

**A SOUTH AFRICAN STUDY OF  
CONSUMERS' PERCEPTION AND HOUSEHOLD UTILIZATION  
OF A RURAL WATER SERVICE**

**U KOLANISI**

**(B Human Ecology)**

**Mini dissertation submitted in the School for Consumer Sciences at the North-West University, Potchefstroom, in partial fulfillment of the requirements for the degree Magister Consumer Sciences (Consumer Behaviour)**

**Study Leader: Dr EL Kempen**

**Co-Study Leader: Mrs M Larney**

**Potchefstroom**

**2005**



## **DEDICATIONS**

*To my late grandmother and my father (Dad wherever you are this is for you!),*

*To my mother for your love and support (Mom you are great!);*

*To my grandfather, for your prayer and encouragement;*

*To my brother for your love and support and*

*To my aunt and cousins, 'Guys' thank you for your support.*

## ACKNOWLEDGEMENTS

---

There is nothing impossible to God! Thank you heavenly father for making this possible for me, without you on my side all would have been in vein.

I would like to express my sincere gratitude to the following people who contributed to make this study possible:

- Dr E.L. Kempen, my study leader, for your inspiration, encouragement, excellent guidance, wisdom, support, patience and believing in me. She led by example, thanks for being a role model.
- Mrs.M. Larney, my co-study leader, for all the guidance and advises.
- Dr M. Van der Merwe, formulation of articles for publication, thanks for all the assistance and advises.
- Ms N. Sonnenburg, co-author in one of the articles, thanks for all the guidance and contribution.
- The Chief 'Kgosi' of Madibogo, the community and local municipality, for cooperation and contribution to this study.
- Water Research Commision for funding this study.
- Naledi Seheri, for introducing and driving me to Madibogo.
- Ferdinard Postma Library, for assisting in literature.
- Dr K. Ita, for support and encouragement.
- Dr S.R. Malefane, for emotional support, assistance and for believing in me.
- To all my friends, for emotional support.

# A SOUTH AFRICAN STUDY OF CONSUMERS' PERCEPTION AND HOUSEHOLD UTILIZATION OF A RURAL WATER SERVICES

---

## Summary

The South African government is engaged in providing 'water for all' especially to rural areas. This is done by developing accessible, potable, safe drinking water systems. Safe drinking water is classified according to its **quality** and **quantity** factors. These factors are an important aspect in the consumers' perception of a rural water service. It is the intention of the Free Basic Water Policy (FBWP) to provide a service that addresses these factors by issuing a water service that is affordable.

Little is known about the way in which these services are experienced, received and perceived by the beneficiaries in the rural communities. It is also not clear whether the FBWP has had the intended effect on its recipients. Therefore the main aim of this study was to determine the consumers' perceptions and household utilization of a rural water service through an exploration of consumers' perceptions of the water quality, water quantity, FBWP and household water utilization.

This study was done by employing a qualitative strategy, making use of focus groups and semi-structured interviews. Data collected with these methods, revealed that consumers rely on physical qualities and performance of water when evaluating a water service. Water quantity was defined through availability and accessibility of which distance has direct economic implications. The FBWP was perceived to be non-beneficial; however its intended purpose is to improve the quality of life of its beneficiaries.

It is suggested that the water service stakeholders be informed about the consumers' understanding and daily experience of these water aspects. It is proposed that this understanding can be achieved through the use of a systems perspective, as it illustrates the interaction and interdependence that exists among the consumers, consumer behavioural processes and service providers. This interaction is considered as an important improvement of quality of life.

## A SOUTH AFRICAN STUDY OF CONSUMERS' PERCEPTION AND HOUSEHOLD UTILIZATION OF A RURAL WATER SERVICES

---

### Opsomming

Die Suid-Afrikaanse regering is betrokke by die verskaffing van "water vir almal" en veral aan landelike gebiede. Dit word gedoen deur die ontwikkeling van toeganklike, bruikbare en veilige drinkwatersisteme. Veilige drinkwater word geklassifiseer volgens **kwaliteits-** en **kwantiteitsfaktore**. Hierdie faktore is 'n belangrike aspek in die verbruiker se persepsie van 'n landelike waterverskaffingsdiens. Dit is die intensie van die Gratis Basiese Water Belyd (GBWB) om 'n bekostigbare diens te lewer wat hierdie faktore aanspreek.

Daar bestaan min inligting oor die wyse waarop hierdie diens ervaar en ontvang word sowel as die persepsie daarvan deur die behoewendes in die landelike gemeenskappe. Dit is ook nie duidelik of die GBWB die bedoelde effek op die behoewendes het nie. Daarom was die doel van hierdie studie om die verbruikers se persepsies en huishoudelike gebruik van 'n landelike waterverskaffingsdiens te verken deur op die verbruiker se persepsie van water kwaliteit, - kwantiteit, GBWB en huishoudelike water gebruik te fokus.

Hierdie studie is uitgevoer deur die toepassing van 'n kwalitatiewe strategie, waartydens daar van fokusgroepe en semi-gestruktureerde onderhoude gebruik gemaak is. Data-insameling met behulp van hierdie metodes, het gewys dat verbruikers staat maak op die fisiese kwaliteite en verrigting van die water wanneer 'n waterverskaffingsdiens geëvalueer word. Waterkwantiteit word gedefinieer deur beskikbaarheid en toeganklikheid waarvan afstand 'n direkte ekonomiese implikasie inhou. Die persepsie van die GBWB is dat dit geen voordele inhou nie, alhoewel die bedoeling daarmee is, om die kwaliteit van lewe van die behoewendes te verbeter.

Daar word voorgestel dat die waterverskaffingsrolspelers ingelig word oor die verbruiker se begrip en daaglikse ervaring van waterverbandhoudende aspekte. Verder word daar voorgestel dat hierdie begrip verkry kan word deur die toepassing van die sisteemperspektief, aangesien hierdie perspektief die interaksie en interafhanklikheid wat tussen die verbruiker, verbruikersgedragsprosesse en diensverskaffers uitbeeld. Hierdie interaksie word as 'n belangrike skakel in die verbetering van kwaliteit van lewe beskou.

## **OPERATIONAL DEFINITIONS**

---

In order to clarify the terminology used in this study the following definitions are provided:

- Consumer - refers only to the way in which an unmet need such as water provision is identified leading to the subsequent consumption of a water product (Gabbott & Hogg, 1998:9)
- Household water use - the use of domestic water for many purposes in and around the house (WRC, 1999b:3)
- Free basic water policy - a vehicle for expedient delivery used by the government within the context of the constitution and the fundamental human rights to basic services (Kasrils, 2002:2)
- Perceptions - is the process by which an individual observes, selects, organizes and reacts to environmental stimuli in a meaningful way (Statt, 1997:46; Blackwell, Miniard & Engel, 2001:6 ; Arnould, Price & Zinkhan, 2004:299)
- Water quality - a description of the microbiological, physical and chemical properties of water that determine its fitness for use (WRC, 2000:2).
- Water quantity - refers to the variables that include amongst other things affordability, reliability and convenience (De Fontaine, 2000:1).

As there are no formal definitions found in water research for these terms, for the purpose of this study the following terms are defined by the researcher as referring to Madibogo:

- Location/ township - refers to the urban areas receiving purified water from the taps.
- Water service - refers to the quality and quantity of drinking water that is being provided to the recipients in the community.
- Water supply - refers to the water source where the water is obtained from which in this instance ground water such as boreholes pumped into reservoirs and distributed into communal taps in the community.

## TABLE OF CONTENTS

---

### CHAPTER 1

#### INTRODUCTION

1.1	Motivation and problem statement .....	1
1.2	Aims and objectives.....	6
1.3	Conceptual framework.....	7
1.3.1	The perception of water quality.....	7
1.3.2	The perception of water quantity.....	8
1.3.3	Perception of Free Basic Water Policy (FBWP).....	9
1.4	Ethical issues.....	11
1.5	The contribution of this study to water .....	11
1.6	Chapter layout .....	11
1.7	Author's contribution to the study.....	12
1.8	References.....	14

### CHAPTER 2

#### LITERATURE REVIEW

2.1	Introduction.....	18
2.2	Water components.....	18
2.2.1	Defining water quality .....	18
2.2.2	Water quality determinants .....	20
2.2.3	The role of water treatment and purification designs.....	23
2.2.4	Water quantity determinants .....	26
2.2.5	Free Basic Water Policy .....	27
2.2.6	Household water utilization .....	29
2.3	Stakeholders involved in water service development .....	30
2.4	Consumer's perception processes .....	32
2.4.1	General Systems Theory .....	34
2.5	Conclusion.....	41
2.6	References.....	42

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

3.1	Introduction.....	46
3.2	Situational context of Madibogo village.....	46
3.2.1	Exploratory visits to Madibogo village .....	47
3.2.2	Orientation of Madibogo in the North West Province .....	48
3.3	Research methods .....	51
3.3.1	Focus groups .....	51
3.3.2	Interviews.....	52
3.4	Sampling .....	53
3.5	Data analysis method .....	53
3.6	Triangulation.....	54
3.7	Trustworthiness of the methods and analysis.....	54
3.8	Conclusion .....	55
3.9	References .....	56

## **CHAPTER 4**

### **FINDINGS AND DISCUSSION**

4.1	Introduction.....	59
4.2	Visual evaluation .....	59
4.3	Water quality.....	60
4.4	Water quantity.....	66
4.5	The responsibility to look after the water services.....	70
4.6	The National Free Basic Water Policy .....	71
4.7	The household water utilization.....	75
4.8	Conclusions.....	80
4.9	References .....	82

## **CHAPTER 5**

### **ARTICLES**

Part 1:	A South African study of consumers' perceptions and household utilization of a rural water service: A qualitative study.....	1-37
Part 2:	A South African study of consumers' perceptions and household utilization of a rural water service: A systems approach to water service provision and consumer behavioural processes.....	1-21

**Addendum:** Water SA journal guidelines for Author/s

## **CHAPTER 6**

### **SUMMARY, RECOMMENDATIONS AND LIMITATIONS**

6.1	Introduction.....	85
6.2	General summary.....	85
6.2.1	The perception of water quality.....	85
6.2.2	The perception of water quantity.....	86
6.2.3	The perception of Free Basic Water Policy.....	87
6.2.4	The perception of household water utilization.....	88
6.3	The proposed theoretical framework for the study of water service provision.....	89
6.4	Recommendations.....	91
6.5	Limitations of the study.....	92
6.6	References.....	94

## LISTS OF TABLES

---

### CHAPTER 1

Table 1.1	The various studies done on water .....	5
Table 1.2	Author's contribution .....	12

### CHAPTER 2

Table 2.1	Contaminants affecting the quality of drinking water .....	19
Table 2.2	The pathogens of concerns in drinking water .....	20
Table 2.3	The chemical compounds in water that affect humans .....	21
Table 2.4	The chemical quality classification of Nitrate+Nitrite .....	22
Table 2.5	A classification system describing the effects of the different classes of water on the various household uses .....	24

### CHAPTER 3

Table 3.1	The research aspects and questions posed to the community leaders .....	53
-----------	---	----

### CHAPTER 4

Table 4.1	The participants' visual perceptions of the water in the glasses .....	60
Table 4.2	Experiences of drinking water .....	61
Table 4.3	Personal experiences of drinking water through sensory receptors .....	61
Table 4.4	Reasons for believing that there is safe drinking water .....	62
Table 4.5	Reasons for not believing that there is safe drinking water .....	64
Table 4.6	Reasons for believing that Madibogo water is safe drinking water .....	64
Table 4.7	Water treatment used by consumers .....	65
Table 4.8	The reasons for the desiring purified water .....	66
Table 4.9	Factors affecting the availability of water from the taps .....	67
Table 4.10	Economic implications of the distance to communal taps .....	69
Table 4.11	No cost for the consumers for the provision of water .....	70
Table 4.12	Responsibility of each partner in development .....	70
Table 4.13	The importance of information through the right channels .....	71
Table 4.14	Reasons for not believing that the FBWP is for the poor people including rural people .....	73
Table 4.15	Participants' suggestion for the improvement of the FBWP .....	74
Table 4.16	Expectation leading to consumers' misconception .....	75
Table 4.17	Consumers' dissatisfaction with the performance and taste of drinking water .....	77
Table 4.18	The cost effect as a challenge in water consumption .....	79
Table 4.19	Reasons for the concerns of participants .....	80

## LIST OF FIGURES

---

### CHAPTER 1

- Figure 1.1 A conceptual framework representing the perception and household utilization of rural water services..... 10

### CHAPTER 2

- Figure 2.1 Proposed framework for water policy implementation across all sectors ..... 28
- Figure 2.2 A model of the relationship within Action-Oriented Groups Interested in Consumer Behaviour ..... 31
- Figure 2.3 A redrawn model of a consumer role and behaviours ..... 32
- Figure 2.4 The perceptual process of a consumer ..... 33
- Figure 2.5 Amended figure of the consumers' perceptual process of a rural water service..... 36
- Figure 2.6 Amended model of the relationship within Action-Oriented Groups Interested in Consumer Behaviour..... 38
- Figure 2.7 A consolidation model of systems perspectives of consumers' perceptions and rural water service providers ..... 40

### CHAPTER 3

- Figure 3.1 North West Province (Mafikeng) Map..... 48
- Figure 3.2 A pictorial representation of existence in Madibogo ..... 50

### CHAPTER 6

- Figure 6.1 A system perspective of a rural water service provision and consumer perception..... 90

# CHAPTER 1

## INTRODUCTION

---

### 1.1 Motivation and problem statement

In South Africa access to water is seen as a basic human right, Bill of rights as stated in the Constitution (SA, 1996). According to MacKay and Ashton (2004:3), the South African Government has been engaged, since 1994, in an intense series of complex, participative processes to renew, revitalize and reform the policy and legislative procedures guiding the provision of water consumption, to communities. This was aimed at eliminating past inequities and to ensure that all citizens enjoy equal access to basic human rights. Consequently, in trying to meet its obligation, the government is committed to ensure that all South Africans receive all the basic municipal services such as water, refuse removal, sanitation and electricity.

According to MacKay and Ashton (2004:3) reform in the provision of basic municipal services, that includes water, restrains from any discriminatory practices towards a household's ability or inability to pay for water services. Hence, the South African Government and water-related agencies such as the Water Research Commission of South Africa are undertaking a vigorous campaign to provide '*water for all*'. These campaigns are highlighted by intensive research aimed at increasing the supply of drinkable water by developing systems of small-scale potable water treatment units for rural and peri-urban areas (Netshiswinzhe, 2002:1; Bailey, 2003:3; Modise & Krieg, 2004:1; Pillay & Jacob, 2004:1).

De Fontaine (2000:1) notes the scarcity of good drinking water and enumerates the criteria of good drinking water supply, as factors related to **water quality** and **water quantity**. Water quality is defined as referring to the aesthetic, physical, chemical and microbiological properties of water. On the other hand water quantity is viewed as including variables such as affordability, accessibility and availability (De Fontaine, 2000:1; Modise & Krieg, 2004:1). Consumers are primarily concerned with water quantity-related issues and water quality usually

takes a back seat. Only once a water supply has been established, consumers turn their attention to water quality (De Fontaine, 2000:1). Bates (2000:29) states that one of the expectations of consumers is that drinking water will be safe and wholesome. Subsequently, De Fontaine (2000:1) lately noted a change in consumers, as they are now becoming more conscious of the quality of water that they are drinking.

Such consciousness of water quality suggests that the water service providers, government and the community or consumers of these water sources need to be involved, from an early stage, in the development of a water project to suit the community. Several authors, such as Sami and Murray (1998:4.3), Pybus Schoeman and Hart (2001:13) and Mathabatha and Naidoo (2004:1) argue that this can help consumers to be clear about their rights, to be informed and to understand the procedures of the project and to create an awareness of the benefits of such projects. It is clear that, through the implementation of proper informative procedures, water services would be better received by community members and consumers of such sources.

It can now be questioned what role the Consumer Scientist can play in creating the proper environment for the acceptance of community services such as basic water supply. The Consumer Scientist is someone who is known to be an educationalist. In this capacity the Consumer Scientist is able to provide the community with the necessary information regarding basic services implemented in the community. The Consumer Scientist's role is, therefore, one of training and informing consumers of the way in which a service can be regarded (Kiamba, 1999:15). De Fontaine (2000:3) warns that in an educational capacity, information should be accessible and consumer friendly. With this idea in mind it is suggested that the consumers should be able to understand the ideas being presented to them. This would eliminate the misunderstandings and wrongful interpretations of the intended information regarding a basic service.

Furthermore, Pybus *et al.* (2001:12) is of the opinion that consumers are important role players in consuming and taking care of the product or service. In relation to this, it can be argued that if a Consumer Scientist intervenes and plays a role as educationalist, consumers of basic services will have a better chance of taking ownership of the service they receive. This is an important issue to consider if a basic service is to be sustainable.

Moreover, Boshoff (1997:2) claims that one of the objectives of Consumer Scientists is to improve quality of life. Quality of life or commonly referred to as well-being consists of psychological, social and the personal factors that may influence the way in which a human being is comfortable within his/her environment (Rice & Tucker, 1986:19; Masetloa, 2004:47). These factors make up some of the behavioural components of a consumer. It is therefore, through an understanding of the quality of life, created through these behaviours that the consumers' needs can be identified and addressed.

These behaviours can also be associated with the academic principles of consumer behaviour. In this regard, consumer behaviour leads to the study of individuals and community groups and the processes they use to consume and dispose of water services as well as the impact that these processes have on the community as consumers. Consumer behaviour in general is defined through the marketing perspective by authors such as, Blackwell, Miniard & Engel (2001:6) and Solomon (2004:49). Their views however, form the bases on which consumer behaviour is viewed in this study. They define consumer behaviour as the study of individuals, groups, or organizations and the processes or activities they use to obtain, consume and dispose products, services, experiences or ideas to satisfy their needs and the impacts that these processes have on the consumer and society. It is within the idea of consumer behaviour that the Consumer Scientist finds the way in which to understand the consumer within a certain environment and situation. The Consumer Scientist's role is therefore, to determine the behaviour of the consumer and address the needs through the general background of a Consumer Scientist and consumer research applied.

With this in mind, the question arises as to why a study of consumers' perceptions and household utilization of a rural water service would be necessary. The psychological process of perception is one way in which answers to this question will be obtained. However, the proposed study suggests that this research needs to explore the thoughts and ideas of the consumers of rural water services, which will then be determined through their perceptions. This, therefore, suggests that a phenomenological approach will be followed. The proposed approach is based on the fact that people's subjective experiences and interpretations of the world and its happenings are explored through their eyes (Trochim, 2002:1). This approach is suitable for applying in the exploration of the views and understanding that consumers hold with regard to a rural water service.

The problem, however, is that little has been done on consumer perceptions and household water utilization in relation to water services in South Africa. Table 1.1 lists the few studies that have been done on water in South Africa. In general these studies have not paid much attention to the psychological processes such as perception of a water service through the consumer. Nor has the consumer been the focus of the research from a phenomenological perspective. These studies have only delivered results in an advisory capacity that should be considered in order to alleviate a particular community problem. These studies have not considered the consumers' understanding and opinions of the situation under study. It is therefore evident that a study looking at consumer perception and household water utilization will be an important contribution to the water research field and can be accomplished through studying the aspects this research has in view, especially as so little attention has been paid to the consumers themselves. Table 1.1, illustrates some of the various studies done on water in South Africa.

**Table 1.1: The various studies done on water in South Africa**

<b>Title of study</b>	<b>Author/s and year of publication</b>
Water purification works	Van Duuren (1997)
Guidelines for the evaluation of water resource for rural development with an emphasis on groundwater	Sami and Murray (1998)
Determining personal and domestic Health and Hygiene Knowledge, Attitudes and Behaviour: A Pilot study	Westaway (1998)
Groundwater quality protection for farmers	Colvin (2000)
Water as consumed and its impact on the consumer	Bates (2000)
Trouble shooting guide for the domestic consumer	De Fontaine (2000)
Safe drinking water	Van Leeuwen (2000)
Evaluation of nanofiltration for the treatment of rural groundwater for potable use	Modise and Krieg (2004)

One of the above mentioned studies done by Modise and Krieg (2004) intended to address the quality of water through a potable water treatment system. Modise and Krieg (2004: viii) further state that groundwater is normally considered to be "clean". In addition to this, some areas experience higher levels, than acceptable of nitrate, fluorides and in some instances, high sulphates in the water (Sami & Murray., 1998:11.20; Pietersen, 2005:26). Murphy (2002:1) argues that in South Africa this situation may be blamed on the treatment of water. This argument is based on the fact that many rural areas in South Africa, such as the community of Madibogo, depend on groundwater as a source. Tests performed on groundwater from the Madibogo community, indicated a high concentration of nitrate (*commonly referred to as salt*) reaching levels of 22.66 mg/l (Hlophe, 2004). Contrary to this, the specification standard set by the South African Bureau of Standards (SABS) for nitrate in drinking water is 10 mg/l. Consequently, this may cause consumers of such a source to have a negative personal and social experience of the water. It is further proposed that these experiences stem from the utilization of groundwater such as sources at Madibogo.

A second issue arises within water research based on the studies done by De Fontaine (2000:1) and Modise and Krieg (2004:1). These studies have addressed water quantity issues like affordability, accessibility and availability. These studies have for example, indicated that water quantity or in fact the provision of water services is of concern to the water recipients of these sources. In the context of the study some of the members of the Madibogo village receive water for household utilization through means of a water service provider. This service makes use of groundwater pumped into reservoirs and distributed to the occupants who cannot afford their own groundwater provision such as boreholes.

It is argued that, although such a service is provided and with good intention, it is not always received in that way by the community members. It is rather proposed that dissatisfaction with the water service provided may occur. The study argues that the Free Basic Water Policy (FBWP) is trying to address these incidents of dissatisfaction. For example, the idea is to provide water to all members of a community without any descriptions and unnecessary expenditures (Netshiswinzhe, 2002:1). It is, therefore, necessary to explore how this policy as well as water quantity issues is received and understood by the members of the rural community. This problem forms the basis of this study.

## **1.2 Aim and objectives**

The main aim of this study is to determine the perceptions and household utilization of rural water services provided to the residents of the Madibogo village in the North West Province. To achieve this aim the following objectives were formulated:

- To explore consumers' perceptions of the water quality of a rural water service.
- To explore consumers' perceptions of the water quantity of a rural water service.
- To explore consumers' perceptions of the Free Basic Water Policy.
- To explore consumers' perceptions of their daily household water utilization.

- To present a model of consumers' perceptions of a rural water service and its relation as well as its influential position in the water service provision act.

### **1.3 Conceptual framework**

The following conceptual framework, presented in Figure 1.1, is an illustration of the relationship between the concepts identified in this study. The conceptual framework illustrates that rural water services are studied through two concepts, namely perceptions of water services and household utilization of such services. It is argued through literature that the perception of rural water services can be explored through means of water quality, water quantity and the FBWP.

#### **1.3.1 The perception of water quality**

According to the Water Research Commission (WRC) (1999a:5) water is viewed as defining the microbiological, physical and chemical properties of water that determine its fitness for use. The physical property is determined by the aesthetic quality factor that means the taste, smell and the visual appearance (Figure 1.1).

For the purpose of this study the water quality will address the physical aspects of water although water quality is defined to have microbial and chemical properties as well. It is also known that the imbalance between these three aspects of water quality will have an effect on the physical quality of water (WRC, 1999a:5). The physical quality of water can be visibly noticed. The idea exists that when water physically looks clean, although the taste and smell is unpleasant, the water is perceived to be ideal. However, this physical component of water quality seems to have a very important role in the utilization of a water source as consumers' judgment is based on the appearance as well as the taste of water. This judgment causes consumers not to use the water for food preparation and drinking purposes although it is safe to do so (WRC, 2000:3).

Concern is also shared in the water guide published by the WRC (1999b:5). It states that water of a bad quality occasionally contains disease-causing organisms that result in ill-health. This water is sometimes accepted by the

communities as a drinkable and usable source. In this instance the physical quality of the water misleads the consumers into making a wrong decision that may affect their quality of life. In this study it is argued that it is especially the physical quality of water that needs to be determined when water studies are performed in communities.

### **1.3.2 Perception of water quantity**

According to De Fontaine (2000:1) and Modise and Krieg (2004:1) the following variables identify water quantity: affordability, accessibility and availability (Figure 1.1). For the purpose of this study a short definition of each variable is given as will be applied to this study.

#### **a) Affordability**

Under the concept of affordability it is suggested that every South African has the right to basic services which includes the provision of water services, sanitation, refuse removal and electricity. Netshiswinzhe (2002:1) clearly states that it is the responsibility of the state to subsidize the municipalities in an attempt to make water affordable to everyone.

