. What method of water storage does your household use? {V8}
[1] Roof tank [2] Underground or ground level tank
[3] Large barrels in the house [4] Small containers and jerrycans
[5] Others (please specify)_____

Appendix B: Questionnaire for the Final Study ….continued

-3-

SECTION II: QUALITY AND PRICE OF SEWERAGE SERVICES PROVIDED BY NWSC

1. Is your house connected onto the central sewerage network in town? {V9}
[1] No [2] Yes
[3] I am not sure

2. If you are not connected onto the central sewerage network, how do you dispose of wastewater generated by your household such human feaces, kitchen wastewater and bathroom wastewater? {V10}
[1] Private septic tank [2] Public septic tank
[3] Pitlatrine only [4] Pitlatrine and soakpit
[5] Others (*please specify*)
_____

3. What is your view about the response time and repair of sewage blockages, overflows and bursts in your area?
{V11}
[1] Very poor [2] Poor
[3] Fairly good [4] Good
[5] Very good [6] I am not sure/ I don't know
[7] Other (*please specify*)_____

4. What is your view about the overall quality of sewerage services offered by NWSC? {V12}
[1] Very poor [2] Poor
[3] Fairly good [4] Good
[5] Very good [6] I am not sure/ I don't know
[7] Other (*please specify*)
_____

5. Do you know how sewerage service charges are calculated? {V13}
[1] No [2] Yes
[3] I am not sure

6. What are your views about the charges being levied by NWSC for sewerage services? {V14}
[1] Very high [2] High
[3] Fair [4] Low
[5] Very low [6] I don't know/I am not sure

Appendix B: Questionnaire for the Final Study ….continued

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SECTION III: ACCESSIBILITY OF NWSC OFFICE PREMISES

You may have gone to NWSC offices for various reasons. It could have been to open an account, to pay for services or to raise complaints about the services being rendered. Please rate the physical appearance and convenience of the premises of NWSC offices. "5" =*Very convenient*, sliding down to "1" =*Very Inconvenient*.

	Very convenient	Convenient	Not sure/ Undecided	Inconvenient	Very Inconvenient	
1.Distance traveled to reach the office, and the suitability of its location regarding the surroundings……………………	……[5]….	…..[4]…..	..[3]………	……..[2]……...	……[1]……	{V15}
2. Office operating hours…….	……[5]….	…..[4]…..	..[3]……...	……..[2]……...	……[1]……	{V16}
3. Office space and facilities for receiving and serving customers such as sitting and/or queuing facilities………………………..	……[5]….	…..[4]…..	..[3]………	……..[2]……...	……[1]……	{V17}
4.Telephone receptions and response in the offices…………	……[5]….	…..[4]…..	..[3]……...	……..[2]……...	……[1]……	{V18}
5. Directions to the right officer…	……[5]….	…..[4]…..	..[3]……...	……..[2]……...	……[1]……	{V19}
6. Official languages used in offices…………………………...	……[5]….	…..[4]…..	..[3]……...	……..[2]……...	……[1]……	{V20}
7. Parking facilities (if applicable)	……[5]….	…..[4]…..	..[3]……...	……..[2]……...	……[1]……	{V21}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION IV: FREQUENCY OF COMPLAINTS

In the period you have been a customer to NWSC, you may have had several problems with services offered by NWSC. Below is a list of probable problems that could attract complaints from customers. Please indicate how frequently you have had a problem on each of the items listed.

	Regularly	Often	Seldom	Rarely	Never	
1. Complaints on over-billing……..	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V22}
2. Complaints on irregular bill delivery…….	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V23}
3. Complaints on a leaking meter……..	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V24}
4. Complaints on poor performance of NWSC field and office contact staff……	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V25}
5. Disconnection in error……..	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V26}
6. Complaints on re-connections taking too long	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V27}
7. Service interruptions……	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V28}
8. Leakage in the water network……	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V29}
9. Lack of notice prior to disconnection……	....[1]……	...[2]..	….[3]…	….[4]…	…[5]…	{V30}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION V: GENERAL HANDLING OF COMPLAINTS BY NWSC

In the period you have been a customer to NWSC, you may have had several problems with services offered by NWSC, such as those listed below. Some customers make complaints, while others do not. If you have had time to approach NWSC staff with complaints, how in your view, were they handled? Indicate on a range from *Very badly* ("1") to *Very Well* ("5"). Please indicate against only those items on which you interacted with the staff.

	Very badly	Badly	Average	Well	Very Well	
1. Application procedures for a new water connection……	...[1]…	....[2]….	….[3]...	….[4]....	….[5]…	{V31}
2. The process and time taken to connect your premises onto the water network……	...[1]…	....[2]….	….[3]...	….[4]....	….[5]…	{V32}
3. Complaints made to NWSC on over billing…	...[1]…	....[2]….	….[3]...	….[4]....	….[5]…	{V33}
4. Complaints on a leaking meter……	...[1]…	....[2]….	….[3]...	….[4]....	….[5]…	{V34}
5. Complaints on irregular bill delivery……	...[1]…	....[2]….	….[3]...	….[4]....	….[5]…	{V35}
6. Complaints on poor performance of NWSC field and front office staff ……	…[1]…	….[2]…	….[3]…	….[4]…	….[5]…	{V36}
7. Complaints made to NWSC concerning disconnection of your water supply made in error	…[1]…	….[2]…	….[3]…	….[4]…	….[5]…	{V37}
8. Complaints on re-connections taking too long	…[1]…	….[2]…	….[3]…	….[4]…	….[5]…	{V38}
9. Leakage in the water network……	…[1]…	….[2]…	….[3]…	….[4]…	….[5]…	{V39}
10. Service interruptions such as lack of water or loss of pressure at your premises……	…[1]…	….[2]…	….[3]…	….[4]…	….[5]…	{V40}
11. Lack of notice prior to disconnection of supply to your premises ……	…[1]…	….[2]...	….[3]…	….[4]..	….[5]…	{V41}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION VI: GENERAL CONDUCT AND ATTITUDE OF NWSC STAFF

Customer service largely depends on the personality of the staff dealing directly with customers. It also depends on the technical capacity of the staff, and the support he/she receives from the organisation. We would like you to take time and reflect on each of the encounters you have had with the staff of NWSC. This could have been either on telephone or through physical contact. Please indicate how much you agree or disagree with each statement below concerning the general behavior and attitude of the various NWSC staff you have dealt with. If you don't have strong views on a particular item, please tick the choice *Uncertain/Undecided* against it.

"5" = *Strongly Agree*, "4" = *Agree*, "3" = *Uncertain/Undecided*, "2" = *Disagree*, "1" = *Strongly disagree*.

	Strongly agree	Agree	Uncertain/ Undecided	Disagree	Strongly disagree	
1. NWSC staff are <u>unconditionally</u> sympathetic and reassuring when we have problems……..	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V42}
2. NWSC staff provide accurate documents such as bills, statements of accounts etc. ……..	…[5]….	…[4]…..	….[3]….	…[2]…	….[1]….	{V43}
3. When NWSC staff promise to do something by a certain date, they do so…	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V44}
4. NWSC staff know and understand our needs……..	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V45}
5. The staff give customers personal attention……..	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	{V46}
6. NWSC staff are arrogant and impolite…	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	*{V47}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION VI continued

	Strongly agree	Agree	Uncertain/ Undecided	Disagree	Strongly disagree	
7. NWSC staff have the knowledge and skills required to serve us effectively……	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	{V48}
8. The staff provide solutions appropriate to problems under consideration……	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	{V49}
9. Customer-contact staff such as plumbers, meter readers and receptionists have the necessary facilities to perform their job…….....	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	{V50}
10. NWSC staff ask for suggestions about how they could serve us better, and our suggestions are seriously considered……	…[5]….	....[4]…..	….[3]….	…[2]...	….[1]….	{V51}
11. NWSC staff solve bill related problems within one month from the date of complaint……..	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V52}
12. NWSC staff solve service related problems such as pipe bursts and water shortage within 48 hours from the time of complaint……..	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V53}
13. NWSC staff have confidence and trust in the services they render……	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V54}
14. The staff admit when a mistake is done by NWSC, apologize for it to the customers, and take necessary measures to correct the situation	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V55}
15. NWSC staff react to errors/problems as soon as they occur……	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V56}
16. On the whole, NWSC staff provide good customer care to the customers ……	…[5]….	….[4]….	….[3]….	…[2]…	….[1]….	{V57}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION VII: FELT VALUE OF WATER SUPPLIED BY NWSC