#### **b) Accessibility**

In this study accessibility refers to water services and water facilities, which should be easily reached and attainable to everyone. This also refers to physical accessibility, economic accessibility, non-discrimination and information accessibility (Anon, 2002:6).

#### **c) Availability**

Availability refers to the fact that in line with the World Health Organization (WHO) guidelines and the South African Water Quality guideline water and water sources should be sufficient and reliable for household chores, activities such as food preparation, drinking, laundering and personal hygiene. (Anon, 2002:5)

### **1.3.3 Perception of Free Basic Water Policy**

The vehicle through which water quantity is addressed is the FBWP (Kasrils, 2002: 2). The main aim of this policy is to eradicate poverty, to improve the health and quality of life of South Africans (Netshiswinzhe, 2002:1). The government is giving 6 kℓ of water to poor households every month, which amounts to about 25-40 ℓ per person per day (Smits, 2004:1).

Furthermore, the illustration suggests that the perception of these three components is influenced by the utilization of the water service. Although household water utilization in Figure 1.1 refers to food preparation and drinking water it also plays a role in personal sustenance but also has a role to play in personal hygiene where it is used for bathing, laundering and other household uses. However, the study argues that the FBWP is attempting to address the utilization needs of the community, consequently influencing the perceptions of water quality, water quantity and FBW in general. Figure 1.1, presents a conceptual framework representing the perceptions and household utilization of rural water services.

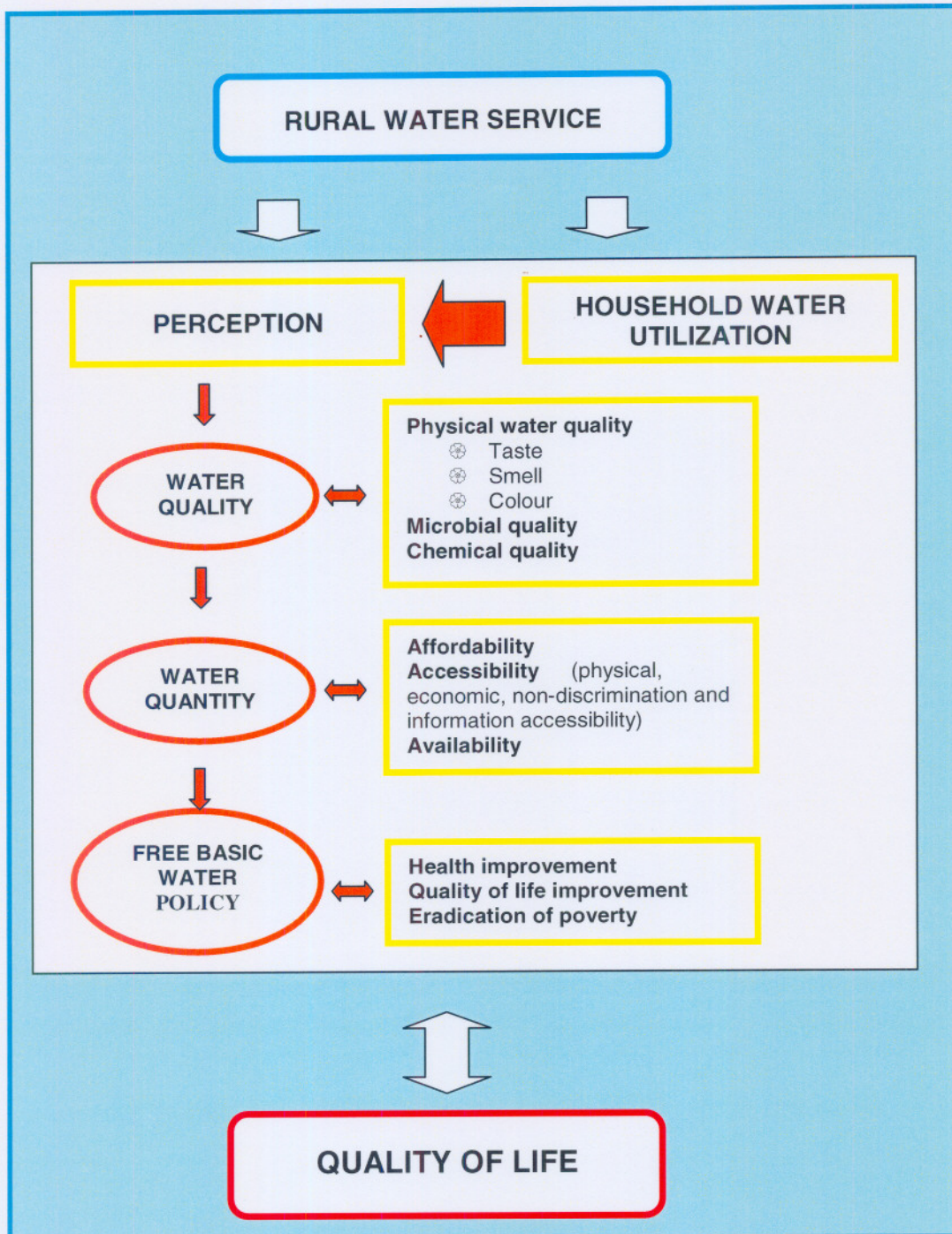


Figure 1.1: A conceptual framework representing the perception and household utilization of rural water services.

#### **1.4 Ethical issues**

The researcher used several opportunities to explain the research to the community. For example, during the introduction meeting to the Chief 'Kgosi' and the community and before each focus group discussion. During these informative sessions the researcher explained to the community members participating that their participation was voluntarily, confidential and anonymous and under no circumstances would they be held accountable for their contribution. They were ensured that there were no right or wrong answers and they were encouraged to speak freely. The participants were also given the opportunity to use nicknames rather than their own names of identification within the focus groups. Data were also not linked to the comments of a particular participant. Findings would be reported to the Water Research Commission for further processing.

#### **1.5 The contribution of this study to water research**

This study will give a consumers' perspective of rural water services which may result in a better understanding of the way in which the consumer perceives and utilizes rural water services. The study is intended to augment the body of knowledge already existing within water bodies and water research commissions. This study will undoubtedly make a valuable contribution to the research field of consumer behavior and the valuable role that the Consumer Scientist plays in working with consumer needs. This study will also play an important role in consumer theory and water behavioural consumer research in a South African context.

#### **1.6 Chapter layout**

The mini-dissertation is divided into six chapters. Chapter one presents the introduction to the study of the consumers' perception and household utilization of a rural water service. The second chapter firstly, presents the literature review regarding water and its related aspects in South Africa such as water quality, water quantity and the FBWP. Secondly, it reviews consumer behavior in relation to water as a service through means of the psychological processes of perceptions. In chapter three the methodology of this study is explained in detail.

In chapter four the findings of this study are reported and discussed. Chapter five presents two articles written about this study and submitted to the journal Water SA. In chapter six the summary, recommendations for future studies and limitations are given. The numbering of the mini-dissertation follows the mini-dissertation format. The numbering used to the articles are based on the submission requirements for Water SA journal and therefore do not follow the dissertation's numbering format.

### 1.7 Author's contribution to the study

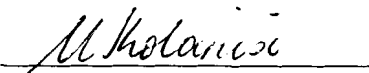
The study reported in this mini-dissertation was planned and executed by a team of researchers. The contribution of each researcher is given in the following table:

**Table 1.2: Author's contribution to the study**


<b>Name</b>	<b>Role in the study</b>
Ms. U. Kolanisi	Author, formulated and conceptualized the study, gathering of data, interpretation of data, descriptive analysis, literature research and preparation of this mini-dissertation.
Dr. E. Kempen	Study leader and co-author. Supervised idea formulation and conceptualization of the study, Supervised descriptive analysis and interpretation of data. Supervised the writing of this mini-dissertation. Also conceived the idea and organized sponsorships and funds to enable the study.
Ms M. Larney	Co-study leader and co-author. Supervised descriptive analysis and interpretation of the data. Supervised the writing of this mini-dissertation.


The following is a statement from the co-authors confirming their individual roles in the study and their permission for the articles to form part of this mini-dissertation.


*I declare that I have approved the above-mentioned article, that my role in the study, as indicated above, is representative of my actual contribution and that I hereby give my consent that it may be published as part of the Masters mini-dissertation of Miss U Kolanisi (2005).*

  
Ms U. Kolanisi

  
Dr. E. Kempen

  
Ms M. Larney

  
Ms N. Sonnenberg  
(Co-author in systems perspective article)

  
Dr. M. Van der Merwe  
(Articles formulation for publishing)

## 1.8 References

ANON. 2002. The Right to Water: General comment No.15. [Web:] <http://www.unhchr.ch/html/menu2/6/gc15.doc> [Date of access: 09 February 2004].

ARNOULD, E.J., PRICE, L.L. & ZINKHAN, G.M. 2004. Consumers. 2<sup>nd</sup> ed. Boston : McGraw-Hill/Irwin .

BATES, A.J. 2000. Water as consumed and its impact on the consumer: do we understand the variables? Food and chemical toxicology. 38 Supplement (1): S29-S36, April. [Web:] <http://www.ncbi.nlm.nih.gov/entrez/query> [Date of access: 20 May 2004].

BAILEY, I.W. 2003. The impact to introducing treated water on aspects of community in a rural community in Kwa-Zulu-Natal. Umngeni: Water Research Commission. WRC report no. 926/03.

BLACKWELL, R.D., MINIARD, P.W. & ENGEL, J.F. 2001. Consumer behaviour. 9<sup>th</sup> ed. Forth worth: Hartcourt College Publishers.

BOSHOFF, E. 1997. Focus and content of consumer science in South Africa. PU vir CHO.

BRYMAN, A. 1996. Quantity and quality in social research. London: Routledge.

COLVIN, C. 2000. Handbook of groundwater quality protection for farmers. Pretoria: Water Reseaech Commission. Water report no. 116/00.

BILL of RIGHTS. 1996. The Constitution of the SA, Act 108 of 1996. Cape Town.

DE FONTAINE, J. 2000. Trouble shooting guide for the domestic consumer. Water Research Commission. Johannesburg: WRC report no. 963/1/00.

GABBOTT, M. & HOGG, G. 1998. Consumer and Services. Chichester: John Wiley & Sons Ltd.

HLOPHE, M. 2004. Unpublished report. North-West University (Mafikeng campus)

KASRILS, R. 2002. Parliamentary media briefing. [Web:] <http://www.info.gov.za/speeches> [Date of access: 08 February 2005].

KIAMBA, J.M. 1999. Home Economics: from housewifery to training for ecologically sustainable development. KwaDlangezwa: University of Zululand.

MACKAY, H.M. & ASHTON, P.J. 2004. Towards co-operative governance in the development and implementation of cross-sectoral policy: Water policy as an example. *Water SA* 30(1) 1-8, January.

MATHABATHA, S. & NAIDOO, D. 2004. A review of public participation in the rural water and sanitation setting. Pretoria: Water Research Commission. WRC report no. 1381/1/04.

MASETLOA, L. S. 2004. An educational intervention program for female farm dwellers focusing on resource management. Potchefstroom: PU vir CHO.

MODISE, S.J. & KRIEG, H.M. 2004. Evaluation of nanofiltration for the treatment of rural ground water for potable water use. Pretoria: Water Research Commission. WRC report no. 1230/1/04.

MURPHY, KO'H. 2002. Guidelines for the implementation of benchmarking practices in the provision of water service in South Africa. Pretoria: Water Research Commission. WRC report no. TT 125/00.

NETSHISWINZHE, B. 2002. Free Basic water-Tapping its Developmental Potential in rural Areas. [Web:] [http:// www.mvula.co.za](http://www.mvula.co.za) [Date of access: 2004/08/1].

PIETERSEN, K. 2005. Groundwater Crucial to Rural Development. WRC, *Water Wheel*, 4(2) 26-27p March/April.

PILLAY, V.L. & JACOB, E.P. 2004. The development of small-scale ultrafiltration systems for potable water production. Pretoria: Water Research Commission . WRC report no.1070/1/04.

PYBUS, P.; SCHOEMAN, G. & HART, T. 2001. The level of communication between communities and engineers in the provision of engineering service. Pretoria: Water Research Commission. WRC report no.TT 133/00.

RICE, A.S. & TUCKER, S.M. 1986. Family Life Management. 6<sup>th</sup> ed. New York: Macmillan, Inc.

SAMI, K. & MURRAY, E.C. 1998. Guidelines for the evaluation of water resource for rural development with an emphasis on groundwater. Pretoria: Water Research Commission. WRC report no. 677/1/98.

STATT, D.A. 1997. Understanding the consumer a psychological approach. London: MacMillan Press Ltd.

SILVERMAN, D. 2000. Doing qualitative research. London: Sage Publications.

SMITS, S. 2004. Free Basic water and “steeping up the ladder” in South Africa. [Web:] <http://www.pt.irc.nl/page/9684> [Date of access: 09 February/2005].

SOLOMON, M.R. 2004. Consumer Behavior. 6<sup>th</sup> ed. Upper Saddle River, N.J.: Pearson/Prentice Hall.

TROCHIM, W.M.K. 2002. Qualitative approaches. [Web:] [www.socialresearchmethods.net/kb/qualapp.htm](http://www.socialresearchmethods.net/kb/qualapp.htm). [Date of access: 11 April 2005].

VAN DUUREN, F.A. 1997. Water Purification Works Design. South Africa: Water Research Commission. WRC report no. TT 92/97.

VAN LEEUWEN, F.X. 2000. Safe drinking water: the Toxicologist's approach. WHO European Center for Environment and Health. 38 Supplement (1):S51-58. Netherlands: Bilthoven Division. [Web:] <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?> [Date of access: 04 March 2004].

WESTAWAY, M. S. 1998. Determining personal and domestic health and hygiene, knowledge, attitudes and behaviour: a pilot study. Pretoria: Water Research Commission. WRC report no. KV106/98.

WRC. 1999a. Quality of Domestic water Supplies. Assessment Guide . Volume 1. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 101/98.

WRC. 1999b. Quality of Domestic water Supplies. Sampling Guide. Volume 2. Pretoria: Water Research Commission. WRC report no. TT 117/99.

WRC. 2000. Quality of Domestic water Supplies. Analysis Guide . Volume 3. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 129/00.

## **CHAPTER 2**

### **LITERATURE REVIEW**

---

#### **2.1 Introduction**

Pietersen (2005:26) points out that more than 400 rural communities in South Africa depend on ground water for household utilization. He furthermore reveals that this source is abstracted through boreholes, stored in the reservoirs and distributed to the communal taps. The ground water is usually clean, but not necessarily fit for household utilization as some areas experience higher levels of nitrate in the water than expected (Sami & Murray, 1998:11.20; Modise & Krieg., 2004: viii; Pietersen, 2005:26). Based on these facts brought forward by these authors the main focus of this literature review will be on water quality, water quantity, the South African FBWP and household water utilization.

#### **2.2 Water components**

Water components have already been discussed in chapter one and in this section a broader view will be provided.

##### **2.2.1 Defining water quality**

Water quality has already been defined in chapter one. The main idea related to the quality of water is the eradication of impurities and to produce water which is healthy and fit for consumption. However, in the natural environment there is not pure water available for general use. Even rainwater contains some impurities. These impurities are commonly in the form of dissolved solids or gases, suspended solids and microorganisms (Van Leeuwen, 2000:S51). Furthermore, Sami and Murray (1998:11.20) and Van Leeuwen (2000: S51) divided these contaminants into two categories, namely natural and man-made contaminants listed in Table 2.1:

**Table 2.1: Contaminants affecting the quality of drinking water**

<b>Natural contaminants</b>	<b>Man-made contaminants</b>
Salts	Treatment or distribution of drinking water
Hardness	Discharge from sewage treatment
Arsenic	Agricultural activities
Bacteriological contaminants	Uncontrolled discharges or leakages from landfill sites and chemical accidents
Manganese	Works and industrial plants

Van Leeuwen (2000:S51) further maintains that water is a universal solvent that will never be pure, that will contain impurities prior to and after treatment. This is a concern that even after treatment water will contain some impurities. Generally, the assumption exists that a water source which has received treatment should adhere to the following standards which are basic requirements for both Van Duuren (1997:27) and the water treatment guide by WRC (2002:2). These requirements are as follows:

- The water must not pose a health risk due to microbial contamination.
- It should not pose a risk due to chemical contamination.
- It should be aesthetically acceptable.
- It should not have economically detrimental effects on either the distribution systems nor on consumers' equipments in terms of corrosivity, scaling, and hardness or sediments.

To achieve the above, it is necessary that the water service providers consider the three main determinants of water quality which are microbiological, chemical and physical (Sami & Murray, 1998:1.20; Vlok, 2003:172; Modise & Krieg, 2004:1). It is further argued that water quality is a major concern that needs to be addressed. An illustration of this argument is presented by Vlok (2003:171) who quotes an article published in the Rand Daily Mail (1982:89) that states "A safe, reliable supply of water is thus an essential requisite for community health." To understand the issues related to this article and therefore to water quality it is necessary to examine the quality determinants. In the next section each of the water quality determinants will be discussed.

## 2.2.2 Water quality determinants

### a) Defining microbiological water quality

The microbiological quality of drinking water refers to the presence of microorganisms that cannot be seen by the naked eye (WRC, 1999b:3). It refers to the pathogens such as the ones listed in Table 2.2:

**Table 2.2: The pathogens of concern in drinking water**

<b>Pathogen</b>	<b>Example</b>
Bacteria	<i>Salmonella and Escherichia coli</i>
Viruses	<i>Hepatitis A</i>
Protozoan	<i>Cyclospora</i>

Theron (2000:10) warns that water service providers should be aware that the microbiological quality of water should not reach unacceptable levels. This is based on the fact that the consumer's health, which is dependent on such a water source, is endangered by ingesting directly or indirectly food prepared from a source with levels of microorganisms. In addition, using it for personal hygiene as well as for crop or vegetable garden irrigation may result in ill health.

The most susceptible people to microbial contaminants are the very young, the elderly, pregnant women and immunocompromised individuals (i.e. people with a weak immune system including AIDS patients, cancer patients undergoing chemotherapy and organ transplant patients) (Van Duuren, 1997:27; Theron, 2000:10). Several authors are of the opinion that the quality of water, especially the microbial quality, is a very important aspect of water quality that plays a role in the consumers' lives (Van Duuren, 1997:27; Theron, 2000:10; Ealse, 2003:10). They argue that, by addressing the microbial quality of water, the quality of lives of the consumers and those who were mentioned earlier as consumers with compromised immune systems can be improved.

According to Eaise (2003:10) water is a simple and inexpensive way of extending the lives of the people who have compromised immune systems. This is based on the fact that proper nutrition and personal hygiene are dependent upon the state of the water the people are using. Meyer and Reed (2001:49) noted that disinfection of water is an essential process to destroy pathogenic microorganisms resulting in potable water that is safe for human consumption.

**b) Defining chemical water quality**

Chemical water quality refers to the nature and concentration of dissolved substances such as salts, metals and organic chemicals. Many of these chemicals are essential for consumers' daily intake. However, if they are at high concentrations they can have a negative impact on human health (WRC, 2000:3; Pietersen, 2005:27). Listed below in Table 2.3 are a large number of chemical compounds in water both natural and man- made which affect humans:

**Table 2.3: The chemical compounds in water that affect humans**

<b>Chemical compound</b>	<b>Effects</b>
Nitrate	Methaemoglobinaemia (Blue baby syndrome)
Mercury and lead	Interfere with the nervous system or upset the human metabolism
Carcinogens (cancer causing substances)	Increase the risk of tumor formation
High magnesium	May result in an upset stomach
Increased zinc, cadmium or copper concentrations	May have health or aesthetic problems
Sodium	Affects taste
Calcium	Can cause scaling and can reduce the lathering of soap

Sami and Murray (1998:11.20), Modise and Krieg (2004: vii) and Pietersen (2005:27) earlier observed that South African groundwater often contains high levels of nitrate. This observation is supported by the findings of the study conducted by Hlophe (2004:1) in one of the North West Province rural areas. Hlophe (2004:1) observed nitrate levels of 22.66 mg/l from a groundwater source in Madibogo. Pietersen (2005: 27) raises a concern about the excess levels of

nitrate found in drinking water as they can result in abortion or still birth, gastric and other cancers as well as hypertension.

According to the nitrate-nitrite classification system provided by WRC (1999a:87) Table 2.4, if a water source falling between 20-40mg/l of nitrate levels is drunk, there might be chronic risk to some babies. However, no aesthetic effects from this source of water are found. If food is prepared from this source of water, possible chronic risk might be observed and if bathing is done slight chronic risk in some babies might be observed. It also suggests that there is no effect in household utilization such as laundering.

**Table 2.4: The chemical quality classification of Nitrate+Nitrite**

Nitrite +Nitrate Range mg/l as N or (mg/l as NO <sub>3</sub> )	Health	Aesthetic	Food preparation	Bathing	Laundry
20-40 mg/l as N (87-177mg/l as NO <sub>3</sub> )	Possible chronic risk to some babies	No aesthetic effects	Possible chronic risk to babies	Slight risk to babies only	No effects
	Blue- ideal	Yellow-marginal	Red-Poor		

The classification provided by the WRC guide (1999a:87) indicates that babies are the most vulnerable to high concentrations of nitrate. It could be argued that this classification opposes the views of the consumers under study who are experiencing high nitrate concentration (22.6 mg/l) in the water provided by the service.

**c) Defining physical water quality**

As mentioned earlier in chapter one the physical quality is interdependent to the microbiological and chemical water qualities. This is based on the fact that physical quality is visible as it is evaluated through the sensory receptors such as taste, smell and visual appearance (WRC, 1999a:5). However, the physical quality is also affected by products added such as disinfectants applied to

address the microbial quality of water (Van Leeuwen, 2000:S51). It therefore, raises the question as to what could be done to improve water quality affected by water quality components? The answer to this question may be found in water treatment and purification designs applied to a water service.

### **2.2.3 The role of water treatment and purification designs**

According to Meyer and Reed (2001:49) there are various ways in which water can be treated or purified to reach the acceptable water quality standards. However, each of the systems has its own effects and concerns. The major concern regarding treatment or purifying systems seems to be that water should be safe and chemically stable to be consumed. To reach these levels of purification Sami and Murray (1998:11.20) and the WRC guide (2002:2) suggest that water should be treated to meet certain requirements to make it fit for domestic use. This means the standards of the drinking water should align with the South African Water Quality Guidelines provided by the WRC guide (1999a:22).

To address the safety issue related to treatment and safety of water, the Department of Health and Water Affairs and Forestry developed a user-friendly guide to give a consumer and water service providers information on different ways in which water can be classified and the main effects each class of water may have (WRC, 1999a:22). Table 2.5 contains relevant information.

**Table 2.5: A classification system describing the effects of the different classes of water on the various household uses.**

Class/colour	Description	Effects
<b>Class 0</b> <b>B</b>	<b>Ideal water quality</b>	<b>Drinking Health:</b> No effects, suitable for many generations <b>Drinking Aesthetic:</b> water is pleasing. <b>Food preparation:</b> No effects. <b>Bathing:</b> No effects. <b>Laundry:</b> No effects.
<b>Class 1</b> <b>G</b>	<b>Good water quality</b>	<b>Drinking Health:</b> Suitable for lifetime use. Rare instances of sub-clinical effects. <b>Drinking Aesthetic:</b> some aesthetic effects may be apparent. <b>Food preparation:</b> Suitable for lifetime use. <b>Bathing:</b> Minor effects on bathing or on bath fixtures. <b>Laundry:</b> Minor effects on laundry or on fixtures.
<b>Class 2</b> <b>Y</b>	<b>Marginal water quality</b>	<b>Drinking Health:</b> May be used without health effects by the majority of individuals of all ages, but may cause effects in some individuals in sensitive groups. Some effects possible after lifetime use. <b>Drinking Aesthetic:</b> Poor taste and appearance are noticeable. <b>Food preparation:</b> Maybe used without health or aesthetic effects by the majority of individuals. <b>Bathing:</b> Slight effects on bathing or on bath fixtures. <b>Laundry:</b> Slight effects on laundry or on fixtures.
<b>Class 3</b> <b>R</b>	<b>Poor water quality</b>	<b>Drinking Health:</b> Poses a risk of chronic health effects, especially in babies, children and elderly. <b>Drinking Aesthetic:</b> Bad taste and appearance may lead to rejection of the water. <b>Food preparation:</b> Poses a risk of chronic health effects, especially in children and the elderly. <b>Bathing:</b> Significant effects on bathing or on bath fixtures. <b>Laundry:</b> Significant effects on laundry or on fixtures.
<b>Class 4</b> <b>P</b>	<b>Unacceptable water quality</b>	<b>Drinking Health:</b> Severe acute health effects, even with short-term use. <b>Drinking Aesthetic:</b> Taste and appearance will lead to rejection of the water. <b>Food preparation:</b> Severe acute health effects, even with short-term use. <b>Bathing:</b> Serious effects on bathing or on bath fixtures. <b>Laundry:</b> Serious effects on laundry or on fixtures.
<b>B= Blue</b>	<b>G=Green</b>	<b>Y=Yellow</b>
		<b>R=Red</b>
		<b>P=Purple</b>

Table 2.5 illustrates how the water is categorized from an ideal water quality (class 0) to an unacceptable water quality (class 4) where the maximum limit of low risk of adverse health or aesthetic effects without treatment is reached. Even though this is a good example of how water quality should be assessed, it could be argued that this classification system is of little significance to the general rural consumer. The fact is that these consumers, in most cases, are illiterate and not concerned with the classification of water quality and it is proposed that the idea of how this classification system is supposed to be implemented might be of little use or importance.

Among other things, such as providing the water service, Van Duuren (1997:32) mentioned that the choice of a particular treatment method should depend on the socio-economic conditions, the technical requirements and capabilities of the particular area that requires the water service provision. Furthermore, Van Duuren (1997:33) elaborates on this matter by stating that the conventional water treatment processes used in urban areas would not be suitable for isolated rural communities of low socio-economic status. However, this does not dispute the fact that rural areas are in an urgent need of practical, simpler, inexpensive and sustainable technologies for the production of satisfactory drinking water.

Modise and Krieg (2004:4) and Pillay and Jacob (2004:4) observed that in South Africa researchers are engaged in finding and developing water purification systems that will be sustainable and provide drinkable water. They, furthermore, observed the international rapid growing favour towards membrane technologies for the production of high quality drinking water, without the direct addition of chemicals. Pillay and Jacob (2004:4) enumerated five pressure-driven membrane processes that the researchers are busy working on, namely micro filtration (MF), ultra filtration (UF), nano filtration (NF), reverse osmosis (RO) and particle filtration. These small-scale developing systems have different advantages and serve different purposes.

However, Pillay and Jacob (2004: i) mention the non-current use of these membrane techniques in drinking water production in South Africa. These are the possible reasons for the non-current use of some of the imported water treatments in South Africa. Some of the reasons blocking the current implementation are the high costs associated with purchasing treatment units, as well as the high cost of obtaining spares for such units, the perceived lack of local membrane expertise in terms of design, construction, operations and troubleshooting, a reticence to use new technology unless it can be sustainable in the long term (Pillay & Jacob, 2004: i). Water quantity will be discussed in the next section.

#### **2.2.4 Water quantity determinants**

Water quantity has already been defined in chapter one. De Fontaine's (2000:1) water quantity related aspects such as reliability and inconvenience, may be equated with a concept of accessibility and availability, as they need to be included when referring to water quantity. This is based on the fact that Modise and Krieg (2004:1) noted that the consumer is highly dependent on the availability of clean water.

##### **a) Concepts of water quantity**

- **Availability** - According to Kasrils (2002:2) the provision and availability of clean water and sanitation to all South Africans is indispensable to the success of the government's Reconstruction and Development Programme (RDP). Availability of water is further linked to accessibility of the water source to the consumers.
- **Accessibility** - Jackson (1997:1) estimates that about 40-60% of the rural areas in South Africa do not have access to adequate water services. Regulation three states that 25 litres per person should be available to each household in a rural community (DWAF, 2001:2). These sources should be within 200 metres of the dwelling place and no consumer should be without a supply for more than seven full days in a year (RSA, 1997:1; De Visser, Cottle & Mettler, 2003:24).

- **Affordability** - It is also argued that the aspects of water quantity are not always the hindering factor in water use. It is rather thought that the affordability is more of an issue when water issues are addressed.

The relationship between these three components of water quantity becomes an important dimension to the FBWP that is trying to address these concepts.

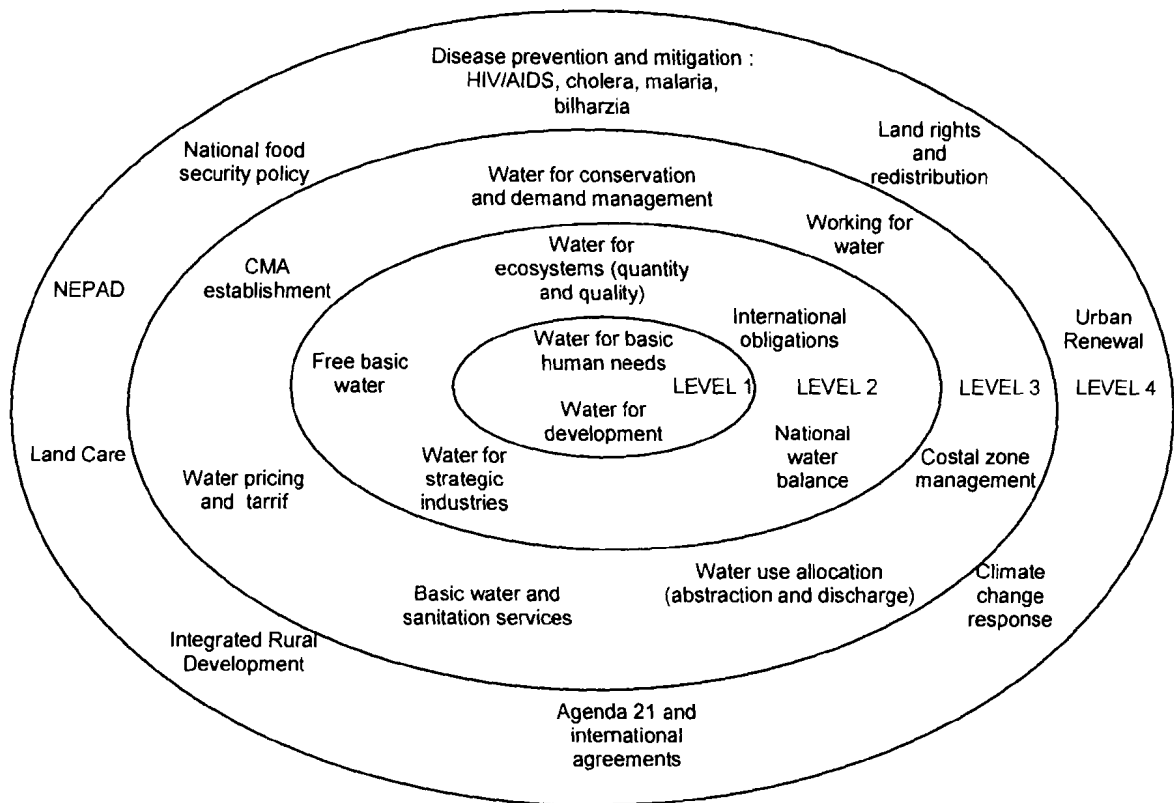
#### **2.2.5 Free Basic Water Policy (FBWP)**

An attempt by the South African government has been made by the initiative of FBWP to address the concepts of water quantity. According to The white paper (RSA, 1997:1) this policy embodies the South African national values of reconciliation, reconstruction and development. This states that water is shared on equitable basis which in effect addresses the needs of those who do not have access to water and sees to it that the need for water in their daily lives are met. In turn this is also a basic human right (RSA, 1997:1).

By implementing the FBWP, Sussen and Vermeulen (2001:131) and Kasrils (2002:2) states that this policy will not only provide a human right but will also ensure the following:

- That no one is denied access to basic water due to the fact that he/she cannot afford to pay for the service.
- Poverty is alleviated.
- Community health is improved.
- The assurance that women labour is liberated from the chore of fetching water for the household.

The intention of the FBWP is evident in addressing the quality of life of the South African water consumers. In order for the consumer to experience the improvement of water quantity, the South African government has proposed a model that is to improve the co-operation between the sectoral agencies that are part of the deliverance of water services. The model is illustrated in Figure 2.1 below.



**Figure 2.1: Proposed framework for water policy implementation across all sectors (MacKay & Ashton, 2004:6).**

According to Figure 2.1 above level 1 illustrates that water is a need for human survival as well as for development. Level 2 supports level 1 as it focuses on programmes implemented and maintained by the lead agent DWAF. The 3<sup>rd</sup> level is a water-focused programme, which is implemented by other agencies at local levels. The 4<sup>th</sup> level is a broader societal program that affects or is affected by water policy implementation and they contribute to the long-term success of water policy implementation. However, according to MacKay and Ashton (2004:6) this framework is still at the early stages of which its success rate and implementation might be argued through its achievements. With implementation of FBWP comes the next theme which needs to be addressed and explored such as the utilization of the water service. An understanding of this theme may result in determining the success of the FBWP on the consumption stage.

## **2.2.6 Household water utilization**

The primary idea of any source of water is that it should be used for drinking, personal hygiene, laundry and for preparing food (WRC, 1999a:6). Water is important for household activities and it has a biological importance as it plays an important role in physiological functioning of the human body. The following paragraphs will illustrate this importance.

### **a) The general basic importance of water for the household use**

Water is used for the following household activities:

- Regular washing of the skin and hair is necessary to remove dirt, grease, dead skin, sweat and pests such as lice, fleas and bedbugs, which may cause skin irritation or transmit diseases.
- Washing hands after using the toilet to prevent contamination of food and cooking utensils.
- Crockery and cutlery need to be washed with water and detergent to remove bacteria.
- Clothes need to be washed with water and detergent in order to remove dirt, bacteria, dead skin, sweat and lice, fleas and bedbugs.
- Water is also used for cleaning the house, for watering the garden, for cooking and for flushing the toilet (if there is a flush toilet) (Built Environment Support Group, 1999:10).

The above mentioned household activities are important for the improvement of personal hygiene. If good hygiene is practiced the human quality of life, in this case the health aspect, will be improved. However, personal hygiene on its own will not improve quality of life. Water is essential in the functioning of the human body and is thus of biological importance.

### **b) The Biological importance of water**

The use of water should also be understood as an important biological aspect (Anon, 2004:1). This includes:

- Quenching thirst.
- The necessity for oxidation of carbohydrates, proteins and fats.

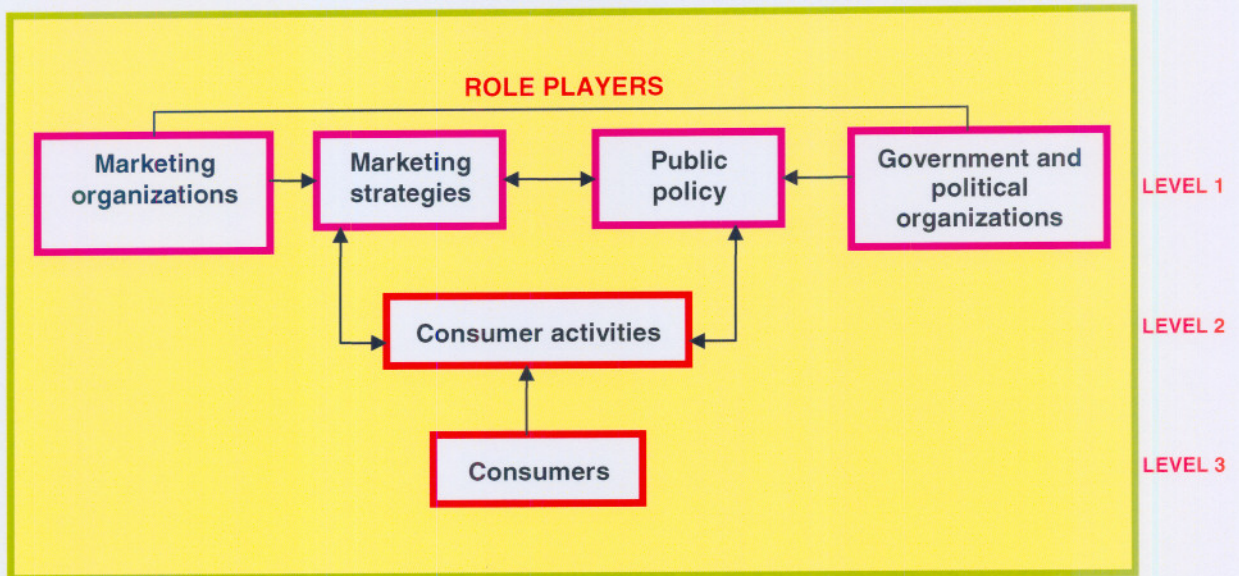
- Its usefulness for rinsing out the mouth after eating to prevent the formation of dental cavities and bad breath.
- Assisting in a metabolic, physiological or biochemical reaction in the body.
- It is important to make sure that digestion, absorption and elimination take place (Anon, 2004:1).

The importance of water cannot be underestimated. It is therefore necessary that water quality and water quantity of the water service are of acceptable levels to aid in the quality of life of the consumers. However, the intention of FBWP is to adhere to these requirements but the reality of the FBWP and its implementation to rural communities may in fact not have a positive influence in the quality of life of its beneficiaries.

Part of the perceptual process consumers have of a water service is linked to the water service providers and the system to which they belong, for example a private water service provider and public water service provider. These service providers are also indicators of a developmental process through which such a water service reaches the consumer.

### **2.3 Stakeholders involved in water service development**

Development is not something that should be taken for granted and accepted as a "hand out" (Netshiswinzhe, 2002:1). It requires an internal process of change whereby people take responsibility for improving their living conditions. The legislative framework within the South African context requires local government to implement development programmes that allows local people, and all other relevant stakeholders, to actively participate in identifying their problems, planning and implementation of appropriate action (Netshiswinzhe, 2002:1). The marketing literature offers a model which indicates the role players, who initiate developmental programmes to inform, educate and thereby improve the quality of life of the consumers.

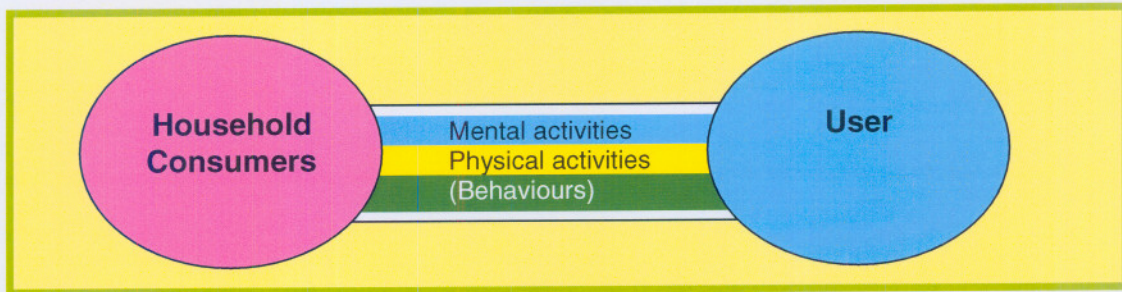


**Figure 2.2: A model of the relationship within Action-Oriented Groups Interested in Consumer Behavior (Peter & Olson, 2005:11)**

Figure 2.2 is of a model put forward by Peter and Olson (2005:11). It illustrates the relationship among the role players (Level 1 in Figure 2.2), consumer (Level 3 in Figure 2.2) and consumer behavior (Level 2 in Figure 2.2) processes (perceptions, attitudes, cognition). It presents the consumer as the main focus. The consumer exhibits certain consumer activities (such as perception) that are of interest to the role players when formulating consumer development programmes. The model suggests that organizations (role players) have an influence on marketing strategy and public policy. The outcome of influences from the latter two aspects will influence further consumer activities. The outcome of this reaction will have an affect on strategy and policy and therefore on the result of a mutual relationship between levels one and two in Figure 2.2.

**a) Consumer’s role in water service provision**

In light of the fact that the study argues from the position of the consumer it is important to identify and define the consumer. Sheth, Mittal and Newman (1999:6) provides an applicable framework of the consumer that is illustrated through the behaviours and role the consumer takes on, that is presented in Figure 2.3.

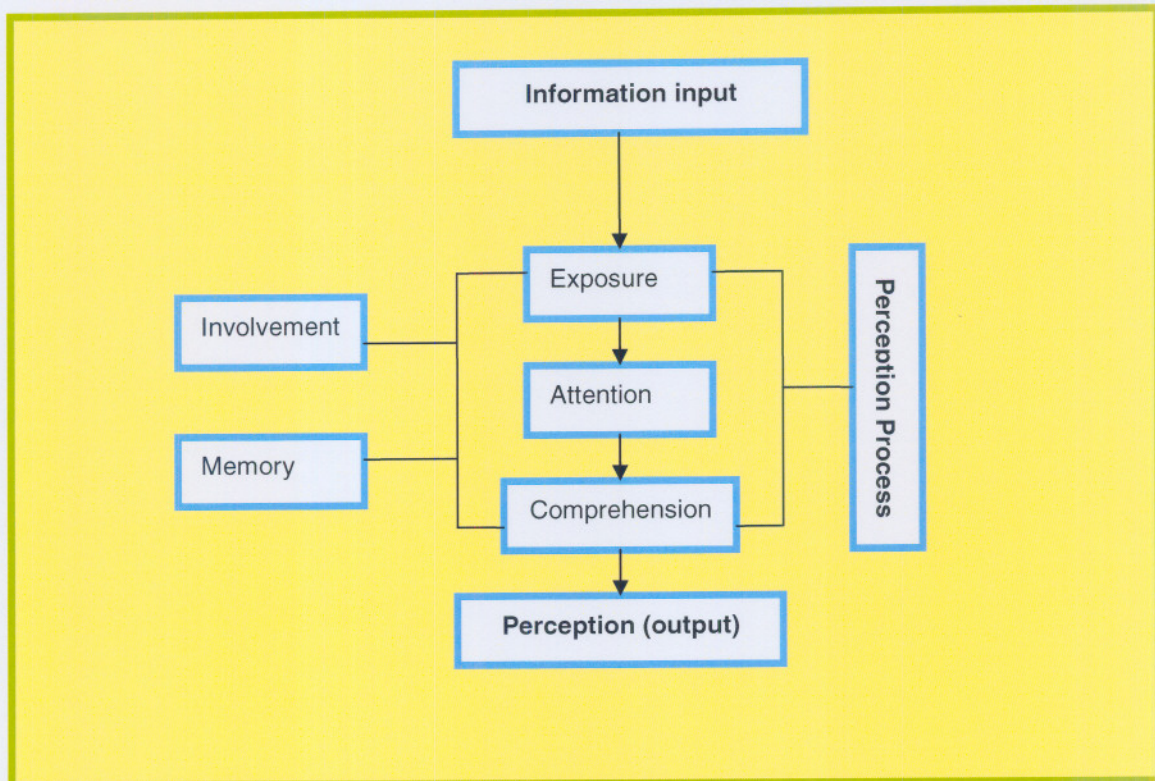


**Figure 2.3: A redrawn model of a consumer role and behaviours (Sheth *et al.*, 1999:6)**

The consumer takes on a special role in the water service provision situation. This role is that of a household consumer, who is of particular mental and physical behaviors and in fact becomes the user of the service (Figure 2.3). However, in this instance the role which Sheth *et al.* (1999:6) puts forward as that of a typical customer who is also a payer and a buyer. In this instance the local municipality is the buyer and the payer of the water service and not the rural water consumer. The consumer as a user and customer of this water service displays certain behaviors which can be studied and captured through the perception process.

#### **2.4 Consumers' perception processes**

Perception can be studied through various models of the perception processes, such as presented by Sheth *et al.* (1999:319); Mowen and Minor (2001:298); Du Plessis and Rousseau, (2003:39) and Schiffman and Kanuk. (2004:129). Mowen and Minor (2001:9) provide a suitable model to study the perceptual process of consumers that may be applied to this study (Figure 2.4).



**Figure 2.4 The perceptual process of a consumer (Mowen & Minor 2001:38)**

It illustrates that for this process to occur, the consumer needs to be exposed to stimuli which offer information to process and form perception. Mowen and Minor (2001:39) are of the opinion that before the stimuli penetrate the perceptual process two additional aspects, consumers' involvement and memory, become role players in the perceptual process which directly influence this process by guiding the way in which the stimuli will be perceived. Consumers' involvement is characterized by the type of service under consideration, the channels used to inform the consumer, the personality of the consumer and the consumers' situational context. The memory aspect for example refers to consumers' socialization.

The stimuli are then processed through the three stages of the perception process which are exposure, attention and comprehension (Figure 2.4). Exposure, occurs when the consumer's sensory receptors come into contact with

the information or stimulus. Attention refers to the activation of one or more of the consumer's sensory receptors, as well as to the resulting sensation that is processed in the brain. The term comprehension is the way in which the processed sensation is interpreted in the consumer's brain or mind (Mowen & Minor, 2000:39). In the above discussed models components of a systems design approach components can be identified. In the next section the systems perspective will be discussed and Figures 2.3 and 2.4 will be amended to be applicable in the water service provision study.

#### **2.4.1 General Systems Theory (GST)**

In this study GST seemed to be the best approach to present the study on water service provision. This is based on the fact that a system is a collection of interrelated parts (subsystems) unified by design to obtain one or more objectives (Spears & Gregoire, 2004:2). This system is based on three key assumptions of systems theories which state that, in order to understand the system, one has to view the whole picture and not the individual or processes of its parts. Secondly, it forms the basis of understanding and brings together knowledge from different study fields, which in this case are marketing, natural and social science fields (Whitchurch & Constantine, 1993:330). Thirdly, it is based on "self- reflexivity" or humans' unique ability to make themselves and their own behaviour the object of examination. In this instance reflexivity was achieved through the agreement held between the Consumer Scientist and the consumers to explore their perceptions in relation to water aspects such as water quality, quantity, and FBWP of a rural water service.

Central to the idea of applying GST to water service provision, is an understanding of various inputs, transformation processes and outputs within this system. Inputs are considered to be the information or stimuli, a consumer is faced with. These inputs or sources of information are processed by the consumer, to form an understanding of what the consumer was exposed to. The output of this transformation process or state of understanding becomes a representation of the thoughts and ideas formulated by the consumer referred to as "perceptions". An integral part of further understanding the application of GST

to the study is the clarification of certain concepts such as interrelatedness and interdependency of parts, equifinality hierarchy of the system and dynamic equilibrium, form an integral part of further understanding of the application of GST to the study (Spears & Gregoire, 2004:4).

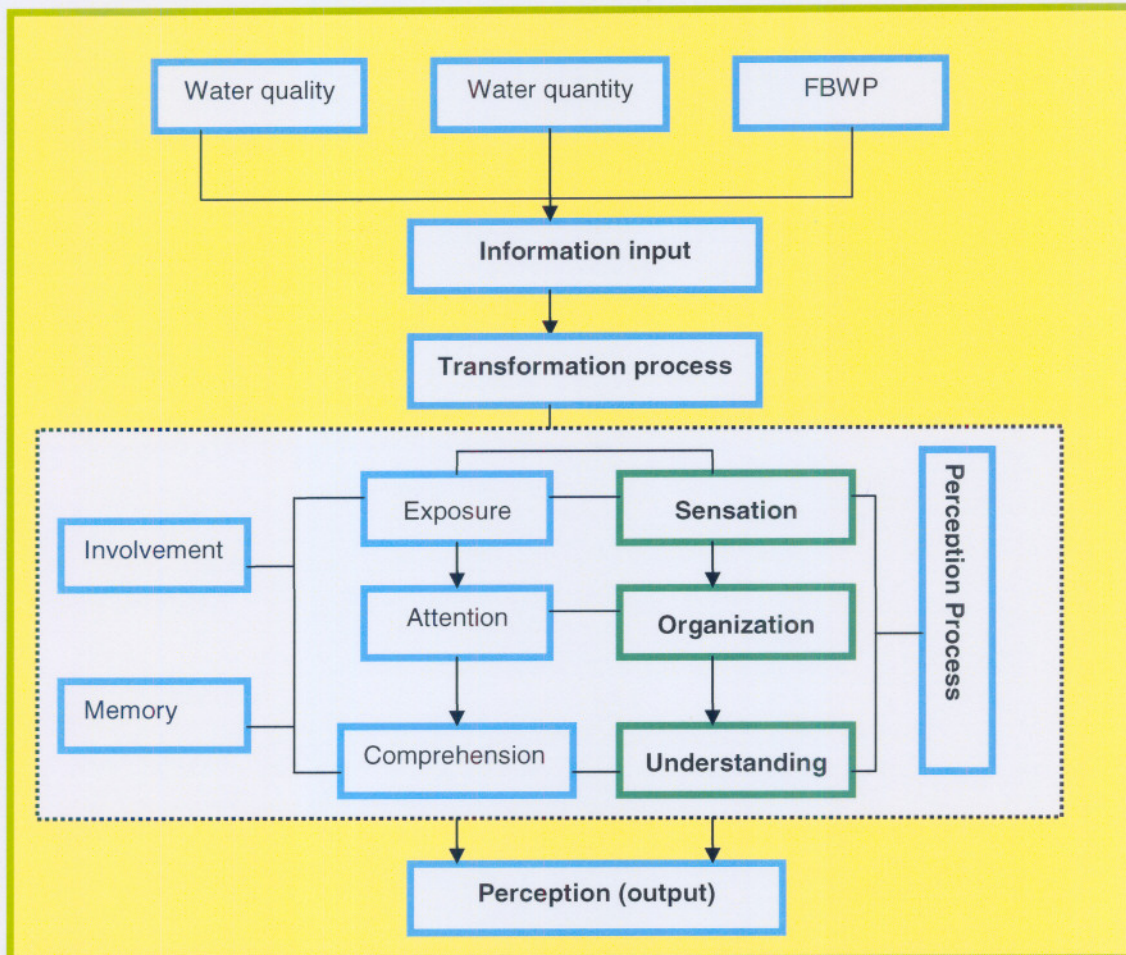
The way in which these concepts are applied and the systems perspective operates, can be practically demonstrated through the study of water provision services, consumer perceptions and household utilization. This means that the relevance of the above discussed concepts to the water study will be clarified through their application in the following models. In the next section an application and illustration of consumers' perceptions from a systems perspective will be presented.