NWSC charges for the water services provided. We are asking you to evaluate the value of services provided by comparing what you benefit from the services, to what you pay or give up in exchange. Remember that, on top of the physical money you pay in terms of bills, you also make other sacrifices, such as the time spent in dealing with NWSC. The statements below will help you to evaluate the value of water services. Please indicate how much you agree or disagree with each statement. You are entitled to your own opinion. "5" = *Strongly Agree*, "1"= *Strongly disagree*

	Strongly disagree	Disagree	Uncertain/Undecided	Agree	Strongly agree	
1. Water is a God-given gift from the sky, and should be given out freely by the Government….	….[1]….	…[2]….	….[3]…..	..[4…	….[5]….	{V58}
2. Although water exists naturally, consumers should pay for costs of purifying it, storing it and transporting it to their households……..	….[1]….	…[2]….	….[3]…..	..[4…	….[5]….	{V59}
3. Water is a limited resource, and it should therefore be paid for by the consumers, in order to preserve it……	….[1]….	…[2]….	….[3]…..	..[4]..	….[5]….	{V60}
4. Water supplied by NWSC is better quality than any other source, and is therefore value for money……	….[1]….	…[2]….	….[3]…..	..[4]..	….[5]….	{V61}
5. Most households are able to pay the connection fee charged by NWSC, and buy materials, in order to be connected onto NWSC water supply network……..	….[1]….	…[2]….	….[3]…..	..[4…	….[5]….	{V62}
6. Water bills are affordable by most households	….[1]….	…[2]….	….[3]…..	..[4…	….[5]….	{V63}
7. More people would be connected onto the water supply if connection fees could be paid in installments……	….[1]….	...[2]….	….[3]…..	..[4]..	….[5]….	{V64}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION VII continued

	Strongly disagree	Disagree	Uncertain/Undecided	Agree	Strongly agree	
8. The minimum charge levied by NWSC is fair	….[1]….	…[2]….	….[3]….	..[4]..	….[5]….	{V65}
9. I prefer my bills to be raised on flat rates …..…	….[1]….	…[2]….	….[3]….	..[4]...	….[5]….	{V66}
10. The time of the day for delivering bills is convenient and should be maintained…..…..…	….[1]….	…[2]….	….[3]….	.[4]…	….[5]….	{V67}
11. Considering the costs incurred in reconnections, the reconnection fee is fair and generally affordable …..…..…..…..…..…..…..…..…	….[1]….	...[2]….	….[3]….	..[4]...	….[5]….	{V68}
12. Water is a critical commodity in my household and water bills should be paid at the earliest opportunity to avoid disconnection of water to the house…..…..…..…..…..…..…..…...	….[1]…	...[2]….	….[3]….	..[4]..	….[5]….	{V69}
13. Bills raised by NWSC staff are clear, simple and understandable to most customers…..…..…	….[1]….	...[2]….	….[3]….	..[4]..	….[5]….	{V70}
14. For metered supplies the bills are always accurately raised according to meter readings…	….[1]….	...[2]….	….[3]….	..[4]..	….[5]….	{V71}
15. Water bills for my household are delivered monthly…..…..…..…..…..…..…..…..…..…..…..…	….[1]….	…[2]….	….[3]….	..[4…	….[5]….	V72}
16. The frequency of water bill delivery is satisfactory…..…..…..…..…..…..…..…..…..…..…	….[1]….	...[2]….	….[3]….	..[4]..	….[5]….	{V73}
17. The current method of delivering water bills to customers is good and should be maintained…	….[1]….	...[2]….	….[3]….	..[4]..	….[5]….	{V74}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION VIII: ATTITUDE TOWARD PAYING WATER BILLS

This section is concerned with the importance you attach to the water services provided by NWSC and your general attitude towards prompt payment for the services provided. Please answer the questions as truthfully as possible.

1.Your household may be using free rainwater at the same time with water from NWSC. If you use water from another source (other than rainwater) at the same time with water supplied by NWSC, which other source(s) do you use? Tick against all that are applicable. {V76-81}

[1] Water Vendors (water sold in jerrycans) [2] Protected spring or/and Boreholes
[3] Tanker water [4] From NWSC water tap elsewhere
[5] Other (*specify*) _____ [6] We do not use any other source when NWSC supply is on

Please indicate your views about the following two statements concerning payment of water bills:

	Strongly disagree	Disagree	Uncertain/Un decided	Agree	Strongly agree	
2. Water bills should be budgeted for on a monthly basis…	..[1]…..	..[2]…..	…..[3]..….	..[4]...	….[5]…..	{V82}
3. Water vendors (those who carry and sell water in jerrycans) are able to receive payment for their services easier than NWSC because the terms for sale are simple and more convenient to customers	…[1]…..	..[2]…..	…..[3]..….	..[4]...	….[5]…..	{V83}

4. In general terms, how often are water bills for your household paid? {V84}
[1] Once in three months [2] Once in two months
[3] Whenever I receive bills [4] Every month
[5] When I receive disconnection warning notice [6] Other (*specify*)_____

5. When were the water bills for your household last paid? {V85}
[1] More than three months ago [2] About three months ago
[3] About two months ago [4] About a month ago
[5] In not more than two weeks ago [6] I am not sure/I can remember

6. Has water supply to your tap(s) ever been disconnected due to non-payment of water bills? {V86}
[1] Yes, regularly [2] Yes, a few times
[3] Yes, but rarely [4] Never ever
[5] Even as I fill this form, my supply is off [6] Other (*specify*) _____

7. What do/did you do when your water was disconnected due to non-payment of water bills? {V87}
[1] I look for money to pay so that the supply can be re-connected immediately
[2] I look for alternative sources of supply such as water vendors
[3] Other *(specify)*_____ [4] Water to my household has never been disconnected due to non-payment

8. Which of these services do you rate as the most important to your household? Choose only one. {V88}
[1] Electricity [2] Telephone/Postal Services [3] All are equally important
[4] No opinion [5] Water and sanitation [6] Other (*specify*) _____

Appendix B: Questionnaire for the Final Study ….continued

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SECTION IX: THE PUBLIC IMAGE OF NWSC

The questions below relate to the corporate image of NWSC. Corporate image is the overall image an organisation has amongst the public, and its overall attractiveness. Please indicate how much you agree or disagree with each of the following aspects in connection with the public image of NWSC. When in doubt, please mark the option of "3"=*Uncertain/Undecided.* "5" = *Strongly Agree*, "1' = *Strongly Disagree*.

	Strongly disagree	Disagree	Uncertain/Undecided	Agree	Strongly agree	
1. NWSC is projected as an organization with high technical competence i.e. able to provide water services with good physical qualities.……	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V89}
2. NWSC is indifferent to customers' needs and wants……..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V90}
3. Staff at NWSC are committed to providing services to customers' satisfaction……..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V91}
4. NWSC is considered as an organization with a leadership committed to financial accountability	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V92}
5. NWSC staff who interact with customers give the impression they are well cared for……..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V93}
6. NWSC puts a lot of emphasis on serving the poorer section of our society……	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V94}
7. NWSC is considered as an organization with a leadership that treats customers as important…..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V95}
8. NWSC is an organization that is striving to expand its services to as large an area as possible	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V96}
9. NWSC has an active public relations desk that keeps customers updated with information…. ….	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V97}
10. NWSC always involves the customers in its decisions and operations ……..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V98}
11. NWSC is most of the time positively projected by the public media……	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V99}
12. NWSC is ranked as the most efficient and effective public utility in the country…….. ..	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V100}
13. Generally the public image of NWSC staff is quite favorable to the type of service they render	….[1]….	...[2]….	….[3]..….	..[4]..	….[5]….	{V101}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION X: DEGREE OF SATISFACTION WITH NWSC WATER SERVICES

Please indicate below how generally satisfied or dissatisfied you are with these specific aspects of provision of water services in your area. Levels of satisfaction: "5"=*Very satisfied*, through "3"= *Uncertain*, to "1"= *Very dissatisfied*

	Very satisfied	Fairly satisfied	Uncertain/ Undecided	Fairly dissatisfied	Very dissatisfied	
1. The technical efficiency of delivering water services to your premises……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V102}
2. The response to technical problems at customers' premises ……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V103}
3. The repair response time to water pipe bursts and leaks……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V104}
4. The overall quality of your tap water……	…[5]…	..[4]..	…[3]….	…[2].....	…[1]….	{V105}
5. The overall pricing policies for water services rendered e.g. connection fees, water bills etc. ……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V106}
6. The system in place in NWSC offices to monitor customers' complaints/compliments	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V107}
7. The response time to complaints on bills	…[5]…	..[4]..	…[3]….	…[2].....	…[1]….	{V108}
8. The overall accessibility of NWSC offices to customers requiring services……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V109}
9. The quality of customer care provided by NWSC contact staff e.g. field staff, receptionists……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V110}
10. The options available for paying water bills, and the process of paying in the money……	…[5]…	...[4]..	…[3]….	…[2].....	…[1]….	{V111}
11. The level of customer involvement in the affairs of the organization……	…[5]…	...[4]..	…[3]….	…[2].....	…[1….	{V112}

Appendix B: Questionnaire for the Final Study ….continued

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SECTION XI: CLASSIFICATION QUESTIONS

Thank you for your patience in answering the previous questions. Now, to help us classify your answers and process them statistically, could you please answer a few questions about yourself and your family.