**a) Consumers' perceptions of a rural water service from a systems perspective**

Perception as viewed by Mowen and Minor (2000:38) can be considered a system on its own, as illustrated in Figure 2.4. The systems perspective is found in the way in which the three major processes of a system operate such as input, transformation process and output. Input initiates the process, as the consumer is confronted by the stimuli, which in this instance are three important water related aspects such as water quality, water quantity and FBWP. According to Spears and Gregoire (2004:4), the inputs or transformation process can be substituted with other variables such as hygiene and water storage and the end result (output) will be the same.

The second process of the system is information or stimuli processing, referred to as the perceptual process. This process is composed of three components namely, exposure, attention and comprehension as seen in Figure 2.4. For the system perspective of a rural water service, it is proposed that these three components, be equated with sensation, organization and understanding, that form the transformation process in a systems perspective, which is equivalent to the perceptual process (Figure 2.5). Sensation is attending to the stimuli with one or more of the five senses. In this instance organization means the way in which

the consumers categorize and relate certain issues such as their past experiences and beliefs with their memory to the situation at hand. Understanding is the way of presenting meaning of what is interpreted by the brain or mind (Sheth *et al.*, 1999:298). The final process in the systems perspective is an output component regarded as the actual perception or opinions expressed by the consumer on the water service provided (Figure 2.5).

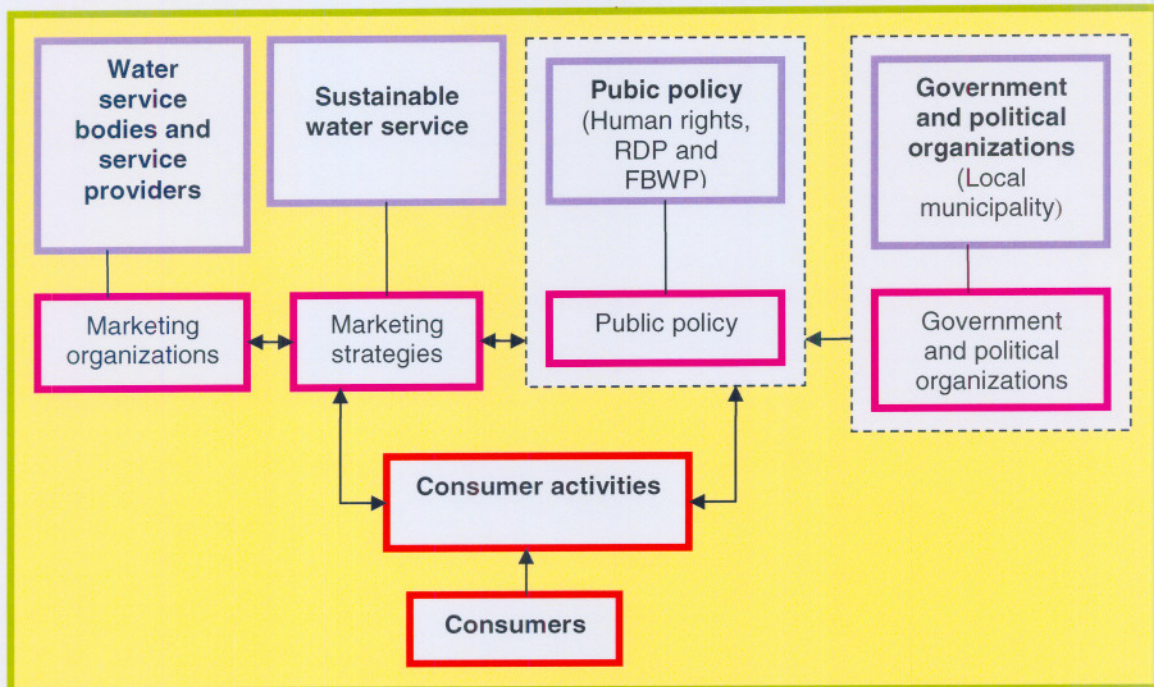


**Figure 2.5** Amended figure of the consumers' perceptual process of a rural water service

**b) Consumers and stakeholders involved in water service provision from a systems approach**

According to Whitchurch and Constantine (1993:330) any given system consists of smaller systems or “subsystems” embedded within larger “suprasystems”. Typically, the rural consumer is part of community structures that make use of rural water services. These communities, however also form part of the larger South African consumer population. This highlights the concept of hierarchy. This concept of hierarchy is also reflected in the model provided by Peter & Olson (2005:11) in Figure 2.2. This model, when applied, to the larger suprasystem of South African water service provision consists of various subsystems. Water service bodies and service providers that market sustainable water service forms the first subsystem. Also embedded within the larger South African water service provision system is the government and political organizations that influence and compile public policies revolving around human rights and FBWP. Simultaneously, the consumer communities and their activities form another important subsystem within this larger suprasystem.

All of the above subsystems within the South African water service provision could be described as open systems with permeable boundaries as information flows among them. This information includes policies, personal issues and activities as well as economic factors. The flow of information between these subsystems is evident in Figure 2.6. In the context of this, the consumer and his/her activities are retained in the model presented by Peter and Olson (2005:11) as a subsystem to the consumer and stakeholders involved in a water service provision system. However, the marketing stakeholders are equated with the relevant stakeholders who have an important role in water service provision. They are the water bodies and service providers, sustainable water services, public policy and government organizations.



**Figure 2.6 Amended model of the relationship within Action-Oriented Groups Interested in Consumer Behaviour**

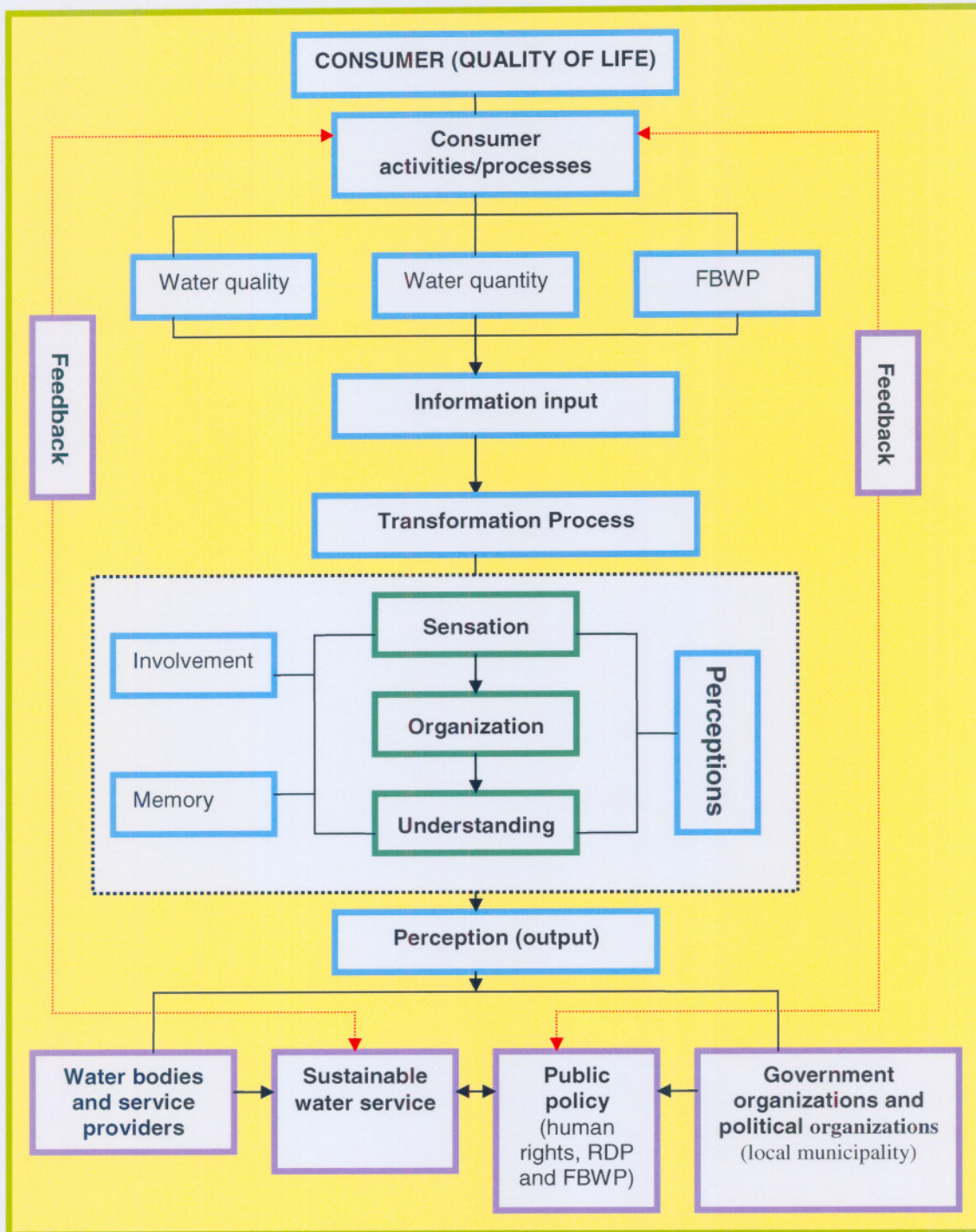
In Figure 2.6, information pertaining to consumer activities (perceptions) enters the subsystem of the stakeholders interested in consumer behaviour. The input will be transformed, within the hierarchy in the water service provision. Within this hierarchy, the sustainable water services will influence the government policies, which in turn will be fed back to the consumer. The feedback is dependent upon the way in which the information is received by the consumer. Consequently, feedback will have an impact on the sustainable water services and the government policies.

This reflects the interdependence that exists among these parts of the system. Interdependence implies an interactive relationship among the parts of the system as they will share the same goals and objectives. For example in this case the shared goal amongst the entities of the system is quality of life enhancement. However, different agendas such as politics, profit making schemes and other factors may be present to achieve this common goal. Consequently, an effective interactive relationship will lead to an outcome that will be beneficial to all the involved parts of the system. Based on the previous

discussions the models presented in Figure 2.5 and Figure 2.6 can be combined into a systems perspective for the study of water service.

**c) Combination model of consumers' perceptions and role players in a systems perspective**

Based on the idea of a systems approach, the amended models presented in Figure 2.5 and Figure 2.6 can be combined into a systems perspective of consumers' perceptions and rural water service providers. Figure 2.7, presents a consolidation of these models. It illustrates the interrelatedness and interdependence that exist among the subsystem of consumers and the service providers. This interaction is achieved by entering information through the transformation phase to get the output which is the consumers' perceptions. This output is then transformed in the subsystem of the water service bodies. In this subsystem, sustainable water services and public policies have an influence on each other. This mutual influence that exists among these two, simultaneously affects the consumers' activities. The feedback from the consumers in turn will have an impact on both the sustainable water services and the public policies. Spears and Gregoire (2004:4) argue that the interaction between the subsystems maintains equilibrium of the system. Thus, it is proposed that the water service provision should be viewed as a system so as to bring balance and to keep in touch with the changes, interventions and new strategies that revolve within the system.



**Figure 2.7** A consolidation model of systems perspective of consumers' perceptions and rural water service providers

## **2.5 Conclusion**

In this chapter system-related aspects of rural water supply models were discussed. The models discussed confirmed a systems perspective process. In the next chapter the research methodology of this study will be discussed.

## 2.6 References

ANON. 2004. Lifestyle: Health and Fitness. Clean water Challenge-Rand Water. [Web:] <http://www.randwater.co.za> [Date of access: 17 August 2004].

BUILT ENVIRONMENT SUPPORT GROUP. 1999. Towards the right to adequate housing. South Africa: Durban and Pitermaritzburg.

DE FONTAINE, J. 2000. Trouble Shooting Guide for the Domestic consumer. Pretoria: Water Research Commission. WRC report no: 963/1/00.

DE VISSER, J.; COTTLE, E. & METTLER, J.N. 2003. Realizing the right of access to water: Pipe dream or watershed? [Web:] [http://www.communitylawcentre.org.za/ser/docs\\_2002/water\\_execsummary.pdf](http://www.communitylawcentre.org.za/ser/docs_2002/water_execsummary.pdf) [Date of Access: 02 March 2005].

DU PLESSIS, P.J. & ROUSSEAU, G.G. 2003. Buyer Behavior: a multi-cultural approach. 3<sup>rd</sup> ed. Cape Town: Oxford University Press Southern Africa. Southern Book Publishers.

DWAF. 2001. Free basic water provision. [Web:] <http://www-dwaf.pwv.gov.za/freebasicwater> [Date of access: 11 August 2004].

EALSE, K. 2003. Interviews with People successful in the Water Field. *Water Wheel*, 2 (2): 10, March /April.

HLOPHE, M. 2004. Unpublished report. North-West University (Mafikeng campus)

JACKSON, B. 1997. The water page. [Web:] [http://www.africanwater.org/ppp\\_debate.htm](http://www.africanwater.org/ppp_debate.htm) [Date of access: 03 May 2004].

KASRILS, R. 2002. Parliamentary media briefing. [Web:] <http://www.info.gov.za/speeches> [Date of access: 08 February 2005].

MACKAY, H.M. & ASHTON, P.J. 2004. Towards co-operative governance in the development and implementation of cross-sectoral policy: Water policy as an example. *Water SA*, 30 (1), 1-8p January.

MEYER, V. & REED, R.H. 2001. SOLAIR disinfection of coliform bacteria in hand-drawn drinking water. *Water SA*, 27 (1), 49-52 January.

MODISE, S.J. & KRIEG, H.M. 2004. Evaluation of nano filtration of rural groundwater for potable water use. WRC report no 1230/1/04.

MOWEN, J.C. & MINOR, M.S. 2001. Consumer behavior: a framework. Upper River: Prentice Hall.

NETSHISWINZHE, B. 2002. Free Basic water-Tapping its Developmental Potential in rural Areas. [Web:] [http:// www.mvula.co.za](http://www.mvula.co.za) [Date of access: 2004/08/1].

PETER, J.P. & OLSON, J.C. 2005. Consumer Behavior and marketing strategy. 9<sup>th</sup> ed. Boston: McGraw-Hill.

PIETERSEN, K. 2005. Groundwater Crucial to Rural Development. WRC, *Water Wheel*, 4(2) 26-27p March/April.

PILLAY, V.L. & JACOB, E.P. 2004. The development of small-scale ultrafiltration systems for potable water production. Pretoria: Water Research Commission. WRC report no.1070/1/04.

REPUBLIC OF SOUTH AFRICA. 1997. The water page-white paper on water policy: For us water is a basic human right. [Web:] <http://www.thewaterpage.com/wp3.htm> - 233k [Date of access: 30 April 2004].

SAMI, K. & MURRAY, E.C. 1998. Guidelines for the evaluation of Water Resource for Rural Development with an Emphasis on groundwater. Pretoria: Water Research Commission. WRC report no 677/1/98.

SCHIFFMAN, L. G. & KANUK, L.L. 2004. Consumer Behavior. 8<sup>th</sup> ed. New York: Pearson/ Prentice Hall.

SHETH, J.N., MITTAL, B. & NEWMAN, B.I. 1999. Consumer Behavior and Beyond. United State of America: the Dryden Press.

SPEARS, M.C. & GREGOIRE, M. 2004. Foodservice organizations: a managerial and systems approach. Upper Saddle: Pearson/Prentice Hall.

SUSSEN, H. & VERMEULEN, A. 2001. Providing free basic water in South Africa. People and systems for water, sanitation and health. [Web:] [www.iboro.ac.uk/departments/cv/wedc/papers/27/.../17](http://www.iboro.ac.uk/departments/cv/wedc/papers/27/.../17) Date of access: 08 February 2005].

THERON, J. 2001. The challenge of identifying waterborne pathogens leads to new technology. *South African Water Bulletin*, 27(3):10-11, May/ June.

VAN DUUREN, F.A. 1997. Water Purification Works Design. South Africa: Water Research Commission. WRC report no. TT 92/97.

VAN LEEUWEN, F.X. 2000. Safe drinking water: the Toxicologist's approach. WHO European Center for Environment and Health. 38 Supplement (1):S51-58. Netherlands: Bilthoven Division. [Web:] <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?> [Date of access: 04 March 2004].

VLOK, M.E. 2003. Manual of community nursing. Republic of South Africa: Juta and Co. Ltd.

WHITCHURCH, G.G. & CONSTANTINE, L.L. 1993. Theory Sourcebook of family theories and methods: a contextual approach. New York: Plenum Press.

WRC. 1999a. Quality of Domestic water Supplies. Assessment Guide . Volume 1. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 101/98.

WRC. 1999b. Quality of Domestic water Supplies. Sampling Guide. Volume 2. Pretoria: Water Research Commission. WRC report no. TT 117/99.

WRC. 2000. Quality of Domestic water Supplies. Analysis Guide . Volume 3. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 129/00.

WRC. 2002. Quality of Domestic Water Supplies. Treatment Guide. Volume 4. 1<sup>st</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 181/02.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

---

#### **3.1 Introduction**

The methodology employed in this chapter is based on a qualitative research strategy. This strategy argues from an inductive approach to research and more in line with an anti-positivism paradigm (Hayes, 2000:7). The reason for using an inductive approach in this study is to summaries the raw data, to clear relevant links between this study's objectives and the findings as well as to develop a model that will illustrate the experiences and processes indicated in the raw data (Thomas, 2003:1).

Furthermore, Hayes (2000:7) and Trochim (2002:1) identified the link between anti-positivism and a phenomological approach within which this study has been framed. In this regard phenomology claims to understand people's views and their experiences. This can be better achieved through an anti-positivist approach to the research such as the qualitative strategy used in this research. According to Flick (1995:5) a qualitative strategy is, therefore, the best way of exploring these experiences and thus the experiences consumers have of a rural water service.

This chapter presents the situational context of the area of Madibogo in which the research was conducted and the research methodology and activities that took place during this study. The situational context of Madibogo is presented by the use of a map indicating its location in the North West Province.

#### **3.2 Situational context of Madibogo village**

The situational context of Madibogo village was explored through general congenial exploratory visits to the village and a study of the orientation of Madibogo in the North West Province.

### **3.2.1 Exploratory visits to Madibogo village**

The context of Madibogo village was determined by the researcher through numerous visits to the village. These visits took place, before commencement of the study. The reasons for the visits were to provide the researcher with a better understanding of the area in which the research was to be conducted. The researcher also felt the need to build a relationship with the community in order to gain their participation and support for the research (Gillbert, 1998:37).

Furthermore, it was necessary for the researcher to familiarize herself with the community structures and to identify the key community leaders and organizations who could act as gatekeepers. Gatekeepers are people who can assist the researcher in gaining entry to the community (Oka and Shaw, 2000:4). Through the introduction meeting with the Chief 'Kgosi' of the community, the researcher obtained permission to hold meetings with the community members and to introduce the research. Subsequently during the meetings, the researcher identified other gatekeepers through which the community operates. These structures consisted of the local municipality, the political and church youth groups, various churches, soccer teams as well as educators who were used to organize the focus group members and venues. The researcher kept a sound relationship with the gatekeepers to arrange venues, meeting times and to confirm dates of meetings as well as other organizational information.

According to various authors such as Gillbert (1998:37), Flick (1999,59) and Mathabatha and Naidoo (2004:24) it is evident that such preliminary fieldwork is an essential part of the qualitative research process especially if unfamiliar circumstances are entered upon by the researcher.

### 3.2.2 Orientation of Madibogo in the North West Province



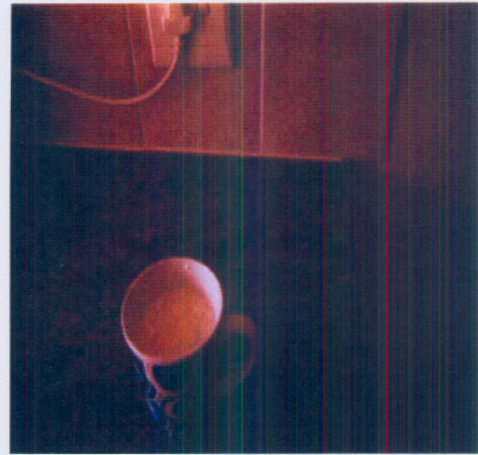
**Figure 3.1** North West Province (Mafikeng) ([www.nwpg.gov.za](http://www.nwpg.gov.za))

Madibogo village is commonly known to its residents as Madibogopan. It is situated in the North West Province outside Mafikeng as illustrated in Figure 1. The North West Province is the sixth-most densely populated province in South Africa with approximately 3.4 million people. It is predominantly rural, with 66% of its population living in rural areas and 34% in urban areas (Tladi, Baloyi & Van Boom, 2002:1). Madibogo is one of the 'deep' rural areas of the North West Province, being situated 90km southwest of Mafikeng in the Ditsobotla District of the former Bophuthatswana which forms the central part of the North West Province. It has a total population of approximately 23 616 people which is composed of about 11 608 males and 12 008 females (Madibogo local municipality statistics, 2004).

The village is divided into five sections namely: Seheri, Tlhaping, Morolong, Dikgantlong and Motsitlame. The village is characterized by a lack of access to basic services such as water, electricity, refuse removal and a proper sanitation infrastructure. It has several service buildings such as a post office, petrol station, several primary and secondary schools, a permanent health clinic and a railway



Picture 1: A communal tap of Madibogo village



Picture 2: Example of coagulated milk mixed with Madibogo water.



Picture 3: A non-functioning water service



Picture 4: Water service shared by animals and community members



Picture 5: Wheel barrows used to carry water- filled containers to the households

**Figure 3.2: A pictorial representation of existence in Madibogo**

station. The road, from Setlagole to Delareyville, which runs along the edge of the village, as well as the main road through the village, is tarred. All other access roads are gravel roads (Francis, 2002:1).

Madibogo village is also characteristic of 86 water standpipes distributed all over the community, five boreholes, of which four are in working condition and two reservoirs that are highly fenced. To gain more insight into the perceptions of a rural water service certain data collection methods were used and they will be discussed in detail in the next section.

### **3.2.3 A pictorial representation of existence in Madibogo**

The photographs in Figure 3.2 illustrates some of the daily happenings in the Madibogo village as well as conditions of a water service of the Madibogo village:

### **3.3 Research methods**

This study mainly used verbal data to achieve an understanding of community members in relation to a communal water service. These verbal methods included focus groups and individual interviews guided through semi-structured interviews (Flick, 1999:65). These methods or instruments were identified to be crucial to determine the point of view of participants as these opinions are more likely to be expressed through this method than through standardized interviews or questionnaires (Flick, 1999:76). A brief discussion of each method follows.

#### **3.3.1 Focus groups**

Focus groups were considered as a research instrument because the group context within which focus group sessions would be contextualized would create an environment within which the participants would be able to reveal their experiences and ideas (Krueger, 1994:6 & Shao, 2002:153). These authors, also identified additional factors that emphasized the necessity of the focus group method to be used in this study, for example, it would create a non-threatening environment, debatable environment, produce believable results and allow the researcher the opportunity to explore unanticipated issues brought forth in the discussion (Krueger, 1994:11 & Shao, 2002:154). In the context of this study the focus group was especially relevant to be used as a research method as it did not discriminate between the literate and the illiterate as both groups could participate and share their views verbally.

In this study seven focus groups consisting of seven to fourteen members each, were used. These groups were composed of teachers, members of political youth organizations, church youth groups, a soccer team as well as the mixed community group (both male and female and mixed age groups).

Each discussion was guided by a questioning format of the main concepts of the study referring to water quality, water quantity and the FBWP. The first two concepts were discussed by the focus groups through means of a projective technique. The reason for using this technique in this study was to encourage participants to express and expose their thoughts. Shao (2002:162) is of the

opinion that this technique overcomes communication barriers and grants participants' freedom of expression. In this instance the participants were presented with three filled water glasses containing different water qualities. Glass A contained water from the location taps, glass B water from Madibogo communal taps and glass C water from Madibogo communal taps with sand added to it. After they had shared all their ideas regarding water quality and water quantity, a discussion on the FBWP was initiated.