1. What is your gender (sex)? {V113}
[1] Male [2] Female

2. What is the total number of years you have spent at school for formal education? {V114}
[1] Less than 7 years [2] Between 7 and 12 years
[3] Between 13 and 16 years [4] Over 16 years

3. What is your occupation? {V115}
[1] Civil servant (Government-employed) [2] Employed by a parastatal/private company
[3] Full time housewife [4] Self-employed professional
[5] Self-employed in business [6] Other (*specify*) _____

3. What is the average size of your normal household, excluding visitors? {V116}
[1] 1-2 people [2] 3-5 people
[3] 6-10 people [4] Over 10 people

4. What type of premises does your household occupy? {V117}
[1] Shared detached house (bungalow) [2] Singly occupied detached house (bungalow)
[3] Shared block of flats [4] Semi-detached house
[5] Singly occupied flat [6] Other (*specify*) _____

5. What is the ownership status of the premises occupied by your household? {V118}
[1] Privately owned by my family
[2] Govt./Company owned and allocated/rented to our household
[3] Privately owned & rented to our household
[4] Other (*specify*) _____

6. Apart from tap water, which other services are available to your household? Tick against all applicable {V119-126}
[1] UEB Electricity [2] Flushing toilets
[3] Telephone [4] Television
[5] Radio [6] Regular newspapers
[7] Private car (owned by the family) [8] Standby electricity

8. If you are renting, how much money do you spend on rent per month? ---------- {V127}

9. How much do you and all members of your household spend on the day-to-day needs or requirements (excluding rent) in one week? {V128}
[1] Below Ug. Shs. 30,000 per week [2] Between Ug. Shs. 30,001-75,000 per week
[3] Between Ug. Shs. 75,001-125,000 per week [2] Between Ug. Shs. 125,001-200,000 per week
[1] Below Ug. Shs. 200,000 per week

Appendix B: Questionnaire for the Final Study ….continued

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To the enumerator: *Ask the respondent if has any specific comments or suggestions that could be useful in improvement of service delivery by NWSC. This could be a specific complaint.*

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Thank you for the time and effort you have spent in answering the questions.
We are grateful for your support and cooperation.

THIS IS THE END.

To the Enumerator:

Time taken to trace the respondent : …………………….. Time taken to fill questionnaire ………………

Any comments? ____

Appendix C: Assumptions Used to Estimate Household Expenditure

The total expenditure is estimated by adding household living expenses, expenses on rent and on other amenities. Estimates were based on the following assumptions:

1. Amenities against which the household indicated they have in the home were given the following average expenditure weights, based on the urban expenditure index that was estimated by *The New Vision* newspaper of August 28, 1999.

AMENITY	ESTIMIMATED 'MAINTENANCE' COSTS (Uganda Shillings per month)
Piped Water only	30,000/=
Flushing Toilets	30,000/=
Electricity	80,000/=
Television	10,000/=
Radio	5,000/=
Regular newspapers	30,000/=
Telephone	30,000/=
Private car	200,000/=
Standby power	50,000/=

Source: The New Vision, Uganda: 28 August 1999.

2. For households that reported to be residing in personal houses, market-based rent values for middle-income property prevailing in the respective urban centres were used to estimate the rent value for each respondent. This value provided a guide to the rent value of the dwellings occupied by the households. The figures for estimated market values for rent in each urban centre were provided by a local estates agent, as shown below:

URBAN CENTRE	ESTIMATED MEAN MIDDLE INCOME RENT (Uganda Shs.)
Kampala	400,000
Jinja	300,000
Entebbe	400,000
Mbarara	300,000
Mbale	250,000
Masaka	200,000
Tororo	200,000
Gulu	150,000
Lira	150,000
Fort-Portal	150,000
Kasese	150,000

Source: Personal Communication with Nyaruhuma C.K.A, Sales Executive Property Links (Uganda) Ltd, Kampala, Uganda.

Appendix D1: Main Study SPSS Data Output for Reliability Analysis - Final Iteration for Technical Quality

```
 ****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)


       N of Cases =       136.0

Inter-item
Covariances          Mean     Minimum     Maximum      Range     Max/Min   Variance
                    .3985      -.0916      1.0575     1.1491   -11.5434      .0546


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance        Item-         Squared          Alpha
             if Item        if Item         Total        Multiple        if Item
             Deleted        Deleted    Correlation    Correlation       Deleted

VAR00004      86.9044       245.4352        .2311         .2189          .9033
VAR00005      86.6176       246.3268        .1960         .2405          .9041
VAR00006      87.1691       240.6304        .3812         .2644          .9003
VAR00007      86.7279       249.1328        .1625         .2068          .9038
VAR00022      87.5515       229.6714        .5140         .4902          .8978
VAR00023      87.0809       239.5119        .2832         .3659          .9040
VAR00024      86.7426       238.4888        .3773         .3969          .9007
VAR00025      86.8824       227.0379        .6689         .5860          .8938
VAR00026      86.7868       232.8505        .5172         .5651          .8975
VAR00027      86.9853       225.5109        .6387         .5106          .8944
VAR00028      87.0221       233.8440        .5075         .4473          .8977
VAR00029      87.1176       231.0527        .5334         .5603          .8971
VAR00030      86.8971       226.2412        .6580         .6203          .8940
VAR00031      87.1471       238.2301        .4949         .5288          .8981
VAR00032      87.2574       235.4074        .5874         .6383          .8964
VAR00033      87.4485       230.7529        .5785         .6463          .8961
VAR00034      87.0882       236.4366        .4791         .5198          .8983
VAR00035      87.0074       236.7185        .5389         .4272          .8973
VAR00036      87.0588       235.7298        .5326         .5121          .8973
VAR00037      87.1838       233.2771        .5884         .6397          .8961
VAR00038      87.3088       228.6002        .7011         .6851          .8935
VAR00039      87.3088       230.2743        .6355         .5938          .8949
VAR00040      87.2353       234.8627        .5709         .5266          .8966
VAR00041      87.4265       228.2168        .6127         .6139          .8952


Reliability Coefficients    24 items

Alpha =   .9018           Standardized item alpha =   .9015
```

Appendix D2: Main Study SPSS Data Output for Reliability Analysis - Final Iteration for Functional Quality

```
****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)


       N of Cases =       376.0

Inter-item
Covariances          Mean    Minimum    Maximum      Range    Max/Min   Variance
                    .2731      .0366      .7288      .6922    19.9344      .0173


Item-total Statistics

              Scale          Scale      Corrected
              Mean         Variance       Item-         Squared          Alpha
            if Item        if Item        Total        Multiple        if Item
            Deleted        Deleted    Correlation    Correlation       Deleted

VAR00015      76.3803       151.9216        .3386         .3083          .8889
VAR00016      76.1383       151.7622        .3930         .4667          .8871
VAR00017      76.5160       151.1891        .3770         .4084          .8878
VAR00018      76.7021       150.0497        .4696         .4022          .8852
VAR00019      76.3005       148.3974        .5408         .4931          .8834
VAR00020      76.1170       151.0956        .4320         .4063          .8861
VAR00021      76.7926       150.6022        .3537         .3143          .8889
VAR00042      76.7021       152.2257        .3228         .1658          .8894
VAR00043      76.5984       150.3850        .4008         .2616          .8872
VAR00044      76.9734       144.8260        .6202         .4670          .8810
VAR00045      76.6410       146.7161        .6153         .5191          .8815
VAR00046      76.4495       147.9814        .5801         .4622          .8825
VAR00047      76.5213       153.6475        .2937         .1361          .8899
VAR00048      76.3670       150.1209        .5553         .4158          .8835
VAR00049      76.6037       148.6665        .5980         .4624          .8823
VAR00050      76.5957       151.4095        .4417         .2911          .8859
VAR00051      77.2074       149.2689        .4731         .3279          .8851
VAR00052      76.9441       153.2689        .3425         .2272          .8883
VAR00053      77.0559       147.2902        .4927         .4294          .8846
VAR00054      76.5532       148.2585        .6193         .5296          .8819
VAR00055      76.8511       146.0738        .5784         .5177          .8822
VAR00056      77.0372       144.3079        .6533         .5936          .8801
VAR00057      76.4681       145.4070        .6728         .6012          .8800


Reliability Coefficients    23 items

Alpha =   .8894           Standardized item alpha =   .8925
```