A tape recording of each focus group's discussions was made to capture all comments of the members. Notes of the comments were also made by the research assistant. This was considered an important reference method with which to verify the tape recording. These procedures follow Krueger's (1994:6-11) guidelines for the presentation of focus groups.

### **3.3.2 Interviews**

Semi-structured interviews commonly referred to as 'guided interviews' were used as a data collecting technique. These interviews offer the opportunity to the participants to answer freely and also for the researcher to have freedom in a way in which he/she asks the question (Hayes, 2000:121). These interviews were held with the community leaders such as the Chief 'Kgos' and the ward councillor after the focus groups had been completed. During the interviews attention was paid to issues brought forward during the focus groups and that needed clarification. Table 3.1 below provides a schedule used during semi-structured interviewing.

**Table 3.1: The research aspects and questions posed to the community leaders.**

Key research aspects	Questions posed to the leaders
<b>Water quality</b>	How do you experience your drinking water? Is there such a thing as safe drinking water? Is there a perception that the Madibogo drinking water is clean?
<b>Water quantity</b>	Where do you get your drinking water? Are the water sources reliable, convenient and affordable? There is a belief that 'pensioners' are still paying R2.00 to the collectors for the maintenance of water services, can you comment on that?
<b>Free basic water</b>	Are the people aware of the free basic water policy and what are your views about it? Do you have any suggestions of what you would like to see improve about rural water services?

The questions posed to the community leaders investigated the same research aspects presented to the focus groups, except for the opening question which was a projective technique and therefore not presented to the community leaders.

### **3.4 Sampling**

A convenient sample or available sample refers to a sample which has been collected in the easiest way, making use of volunteers and participants who were available at that point in time (Maisel & Persell, 1996:6; Coolican, 1999:39).

### **3.5 Data analysis method**

Data analysis was conducted by means of content analysis. Content analysis refers to a textual investigation of the verbal data through means of inferences of data by identifying categories and themes that best represent the data (Shaughnessy & Zechmeister, 1997:173; Silverman, 2000:59).

In order to do content analysis the tape recordings of the focus groups as well as the semi-structured interviews were transcribed. According to Hayes (2000:203) such transcripts is a method with which to record the conversations for analysis purposes.

Each transcript was read several times by the researcher after which concepts related to each of the objectives were identified. These concepts were clustered to form the themes of the findings through an interpretation of the data. The themes and concepts are discussed in the results chapter of this study. Apart from the transcripts gathered from the verbal data an analysis was also done on the notes taken by the researcher's assistant. Oka and Shaw (2000:9) are of the opinion that collected/recorded verbal data can be subjected into a form of analysis whereby the ideas brought forward by the focus groups can be investigated further in focus group discussions to follow.

### **3.6 Triangulation**

This study aimed at achieving triangulation within the measuring instruments used in the study. Various authors such as Bryman (1996:131), Denzin and Lincoln (1998:46) and Silverman (2000:177) consider this method as helpful to the researcher, through different measuring instruments, to gain a true reflection of the situation under study. In this study the researcher used focus groups, semi-structured interviews as well as a projective technique such as three filled water glasses to achieve a consistent reflection of the situation of the inhabitants of Madibogo. By using the above mentioned methods of data collection methodological triangulation can be obtained.

### **3.7 Trustworthiness of the methods and analyses**

One of the questions that can arise when implementing the qualitative strategy could be whether the methods of data collection applied in this study are indeed a true reflection of the experiences of the participants. To ensure that the findings would be truthful and reliable the researcher made use of different measuring instruments. The researcher also followed a strict sequence with which the focus groups were led and semi-structured interviews were conducted. Furthermore, the notes made by the researcher's assistant were also presented to the focus groups at the end of the session so that they were certain that their opinions were correctly noted.

Before the actual study was undertaken, the researcher conducted several pilot focus group sessions to identify problems in question formulation, understanding of questions, testing and adapting the measuring instrument and suitability of measuring instrument. According to Van Teijlingen and Hundely (2001:1-4) as well as Strydom (2003:210) this is a very important aspect to consider during the development of the research instruments and is vital to the success of the research.

### **3.8 Conclusion**

The researcher employed various techniques to ensure a truthful and consistent presentation of the opinions of the community members about a rural water service as experienced by them. The findings will be presented in the next section.

### 3.9 References

BRYMAN, A. 1996. Quantity and Quality in Social Research. London: Routledge.

COOLICAN, H. 1999. Research methods and statistics in psychology. 3<sup>rd</sup> ed. London: Hodder & Stoughton.

DENZIN, N.K. & LINCOLN, Y.S. 1998. Strategies of Qualitative Inquiry. Thousand Oaks: Sage Publications Inc.

FLICK, U. 1999. An Introduction to Qualitative Research. London: Sage Publications.

FRANCIS, E. 2002. Livelihoods, institutions and vulnerability in South Africa. [Web:] <http://www.lse.ac.uk/collections/DESTIN/pdf/WP30.pdf> [Date of access: 07 July 2004].

GILLBERT, N. 1998. Researching social Life. London: Sage Publications.

HAYES, N. 2000. Doing Psychological Research. Buckingham: Open University Press.

KRUEGER, RA. 1994. Focus Groups. 2<sup>nd</sup> ed. Thousand Oaks: Sage Publications.

MAISEL, R. & PERSELL, C.H. 1996. How sampling works. Thousand Oaks: Sage Publications.

MADIBOGO MUNICIPALITY. 2004. Population statistics of the village. Mafikeng.

MATHABATHA, S. & NAIDOO, D. 2004. A review of public participation in the rural water and sanitation setting. Pretoria: Water Research Commission. WRC report no. 1381/1/04.

OKA, T. & SHAW, I. 2000. Qualitative research in Social work. [Web:] <http://www.incds.pweb.sophia.ac.jp/~t-oka/papers/2000/qrsq/qrsq.html> [Date of access: 11 November 2004].

SHAO, T.A. 2002. Marketing Research: an aid to decision-making. Australia: South Western/Thomson Learning.

SHAUGHNESSY, J.J. & ZECHMEISTER, E.B. 1997. Research Methods in Psychology. New York: McGraw-Hill.

SILVERMAN, D. 2000. Doing qualitative research. London: Sage publications.

STRYDOM, C.B. 2003. Research at Grass Roots. 2<sup>nd</sup> ed. South Africa: Van Schaik Publishers.

THOMAS, D.R. 2003. A general inductive approach for data analysis. [Web:] <http://www.health.auckland.ac.nz/hrmas/resources/Inductive2003.pdf> [Date of access: 04 February 2005].

TLADI, B., BALOYI, T. & VAN BOOM, E. 2002. The social environment. [Web:] <http://www.nwpg.gov.za> [Date of access: 07 July 2004].

TROCHIM, W.M.K. 2002. Qualitative approaches. [Web:] <http://www.socialresearchmethods.net/kb/qualapp.htm> [Date of access: 11 April 2005]

VAN TEIJLINGEN, E.R. & HUNDLEY, V. 2001. The importance of pilot studies. Issue 35. [Web:] <http://www.soc.surrey.ac.uk/sru/SRU35.html> [Date of access: 02 March 2005].

## **CHAPTER 4**

### **FINDINGS AND DISCUSSIONS**

---

#### **4.1 Introduction**

With the application of the research methodology discussed in the previous chapter the main purpose of the study was to explore the perception of the consumers towards a rural water service in Madibogo village. The findings are discussed in relation to the perception of participants (community members) towards the rural water services which was measured through a visual evaluation as well as through the thoughts and opinions captured in the perception of the consumers. As mentioned in the previous chapter the community leaders' responses were incorporated with the participants' responses. The findings from the visual evaluation of water will be discussed in the section to follow:

#### **4.2 Visual evaluation of water**

This method was used to start the participants' discussion on water quality and water quantity. It can be seen as an ice-breaker (Krueger, 1994:11). Participants evaluated the three glasses of water presented to them by the researcher. During the evaluation the participants had to indicate their preference and give reasons for their choice. The findings revealed that the participants' perceptions varied although the majority of the participants chose glass A.

Table 4.1 gives an illustration of the concept that represents the fundamental factors with regard to each glass as perceived by the participants. For example glass A was perceived to be crystal clear, beautiful, healthy and purified. Glass B was perceived to be clean, unclear, fine and not good for human consumption. Glass C was considered to be dam water, contaminated dirty water, muddy and water from the valley.

**Table 4.1: The participants' visual perceptions of the water in the glasses**

Water in glasses	Stimuli interpretation
Glass A	Pure, purified, clean, best, beautiful, crystal clear, soluble, healthy and distilled.
Glass B	Clean, unclear, fine, not good for human consumption
Glass C	Dam water, contaminated, dirty water, muddy, water from the valley

The clear distinctions made by the participants through the perception of these three water filled glasses were an indication that they had identified differences in water quality.

#### **4.3 Water quality**

To further explore the water quality through the perceptions of the participants' situation in relation to the drinking water of Madibogo, three different themes were identified. These themes included the experience of drinking water, opinions on safe drinking water as well as water treatment and purification. Each theme will be discussed individually.

##### **a) Theme 1: Experience of drinking water**

As shown in (Table 4.2) the participants expressed their experiences towards the drinking water from the Madibogo community. From these responses it was evident that their experiences were based on both aesthetic and sensory evaluations. These evaluations were formed through experiences of vision, smell and taste. Gabbott and Hogg (1998:40) are of the opinion that individuals respond to their environment at every basic level by processing sensation received through the five senses, which in this case were the vision, taste and smell. These three categories were also found in the perceived experience of the water from Madibogo. In this instance, the colour of their drinking water was perceived to be of a milky colour, the smell was that of jik or bleach and the taste

was experienced as being salty, bitter and not pleasant. The community leaders also shared the same experience as the participants about the water, as they also experienced the salty taste and a milky colour.

**Table 4.2: Experience of drinking water**

<b>Aesthetic and sensory evaluation factors</b>	<b>Experience</b>
Vision	It has a milky colour
Smell	Smells like Jik or bleach
Taste	It has a salty, bitter, sour and not pleasant.

The experience of the quality of water is further illustrated through a very descriptive quote used to express this experience found under the concept of taste.

### **Concept 1: Taste**

In Table 4.3 below quote 1, the personal experience is depicted as that of water which tastes like freshen (laxative).

**Table 4.3: Personal experience of drinking water through sensory receptors**

<b>Concept</b>	<b>Participants' statements</b>
<b>Taste</b>	1. "The water tastes like freshen (laxative)"

To further explore the water quality factor, participants were asked whether they believed that there was such a thing as safe drinking water and what it meant to them as it was constantly brought forward during the evaluation of the three glasses of water. The theme below reflects the participants' opinions about the existence of safe drinking water.

**b) Theme 2: Opinions on safe drinking water**

Through this theme it was found that participants had different views about the existence of safe drinking water. The different views posed by participants made it possible for the researcher to categorize the opinions into two main categories, i.e. those who believed that there was such a thing as safe drinking water and those who held an opposite point of view.

**Category 1: Participants that held a belief that safe drinking water in general existed**

Participants who held a belief that safe drinking water in general existed further elaborated on what forms of water were considered safe (See *Table 4.4 below, quotes 1-3*).

Findings point to the fact that rain water was considered to be the best form of safe drinking water as it has a pleasing taste and it satisfies their household needs (*Refer to Table 4.4 below, quote 4*). Vlok (2003:171) supports the idea of these participants by the fact that falling rain-water is free of pathogenic microbes, it has no mineral salts and it is soft. Secondly the participants identified bottled water as another form of drinking water; their claim was that it was approved by the SABS. Anon (1997:1) is of the opinion that people choose bottled water because it is perceived to be safer and of better quality. The third form of drinking water was considered to be purified water when, according to the participant, it has been tested and the pipes of the service have been checked (*See Table 4.4 below, quotes 2-3*).

**Table 4. 4: Reasons for believing that there is safe drinking water**

Concept	Participants' statements
<b>Believers</b>	<ol style="list-style-type: none"><li>1. "It is the water that has been cleaned and purified just like the water from the location"</li><li>2. "It is water that you know what it consists, water that you do not have to worry when you are going to use it and it is approved by the SABS" [cit]</li><li>3. "Purified water the pipes are checked and water is tested" [cit]</li><li>4. "With rain water you can do anything and it also taste wonderful" [cit]</li></ol>

## **Category 2: Participants who had a belief that safe drinking water does not exist**

In contrast to the believers' idea that safe drinking water existed in general, there were participants who were of the opinion that safe drinking water does not exist. According to this group the belief was that water could be contaminated at any time (*See Table 4.5, quote 1*). The notion raised by the participants supports the statement made by Van Leeuwen (2000:S51) that in the natural environment there is no pure water, including rainwater, as it contains some impurities. The other contributing factors that influenced the participants' disbelief that safe drinking water existed were:

- They do not have trust in the people who are responsible for purifying water in general as they are scared that they could make a mistake and add more chemicals than required (*Refer to Table 4.5, quote 2*). This statement supports the notion of Van Leeuwen (2000:S51) when he mentioned that disinfectants and disinfectant by-products are known contaminants resulting from processes used by the industry responsible for the treatment or purification of water. Hence, this suggests that a toxicologist should provide risk assessments for chemical pollutants and derive guidelines for drinking water quality standards. The guidelines should ensure that drinking water is safe and can be consumed without any risk.
- The participants believed that boiled water or the addition of bleach makes water partially safe (*Refer to Table 4.5, quote 3*). This is supported by the observation made by Solsona (1996:1) when he/she considers boiling and aeration as water treatment methods used on limited applications (small volumes) sometimes with unreliable results due to the relevant factors such as inaccurate dosing of disinfectant or lack of resources such as appropriate equipment for treating the water.

**Table 4.5: Reasons for not believing that there is safe drinking water**

Concept	Participants' statement
<b>Non-believers</b>	<ol style="list-style-type: none"> <li>1. "Germs are all over therefore water can be purified but still have germs"</li> <li>2. "You will never know what if those people who pour chemicals in water pour more than it is required" [cit]</li> <li>3. "If water is boiled bleach or Jik is added then the water will be safe but not 100%" [cit]</li> </ol>

Although the discussion was about the existence of safe drinking water in general, the participants found it relevant to discuss and categorize their drinking water service. Some of the participants believed that their drinking water service was safe in relation to their existence. The participants questioned whether the fact that the residents lived up to a certain age directly pointed to the fact that Madibogo village water was safe (See Table 4.6 below, quote 1). According to the community leaders, Madibogo water was safe. To further elaborate on that statement one of the leaders related his existence to the safety of the Madibogo water (Refer to Table 4.6 below, quote 2), in that he had been drinking it since childhood.

**Table 4.6: Reason for believing that Madibogo water is safe drinking water**

Concepts	Participants' statements
<b>Part of existence</b>	<ol style="list-style-type: none"> <li>1. "Do you want to tell me that for the past twenty years you have been staying here drinking this water do you mean to tell me that this water is not safe?"</li> <li>2. "I cannot answer that because since childhood I have been using the water and I am still here"</li> </ol>

**c) Theme 3: water treatments and purification**

According to the responses of the participants, a variety of methods were utilized in treating water. This theme was conceptualized through methods used for water quality improvement and cleaning process of the local water service.

### **Concept 1: Methods used for quality improvement**

These methods included 'boiling water before use', 'adding Jik or Bleach' to the water or 'adding cement', which was claimed to improve the colour of the water (Refer to Table 4.7 below, quotes 1-2).

**Table 4.7: Water treatments used by consumers**

<b>Concept</b>	<b>Participants' statements</b>
<b>Methods used for water quality improvement</b>	1. " We add bleach or boil the water" 2. "We add cement to our water to improve its colour"

Furthermore the participants were uncertain on whether Madibogo water was cleaned. According to the participants 'cleaned' meant the addition of chemicals to clean the water (See Table 4.8, quote1) while purification meant water from the urban areas.

### **Concept 2: Consumers' concerns about the cleaning process**

The participants were concerned about not knowing who was cleaning the water, which rendered the skills of those who were responsible for purifying the water questionable (Refer to Table 4.8, quotes 1- 2). According to the way in which the water was treated and purified the participants moved on to give reasons for the desire for purified water. These reasons included the desire to have water purified as there was uncertainty about the cleaning process as they thought that water was being cleaned but still retained the milky colour (Refer to Table 4.8, quotes 2-3).

### **Concept 3: Consumers' desires for purified water**

The participants wished that the water received, be exactly as that of the township (Refer to Table 4.8, quote 4). The community leaders were also of the opinion that the water was cleaned even though no one wanted to commit him/herself to further explain the matter. However, one of the community leaders based his belief for the cleaning of water on his past experience, as that when he used to live in Johannesburg, the water had a milky colour. It was believed that

milky water was an indication that the water had been treated recently (*Refer to Table 4.8 below, quotes 5-6*).

**Table 4.8: The reasons for the desiring purified water**

Concepts	Participants' statement
<b>Concerns</b>	<ol style="list-style-type: none"> <li>1. "The problem here at home is that they will say if there is no water for the day they just claim that they have been cleaning it"</li> <li>2. "We do know if the water is being cleaned and who cleans it. But the surprising thing is that we get the water with a milky colour"</li> <li>3. "I think our water needs to be purified"</li> </ol>
<b>Desire of purified water</b>	<ol style="list-style-type: none"> <li>4. " I wish the water could be like the one from the location because you do not have to worry with it" [cit]</li> <li>5. "I believe it is cleaned but I am not sure"</li> <li>6. " when I used to stay in Johannesburg we used to receive water with a milky colour when it just cleaned" [cit]</li> </ol>

#### 4.4 Water quantity

Water quantity was discussed by the participants through the idea of water sources. To this effect the participants were asked to identify different water sources in their community. They identified taps, reservoirs, streams, boreholes and rain water as particular to their community. Furthermore, water sources were explored through the aspects of reliability, convenience and affordability.

##### a) Theme 1: The reliability of the water sources

With regard to the reliability of water sources the participants referred to three main sources in relation to reliability of community taps, underground water and reservoirs. The communal taps were further debated in terms of availability of water provided by the communal taps. Concepts such as availability of water and vandalism, hygiene and safety were identified.

##### Concept 1: Availability of water and vandalism

According to the participants the availability of water was adversely affected by occurrences of vandalism in the community (*Refer to Table 4.9, quotes 1 and 3*). Even the community leaders shared the same view as the participants about the

reliability of communal taps. They defined reliability through availability which was affected by factors such as vandalism, faulty pumps and leakages (*Refer to Table 4.9, quote 3*). According to (*quote 3*) the unavailability of water affected the community's needs and activities such as funerals.

### Concept 2: Hygiene

The reliability of the water sources were further defined in relation to concepts referring to hygiene and safety. In this instance the participants commented that the water sources could not be trusted as they had to share the taps with animals. This would influence the hygiene of the water sources (*Refer to Table 4.9, quote 5 and to picture 4 in chapter three*).

### Concept 3: Safety

Another aspect was revealed with regard to safety. In this instance participants mentioned the way in which a water source was constructed as being the cause of uncertainty about the safety of that source (*Refer to Table 4.9 below, quote 6*).

**Table 4.9: Factors affecting the availability of water from the taps**

Concepts	Participants' statements
Availability and vandalism	<ol style="list-style-type: none"> <li>1. "Sometimes the water is cut and we will be told that the water was being cleaned"</li> <li>2. "Sometimes water is not available during funerals"</li> <li>3. "People vandalize the taps, sometimes the water is unavailable because of faulty pumps and leakages"</li> <li>4. "People vandalize the taps by stealing the caps"</li> </ol>
Hygiene	<ol style="list-style-type: none"> <li>5. "We have to share the taps with the animals so that puts our health at risk"</li> </ol>
Safety	<ol style="list-style-type: none"> <li>6. "The reservoirs are not safe as they are open and anything can happen to them "</li> </ol>

To further explore the water quantity the convenience factor was discussed.

## **b) Theme 2: The convenience of the water sources**

Convenience was discussed in relation to water sources. Two concepts were identified, namely distance to the communal taps and economic implications which dominated the convenience of the water supply.

### **Concept 1: Distance to communal taps**

In Madibogo the majority of participants claimed that the taps were far from the houses and as a result they, had to use wheel-barrows to carry water. Picture 5 in chapter three illustrates this practice. According to the RDP standard the distance of taps from the households is supposed to be 200m away (Mvula Trust, 2000:1). Hence the participants expressed their desire for this distance to be implemented. They also expressed the desire for individual taps, as they claimed that sometimes there are elderly people who are staying alone that cannot walk long distance, especially not while conveying water which is heavy to carry (*Refer to Table 4.10, quote 1*).

### **Concept 2: Economic implications**

According to Table 4.10, quote 1 this has a major economic implication since the old citizens have to pay children to fetch water for them. The participants' idea about the distance of communal taps was also supported by the community leaders as they mentioned that the current distance from the dwelling place and communal taps measured  $\frac{1}{2}$  kilometre and sometimes  $\frac{3}{4}$  kilometre. They furthermore explained that the local municipality's future plans are to implement the minimum RDP standard distance in their community. The implementation will take time as the current plan is to first provide water to villages that do not have water at all (*Refer to Table 4.10, quotes 2-3*).

**Table 4.10: Economic implications of the distance to communal taps**

Concepts	Participants statement
<p><b>Distance and economic implications</b></p>	<ol style="list-style-type: none"> <li>1. Sometimes there are old people who are staying alone therefore the taps are far from them, then they will have to pay children to fetch water for them" [cit]</li> <li>2. "Our people are suffering, the distance is a challenge as the taps are far from the households sometimes people have to walk long distances like 500m or even further ¾ kilometers" [cit]</li> <li>3. "We are planning to move them closer to the people but that will take time since now we are busy with other villages who do not have water at all" [cit]</li> </ol>

The next section will deal with the affordability of water sources.

**c) Theme 3: The affordability of the water sources**

The main concept that dominated the affordability theme was the payment. It is clearly indicated through the findings that the participants were not paying because they are subsidized by the municipality (*Refer to Table 4.11, quotes 1-2*). However, a minority of participants claimed that there were people who were still paying for the water. They claimed that the pensioners were still paying two rand every pension day. According to the spokesman of Mvula Trust (2000:1) and MacKay and Ashton (2004:3), the South African government has committed itself in ensuring that all South African citizens receive at least a basic level of municipal services such as water, sanitation, refuse removal and electricity, regardless of the ability to pay. Hence there are guidelines to help the municipalities to implement the policy that has been developed by the department of Water Affairs and Forestry. The national government subsidizes the municipalities so that the South African citizens can receive free water (Mvula Trust, 2000:1). The participants are aware of this (*Refer to Table 4.11, quote 2*). They know that the municipality is subsidizing them hence; they do not have to pay for water. The community leaders were not aware that there were people who were still paying for their water supply especially pensioners as they claimed that people were receiving free water (*Refer to Table 4.11, quote 3*).

**Table 4.11: No cost for the consumers for the provision of water**

Concept	Participants' statements
<b>Payment</b>	<ol style="list-style-type: none"> <li>1. " We are not paying, the water is free"</li> <li>2. "The municipality is paying for the maintenance"</li> <li>3. "People are receiving free water"</li> </ol>

#### **4.5 The responsibility to look after the water services**

This question was conceptualized through the concept of ownership. In this instance two parties were identified by the participants as being responsible for the water service.

##### **Concept 1: Community**

The participants identified themselves as the community and as the consumers who receive the water service. This implied that they had to be the ones who would take care and be responsible for the water service. They also suggested that the community should have structures that would look after the water services (*Refer to Table 4.12, quote 1*). Netshiswinzhe (2002:1) and Mathabatha and Naidoo (2004:13) support this idea by arguing that community involvement encourages ownership, accountability and independency to help themselves.

##### **Concept 2: Government**

The participants made a clear point of suggesting that the government should be responsible for the improvement of water quality (*Refer to Table 4.12, quote 2*). Netshiswinzhe (2002:2) also found it important for the people to understand the role of the government and other external agencies as facilitators of development.

**Table 4.12: Responsibility of each partner in development**

Concepts	Participants' statements
<b>Ownership</b>	<ol style="list-style-type: none"> <li>1. "Community and the community structures should look after their taps"</li> <li>2. "If the government can improve the quality of water we are drinking then we would be happy"</li> </ol>

The section below will give a clear insight about whether the participants were aware of FBWP, or not, and what their perceptions were.

#### 4.6 The National Free Basic Water Policy

The FBWP was interpreted by the participants in terms of four themes namely awareness, non-beneficiaries, recommendations and expectations. In the next section each theme will be discussed in detail highlighting the concepts related to each theme.

##### a) Theme 1: Awareness

The theme of awareness was identified through the concepts of knowledge, source of information and transfer of information.