Appendix D3: Main Study SPSS Data Output for Reliability Analysis: Final Iteration for Service Value

```
****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)


       N of Cases =       433.0

Inter-item
Covariances          Mean    Minimum    Maximum      Range    Max/Min   Variance
                    .1957     -.0374      .6420      .6794   -17.1645      .0163


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance       Item-          Squared          Alpha
             if Item        if Item        Total         Multiple        if Item
             Deleted        Deleted    Correlation    Correlation       Deleted

VAR00058      52.5127        58.3245        .2189         .1210           .7848
VAR00059      52.0208        60.8213        .1888         .1535           .7818
VAR00060      52.5058        57.8755        .3112         .1667           .7745
VAR00061      52.3880        56.2982        .4618         .2696           .7627
VAR00062      53.3210        57.4638        .2878         .2635           .7776
VAR00063      53.3002        55.4467        .4311         .3730           .7645
VAR00065      53.1917        55.5349        .3969         .2652           .7677
VAR00067      52.1732        56.3056        .5103         .3863           .7600
VAR00068      53.6605        57.5025        .2906         .1943           .7772
VAR00069      52.0739        59.4621        .3312         .2173           .7728
VAR00070      52.8360        54.8318        .4761         .3827           .7606
VAR00071      52.7667        55.6607        .4753         .3759           .7612
VAR00072      52.1663        58.9815        .3227         .3382           .7731
VAR00073      52.3072        56.2735        .5253         .5333           .7592
VAR00074      52.1501        57.1973        .5082         .5578           .7616
VAR00075      52.4273        57.6851        .4021         .2462           .7676


Reliability Coefficients    16 items

Alpha =   .7806           Standardized item alpha =   .7904
```

Appendix D4: Main Study SPSS Data Output for Reliability Analysis - Final Iteration for Corporate Image

```
****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E  (A L P H A)


       N of Cases =       445.0

Inter-item
Covariances          Mean    Minimum    Maximum      Range    Max/Min   Variance
                    .2344      .0951      .4330      .3379     4.5535      .0041


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance       Item-          Squared          Alpha
             if Item        if Item       Total         Multiple        if Item
             Deleted        Deleted    Correlation    Correlation       Deleted

VAR00089      36.9685        35.6432        .4716         .3338           .8140
VAR00091      37.1236        34.3428        .5933         .4073           .8046
VAR00092      37.5303        35.8442        .4211         .2208           .8177
VAR00093      37.4202        35.1541        .4397         .2469           .8165
VAR00094      38.1281        34.6254        .4057         .2565           .8210
VAR00095      37.1528        34.5036        .5702         .3465           .8063
VAR00096      37.1618        35.9062        .4136         .2039           .8183
VAR00097      37.4157        34.3245        .4925         .3057           .8122
VAR00098      38.0764        33.8905        .4825         .2958           .8135
VAR00099      37.4539        35.8115        .4451         .2259           .8159
VAR00100      37.3865        34.1205        .5070         .3110           .8109
VAR00101      37.1798        34.3190        .5706         .3928           .8060


Reliability Coefficients    12 items

Alpha =   .8260           Standardized item alpha =   .8292
```

Appendix D5: Main Study SPSS Data Output for Reliability Analysis - Final Iteration for Customer Satisfaction

```
****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S  -  S C A L E  (A L P H A)


       N of Cases =       441.0

Inter-item
Covariances          Mean     Minimum     Maximum      Range     Max/Min   Variance
                    .3246       .1374       .7068       .5694     5.1435       .0125


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance       Item-          Squared          Alpha
             if Item        if Item        Total         Multiple        if Item
             Deleted        Deleted    Correlation    Correlation       Deleted

VAR00102      35.1202        42.1060         .4303         .2602          .8124
VAR00103      35.6100        38.5339         .5933         .4532          .7969
VAR00104      35.9093        38.8690         .5195         .3549          .8043
VAR00105      35.0023        42.7295         .4101         .2368          .8141
VAR00106      36.2948        39.4584         .4425         .2405          .8130
VAR00107      35.8889        39.3035         .5437         .3416          .8019
VAR00108      35.9184        38.8979         .5366         .3368          .8025
VAR00109      35.3492        40.8823         .4511         .2728          .8106
VAR00110      35.3923        39.8617         .5661         .3747          .8005
VAR00111      35.2993        41.2647         .4685         .2422          .8091
VAR00112      36.3016        40.4066         .4339         .2283          .8127


Reliability Coefficients    11 items

Alpha =   .8216           Standardized item alpha =   .8229
```

Appendix D6: Main Study SPSS Data Output for Reliability Analysis - Attitudinal Loyalty

```
****** Method 2 (covariance matrix) will be used for this analysis ******
_


  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)


       N of Cases =       460.0

Inter-item
Covariances          Mean    Minimum    Maximum      Range    Max/Min   Variance
                    .3091      .0805      .6247      .5441     7.7582      .0248


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance       Item-          Squared          Alpha
             if Item        if Item        Total         Multiple        if Item
             Deleted        Deleted    Correlation    Correlation       Deleted

VAR00082      20.1457        16.4428        .3862         .2048           .6848
VAR00083      20.0196        16.0236        .3971         .2393           .6830
VAR00084      19.6609        15.7409        .4766         .3244           .6606
VAR00085      19.5870        16.3083        .4687         .3318           .6639
VAR00086      18.8891        16.8962        .4736         .5184           .6658
VAR00087      18.9174        17.0171        .4507         .5175           .6706
VAR00088      20.4804        16.7687        .3184         .1738           .7042


Reliability Coefficients     7 items

Alpha =   .7090           Standardized item alpha =   .7181
```

Appendix E1: Main Study SPSS Data Output for Factor Analysis - Final Iteration for Technical Quality

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.634	33.169	33.169	6.634	33.169	33.169	4.462	22.311	22.311
2	1.669	8.343	41.512	1.669	8.343	41.512	3.331	16.657	38.968
3	1.537	7.686	49.198	1.537	7.686	49.198	2.046	10.231	49.198
4	1.162	5.808	55.006						
5	1.072	5.358	60.364						
6	.953	4.763	65.127						
7	.873	4.367	69.494						
8	.824	4.120	73.614						
9	.769	3.845	77.459						
10	.701	3.504	80.963						
11	.640	3.201	84.164						
12	.577	2.884	87.049						
13	.473	2.363	89.412						
14	.418	2.091	91.503						
15	.374	1.871	93.374						
16	.352	1.760	95.133						
17	.290	1.448	96.581						
18	.252	1.262	97.843						
19	.243	1.213	99.056						
20	.189	.944	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
solve reconn-delay	.787	.147	-.228
compl disc-notice	.729	-.141	.189
solve no-discon-notice	.719	8.767E-02	-.220
compl staff-perf	.687	-.209	.205
solve conn-proccess	.682	.150	-.365
solve wrong-disc	.668	-.166	-.240
solve bill_compl	.652	-.329	-6.68E-02
solve leaks	.641	.152	1.235E-02
solve staff-behav	.632	-.220	-.353
solve bill-del	.595	-5.75E-02	-.246
solve appl-proc	.583	.110	-.405
compl leaks	.569	.109	.411
compl discon	.558	2.600E-02	.254
compl-billing	.544	-.301	.445
compl serv-inter	.535	-8.25E-02	.430
service interruction	.448	.391	.217
appearance	.177	.664	.184
flow time	.231	.639	9.006E-02
enough pressure?	.222	.372	3.315E-02
compl bill-del	.316	-.281	.329

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Rotated Component Matrix[a]

	Component		
	1	2	3
solve conn-proccess	***.742***	8.442E-02	.249
solve reconn-delay	***.734***	.248	.306
solve staff-behav	***.723***	.193	-.108
solve appl-proc	***.697***	1.108E-02	.175
solve no-discon-notice	***.681***	.234	.233
solve wrong-disc	***.673***	.278	-2.23E-02
solve bill-del	***.614***	.193	5.745E-02
solve bill_compl	***.561***	.451	-.141
solve leaks	***.467***	.335	.323
compl-billing	.145	***.750***	-3.19E-02
compl serv-inter	.132	***.658***	.167
compl staff-perf	.403	***.628***	4.102E-02
compl disc-notice	.440	***.617***	.112
compl leaks	.156	***.597***	.351
compl bill-del	4.637E-02	***.524***	-.102
compl discon	.256	***.505***	.236
appearance	-3.24E-02	7.538E-03	***.711***
flow time	7.082E-02	-2.02E-02	***.682***
service interruction	.171	.287	***.538***
enough pressure?	.120	2.552E-02	***.417***

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix E2: Main Study SPSS Data Output for Factor Analysis - Final Iteration for Functional Quality

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.951	31.596	31.596	6.951	31.596	31.596	5.861	26.643	26.643
2	2.363	10.739	42.335	2.363	10.739	42.335	3.452	15.692	42.335
3	1.150	5.227	47.562						
4	1.115	5.069	52.631						
5	.979	4.450	57.081						
6	.947	4.306	61.388						
7	.854	3.884	65.271						
8	.811	3.688	68.959						
9	.746	3.392	72.351						
10	.700	3.182	75.533						
11	.645	2.932	78.465						
12	.608	2.764	81.229						
13	.579	2.631	83.860						
14	.527	2.397	86.258						
15	.485	2.202	88.460						
16	.441	2.004	90.465						
17	.434	1.974	92.438						
18	.399	1.812	94.250						
19	.344	1.562	95.812						
20	.333	1.513	97.325						
21	.311	1.415	98.740						
22	.277	1.260	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix [a]

	Component	
	1	2
good customer care	.747	-.252
react to problems asap	.732	-.249
staff are confident	.698	-.213
staff understand needs	.688	-.133
keep promises	.675	-7.31E-02
admit mistakes	.665	-.333
relevant solns	.664	-5.22E-02
give personal attn	.632	-2.05E-02
knowledgeable	.627	-8.81E-02
techn. problem in 48hrs	.580	-.283
office directions	.565	.493
seek advice	.556	-.296
staff facilitated	.507	-9.91E-02
tel reception	.483	.463
accurate docs	.464	-8.04E-02
bills corrected in 1 month	.391	-.160
staff sympathetic	.379	-.168
office facilities	.388	.620
operating hrs	.403	.606
language used	.460	.483
parking	.378	.437
dist to office	.362	.420

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix [a]

	Component	
	1	2
good customer care	***.775***	.144
react to problems asap	***.761***	.140
admit mistakes	***.743***	3.325E-02
staff are confident	***.713***	.154
staff understand needs	***.665***	.219
techn. problem in 48hrs	***.644***	3.500E-02
seek advice	***.630***	1.230E-02
keep promises	***.625***	.265
relevant solns	***.605***	.278
knowledgeable	***.590***	.229
give personal attn	***.562***	.290
staff facilitated	***.491***	.160
accurate docs	***.444***	.156
bills corrected in 1 month	***.420***	5.093E-02
staff sympathetic	***.413***	3.812E-02
office facilities	3.724E-02	***.730***
operating hrs	5.650E-02	***.726***
office directions	.253	***.706***
language used	.167	***.646***
tel reception	.197	***.640***
parking	.117	***.565***
dist to office	.111	***.543***

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Appendix E3: Main Study SPSS Data Output for Factor Analysis - Final Iteration for Service Value

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.091	25.570	25.570	4.091	25.570	25.570	3.244	20.276	20.276
2	1.858	11.612	37.182	1.858	11.612	37.182	2.265	14.158	34.435
3	1.409	8.806	45.988	1.409	8.806	45.988	1.849	11.553	45.988
4	.990	6.189	52.176						
5	.970	6.062	58.238						
6	.926	5.786	64.024						
7	.834	5.210	69.235						
8	.780	4.875	74.110						
9	.733	4.580	78.690						
10	.656	4.099	82.789						
11	.600	3.751	86.539						
12	.565	3.534	90.073						
13	.462	2.887	92.960						
14	.459	2.871	95.830						
15	.366	2.286	98.116						
16	.301	1.884	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix [a]

	Component		
	1	2	3
time of bill delivery ok	.673	-.228	-9.11E-02
bills clear	.598	7.397E-02	-.168
bills accurate	.616	-6.76E-02	-.197
bills monthly	.507	-.421	-.299
freq of bill delivery ok	.698	-.388	-2.29E-02
method of delivery ok	.699	-.446	-8.81E-02
payment options ok	.545	-.125	2.497E-02
connection affordable	.334	.511	-.343
bills affordable	.475	.547	-.225
min charge fair	.428	.514	1.881E-02
re-conn fee fair	.320	.530	-.147
water God given	.302	-8.51E-02	.498
pay for costs	.225	.102	.665
water economic good	.358	.296	.313
water value for money	.536	.204	.350
water critical commodity	.437	-4.17E-02	.365

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Rotated Component Matrix [a]

	Component		
	1	2	3
time of bill delivery ok	***.684***	.139	.160
bills clear	***.485***	.383	9.680E-02
bills accurate	***.583***	.281	6.067E-02
bills monthly	***.713***	-3.19E-02	-.119
freq of bill delivery ok	***.770***	-3.82E-03	.213
method of delivery ok	***.820***	-3.20E-02	.147
payment options ok	***.494***	.132	.226
connection affordable	9.154E-02	***.685***	-.115
bills affordable	.152	***.742***	5.257E-02
min charge fair	6.224E-02	***.617***	.251
re-conn fee fair	1.437E-02	***.634***	5.930E-02
water God given	.146	-9.04E-02	***.563***
pay for costs	-6.28E-02	-2.04E-02	***.706***
water economic good	3.988E-02	.312	***.464***
water value for money	.221	.303	***.558***
water critical commodity	.268	4.776E-02	***.502***

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Appendix E4: Main Study SPSS Data Output for Factor Analysis – Final Iteration for Corporate Image

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.009	36.448	36.448	4.009	36.448	36.448	2.609	23.718	23.718
2	1.019	9.268	45.715	1.019	9.268	45.715	2.420	21.997	45.715
3	.880	8.003	53.718						
4	.858	7.796	61.515						
5	.771	7.009	68.523						
6	.709	6.448	74.972						
7	.648	5.895	80.867						
8	.643	5.844	86.711						
9	.561	5.098	91.809						
10	.481	4.374	96.183						
11	.420	3.817	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix [a]

	Component	
	1	2
technical competence	.618	-.447
commited to customer satisfaction	.708	-.256
fin accountability	.538	-.239
staff were cared for	.518	-.385
leadership customer focused	.677	-5.80E-02
expansion oriented	.512	-1.81E-02
vibrant PR	.609	.335
involve customers	.566	.475
well projected	.544	.380
most efficient	.621	.250
good public image	.690	-1.07E-03

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix [a]

	Component	
	1	2
technical competence	***.756***	9.695E-02
commited to customer satisfaction	***.692***	.298
fin accountability	***.556***	.194
staff were cared for	***.641***	7.345E-02
leadership customer focused	***.533***	.421
expansion oriented	***.386***	.337
vibrant PR	.215	***.661***
involve customers	8.767E-02	***.734***
well projected	.136	***.649***
most efficient	.282	***.607***
good public image	.504	***.472***

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Appendix E5: Main Study SPSS Data Output for Factor Analysis - Final Iteration for Customer Satisfaction

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.606	36.057	36.057	3.606	36.057	36.057	2.413	24.134	24.134
2	1.131	11.311	47.368	1.131	11.311	47.368	2.323	23.234	47.368
3	.948	9.476	56.844						
4	.828	8.279	65.123						
5	.716	7.157	72.280						
6	.661	6.610	78.890						
7	.617	6.169	85.059						
8	.575	5.751	90.810						
9	.513	5.128	95.938						
10	.406	4.062	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
problems at customers' prem	.719	.282
complaints monitori	.653	-.258
repair response time	.651	.184
response time to bil complaints	.644	-.386
options for paying	.574	.211E-03
tech efficiency	.562	.463
pricing policies	.558	-.431
customer involveme	.554	-.423
overall accessibilty offices	.541	.130
water quality	.516	.454

Extraction Method: Principal Component A

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
tech efficiency	***.726***	5.644E-02
problems at customers' prem	***.713***	.297
water quality	***.687***	3.104E-02
repair response time	***.597***	.319
overall accessibilty of offices	***.479***	.282
options for paying	***.418***	.393
response time to bill complaints	.196	***.725***
pricing policies	.103	***.697***
customer involvement	.106	***.689***
complaints monitoring	.291	***.639***

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalizati

a. Rotation converged in 3 iterations.