##### Concept 1: Knowledge

The findings indicated that the majority of the participants' awareness about the FBWP was that water was given for free (*Refer to Table 4.13, quotes 1-2*). However, the amount of water that was given for free was not really known to the participants (*Refer to Table 4.13, quote 3-4*).

**Table 4.13: The importance of information through the right channels**

Concept	Participants statement
Knowledge	<ol style="list-style-type: none"> <li>1. "We are not paying, water is free"</li> <li>2. "The government is giving free water"</li> <li>3. " I have heard about it but it is my first time to hear how much was actually given"</li> <li>4. "The water that we are given free by the government is 1000L per household"</li> </ol>
Source of information	<ol style="list-style-type: none"> <li>5. "I have heard about it from the radio, television and news papers" [cit]</li> <li>6. "When the councilors were canvassing for the elections they told us about free water" [cit]</li> <li>7. "I have seen it in my municipality invoices and on television"</li> </ol>
Transmission of information	<ol style="list-style-type: none"> <li>8. Our leaders never called a formal meeting to inform us about this policy"</li> <li>9. "We told our people about the FBWP when we were canvassing"</li> </ol>

### **Concept 2: Sources of information**

The participants were informed about the FBWP through various sources which were (in no particular order): ward councillors, television, radios, newspapers and invoices from municipality statements for mainly those who are from the urban areas (*Refer to Table 4.13, quote 5-7*).

### **Concept 3: Transfer of information**

The only time they were informed of the FBWP from the councillors was when they were canvassing during the national elections (*Refer to Table 4.13, quote 8*). The community leaders were aware of the FBWP and they stated that the community was also informed of FBWP as the information was transferred to them when they were canvassing for the national elections (*Refer to Table 4.13, quote 9*). Pybus *et al.* (2000:13) are of the opinion that the situation and the context in which the information is transferred have an influence on the way in which the information will be interpreted.

### **b) Theme 2: Non-Beneficiaries**

The theme of non-beneficiaries was conceptualized in terms of the distinction of site and the rural people's opinion about the FBWP.

#### **Concept 1: Distinction of site**

The participants thought that the FBWP mostly benefited people from the township, as they (people from rural areas) used communal taps which constantly supplied water and was not monitored in any way (*Refer to Table 4.14, quote 1*).

#### **Concept 2: Rural people's opinion about the FBWP**

The participants felt that the people from the locations were rather benefiting from the FBWP as they were able to monitor their water consumption through the meters in their homes. It is based on this idea that the participants were inclined to think that the FBWP was a waste of government money and not benefiting them in any way (*Refer to Table 4.14, quote 2*). The community leaders opposed

the participants' view about the FBWP as they believed that FBWP was aimed at improving the well-being of the poor. According to the findings, the community leaders believe that FBWP is benefiting the poor communities, such as Madibogo community as there is a high rate of unemployment. To further expand on that view one of the community leaders viewed it as a government hand-out that should not be refused (*Refer to Table 4.14, quote 3-4*). Pybus *et al.* (2000:11) state that community leaders, also known as opinion leaders, are people who pass information to the community through interpersonal skills communication. They have more access to information compared to the community members, thus they have a power over the community.

**Table 4.14: Reasons for not believing that the FBWP is for the poor people including rural people**

Concepts	Participants' statements
<b>Distinction of location</b>	1. "It does not make a difference in rural areas because we get our water from communal taps and they are far from our homes and people from the location they can see how much water they are saving"
<b>People's opinions</b>	2. "I think it is a waste of government's money as it is not benefiting the target group, which are the rural people who are the poor people" 3. " The poor people like us are going to benefit because here people are not working" 4. " This is government's handout, we have no choice, we have to accept it, it will help our people"

**c) Theme 3: Recommendations**

This theme was identified through the concept of water service improvement. Water quality and objects such as the water taps were included (*Refer to Table 4.15, quotes 1-5*). In support of the findings Netshiswinzhe (2002:2) foresees that if yard tap connections are put in place, as suggested by the participants, the same consumers who are not paying for the water would consume more water. This would have a negative impact on their economic situation. In effect this situation would not alleviate the problem of providing water for all.

It is based in this discussion that the participants made suggestions that they thought would help change the focus of the FBWP to target the rural communities. In addition to what had been suggested by the participants the community leaders suggested that the water should be available at all times to limit inconveniences (*Refer to Table 4.15, quote 6*).

**Table 4.15: Participants' suggestions for the improvement of the FBWP**

Concepts	Participants' statements
<p><b>Improvement of water services</b></p>	<ol style="list-style-type: none"> <li>1. "If the government can improve the quality of water we are drinking then we would be happy"</li> <li>2. "I think the government can help the disadvantaged areas like Madibogo by supplying them with taps and pipes in their yards and make sure that the water is purified"</li> <li>3. "We should have individual taps"</li> <li>4. "Yard taps would be a better solution as now we are sharing our taps with animals"</li> <li>5. "At least if you have your tap you have a control over it, you take care of it and you are guaranteed to get safe water"</li> <li>6. " The government must help us with the water because sometimes when the water is cut and people do not have water for funerals they say the Chief 'Kgos' has cut the water"</li> </ol>

**d) Theme 4: Expectations**

The participants shared their views about the free basic water policy in light of their expectations. These expectations were conceptualized through the idea of misconception.

**Concept 1: Misconception**

In this instance the participants were under the impression that if water was free due to the fact that FBWP provided the source, there should be no charge on any source of water. For example water from boreholes in the community as well as the people who are selling water at water points and other points in the community should not charge for the water as this water was provided by the FBWP (*Refer to Table 4.16, quote 1*).

**Table 4.16: Expectation leading to consumers' misconception**

Concepts	Participants' statements
Misconceptions	1. "We won't be buying water from the people who are selling water from their own boreholes"

The next section will reflect the consumers' perception towards household utilization.

#### **4.7 The household water utilization**

The participants listed their daily household uses of water in no particular order as being bathing, cooking, drinking, animal drinking, car washing, garden watering, washing of clothes and household chores. These water uses listed by the participants were also mentioned in the WRC guide (1999a:7). Furthermore, household water utilization was explored through the following themes: water use and the problems of consumers with regard to the water usage.

##### **a) Theme 1: The problems when using water for household activities**

The theme of challenges of water usage was defined by the concepts of personal image, social image, concerns with laundering, food preparations and biological needs.

##### **Concept 1: Personal image**

The participants perceived the water they used for personal hygiene as unpleasing as they had to add powdered soap to make it soft and to get lather (*Refer to Table 4.17, quote1*). Furthermore, the participants stated that the water consumed was responsible for the patches, changes in complexion in their faces and it discoloured their hair (*Refer to Table 4.17, quote 2-4*). This is the participant's opinion not necessarily justified, claiming that the patches in their faces and discolouration of hair were caused by the Madibogo water. It is through this idea that the participants stated that the state of Madibogo water was killing their self-esteem and they could not live their lives freely (*Refer to Table 4.17, quotes 5-6*). Blackwell *et al.* (2001:233) are of the opinion that one of the social needs explains that personal social image depends at least in part on the

products that the person buys and consumes which in this case is the Madibogo water.

### **Concept 2: Social image**

The participants reflected that they were not comfortable with offering water to visitors as they were concerned about the visitors' health. Furthermore, they were not comfortable offering the water (especially tea with powdered milk) to visitors, because of uncertainty over the effect it might have on their health (*Refer to Table 4.17, quote 7*) and the tea's appearance (*Refer to Table 4.17, quote 8*).

### **Concept 3: Laundering**

The participants were unhappy about the water quality performance when doing the laundry, as the water discoloured their clothes. They also claimed that their clothes lost quality as they became discoloured when washed with the water (*Refer to Table 4.17, quote 9*). Van Duuren (1997:27), in chapter two, mentioned the water quality aspects as stating that water should not pose any economical detrimental effects on either the distribution systems or on consumers' equipment or belongings.

### **Concept 4: Food preparations**

This was dominated by the unpleasant taste experienced when preparing food (*Refer to Table 4.17, quote 10*). As mentioned, there was a concern on the coagulation of powdered milk as a result of the water, when preparing tea. They had to wait for the tea to cool down, consequently not being able to serve a hot beverage (*Refer to Table 4.17, quote 11*).

### **Concept 5: Biological needs**

Biological needs were also of concern to the participants, as they were of the opinion that the Madibogo water did not quench thirst (*Refer to Table 4.17, quote 12*), although Anon (2004:1) in chapter two listed one of the water functions as the best liquid to quench thirst. Even if the participants tried other means like putting the water in the refrigerator to make it cold, the taste and the appearance of water would not improve (*Refer to Table 4.17, quotes 13-14*). Solomon

(2004:117) is of the opinion that people are born with a need for certain elements necessary to maintain life, such as food, water, air and shelter. Even the community leaders were of the opinion that the water was not good for food preparation as its unpleasant taste affected tea making and coagulated powdered milk when making tea (Refer to Table 4.17, quotes 10-11 and picture 2 in chapter three).

**Table 4.17: Consumers' dissatisfaction with the performance and taste of drinking water**

Concepts	Participants' statements
<b>Personal image</b>	1. "When taking a bath, if we want to get lather and the water to soften we have to add powdered soap or else we will have a dry skin as if you have not bathed yet" 2. " It changes our complexion" 3. "Our faces have patches because of this water" 4. " I have to shave my hair because if I do not, I will have ginger hair" 5. "This water is killing our self-esteem" 6. "We cannot live our lives freely with this water".
<b>Social image</b>	7. "If you are a visitor and drink this water you will have a running tummy" 8. "It is not easy to make tea with this water as if you use powdered milk the milk will coagulate"[cit]
<b>Laundering</b>	9. " It discolours our clothes, therefore they lose quality"
<b>Food preparation</b>	10. To show you, how salty this water is, when you cook 'pap' you do not have to add salt" 11. "If you add powdered milk, when making tea it coagulates, you have to wait for it to cool down before you drink it" 12. "When making custard it coagulates and the taste is affected"
<b>Biological needs</b>	13. "It does not quench thirst" 14. " Even if you put it in the refrigerator it does not help, the only thing you will notice is a white substance on top of the ice cubes"

**b) Theme 2: Economic implications**

The theme of economic implications is defined through the concepts of addition of water substances, appliances/time as well as fuel or electricity.

**Concept 1: Addition of water substances**

The findings indicated that the participants were adding foam bath or powdered soap, an expensive addition, to the bath water or extra powdered soap to do laundry (*Refer to Table 4.18, quotes 1-2*).

**Concept 2: Appliances/time**

The electric appliances such as kettles and irons had to be replaced on regular basis as the water affected the elements (*Refer to Table 4.18, quotes 3-4*). It also affected the fuel or electricity consumption as the water took a longer time to boil. This is their personal observation and not necessarily justified in any way. They also had to boil the water before they gave it to babies (*Refer to Table 4.18, quotes 5-6*). If they were going to have visitors they had to buy water from the people who own boreholes. The visitors and people who are taking medication were required to bring or buy water, as the people were concerned about the after effects of drinking the water from Madibogo water supply (*Refer to Table 4.18, quotes 7-8*).

The views of these participants supported the concerns raised by the WRC (2002: 5) when recommended the importance for treatment of domestic water. This implies that the failure to treat the water may result in costs that could have been prevented, for example higher electricity costs for heating the water and earlier or regular replacement of elements.

**Table 4.18: The cost effect as a challenge in water consumption**

Concepts	Participants' statements
<b>Addition of water substances</b>	<ol style="list-style-type: none"> <li>1. "Foam bath is expensive some of us do not afford to buy it" [cit]</li> <li>2. "You have to add more powdered soap to the water when doing washing"</li> </ol>
<b>Appliances /time</b>	<ol style="list-style-type: none"> <li>3. "It takes time for the water to boil because of the white sediment in the kettles"</li> <li>4. "Electrical appliances are affected by this water"</li> </ol>
<b>Fuel or electricity/time</b>	<ol style="list-style-type: none"> <li>5. "If you boil water it takes long to boil because of the white sediment"</li> <li>6. "If you have a baby you have to boil the water before giving it to the baby"</li> <li>7. " People who visit Madibogo cannot drink this water some of them they bring their own water" [cit]</li> <li>8. " If there is someone who takes treatment you have to buy water from the people who have their own boreholes"</li> </ol>

The section below will elaborate more on participants' concerns about the water supply.

**c) Theme 3: Concerns**

The theme of concern was related through the concept of health relation.

**Concept 1: Health relation**

The findings reflected that the participants were concerned about the health problems that would be caused by the water especially of those who have to take treatment (*Refer to Table 4.19, quote 1*) for chronic diseases. Easle (2003:10) also shares the participants' concerns as he/she is of the opinion that, personal hygiene and proper nutrition are instrumental in extending the lives of people who have compromised immune systems such as HIV positive people. Thus, the proposed model for the implementation of the water policy presented by MacKay and Ashton (2004:6) level 4 in chapter one (*Refer to Figure 2.1*) also incorporated and targeted the diseases like HIV/AIDS as they affect development.

Participants also had fears about using water, as they were scared of skin cancer. They claimed that the water caused itchiness and dryness of the skin (Refer to Table 4.19, quote 3). Pietersen (2005:27) also shares the participants' concern as s/he is of the opinion that the excess levels of nitrate in drinking water can result in cancers as well as hypertension. The health concern was also shared by the community leaders as they were worried about the effects that the salty tasting water could have on its consumers (Refer to Table 4.19, quote 4.)

**Table 4.19: Reasons for the concerns of participants**

Concepts	Participants' statements
Health relations	<ol style="list-style-type: none"> <li>1. 1 "I think the water is not healthy for people with ulcers, because it is salty"</li> <li>2. 2 " If the water is not good for the kettles and pots how much more for the stomach and especially for people who are taking medication, because you cannot take tablets with alcohol what about this water?" [cit]</li> <li>3. "I think this water can cause skin cancer because after bathing you will feel that your skin becomes itchy and dry'</li> <li>4. "Coming to saltiness of water I cannot really say the water is safe as I do not know if it is affecting their health or not"</li> </ol>

The next section will present the conclusion of this chapter.

#### **4.8 Conclusion**

In this chapter the consumers' perceptions and household utilization of a rural water service were revealed. The consumers' perceptions were identified through the study objectives listed in chapter one. The methodology discussed in chapter four was followed and themes were identified and discussed through various concepts to bring meaning to the participants' responses. The findings revealed that the participants perceived water quality through the aesthetic factors and the physical appearance was dominant in their evaluations. They indicated that the water had a salty taste, with a milky colour and that it smelt of Jik/Bleach. It is through this idea that the participants believed that the water they consumed was not safe. This was caused by the fact that they had uncertainties about its safety and hygiene as they lacked trust in the people who were responsible for cleaning the water system as it still maintained the milky colour even after the cleaning process.

The most important issues that sufficed when discussing water quantity, were water availability and the distance of communal taps. According to the findings, availability of water was mainly affected by vandalism, tap leakages and faulty pumps. These affected the reliability of the communal taps as at times the water was not available. This caused disturbance in the community as at times this water was needed for funeral purposes. The distance of communal taps mostly affected the elderly as they had to pay people to fetch the water for them as the communal taps are about  $\frac{1}{2}$  kilometres to  $\frac{3}{4}$  kilometres away from the households.

According to the participants the FBWP did not benefit the rural people as it was still favouring the township (*also referred to by the citizen as the 'location'*) citizens. This idea was a result of the fact that the rural people had a continuous central continuous water supplying system and they could not see how much water they were consuming or how much they were saving or given for free as opposed to the township people who have meters and individual taps. Therefore the participants suggested some changes such as improvement of water quality, installation of yard taps and others to be made by the FBWP to benefit the rural areas. The participants did not have enough information about the FBWP.

In relation to household utilization of the rural water service, the participants related the quality (the aesthetic factors) to poor performance of the water. The findings indicated that the salty taste affected food preparation as it had unpleasant taste. The participants blamed water quality, which is due to poor water services for affecting their personal and social image. The findings also reflected that the water quality affected the participant's economic situation to name a few examples; where they had to add powdered soap to bathing water as they could not afford foam bath to soften the water and for lather formation. Furthermore the water service raised participants' health concerns as they feared what health implication the water would have to its consumers. In the next chapter, articles written from this study will be presented.

#### 4.9 References

ANON. 2004. Lifestyle: Health and Fitness. Clean water Challenge-Rand Water. [Web:] <http://www.randwater.co.za/> [Date of access: 17 August 2004].

BLACKWELL, R.D., MINIARD, P.W. & ENGEL, J.F. 2001. Consumer behaviour. 9<sup>th</sup> ed. Forth worth: Hartcourt College Publishers.

GABBOTT, M. & HOGG, G. 1998. Consumer and services. Great Britain: John Wiley & Sons Ltd.

MACKAY, H.M. & ASHTON, P.J. 2004. Towards co-operative governance in the development and implementation of cross-sectoral policy: Water policy as an example. *Water SA*, 30 (1), 1-8p January.

MATHABATHA, S. & NAIDOO, D. 2004. A review of public participation in the rural water and sanitation setting. Pretoria: Water Research Commission. WRC report no. 1381/1/04.

MVULA TRUST. 2000. Free basic water\_tapping its developmental potential in rural areas. [Web:] <http://www.mvula.co.za/resources> [Date of access; 20August 2004].

NETSHISWINZHE, B. 2002. Free Basic water-Tapping its Developmental Potential in rural Areas. [Web:] <http://www.mvula.co.za/pages> [Date of Access: 01 August 2004].

PIETERSEN, K. 2005. Groundwater Crucial to Rural Development. WRC, *Water Wheel*, 4(2) 26-27p March/April.

PYBUS, P.; SCHOEMAN, G. & HART, T. 2001. The level of communication between communities and engineers in the provision of engineering service. Pretoria: Water Research Commission. WRC report no.TT 133/00.

SOLOMON, M.R. 2004. Consumer Behavior. 6<sup>th</sup> ed. United States of America: Prentice Hall.

SOLSONA, F. 1996. Non conventional disinfection technologies for small systems. Pretoria: Water Research Commission. WRC report no. 449/1/95.

VAN DUUREN, F.A. 1997. Water Purification Works Design. South Africa: Water Research Commission. WRC report no. TT 92/97.

VAN LEEUWEN, F.X. 2000. Safe drinking water: the Toxicologist's approach. WHO European Center for Environment and Health. 38 Supplement (1):S51-58. Netherlands: Bilthoven Division. [Web:]  
<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?> [Date of access: 04 March 2004].

VLOK M. E. 2003. Manual of Community Nursing. Republic of South Africa: Juta and Co.Ltd.

WRC. 1999a. Quality of Domestic Water Supplies. Assessment Guide. Volume 1. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no.TT 101/98.

WRC. 2002. Quality of Domestic Water Supplies. Treatment guide. Volume 4. 1<sup>st</sup> ed. Pretoria.: Water Research Commission. WRC report no. TT 181/02.

## **CHAPTER 5**

### **ARTICLES**

---

In this chapter, the articles written from this study are presented as part one and part two. The first part presents the qualitative study, while the second part presents a proposed theoretical framework for the study of water service provision. These articles will be submitted to the Water SA journal.

The general summary, recommendations and limitations of this study will be presented in the next chapter.

# **A South African study of consumers' perception and household utilization of a rural water service. Part 1: A qualitative study**

**U Kolanisi \*, E L Kempen, M Larney and M Van der Merwe**

*Department of Consumer Science, North-West University, Potchefstroom campus P/Bag X 6001;  
South Africa*

## **Abstract**

The South African Government, water service bodies and service providers are engaged in providing 'water for all,' especially in rural areas. This is achieved by developing sustainable, potable water treatment units, which will address both the water quality and water quantity factors. The current challenge is that little is known about the way in which these services are experienced, received and perceived by the beneficiaries in the rural communities. The aim of this study was to determine consumers' perceptions and household utilization of a rural water service, through an exploration of consumers' perceptions of the water quality, water quantity, Free Basic Water Policy (FBWP) and household water utilization. This was done by employing a qualitative strategy, making use of focus groups and semi-structured interviews. Data collected with these methods, revealed that consumers rely on physical qualities and performance of water when evaluating a water service. Water quantity is defined through availability and accessibility, of which distance, has direct economic implications. The FBWP intended to address water quality and water quantity factors, although its beneficiaries do not perceive this to be effective.

**Keywords:** consumer behaviour; household utilization; perception; water quality; water quantity.

\*To whom all correspondence should be addressed.

Dr EL Kempen; Tel: 018 299 2483; fax: 018 299 2470; e-mail: [vgeelk@puk.ac.za](mailto:vgeelk@puk.ac.za)

## **Introduction**

According to Mackay and Ashton (2004), water is an essential need for human survival and human development. In this regard human survival includes general importance and biological needs of water. Human development is the improvement of human quality of life, which is directly related to human basic rights.

In South Africa access to water in effect is seen as a basic human right as stated in the Constitution, that consists of several unnoticed components such as enhancing water quality, water quantity, policy legislation, utilization, consumer behaviour and quality of life (SA, 1996). Figure 1 indicates a conceptual framework of the way in which water provision can be viewed, the relationship between these components and the contribution they make to the consumers' quality of life. Rice & Tucker, 1986:19 and Masetloa, 2004:47 defines quality of life as the psychological, social and personal factors that may influence the way in which a human being is comfortable within his/her environment (Figure 1). These factors make up some of the behavioural components of a consumer. It is therefore, through an understanding of the quality of life, created through these behaviours that consumers' needs can be identified and addressed. This figure also suggests that perception, as a consumer behavior process, is the key to understanding water as a basic human right.

To ensure that this basic human right is experienced by all, the South African Government has been engaged, since 1994, in an intense series of complex, participative processes. The aim of these processes is to renew, revitalize and reform

the policy and legislative procedures, guiding the provision of consumable water to communities (MacKay and Ashton, 2004). De Fontaine (2000) noted the scarcity of consumable drinking water and enumerated the criteria of good drinking water supply, factors related to *water quality* and *water quantity* (Figure 1).

### **Water quality**

De Fontaine (2000) realized that consumers are becoming more conscious about the quality of drinking water. According to the Department of Water Research Commission (WRC) (WRC, 1999b), water quality includes the microbiological, physical and chemical properties of water that determine its fitness for use (Figure 1). The physical property is determined by the aesthetic quality factor that consists of the taste, smell and the visual appearance of the water. The general concern is that an imbalance between the physical, microbiological and chemical properties of water might have an effect on the quality of water (WRC, 2000). The alarming fact remains that the consumer judges the water through its physical appearance, assuming that it is safe to consume if it has a clean appearance. According to the WRC guide (1999a), water with an unacceptable quality could be consumed. The consumers' ineffective judgment could consequently be detrimental to their health.

Many rural area communities in South Africa, depend on groundwater as a water feeding source. Modise and Krieg (2004) are of the opinion that groundwater is normally "clean". However, some areas experience high levels, up to 22.66 mg/ℓ of nitrates (commonly referred to as salt), fluorides and in some instances, sulphates.

Murphy (2002) argued that in South Africa, the problem lies within the treatment of water. It was furthermore proposed that this problem may be eliminated if water is treated to such an extent that an acceptable standard for potable water is achieved. Hence, the South African Government and water-related agencies such as the Water Research Commission of South Africa, are undertaking a vigorous campaign to provide 'water for all'. These campaigns are highlighted by intensive research aimed at developing systems of small-scale potable water treatment units, for both rural and peri-urban areas, to improve the quality of water (Netshinswinzhe, 2002; Bailey, 2003; Modise and Krieg.; 2004; Pillay and Jacobs, 2004).

#### **Water quantity**

According to De Fontaine (2000) and Modise and Kreig (2004) affordability, accessibility and availability are characteristics of water quantity (Figure 1):

- **Affordability** - suggests that every South African has the right to basic services, including the provision of water services, sanitation, refuse removal and electricity. Netshinswinzhe (2002) stated that it is the responsibility of the state to subsidize the municipalities, in an attempt to make water affordable to everyone.
- **Accessibility** - refers to water services and water facilities, which should be easily reached and attainable to everyone. This also refers to physical accessibility, economic accessibility, non-discrimination and information accessibility (Anon, 2002).

- **Availability** - refers to the fact, that in line with the World Health Organization (WHO) guidelines and the South African Water Quality guideline, water and water sources should be sufficient and reliable for household chores, activities such as food preparation, drinking, laundering and personal hygiene (Anon, 2002).

De Fontaine (2000) is of the opinion, that consumers are primarily concerned with water quantity-related issues and that water quality usually takes a back seat. Only once a water supply has been established, consumers turn their attention to water quality. Viewed in this context, water quantity represents a water service, which offers safe water that is beneficial to the consumer (Bates, 2000).

#### **Free Basic Water Policy**

The vehicle, through which water quality and water quantity issues are addressed, is the Free Basic Water Policy (FBWP) (WRC, 2000) (Figure 1). The main aim of this policy is to eradicate poverty and improve the health and quality of life of South Africans (Netshiswinzhe, 2002) (Figure 1). To achieve this through the FBWP the South African government is providing 6 kℓ of water to households per month (about 25-40 ℓ per person per day) (DWAF, 2001; Netshiswinzhe, 2002, Mackay and Ashton., 2004; Smits, 2004). This is an attempt to provide water to all citizens, including those who have been marginalized. By improving water quality and water quantity, the assumption is made that general utilization will improve.

## **Household utilization**

Household water utilization refers to personal sustenance, including food preparation and drinking water, as well as personal hygiene. It is speculated that if water quality and water quantity are not acceptable, these household uses may not be satisfactory. This in turn may have a negative effect on the perception of the FBWP.

Little research has been done on consumer perceptions and household water utilization, in relation to water services in South Africa. Studies that have been done, have focused on safe drinking water for health and hygiene purposes as well as improvement of water quality (Van Duuren, 1997; Sami and Murray., 1998; Westaway, 1998; Colvin, 1999; Bates, 2000; De Fontaine, 2000; Van Leeuwen, 2000; Modise and Krieg, 2004). The main aim of the present study was to determine consumers' perceptions and household utilization of rural water services, through an exploration of their perceptions of the water quality, water quantity, FBWP and daily household water utilization.

## **Methodology**

The study was conducted in Madibogo, one of the rural areas of the North West Province.

### **Study /research design**

This study was based on a qualitative strategy through which an exploration was made of the perceptions and utilization of a rural water service by consumers of this service. Flick (1995) is of the opinion that a qualitative strategy is the best way of exploring consumers' experiences, which in this regard would be consumers' perceptions and daily use of a community water service.

In order to gather the perceptions of participants for the present study a verbal methodology was followed, using an evaluation exercise, tape recorded focus group discussions, as well as individual interviews with key community leaders. The application of these different measuring instruments created triangulation in this qualitative study. Various authors such as Bryman (1996), Denzin and Lincoln (1998) and Silverman (1999) considered this method useful in gaining a true reflection of the situation under study.

### **Sampling**

A convenient sample of community members of Madibogo who belonged to various community organizations, served as participants in this study.

### **Ethical issues**

The researcher used several opportunities to explain the research to the community, for example, during the introduction meeting with the chief and the community and before each focus group procession. During these informative sessions, the researcher explained to the participants that their participation was voluntarily, confidential, anonymous and under no circumstances the participants would be accountable for their contribution.

### **Trustworthiness of the methods and analysis**

The question arises whether the methods of data collection applied in this study are a true reflection of the experiences of the participants. To ensure that the findings are truthful and reliable the inclusions of triangulated instruments, as well as a strict sequence with which the focus groups were led and semi-structured interviews were conducted, were applied. Furthermore, the notes made by the researcher's assistant were also presented to the focus groups, at the end of each session, in order to evaluate the representativeness of their opinions. The researcher also conducted several pilot focus groups sessions prior to the execution of the actual study, to identify problems with question formulation, question comprehension, testing and adapting the measuring instrument and suitability of measuring instruments (Van Teijlingen and Hundley, 2001).

## **Data collection**

### *Focus groups*

Focus groups were considered as a research instrument because the group context within which focus group sessions was contextualized created an environment within which the participants were able to reveal their experiences and ideas. Krueger (1994) is of the opinion that focus groups create a non-threatening, debatable environment producing believable results and allowing the researcher the opportunity to explore unanticipated issues brought forth during the discussion.

The focus groups were started by presenting the participants with three water-filled glasses, containing water from different water sources. The three glasses were labeled A, B and C. Glass A contained water from the township taps; glass B, water from Madibogo communal taps and glass C, water from Madibogo communal taps with sand added to it. After the consumers had made an evaluation of the water in the filled glasses, the focus group discussions were introduced. The discussions were initiated by asking the members to discuss their experience of drinking water, the source of drinking water, the responsibility of looking after their water service, the FBWP, their daily use of water and the challenges they encountered when using the water service for personal and household chores.

### *Interviews*

Semi-structured interviews commonly referred to as 'guided interviews' were used as a data collecting technique. They were held with the community leaders, such as the chief and the ward councillor, after the focus groups had been completed. These interviews consisted of the same questions discussed in the focus group sessions, except for the evaluation exercise, which was replaced by the issues brought forward during the focus groups that needed clarification.

### **Data analysis**

Data analysis was conducted by means of content analysis. Content analysis refers to a textual investigation of the verbal data through means of inferences of data by identifying categories and themes that best represent the data (Shaughnessy and Zechmeister., 1997; Silverman, 2000). In order to do content analysis the tape recordings of the focus groups as well as the semi-structured interviews were transcribed.

### **Results and discussion**

The results of this study are presented as concepts and themes, with illustrative examples from the actual quotes of the respondents.

### **Visual evaluation of water**

The consumers' perceptions varied, although the majority chose glass A. Glass A, was perceived to be crystal clear, beautiful, healthy and purified: "*Glass A is purified water*". Glass B was experienced as clean, unclear, fine and not good for human consumption: "*Glass B is not good for people and I think here at home we are using that water*". Glass C, was considered to be dam water, contaminated dirty water, muddy and water from the valley: "*Glass C that water has been drawn from the valley*". The evaluation, as expressed by the consumers, resembled physical quality, based on its appearance. This quality is basic to the identification of water quality, as indicated by WRC guide (WRC,1999a).

### **Focus group discussion and semi-structured interviews**

#### *How do you experience your drinking water?*

Three themes were identified from this question:

#### *Theme 1: Experience drinking water*

The experiences were based on the physical quality of water, resembling an evident sensory evaluation. These evaluations consisted of visual appearance: "*Our water has a milky colour*", smell: "*This water smells like Jik or Bleach*" and taste experiences: "*The water from here is not good*" "*The water tastes like freshen (laxative)*". Gabbott and Hogg (1998) were of the opinion that individuals respond to their environment at

every basic level by processing sensation received through the five senses. In the present study, the vision, taste and smell experienced by consumers were evident.

*Theme 2: Opinion on safe drinking water*

Through this theme, it was found that consumers had different views about the existence of safe drinking water. The different views posed, were categorized into two main categories, namely: those who believed that there was such a thing as safe drinking water and those who held an opposite point of view.

*Category 1: Consumer's who held a belief that safe drinking water in general existed*

Consumers who held a belief that safe drinking water in general existed, presented forms of water they considered to be safe. Rainwater was considered to be the best form of safe drinking water, as it has a pleasant taste and it satisfies their household needs: *"With rain water you can do anything and [cit] also tastes wonderful"*. Vlok (2003) supports the idea of these consumers, stating that falling rainwater is free of pathogenic microbes, has no mineral salts and is soft.

Secondly the consumers identified bottled water as another form of drinking water; the claim was that it was approved by the SABS *"It is water that you know what it consists, [cit] water that you do not have to worry [cit] when you are going to use it and it is approved by the SABS."* People choose bottled water because it is perceived to be safer and of better quality (Anon, 1997). The third form of drinking water was considered to

be purified water as it had been tested and the pipes had been checked "*Purified water [cit] the pipes are checked and water is tested*"

Category 2: Consumers who had a belief that safe drinking water does not exist

According to this group water could be contaminated at any time: "*I do not believe that there is such a thing as safe drinking water, because water can be contaminated any time*". The notion raised by the consumers, supports the statement made by Van Leeuwen (2000) that in the natural environment there is no pure water. Even rainwater contains some impurities.

Another influencing factor that led the consumers' disbelief of safe drinking water, was the lack of trust towards the people who were responsible for water purification. For example, they raised a clear concern for mistakes being made with regard to chemicals being added to the water: "*You will never know what if those people who pour chemicals in water pour more than it is [cit] required*". Van Leeuwen (2000) mentioned that disinfectants and disinfectant by-products are known contaminants, resulting from processes used by the industry responsible for the treatment or purification of water. It was also suggested that the toxicologists should provide risk assessments for chemical pollutants and derive guidelines for drinking water quality standards (Van Leeuwen, 2000). These guidelines should ensure that drinking water is safe and can be consumed without any risk. The respondents also believed that boiling water and adding household bleach would make water partially safe: "*If water is boiled*

*or Jik is added then the water will be safe but not 100%*". Solsona (1996) warned that boiling and aeration, which are water treatment methods used on small volumes of water, sometimes render unreliable results.

Although the discussion was about safe drinking water in general, the consumers found it important to relate the issue of safe drinking water to their water service. Consumers believed that their water service was safe, as it was associated with their existence: *"Do you want to tell me that for the past twenty years you have been staying here drinking this water do you mean to tell me that this water is not safe?"*

### *Theme 3: Water treatments and purification*

The consumers used water treatment methods, which included boiling water before use and adding household bleach. The water and the addition of cement, were also claimed to improve the colour of the water: *"We add bleach or boil the water"* and *"we add cement to our water to improve its colour"*

The consumers were uncertain about the cleaning process of the water that was being consumed: *"I believe it is cleaned but I am not sure"* However, they did not know who was cleaning the water, which rendered the skills of those who were responsible for purifying the water questionable: *"We do not know if the water is being cleaned and who cleans it, but the surprising thing is that we get the water with a milky colour"*.

Pybus et al. (2000) indicated that studies done in South Africa and elsewhere have proven, that communication as well as transference of knowledge and technical skills, is crucial in a water development project. Such approaches serve as a vehicle for obtaining community participation and as mechanisms to promote management at local level.

Consumer provided reasons for the desire for purified water were based on the appearance of the water, as it attained a milky colour and an association with the urban area. In this regard they assumed that water from the township was of a quality difference from what they were receiving: *"I wish this water could be like the one from the location because you do not have to worry with it". [cit]*

***Where do you get your drinking water?***

The consumers identified the water sources such as communal taps, reservoirs, streams, boreholes and rainwater as particular to their community. Water sources, specifically communal taps, were explored through aspects of reliability, convenience and affordability.

***Theme 1: The reliability of the water sources***

The reliability of the communal taps was debated in terms of availability of water gathered from these taps. Availability was affected by factors such as vandalism, faulty

pumps and leakages: *“People vandalize the taps; sometimes the water is unavailable because of faulty pumps and leakages”*. Furthermore availability was a concern, since it affects the community’s needs when, for example, funerals are held: *“Sometimes water is not available during funerals”*.

*Theme 2: The convenience of the water sources*

Convenience of the communal taps was expressed in terms of distance and economic implications. The consumers mentioned that the communal taps were distant from their dwelling places, thereby forcing them to use wheel-barrows to carry water: *“Our people are suffering; the distance is a challenge as the taps are far from the households sometimes people have to walk long distances like half a kilometre or even further, ¾ kilometres”*. According to the Reconstruction and Development Programme (RDP) standard, the distance of taps from the households is supposed to be 200m away (Netshiswinzhe: 2000). The distance issue induced consumers’ desire for the proposed RDP distance and individual taps. They also claimed that the elderly were affected by this issue: *“Sometimes there are old people who are staying alone therefore the taps are far from them, then they will have to pay children to fetch water for them”*. According to this quote the distance poses an economic implication, as the elderly have to pay children to fetch water for them. It is proposed that adequate water services and water facilities should be accessible to everyone (Anon, 2002).

### *Theme 3: The affordability of the water sources*

The main concept that dominated the affordability of the water source was non-payment. The consumers were receiving a free water service, subsidized by the municipality: *"We are not paying, the water is free"*. However, a small number of consumers claimed that there were people who were still paying unauthorized collectors for water services, unaware of the FBWP being implemented: *"But the pensioners are still paying two rands for the water every pension day"*. Netshiswinhze (2002) as well as MacKay and Ashton. (2004), agreed that the South African government has committed itself to ensuring that all South African citizens receive, at least a basic level of municipal services, such as water, sanitation, refuse removal and electricity, regardless of ability to pay. Hence, there are guidelines to aid the municipalities in implementing the policy, that has been developed by the department of Water Affairs and Forestry. Furthermore, Netshiswinhze (2002) and Smits (2004) stated that the National Government has subsidized municipalities to ensure that South African citizens can receive free basic water of 25 ℓ per person per day.

#### ***Whose responsibility is it to look after the water service?***

This question was conceptualized through the concept of ownership. The consumers identified themselves as the community and felt that as beneficiaries of the water service they should be the ones responsible for taking care of the water service. They also suggested that the community should have structures that would look after the

water services: *“Community and the community structures should look after their taps”*. Netshiswinzhe (2002) and Mathabatha and Naidoo (2004) supported this idea, by arguing that community involvement encourages ownership, accountability and independency to help themselves. Secondly, the consumers made a clear point of suggesting that the government is responsible for the improvement of water quality: *“If the government can improve the quality of water we are drinking then we would be happy”*. Netshiswinzhe (2002) also found it important for the people to understand the role of the government and other external agencies, as facilitators of development.

***What are your thoughts about the FBWP?***

The FBWP was interpreted by the consumers in terms of four themes, as referring to the awareness, non-beneficiaries, recommendations and expectations.

***Theme 5: Awareness***

The theme of awareness was identified through these concepts:

***Concept 1: Knowledge***

The majority of the consumers were aware of the FBWP mostly due to the fact that they did not have to pay for water anymore *“The government is giving free water”*. However, the amount of water that was given for free was not really known *“I have heard about it but it is my first time to hear how much was actually given”*. Other

misleading amounts were also communicated, such as: *“The water that we are given free by the government is 1000 £ per household”*.

#### *Concept 2: Transmission of information*

According to the consumers, an awareness of the FBWP was created through various channels, such as (in no particular order): ward councillors during elections, television, radio, newspapers and invoices from municipality statements for mainly those from the urban areas: *“When the councillors were canvassing for the elections they told us about free water”*. This quote also illustrates that the FBWP was used in a political campaign as a platform to gain votes: *“We told our people about the FBWP when we were canvassing”*. Pybus et al. (2000) is of the opinion that the situation and the context in which the information is transferred, have an influence on the way information will be transferred and interpreted.

#### *Theme 6: Non-Beneficiaries*

The theme of non-beneficiaries was conceptualized in terms of the distinction of site and the consumers' opinion about the FBWP and who benefits from it. The consumers thought that the FBWP mostly benefited the people from the townships, the consumers themselves (people from rural areas) have to use communal taps, which constantly supply water and was not monitored in anyway: *“It does not make a difference in rural areas because we get our water from communal taps and they are far from our homes*

*and people from the location they can see how much water they are saving".* The consumers felt that the people from the urban area were benefiting more from the FBWP because they were able to monitor their water consumption through meters in their homes. It is based on this idea that the consumers were inclined to think that the FBWP was a waste of the government's money and not benefiting them in any way: *"I think the government can help the disadvantaged areas like Madibogo by supplying them with taps and pipes in their yards and make sure that the water is purified".* However, the community leaders had a different view, as they believed that the FBWP was aimed at improving the well-being of the poor: *"The poor people like us are going to benefit because here people are not working".* Pybus et al. (2000) stated that the community leaders, also known as opinion leaders, are people passing information to the community through interpersonal skills communication. They have more access to information compared to the community members.

#### *Theme 7: Recommendations*

This theme was identified through the concept of water improvement. Consumers made suggestions to the FBWP, by suggesting that the government should improve the quality of water: *"If the government can improve the quality of water we are drinking then we would be happy",* give them yard taps: *"I think the government can help the disadvantaged areas like Madibogo by supplying them with taps and pipes in their yards and make sure[cit] that the water is purified"* and to make sure that water is available at all times: *" The government must help us with the water because sometimes*

*when the water is cut and people do not have water for funerals they say the chief has cut the water".* Netshiswinzhe (2002) foresees that if yard tap connections are put in place, as suggested by the consumers, the same consumers who are not paying for the water, would consume more water. This would have a negative impact on their economical situation. In effect this situation does not alleviate the problem of providing water for all.

#### *Theme 8: Expectations*

The consumers shared their views about the FBWP in light of their expectations. These expectations were conceptualized through the idea of a misconception, since the consumers were under the impression that if water was free due to the fact that FBWP provided the source, there should be no charge on any source of water. This includes water from boreholes in the community and people who are selling water at water points: *"We won't be buying water from the people who are selling water from their own boreholes".*

#### *What do you use water for in your daily life?*

The consumers listed these uses as their daily household uses of water: bathing, cooking, drinking, animal drinking, car washing, gardening, washing of clothes and household chores. This given list corresponds with the list of household water uses mentioned by the WRC (2000).

*Do you experience any problems when using the water for your daily household chores?*

*Theme 9: The problems when using water for household activities*

The theme of challenges was defined by the following concepts:

*Concept 1: Personal image*

This concept was expressed through the experience of their personal hygiene, to them the water was unpleasant for bathing as they had to add powdered soap to make it soft and for lather formation: *"When taking a bath, if we want to get lather and the water to soften we have to add powdered soap or else we will have a dry skin as if you have not bathed yet"*. Furthermore, the consumer stated that the water used was responsible for the patches and changed complexion of their faces: *"Our faces have patches because of this water"*, as well as discolouring their hair: *"I have to shave my hair because if I do not, I will have ginger hair"*. These were participants' opinions, not necessarily justified, claiming that the patches on their faces and discolouration of hair was caused by the water from the water service in use. It is through this idea that the consumers mentioned, that the state of the water service used was responsible for poor self-esteem and that they could not live their lives freely: *"This water is killing our self-esteem"* and *"We cannot live our lives freely with this water"*. Blackwell et al. (2001) explained that personal social image depends, at least in part, on the products that the person buys and use, which in this case is the water service in use. This statement supports the consumers' thoughts as they are of the opinion that the water service in use is reflected through their image, consequently demotivating and losing confidence in themselves.

*Concept 2: Social image*

The social image of the consumers was reflected in an uncomfortable experience they had when entertaining guests or visitors. They were not confident in offering the water to the visitors, because of uncertainty over the effect it might have on their health: *"If you are a visitor and drink this water you will have a running tummy"*. They were also concerned about the appearance and the taste of the tea prepared with this water, especially when using powdered milk, as the milk would coagulate when mixed with this water: *"It is not easy to make tea with this water as if you use powdered milk the milk will coagulate"*

*Concept 3: Laundering*

The consumers were unhappy about the water service performance when doing the laundry, as the water discolours their clothes with a consequent loss in quality: *"It discolours our clothes, therefore they lose quality"*. Van Duuren (1997) also mentioned water quality aspects, stating that water should not pose any economical detrimental effects on either the distribution systems or on consumers' equipment or belongings.

#### *Concept 4: Food preparations*

This was dominated by the unpleasant taste experienced when preparing food: *“To show you how salty this water is, when you cook ‘pap’ you don’t have to add salt”*. As mentioned, there was a concern on the coagulation of powdered milk as a result of the water, when preparing tea. They had to wait for the tea to cool down, consequently not being able to serve a hot beverage.

#### *Concept 5: Biological needs*

Biological needs were also of concern to the consumers, as they were of the opinion that the Madibogo water did not quench their thirst: *“It does not quench thirst”*, although one of the functions of water mentioned in the literature, is being the best liquid to quench thirst (Anon, 2004). Even if the consumers tried other means, like putting the water in the refrigerator to make it cold, it did not improve the taste and the appearance of water: *“Even if you put it in the refrigerator it does not help, the only thing you will notice is a white substance on top of the ice cubes”*. Solomon (2004) stressed the fact that people are born with a need for certain elements necessary to maintain life, such as food, water, air and shelter.

*Theme 10: Economic implications*

This theme was defined through the concepts of resources such as addition of water substances, time, appliances, fuel or electricity and additional financial expenditures.

*Concept 1: Addition of water substances*

The consumers were adding foam bath, an expensive addition, to the bath water or extra powdered soap to do laundry. They also could not use face soap on its own. All these additions were applied to give richer foam which in turn caused greater expenses: *"Foam bath is expensive some of us do not [cit] afford to buy it"* and *"You have to add more powdered soap to the water when doing washing"*.

*Concept 2: Appliances/time*

The appliances did not last long and were a constant expense: *"It takes time for the water to boil because of the white sediment in the kettles"* and *"Electrical appliances are affected by this water "*.

*Concept 3: Fuel or electricity/time*

It also affected the fuel or electricity consumption as the water took a longer time to boil: *"If you boil water it takes long to boil because of the white sediment"*. This is their

personal assumption and not justified in any way. They also had to boil the water before offering it to babies: *"If you have a baby you have to boil the water before giving it to the baby"*.

#### *Concept 4: Additional Financial expenditure*

When expecting visitors the consumers had to buy water from the people who own boreholes: *" People who visit Madibogo cannot drink this water some of them they bring their own water"*. Visitors and people taking medication were required to bring or buy water, as they were concerned about the after-effects of drinking the water from Madibogo water service: *"If there is someone who takes treatment you have to buy water from the people who have their own boreholes"*. The consumers' views were similar to concerns raised by WRC (2002) who recommended the importance of treating domestic water. This treatment of domestic water is necessary to make it chemically stable, as untreated water may cause corrosion or may result in the formation of a layer of chemical deposits (scale) on heating elements of kettles and geysers. This may result in higher electricity costs to heat water and may result in the need to replace elements earlier.

#### *Theme 10: Health Concerns*

The theme of health concern was addressed through the concept of health-related problems that would be caused by the water: *"Coming to saltiness of water I cannot really say the water is safe as I do not know if it is affecting their health or not"*. This is

important, especially for those taking treatment for chronic diseases: *"I think the water is not healthy for people with ulcers, because it is salty"* and *" If the water is not good for the kettles and pots how much more for the stomach and especially for people who are taking medication, because you cannot take tablets with alcohol what about this water?"*. Easle (2003) also shared the consumers' concerns by stressing that personal hygiene and proper nutrition are instrumental in extending the lives of people who have compromised systems, such as HIV positive people. In the proposed model for the implementation of the FBWP presented by Mackay and Ashton. (2004), HIV/AIDS was also one of the chronic diseases that were noted to be of concern to water development projects.

Consumers also had fears about using the water, as they were scared of skin cancer. They claimed that the water caused itchiness and dryness to the skin: *"I think this water can cause skin cancer because after bathing you will feel that your skin becomes itchy and dry"*. Although not specifically relevant to skin cancer, Petersen and Olson (2005) also shared the consumers' health concerns that the excess levels of nitrates in drinking water can result in cancers, as well as hypertension.

## **Conclusion**

It is evident that the physical quality of the water and performance of the water service remains foremost in the consumer's judgment of water quality. Therefore, in any educational endeavour, the consumer should be informed about the physical, microbiological and chemical properties of water and the evaluation of safe drinking water should not be based on only one of these three concepts. Although sensory evaluation of water is a guiding factor to determine the utilization of the water source, it becomes evident that consumers of water focus on these qualities.

The consumer is concerned about water quantity in terms of availability and accessibility. This is directly linked to the way in which a water service is implemented and how it serves the community. The intention of the FBWP is to address water quality and water quantity in rural areas. Despite the intention the consumers did not experience this water service as being beneficial to them. The cause of this may be reflected through misinformation and wrongly applied campaigns. It is only through studying household utilization of a rural water service, that the way in which the service is benefiting the community can be determined. A study on the perceptions of consumers of a rural water service and the household utilization of this service provides vital information to government, water service bodies and water service providers when water provision is being planned. In order to benefit the users of the service, consumer education needs to be implemented. This should be done in a further study which could be based on what consumers understand about such a service and how they will benefit from it. By making this a starting point, it is certain that the consumer has been

included as a vital component to the water service provision, thereby validating the success intentions of the FBWP and the improvement of quality of life. Part two of this article will present a theoretical framework to be followed when addressing water service provision issues.

### **Acknowledgement**

The authors would like to thank the Water Research Commission for financial assistance. We are also thankful to the community of Madibogo for their cooperation during the research.

### **References**

ANONYMOUS (2002) *The right to water*. General comment No. 15  
[www.iisd.ca/Water-l/water-L\\_News\\_3.html-353k](http://www.iisd.ca/Water-l/water-L_News_3.html-353k). [2005/02/09].

ANONYMOUS (2004) *Lifestyle. Health and Fitness*. Clean water Challenge-  
RandWater [tp://www.randwater.co.za/Water\\_Quality/detyails.asp?ArticleId=19](http://www.randwater.co.za/Water_Quality/detyails.asp?ArticleId=19),  
[2004/08/17].

ANONYMOUS (1997) *Exploding sales: Marketing a perception of purity*.  
<http://www.bottledwaterweb.com/indus.html>. [16/05/2005].

BAILEY IW (2003) *The impact to introducing treated water on aspects of community in a rural community in Kwa-Zulu-Natal*. Umngeni, Water Research Commission. Water report no. 925/03, Umngeni

BATES A.J (2000) *Water as consumed and its impact on the consumer - -do we understand the variables?* Food and Chemical Toxicol. 38(1):S29-S36, 2000 April.[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=10717368](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10717368). [2004/05/20].

BILL OF RIGHTS (1996) *The Constitution of the SA, Act 108 of 1996*, Cape Town.