Appendix E6: Main Study SPSS Data Output for Factor Analysis - Final Iteration for Attitudinal Loyalty

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.595	37.068	37.068	2.595	37.068	37.068	2.084	29.769	29.769
2	.969	13.849	50.917	.969	13.849	50.917	1.480	21.148	50.917
3	.909	12.986	63.903						
4	.815	11.648	75.551						
5	.733	10.478	86.030						
6	.545	7.787	93.817						
7	.433	6.183	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
most important utility	.708	-.190
ok to budget?	.649	-.118
payment intervals	.647	-5.75E-02
ever disconnected?	.644	.455
post-disc. steps	.541	-3.16E-03
last payment made	.476	.604
lumpsum bills ok?	.565	-.586

Extraction Method: Principal Component Anal

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
lumpsum bills ok?	***.796***	-.169
most important utilit	***.693***	.240
ok to budget?	***.604***	.266
payment intervals	***.568***	.315
post-disc. steps	***.450***	.301
last payment made	5.529E-02	***.767***
ever disconnected?	.278	***.738***

Extraction Method: Principal Component Analy

Rotation Method: Varimax with Kaiser Normaliz

a. Rotation converged in 3 iterations.

Appendix F1: SPSS Data Output of Regression Analysis for Model 1 - Predictors of Corporate Image

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.583	.250

a. Predictors: (Constant), SER_VAL, FUNCT_QU, TECH_QUA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.758	3	10.253	164.679	.000[a]
	Residual	21.666	348	6.226E-02		
	Total	52.424	351			

a. Predictors: (Constant), SER_VAL, FUNCT_QU, TECH_QUA

b. Dependent Variable: CORP_IMA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.792	.122		6.514	.000		
	TECH_QUA	8.378E-02	.035	.107	2.418	.016	.603	1.659
	FUNCT_QU	.424	.034	.523	12.297	.000	.655	1.526
	SER_VAL	.230	.035	.275	6.611	.000	.684	1.462

a. Dependent Variable: CORP_IMA

Appendix F2: SPSS Data Output of Regression Analysis for Model 2 - Predictors of Customer Satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.709[a]	.503	.496	.4148

a. Predictors: (Constant), CORP_IMA, TECH_QUA, SER_VAL, FUNCT_QU

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.721	4	13.180	76.605	.000[a]
	Residual	52.132	303	.172		
	Total	104.853	307			

a. Predictors: (Constant), CORP_IMA, TECH_QUA, SER_VAL, FUNCT_QU

b. Dependent Variable: CUST_SAT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.328	.232		-1.418	.157		
	TECH_QUA	.238	.063	.198	3.754	.000	.589	1.697
	FUNCT_QU	.422	.076	.336	5.540	.000	.446	2.242
	SER_VAL	.166	.066	.131	2.523	.012	.605	1.652
	CORP_IMA	.281	.096	.183	2.939	.004	.424	2.359

a. Dependent Variable: CUST_SAT

Appendix F3: SPSS Data Output of Regression Analysis for Model 3 - Predictors of Attitudinal Loyalty

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.469[a]	.220	.212	.3953

a. Predictors: (Constant), CUST_SAT, SER_VAL, CORP_IMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.163	3	4.388	28.081	.000[a]
	Residual	46.718	299	.156		
	Total	59.881	302			

a. Predictors: (Constant), CUST_SAT, SER_VAL, CORP_IMA

b. Dependent Variable: ATT_LOY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.055	.209		9.847	.000		
	SER_VAL	.277	.063	.283	4.364	.000	.620	1.613
	CORP_IMA	-7.50E-02	.080	-.066	-.943	.347	.533	1.876
	CUST_SAT	.228	.050	.304	4.566	.000	.589	1.697

a. Dependent Variable: ATT_LOY

Appendix F4: SPSS Data Output of Regression Analysis for Model 4 - Predictors of Attitudinal Loyalty

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.293[a]	.086	.071	75.3670

a. Predictors: (Constant), ATT_LOY, CORP_IMA, SER_VAL, CUST_SAT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	272.728	50.479		5.403	.000		
	SER_VAL	-7.169	13.916	-.041	-.515	.607	.592	1.689
	CORP_IMA	14.892	17.188	.075	.866	.387	.502	1.992
	CUST_SAT	-12.056	11.328	-.091	-1.064	.288	.521	1.920
	ATT_LOY	-43.993	12.203	-.251	-3.605	.000	.779	1.284

a. Dependent Variable: M_BI_PA

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	SER_VAL	CORP_IMA	CUST_SAT	ATT_LOY
1	1	4.963	1.000	.00	.00	.00	.00	.00
	2	1.449E-02	18.507	.13	.00	.01	.50	.17
	3	1.033E-02	21.923	.02	.27	.08	.20	.49
	4	7.739E-03	25.324	.38	.62	.09	.02	.15
	5	4.528E-03	33.106	.46	.11	.82	.28	.19

a. Dependent Variable: M_BI_PA

Appendix G: SPSS Data Output for Testing Bias in Questionnaire Administration Methods Using Independent T-Tests

Group Statistics

	Questionnaire admin method	N	Mean	Std. Deviation	Std. Error Mean
TECH_QUA	self-administered	302	3.7467	.5204	2.994E-02
	translated	161	3.7724	.4918	3.876E-02
FUNCT_QU	self-administered	333	3.4672	.5429	2.975E-02
	translated	183	3.5526	.5102	3.772E-02
SER_VAL	self-administered	332	3.384	.461	2.529E-02
	translated	178	3.392	.495	3.709E-02
CORP_IMA	self-administered	262	3.362	.417	2.577E-02
	translated	144	3.439	.358	2.985E-02
CUST_SAT	self-administered	292	3.5223	.6553	3.835E-02
	translated	150	3.5687	.5822	4.754E-02
ATT_LOY	self-administered	298	3.5208	.4771	2.763E-02
	translated	168	3.5821	.5070	3.912E-02
M_BI_PA	self-administered	307	132.9577	131.6975	7.5164
	translated	147	145.0721	185.2541	15.2795

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Mean	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TECH_QUA	Equal variances assumed	.995	.319	-.516	461	.606	-2.57E-02	4.983E-02	-.1236	7.220E-02
	Equal variances not assumed			-.525	343.057	.600	-2.57E-02	4.898E-02	-.1220	7.062E-02
FUNCT_QU	Equal variances assumed	1.349	.246	-1.744	514	.082	-8.53E-02	4.891E-02	-.1814	1.078E-02
	Equal variances not assumed			-1.776	395.066	.077	-8.53E-02	4.804E-02	-.1798	9.127E-03
SER_VAL	Equal variances assumed	2.099	.148	-.177	508	.860	-7.77E-03	4.394E-02	-9.41E-02	7.855E-02
	Equal variances not assumed			-.173	340.549	.863	-7.77E-03	4.489E-02	-9.61E-02	8.053E-02
CORP_IMA	Equal variances assumed	4.023	.046	-1.870	404	.062	-7.71E-02	4.120E-02	-.158	3.946E-03
	Equal variances not assumed			-1.954	333.957	.051	-7.71E-02	3.943E-02	-.155	5.035E-04
CUST_SAT	Equal variances assumed	2.576	.109	-.732	440	.465	-4.64E-02	6.344E-02	-.1711	7.827E-02
	Equal variances not assumed			-.760	333.692	.448	-4.64E-02	6.108E-02	-.1665	7.374E-02
ATT_LOY	Equal variances assumed	1.469	.226	-1.303	464	.193	-6.13E-02	4.709E-02	-.1539	3.119E-02
	Equal variances not assumed			-1.281	329.200	.201	-6.13E-02	4.789E-02	-.1556	3.288E-02
M_BI_PA	Equal variances assumed	7.502	.006	-.799	452	.424	-12.1145	15.1540	-41.8955	17.6666
	Equal variances not assumed			-.711	219.089	.478	-12.1145	17.0282	-45.6745	21.4456

Appendix H : SPSS Data Output for Testing Non-Response Bias Methods Using Independent T-Tests.

Group Statistics

	Received response	N	Mean	Std. Deviation	Std. Error Mean
Years of formal education by head of household	by Sept 19	494	14.565	3.640	.164
	after Sept 19	42	14.429	3.277	.506
Estimated household income p.m.	by Sept 19	388	597.834	259.806	13.190
	after Sept 19	27	568.148	53.280	10.254
Household size	by Sept 19	494	6.955	2.945	.133
	after Sept 19	42	6.810	2.965	.458
Mean bill payment period	by Sept 19	442	166.2483	203.3652	9.6731
	after Sept 19	40	137.0161	109.5997	17.3292

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Mean	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Years of formal education by head of household	Equal variances assumed	.626	.429	.235	534	.815	.136	.581	-1.005	1.277
	Equal variances not assumed			.256	50.006	.799	.136	.532	-.931	1.204
Estimated household income p.m.	Equal variances assumed	44.904	.000	.592	413	.554	29.686	50.127	-68.849	128.221
	Equal variances not assumed			1.777	154.759	.078	29.686	16.706	-3.316	62.688
Household size	Equal variances assumed	.062	.803	.308	534	.758	.146	.474	-.785	1.076
	Equal variances not assumed			.306	48.140	.761	.146	.476	-.812	1.104
Mean bill payment period	Equal variances assumed	2.995	.084	.897	480	.370	29.2322	32.5960	-34.8164	93.2807
	Equal variances not assumed			1.473	66.518	.145	29.2322	19.8462	-10.3863	68.8506

Appendix I1: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Gender of Head of Household and the Predictor/Criterion Variables of the Moderated Regression Model

ANOVA Table[a]

			Sum of Squares	df	Mean Square	F	Sig.
Customer Satisfaction * Gender	Between Groups	(Combined)	.334	1	.334	.841	.360
	Within Groups		174.420	439	.397		
	Total		174.754	440			

a. With fewer than three groups, linearity measures for Customer Satisfaction * Gender cannot be computed.

Measures of Association

	Eta	Eta Squared
Customer Satisfaction * Gender	.044	.002

ANOVA Table[a]

			Sum of Squares	df	Mean Square	F	Sig.
Attitudinal Loyalty * Gender	Between Groups	(Combined)	.607	1	.607	2.592	.108
	Within Groups		106.981	457	.234		
	Total		107.587	458			

a. With fewer than three groups, linearity measures for Attitudinal Loyalty * Gender cannot be computed.

Measures of Association

	Eta	Eta Squared
Attitudinal Loyalty * Gender	.075	.006

Appendix I2: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations Between Level of Education of Head of Household and the Predictor/Criterion Variables of the Moderated Regression Model

Satisfaction levels * education Crosstabulation

Count

		education				
		less than 7 yrs	7-12 yrs	13-16 yrs	over 16 yrs	Total
Satisfaction levels	Very dissatisfied	5	13	39	33	90
	Dissatisfied	25	77	115	122	339
Total		30	90	154	155	429

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.098	.091	-1.090	.276
N of Valid Cases		429			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Loyalty levels * education Crosstabulation

Count

		education				
		less than 7 yrs	7-12 yrs	13-16 yrs	over 16 yrs	Total
Loyalty levels	Very low	11	12	39	36	98
	Low	32	75	119	121	347
Total		43	87	158	157	445

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.069	.089	-.771	.441
N of Valid Cases		445			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Appendix I3: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Type of Employment of Head of Household and the Predictor/Criterion Variables of the Moderated Regression Model

ANOVA Table[a]

			Sum of Squares	df	Mean Square	F	Sig.
Customer Satisfaction * Occupation	Between Groups	(Combined)	.003	1	.003	.008	.931
	Within Groups		162.679	398	.409		
	Total		162.682	399			

a. With fewer than three groups, linearity measures for Customer Satisfaction * Occupation cannot be computed.

Measures of Association

	Eta	Eta Squared
Customer Satisfaction * Occupation	.004	.000

ANOVA Table[a]

			Sum of Squares	df	Mean Square	F	Sig.
Attitudinal Loyalty * Occupation	Between Groups	(Combined)	.724	1	.724	3.073	.080
	Within Groups		97.977	416	.236		
	Total		98.700	417			

a. With fewer than three groups, linearity measures for Attitudinal Loyalty * Occupation cannot be computed.

Measures of Association

	Eta	Eta Squared
Attitudinal Loyalty * Occupation	.086	.007

Appendix I4: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Household Size and the Predictor/Criterion Variables of the Moderated Regression Model

Satisfaction levels * education Crosstabulation

Count

		education				
		less than 7 yrs	7-12 yrs	13-16 yrs	over 16 yrs	Total
Satisfaction levels	Very dissatisfied	5	13	39	33	90
	Dissatisfied	25	77	115	122	339
Total		30	90	154	155	429

Symmetric Measures

		Value	Asymp. Std. Error [a]	Approx. T [b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.098	.091	-1.090	.276
N of Valid Cases		429			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Loyalty levels * education Crosstabulation

Count

		education				
		less than 7 yrs	7-12 yrs	13-16 yrs	over 16 yrs	Total
Loyalty levels	Very low	11	12	39	36	98
	Low	32	75	119	121	347
Total		43	87	158	157	445

Symmetric Measures

		Value	Asymp. Std. Error [a]	Approx. T [b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.069	.089	-.771	.441
N of Valid Cases		445			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Appendix I5: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Ownership Status of Premises Occupied and the Predictor/Criterion Variables of the Moderated Regression Model

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Satisfaction levels * Tenure of property	Between Groups	(Combined)	.001	1	.001	.003	.953
	Within Groups		71.293	431	.165		
	Total		71.293	432			

Measures of Association

	Eta	Eta Squared
Satisfaction levels * Tenure of property	.003	.000

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Loyalty levels * Tenure of property	Between Groups	(Combined)	.330	1	.330	1.937	.165
	Within Groups		76.376	449	.170		
	Total		76.705	450			

Measures of Association

	Eta	Eta Squared
Loyalty levels * Tenure of property	.066	.004

Appendix I6: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Type of Premises Occupied by the Household and the Predictor/Criterion Variables of the Moderated Regression Model

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Customer Satisfaction * Premise type	Between Groups	(Combined)	.539	1	.539	1.387	.240
	Within Groups		163.937	422	.388		
	Total		164.476	423			

Measures of Association

	Eta	Eta Squared
Customer Satisfaction * Premise type	.057	.003

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Attitudinal Loyalty * Premise type	Between Groups	(Combined)	.268	1	.268	1.146	.285
	Within Groups		102.996	440	.234		
	Total		103.264	441			

Measures of Association

	Eta	Eta Squared
Attitudinal Loyalty * Premise type	.051	.003

Appendix I7: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Household Income Level and the Predictor/Criterion Variables of the Moderated Regression Model

Satisfaction levels * Income level Crosstabulation

Count

		Income level		
		Below shs 600,000 p.m	Above shs. 600,000 p.m.	Total
Satisfaction levels	Very dissatisfied	47	26	73
	Dissatisfied	207	72	279
Total		254	98	352

Symmetric Measures

		Value	Asymp. Std. Error [a]	Approx. T [b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.228	.133	-1.574	.115
N of Valid Cases		352			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Loyalty levels * Income level Crosstabulation

Count

		Income level		
		Below shs 600,000 p.m	Above shs. 600,000 p.m.	Total
Loyalty levels	Very low	58	26	84
	Low	199	76	275
Total		257	102	359

Symmetric Measures

		Value	Asymp. Std. Error [a]	Approx. T [b]	Approx. Sig.
Ordinal by Ordinal	Gamma	-.080	.135	-.579	.562
N of Valid Cases		359			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Appendix I8: Testing for Multicollinearity - SPSS Data Output of Non-Parametric Correlations between Household Use of Alternative Water Sources and the Predictor/Criterion Variables of the Moderated Regression Model

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Customer Satisfaction * Alternative source?	Between Groups	(Combined)	1.101	1	1.101	2.799	.095
	Within Groups		171.570	436	.394		
	Total		172.672	437			

Measures of Association

	Eta	Eta Squared
Customer Satisfaction * Alternative source?	.080	.006

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Attitudinal Loyalty * Alternative source?	Between Groups	(Combined)	.226	1	.226	.949	.330
	Within Groups		110.400	463	.238		
	Total		110.626	464			

Measures of Association

	Eta	Eta Squared
Attitudinal Loyalty * Alternative source?	.045	.002

Appendix J1: Test for Moderator Effects of Gender - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.400[a]	.160	.155	.4488

a. Predictors: (Constant), G, CUST_SAT

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.531	2	7.265	36.064	.000[a]
	Residual	76.353	379	.201		
	Total	90.884	381			

a. Predictors: (Constant), G, CUST_SAT

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.490[a]	.240	.234	.4276

a. Predictors: (Constant), GXCU_SA, CUST_SAT, G

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.786	3	7.262	39.727	.000[a]
	Residual	69.098	378	.183		
	Total	90.884	381			

a. Predictors: (Constant), GXCU_SA, CUST_SAT, G

b. Dependent Variable: ATT_LOY

Appendix J2: Test for Moderator Effects of Level of Education - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.405[a]	.164	.155	.4489

a. Predictors: (Constant), E3, CUST_SAT, E1, E2

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.913	4	3.728	18.501	.000[a]
	Residual	75.971	377	.202		
	Total	90.884	381			

a. Predictors: (Constant), E3, CUST_SAT, E1, E2

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464[a]	.216	.201	.4366

a. Predictors: (Constant), E3XCU_SA, CUST_SAT, E1XCU_SA, E2XCU_SA, E3, E2, E1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.608	7	2.801	14.698	.000[a]
	Residual	71.276	374	.191		
	Total	90.884	381			

a. Predictors: (Constant), E3XCU_SA, CUST_SAT, E1XCU_SA, E2XCU_SA, E3, E2, E1

b. Dependent Variable: ATT_LOY

Appendix J3: Test for Moderator Effects of Type of Occupation - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.400[a]	.160	.153	.4494

a. Predictors: (Constant), O2, CUST_SAT, O1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.556	3	4.852	24.029	.000[a]
	Residual	76.328	378	.202		
	Total	90.884	381			

a. Predictors: (Constant), O2, CUST_SAT, O1

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426[a]	.181	.170	.4449

a. Predictors: (Constant), O2XCU_SA, CUST_SAT, O1, O2, O1XCU_SA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.462	5	3.292	16.634	.000[a]
	Residual	74.422	376	.198		
	Total	90.884	381			

a. Predictors: (Constant), O2XCU_SA, CUST_SAT, O1, O2, O1XCU_SA

b. Dependent Variable: ATT_LOY

Appendix J4: Test for Moderator Effects of Household Size - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.416[a]	.173	.166	.4240

a. Predictors: (Constant), H2, CUST_SAT, H1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.096	3	4.699	26.134	.000[a]
	Residual	67.422	375	.180		
	Total	81.517	378			

a. Predictors: (Constant), H2, CUST_SAT, H1

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.429[a]	.184	.173	.4223

a. Predictors: (Constant), H2XCU_SA, CUST_SAT, H1, H2, H1XCU_SA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.002	5	3.000	16.826	.000[a]
	Residual	66.515	373	.178		
	Total	81.517	378			

a. Predictors: (Constant), H2XCU_SA, CUST_SAT, H1, H2, H1XCU_SA

b. Dependent Variable: ATT_LOY

Appendix J5: Test for Moderator Effects of Type of Premises - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.407[a]	.166	.161	.4254

a. Predictors: (Constant), P1, CUST_SAT

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.119	2	6.559	36.242	.000[a]
	Residual	66.059	365	.181		
	Total	79.178	367			

a. Predictors: (Constant), P1, CUST_SAT

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.415[a]	.172	.165	.4244

a. Predictors: (Constant), P1XCU_SA, CUST_SAT, P1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.617	3	4.539	25.201	.000[a]
	Residual	65.561	364	.180		
	Total	79.178	367			

a. Predictors: (Constant), P1XCU_SA, CUST_SAT, P1

b. Dependent Variable: ATT_LOY

Appendix J6: Test for Moderator Effects Type of Tenure - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.404[a]	.164	.157	.4279

a. Predictors: (Constant), T2, CUST_SAT, T1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.432	3	4.477	24.453	.000[a]
	Residual	68.664	375	.183		
	Total	82.096	378			

a. Predictors: (Constant), T2, CUST_SAT, T1

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.430[a]	.185	.174	.4237

a. Predictors: (Constant), T2XCU_SA, CUST_SAT, T1, T2, T1XCU_SA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.149	5	3.030	16.880	.000[a]
	Residual	66.947	373	.179		
	Total	82.096	378			

a. Predictors: (Constant), T2XCU_SA, CUST_SAT, T1, T2, T1XCU_SA

b. Dependent Variable: ATT_LOY

Appendix J7: Test for Moderator Effects of Estimated Household Income - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.157	.150	.4503

a. Predictors: (Constant), I2, CUST_SAT, I1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.163	3	4.388	21.638	.000[a]
	Residual	70.565	348	.203		
	Total	83.728	351			

a. Predictors: (Constant), I2, CUST_SAT, I1

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426[a]	.182	.169	.4451

a. Predictors: (Constant), I2XCU_SA, CUST_SAT, I1, I1XCU_SA, I2

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.445	5	2.889	14.580	.000[a]
	Residual	64.990	328	.198		
	Total	79.434	333			

a. Predictors: (Constant), I2XCU_SA, CUST_SAT, I1, I1XCU_SA, I2

b. Dependent Variable: ATT_LOY

Appendix J8: Test for Moderator Effects of Alternative Water Source(s) - SPSS Data Output showing results of a hierarchical moderated regression analysis to compare F-statistics for a reduced model with no interaction terms (un-shaded), and a full model with interactive terms (shaded)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.157	.152	.4497

a. Predictors: (Constant), AW, CUST_SAT

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.244	2	7.122	35.219	.000[a]
	Residual	76.641	379	.202		
	Total	90.884	381			

a. Predictors: (Constant), AW, CUST_SAT

b. Dependent Variable: ATT_LOY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.401[a]	.161	.154	.4492

a. Predictors: (Constant), AWXCU_SA, CUST_SAT, AW

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.615	3	4.872	24.144	.000[a]
	Residual	76.269	378	.202		
	Total	90.884	381			

a. Predictors: (Constant), AWXCU_SA, CUST_SAT, AW

b. Dependent Variable: ATT_LOY

Appendix K : Table Showing Procedure Used for Computing the Partial F-Statistics for Evaluating the Significance of Moderator Terms

	No. of listwise cases (N)	No. of predictor terms for reduced model (k1)	No. of predictor terms for full model (k2)	R-square value for reduced model (R1)	R-square value for full mode model (R2)	(k2- k1 + 1)	[b]Computed partial F-statistic (F-diff) $F_{(k2-k1)(N-k2-1)}$	[a]Fcritical at $\alpha = 0.01$	Fcritical at $\alpha = 0.05$	Fcritical at $\alpha = 0.1$
HOUSE CHARACTERISTIC										
Gender of Head of Household	379	2	3	.160	.240	2	39.5**	6.63	3.84	
Level of Formal Education by Head of Household	381	4	7	.164	.216	4	8.25**	3.78	2.6	
Type of Occupation for Head of Household (formal or informal)	378	3	5	.160	.181	3	4.77**	4.61	3.0	
Size of Household	375	3	5	.173	.184	3	2.49[ns*]	4.61	3.0	2.08
Type of Premises Occupied by Household (whether shared)	365	2	3	.166	.172	2	2.62[ns*]	6.63	3.84	2.3
Ownership Status of Premises Occupied by Household	373	3	5	.164	.185	3	4.73**	4.61	3.0	
Estimated Household Income	348	3	5	.157	.182	3	5.23**	4.61	3.0	
Whether Household has Alternative Water Source	379	2	3	.157	.161	2	1.79[ns]	6.63	3.84	2.3

** - $p < 0.001$ [ns] - Not significant at $p < 0.1$

[ns*] - not significant at $p < 0.05$ but significant at $p < 0.1$

[a] - Figures of $F_{critical}$ values are adopted from Dielman (1991).

[b] - Partial F-statistic computed by formula adopted from Bohrnstedt and Knoke (1982) as follows:

$$F_{(k2-k1)(N-k2-1)} = [(R_2^2 - R_1^2) / (k_2 - k_1)] \; / \; [(1 - R_2^2)(N - k_2 - 1)]$$