BLACKWELL RD, MINIARD PW and ENGEL JF (2001) *Consumer Behaviour* (9<sup>th</sup> edn.) United States of America, Harcourt College Publishers.

BRYMAN A (1996) *Quantity and Quality in social research*. London, Rutledge.

COLVIN C (2000) *Handbook of groundwater quality protection for farmers*. Pretoria, Water Research Commission. WRC report no. TT 166/00, Pretoria.

COOLICAN H (1999) *Research methods and statistics in psychology*. London, Hodder & Stoughton.

De FONTAINE J (2000) *Trouble shooting guide for the domestic consumer*. WRC.  
South Africa, Johannesburg. WRC report no.963/1/00.

DENZIN NK and LINCOLN YS (1998) *Collecting interpreting qualitative materials*.  
Thousand Oaks, Sage Publications.

DWAF. (2001) *Free basic water provision*. [Web:] <http://www-dwaf.pwv.gov.za/freebasicwater> [11 /08/2004].

EASLE K (2003) *Interviews with People successful in the Water Field*. Water Wheel, 2  
(2): 10, March /April.

GABBOTT M and HOGG G (1998) *Consumers and service*. Chinchester: Wiley.

KRUEGER RA (1994) *Focus Groups* ( 2<sup>nd</sup> edn.) Thousand Oaks, Sage Publications.

MACKAY HM and ASHTON PJ (2004) *Towards co-operative governance in the  
development and implementation of cross-sectoral policy: Water policy as an  
example*. Water SA 30(1) 2004 January.

MAISEL R and PERSELL CH (1996) *How sampling works*. Thousand Oaks, Sage  
Publications.

MATHABATHA S and NAIDOO D (2004) *A review of public participation in the rural water and sanitation setting*. Pretoria, Water Research Commission. WRC report no. 1381/1/04.

MASETLOA LS (2004) *An educational intervention program for female farm dwellers focusing on resource management*. Potchefstroom: PU vir CHO.

MODISE SJ and KRIEG HM (2004) *Evaluation of nanofiltration for the treatment of rural ground water for potable water use*. Pretoria, Water Research Commission. WRC report no 1230/1/04.

NETSHISWINZHE B (2002) *Free Basic Water-Tapping it's Developmental Potential in Rural Areas*. [www.mvula.co.za](http://www.mvula.co.za). [2004/08/1].

PYBUS P, SCHOEMAN G and HART T (2001) *The level of communication between communities and engineers in the provision of engineering service*. Pretoria., Water Research Commission. WRC report no. TT 133/00.

PIETERSEN K (2005) Ground water Crucial to Rural Development. Water Wheel. 4 (2) (26).

PILLAY VL and JACOBS EP *The development of small-scale ultrafiltration systems for potable water production*. Pretoria, Water Reserch Commission. WRC report no.1070/1/04.

RICE AS and TUCKER SM. (1986) *Family Life Management* (6<sup>th</sup> edn). New York: Macmillan, Inc.

SAMI K and MURRAY EC (1998) *Guidelines of the evaluation of water resources for rural development with an emphasis on groundwater*. Pretoria, Water Research Commission. WRC report no 677/1/98.

SHAUGHNESSY JJ and ZECHMEISTER EB (1997) *Research Methods in Psychology*. New York, McGraw-Hill.

SILVERMAN D (2000) *Doing qualitative research: a practical handbook*. London, Sage Publications.

SMITS S (2004) *Free Basic water and "steeping up the ladder" in South Africa*. <http://www.pt.irc.nl/page/9684> [09/02/2005].

SOLOMON MR (2004) *Consumer Behaviour* (6<sup>th</sup> edn.) United States of America, Prentice Hall.

SOLSONA F (1996) *Non conventional disinfection technologies for small systems.*

Pretoria, Water Research Commission. WRC report no. 449/1/95.

VAN TEIJLINGEN ER and HUNDLEY V (2001) *The importance of pilot studies.*

Issue 35 <http://www.soc.surrey.ac.uk> [02/03/05].

VAN DUUREN FA (1997) *Water purification works design.* Water Research

Commission. WRC report no. TT 92/97.

VAN LEEUWEN FX (2000) *Safe drinking water: the Toxicologist's approach.* WHO

*European Center for Environment and Health.* 38(1):S51-58.

Netherlands,BilthovenDivision.

[http://www.sciencedirect.com?science?\\_ob=ArticleURL\\_&udi=B6T6P-YS980G-](http://www.sciencedirect.com?science?_ob=ArticleURL_&udi=B6T6P-YS980G-)

[P&\\_coverdate=04%](http://www.sciencedirect.com?science?_ob=ArticleURL_&udi=B6T6P-YS980G-P&_coverdate=04%2004) [04/04/2004].

VLOK ME (2003) *Manual of Community Nursing.* Republic of South Africa, Juta and

Co.Ltd.

WESTAWAY MS (1998?) *Determining personal and domestic health hygiene*

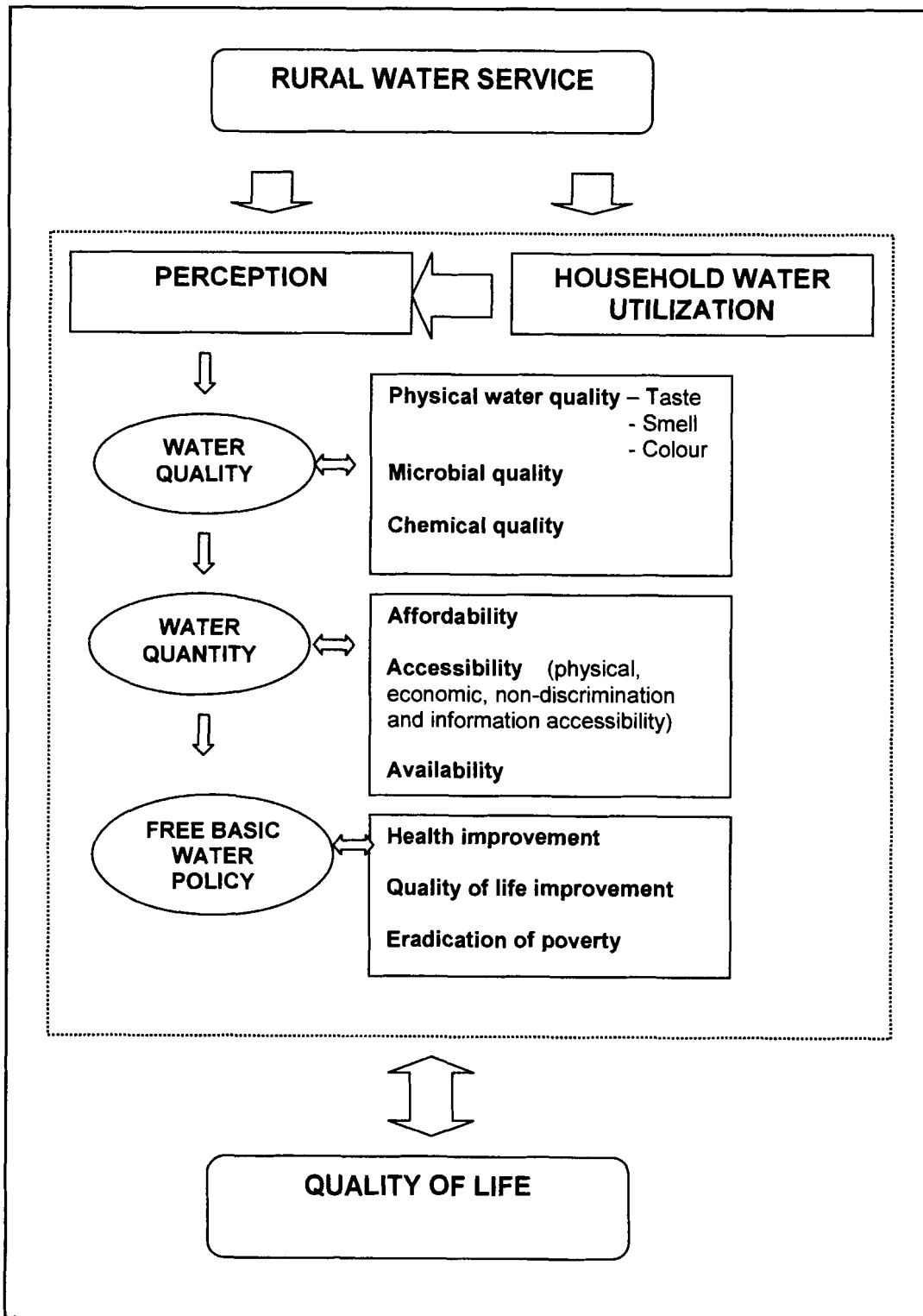
*knowledge, attitudes and behaviour: a pilot study.* Water Research Commission.

WRC report no. KV 106/98.

WRC (1999a) *Quality of Domestic water Supplies. Assessment Guide . Volume 1. 2<sup>nd</sup>* ed. Pretoria, Water Research Commission. WRC report no. TT 101/98.

WRC (1999b) *Quality of Domestic water Supplies. Sampling Guide . Volume 2. 2<sup>nd</sup>* ed. Pretoria, Water Research Commission. WRC report no. TT 101/98.

WRC (2000) *Quality of Domestic water Supplies. Analysis Guide . Volume 3.* Pretoria, Water Research Commission. WRC report no. TT 129/00.



**Figure 1**

*A conceptual framework representing the perception and domestic utilization of rural water services.*

**A South African study of consumers' perceptions and household utilization of a rural water service. Part 2: A systems approach to water service provision and consumer behavioural processes.**

**U Kolanisi\*, E L Kempen, N Sonnenberg, M Van der Merwe and M Larney**  
*Department of Consumer Science, North-West University, Potchefstroom Campus P/Bag X 6001; South Africa*

**Abstract**

Water quality and water quantity are important aspects in the consumers' perception of a rural water service. The Free Basic Water Policy (FBWP) provides the services to address these aspects, by issuing affordable water services. The aim of this study was to determine consumers' perceptions and household utilization of a rural water service, through an exploration of consumers' perceptions of the water quality, water quantity, Free Basic Water Policy (FBWP) and household water utilization. A clear interrelationship and interdependence exist amongst consumers of a rural water service, their consumer behavioural processes and the stakeholders involved in water service provision. This interaction is considered important in achieving the objective of an enhanced quality of life. Systems theory provides a framework for integrating the knowledge gained on how consumers' perceptions and household utilization of rural water service interlinks with the efforts of the water service providers.

**Keywords:** consumer behaviour; consumer processes; perceptions, systems perspective; quality of life, water service.

\*To whom all correspondence should be addressed.

Dr E L Kempen; Tel: 018 299 2483; fax: 018 299 2470; e-mail: vgeelk@puk.ac.za

---

## **Introduction**

The South African Government and water-related agencies such as the Water Research Commission of South Africa are undertaking a vigorous campaign to provide '*water for all*'. These campaigns are highlighted by intensive research aimed at increasing the supply of drinkable water by developing systems of small-scale potable water treatment units for rural and peri-urban areas (Netshinswinzhe, 2002; Bailey, 2003; Modise and Krieg, 2004; Pillay and Jacob, 2004). The problem, however, is that little has been done on consumer perceptions and household water utilization in relation to water services in South Africa. In general the previous studies have not paid much attention to the psychological processes such as perception of a water service through the consumer.

Part one of this article presents the important findings and arguments that exist within rural water services. In following a phenomenological approach and applying a qualitative strategy, descriptive data were generated, which provided an in depth understanding of the processes involved in a rural community's perceptions of a basic water service (Kolanisi et al., submitted for publication). The findings of this study brought to the foreground consumers' understanding, ideas and beliefs of certain water-related aspects when evaluating a rural water service. The provision of water, within the South African context (especially rural water provision), however, involves certain complexities and therefore needs to be understood and looked at as a whole. Adopting a systems way of thinking in fact enforces the idea that the phenomena in question can only be fully understood, once all the relevant components have been taken into account.

The purpose of this article was to present a theoretical framework that has been developed from the findings presented in part one of this article in addition to various existing behavioural theories that have been consulted. The findings reflected that consumers perceive rural water service through the water quality, water quantity and Free Basic Water Policy (FBWP). Water quality was perceived through the aesthetic or physical factors and performance of the water when utilized for household purposes. The concept of water quantity was directly linked to the distance and economic implications of the communal taps. The consumers misunderstood the intentions of the FBWP which led to a perception that its intentions were not beneficial to the rural communities (Kolanisi et al. Part 1 submitted for publication). This framework, highlights rural water service behaviour from a systems perspective

## **Background**

### **Consumers' perception processes**

Perception processes can be studied through various models, such as those presented by Sheth et al. (1999); Mowen and Minor (2001), Du Plessis and Rosseau (2003) and Schiffman and Kanuk (2004). The model proposed by Mowen and Minor (2001) in Figure 1 is of particular interest. It illustrates that in order for this process to occur, consumers need to be exposed to stimuli which offer information to process in order to form a perception. In this instance the stimuli that the consumers were exposed to were the water-related concepts such as water quality, quantity and FBWP. From a systems perspective, this information could be regarded as inputs (Spears and Gregoire, 2004). Mowen and Minor (2001) were of the opinion that before the stimuli penetrate the

perceptual process, two additional aspects are brought into account namely, consumers' involvement and memory. Consumers' involvement is characterised by the type of service under consideration, the channels used to inform the consumer, the personality of the consumer and the consumers' situational context. For example, in this study the information about the FBWP which is "free water" service was transmitted through the political meetings while politicians were canvassing for the national elections (Kolanisi et al., Part 1, submitted for publication). The memory aspect for example refers to consumers' socialization. In this regard socialization refers to the way in which consumers evaluated their water service by comparing it to the urban areas' water service "*I wish this water could be like the one from the location because you do not have to worry with it*" [cit] (Kolanisi et al., submitted for publication). These two aspects can be regarded as internal controls as they become role players in the perceptual process by directly influencing and guiding the way in which the stimuli are perceived (Spears and Gregoire, 2004).

These stimuli are transformed through three perceptual stages, namely exposure, attention and comprehension (Figure 1). Exposure occurs when the consumer's sensory receptors come into contact with the information stimulus. Attention, on the other hand, refers to the activation of one or more of the consumer sensory receptors, as well as the resulting sensation that is processed in the brain. The term comprehension is the way in which the processed sensation is interpreted in the consumer's brain (Mowen and Minor 2001).

In addition to the above, it is important to consider that the perceptual processes consumers have of a water service, is linked to the water service providers and the system to which they belong. These service providers contribute a great deal of effort towards the developmental process through which such a water service reaches the consumer.

#### **Stakeholders involved in water service development**

Development is not something that should be taken for granted and accepted as a “hand out” (Netshinswinzhe, 2002). It requires an internal process of change whereby people take responsibility for improving their living conditions. The legislative framework within the South African context requires local government to implement development programmes that would allow local people and all other relevant stakeholders, to actively participate in identifying their problems, planning and implementation of appropriate action (Netshiswinzhe, 2002). In other words, transparency and permeability of boundaries between the local subsystems and larger governmental systems are promoted (Whitchurch and Constantine, 1993).

The marketing literature offers a model which indicates the role players, who initiate developmental programmes to inform, educate and thereby improve the quality of life of consumers. This model was put forward by Peter and Olson (2005) and is provided in Figure 2. It illustrates the interrelation among the stakeholders (marketers and government organizations), consumer and consumer behaviour processes or activities such as perceptions, attitudes and cognition. In this regard interrelation is evident through the fact that the consumer presents certain behavioural activities that influence the service

provided by the service providers. Furthermore the laws, regulations, conditions and policies and the type of service provided exercise an influence on the consumer's behavioural activities. The model, as illustrated in Figure 2, revolves around the consumer as the main focus and presents consumer activities as a major concern for the relevant stakeholders interested in consumer development. It also emphasizes that organizations (marketing or governmental) have an influence on marketing strategy and public policy.

Marketing strategies and public policies can be viewed as control elements within the system of a rural water provision. Yet, system theorists advocate that even in the simplest of systems, control over the behaviour of the system is a function of the arrangement of components, and not the actions of any individual component or group in itself (Whitchurch and Constantine, 1993). Typically the mutual influence that exists among government, political and marketing organizations as well as the consumer, illustrates this scenario. For example, marketing organizations develop strategies which influence consumers' activities. Simultaneously government also formulates policies which affect both marketing strategies and consumer activities as depicted in Figure 2.

In the above discussed models various systems perspective processes and concepts were identified and briefly introduced. The next section will provide a broader discussion of the application of General System Theory (GST). Figures 1 and 2 will also be combined and further refined to illustrate the basis of a theoretical framework from which a study of water service provision can be approached.

## **General Systems Theory (GST)**

As pointed out by Whitchurch and Constantine (1993) General Systems Theory (GST) is a transdisciplinary field as it has the potential of bringing together knowledge from different disciplines. In the present study it includes knowledge from the marketing, natural and social science fields. General Systems Theory seemed to be particularly suited to the present study as it presents a world view of how parts of the system interrelate with each other to obtain one or more objectives (Spears and Gregoire, 2004).

Central to the idea of applying GST to water service provision, is an understanding of various inputs, transformation processes and outputs within this system. Inputs are considered to be the information or stimuli a consumer are faced with (Whitchurch and Constantine, 1993). These inputs or sources of information are processed by the consumer to form an understanding of what the consumer had been exposed to (Whitchurch and Constantine, 1993). The output of this transformation process or state of understanding becomes a representation of the thoughts and ideas formulated by the consumer referred to as “perceptions”. The following section will present an application and illustration of perceptions from a systems perspective.

### **Perceptions of a rural water service from a systems perspective**

Perceptions as depicted in Figure 1 are described by Mowen and Minor (2001) as a system on its own. It is characterized by certain inputs, a transformation process and

outputs. The model provided by Mowen and Minor (2001) was considered by the authors of this article as being applicable to the study of rural consumers' perceptions and household utilization of a rural water service. This was based on the fact that it dealt with the consumers' perceptual process.

In Figure 3 inputs initiate the process, as the consumer is confronted by the stimuli, which in this instance are three important water-related aspects such as water quality, quantity and FBWP. The above-mentioned information or stimuli inputs are transformed during the perceptual process. This process entails three components, namely exposure, attention and comprehension, as shown in Figure 1. During the application of a systems approach to a rural water service, it is proposed that these three components, be equated with sensation, organization and understanding (Figure 3). This is based on earlier findings (Kolanisi et al, Part 1, submitted for publication). These findings revealed that the physical factor of water quality was the main concern of the consumers when evaluating a water service. The physical factor refers to the visual appearance, smell and taste of the water, which are also characteristics of sensation, as it entails the sensory receptors. In the present study organization refers to the way in which the consumers categorize and relate certain issues, such as their past experiences and beliefs, with their memory to the situation at hand. Understanding is the way of presenting meaning of what is interpreted by the brain. Once the inputs have been transformed, an output is achieved, which in the current study refers to the actual perception or opinions expressed by the consumer on the water service provided and its qualities (Figure 3).

An integral part of further understanding the application of GST to the present study, is the clarification of certain concepts such as equifinality (Spears and Gregoire, 2004). The “equifinality” concept implies that inputs or transformation processes can be substituted with other variables and the end result (output) will remain the same. For example, water quality, quantity and FBWP aspects can be substituted with other water related aspects, such as hygiene and water storage, to produce the same output or perception.

It is important to remember that the situation to which the consumer is exposed and that will start the input system, is compiled of different variables. The consumer might consciously be aware of these situational variables or not. For example, the regulations and policies that form part of the service provided, may not be clearly understood by the consumers, consequently influencing their perception of the water service. It can be argued that there is interrelatedness between the situational variables and consumers’ perceptions. Therefore, the variables have an impact on the perception process. The next section clarifies how the consumer process or activities, such as “perception” and stakeholders’ positions in water provision, interrelate and mutually influence each other.

#### **Consumers and stakeholders involved in water service provision from a systems perspective**

According to Whitchurch and Constantine (1993) any given system consists of smaller systems or “subsystems” embedded within larger “suprasystems”. Typically, the rural consumer is part of community structures that make use of rural water services. These communities, however, also form part of the larger South African consumer population.

This highlights the concept of hierarchy. This concept of hierarchy is also reflected in the model provided by Peter and Olson (2005) in Figure 3. Hierarchy is formed from the national government, provincial, local government and the community leaders. This model, when applied, to the larger suprasystem of South African water service provision, consists of various subsystems. Figure 4 shows how marketers and governmental organizations can be equated with water service bodies and governmental and political organizations. Water service bodies and service providers that market sustainable water service forms the first subsystem. Also embedded within the larger South African water service provision system is the government and political organisations that influence and compile public policies revolving around human rights and FBWP. Simultaneously, the consumer communities and their activities form another important subsystem within this larger suprasystem (Figure 4).

All of the above subsystems within the South African water service provision could be described as open systems with permeable boundaries as information flows among them (Whitchurch and Constantine 1993). This information includes policies, personal issues and activities, as well as economic factors.

The flow of information between these subsystems is evident through perceptions in Figure 4. In context of the present study, the organization of the model is equated with water service providers and government and political parties. Marketing strategies are equated with water service and public policy, including the FBWP as a policy of water service providers. Information pertaining to consumer activities (perceptions), enters the

subsystem of the stakeholders (water service providers and the government organizations) interested in consumer behaviour. The latter provide a better understanding of the consumer to which such a service is provided. The input will be transformed, within the hierarchy in the water service provision. Within this hierarchy, the sustainable water services will influence the government policies, which in turn will be fed back to the consumer (Figure 4). The feedback is dependent upon the way in which the information is received by the consumer. Consequently, feedback will have an impact on sustainable water services and the government policies.

This reflects the interdependence that exists among these parts of the system. Interdependence implies an interactive relationship among the parts of the system as they will share the same goals and objectives. For example, in this case the shared goal amongst the entities of the system is enhancement of quality of life (Kolanisi et al, submitted for publication). However, different agendas such as politics, profit making schemes and other factors may be present during the achievement of this common goal. Consequently, an effective interactive relationship will lead to an outcome that will be beneficial to all the parts or parties involved (consumers, water service providers and the government organizations) in the system. Based on the previous discussions the models presented in Figure 3 and Figure 4 can be combined into a theoretical framework for the study of a water service.

### **Proposed theoretical framework for the study of a water service**

Whitchurch and Constantine (1993) argued that one of the core assumptions of GST is that of “self-reflexivity” or then humans’ unique ability to make themselves and their own behaviour the object of examination. The authors explained that self-reflexivity is also what allows human beings to explore their systems and establish goals for themselves, such as enhancing the quality of life. The role of the consumer researcher can be highlighted in this regard as a fundamental link between the consumer population and water providers, in the system of water service provision. In this instance, reflexivity is achieved through the agreement held between the consumer scientist and the consumers to explore their perceptions in relation to water aspects, such as water quality, quantity, and FBWP of a rural water service. This information input can be transformed by service providers and the water service stakeholder subsystem to achieve the ultimate goal of positive consumer perceptions and the accompanying enhancement of consumers’ quality of life. This can be achieved through the application of the consolidation of the models discussed in this article of which Figure 5 represents the intergration and application.

It illustrates the way in which the parts of the systems perspective of a rural water service provision, interlink with each other to form a system. It is proposed that the system is initiated through the quality of life of which the consumer is part. Furthermore, the consumer scientist research acts as a linking process among the subsystems as it aims to understand the aspects which need to be addressed to improve the quality of life. According to Spears and Gregoire (2004) the linking process coordinates the characteristics of the system by trying to bring balance to the system through the

transformation of inputs into outputs. In this present study this can be achieved through studying the consumers' psychological processes such as perception. Figure 3 presented consumers perceptions from a systems perspective and is incorporated into Figure 5.

The outcome of the consumer perceptual process, becomes the input in the subsystem of the water service bodies. This input could be used to improve and amend the plans and strategies of the water service bodies, so they can deliver valuable and consumable services that will be beneficial to the consumers and eventually improve their quality of life (Figure 5). This subsystem is composed of external controls such as laws, policies, programmes and others which will influence the transformation process intended to improve the quality of life of the consumer. External controls refer to contracts, laws and regulations that are linked to the service provided (Spears and Gregoire, 2004). The outcome of this process may result in a further feedback and evaluation of the experiences of the consumers after implementation of the research findings and information on the consumers' perceptions. In this instance the ability of the system to adapt to the internal and external environment is affected, consequently disturbing the equilibrium of the system. According to the GST, this imbalance can be brought into equilibrium through feedback (Whitchurch and Constantine, 1993).

Kolanisi et al. (submitted for publication) has revealed an imbalance existing among the systems perspective of a rural water service provision and consumers' perceptions. This is evident, through the misunderstanding consumers have about the FBWP's intentions (Kolanisi et al., submitted for publication). Systems approach suggests effective

interaction within the parts of the system that can bring equilibrium to the system. This can be achieved through research that will bring feedback to both the subsystems so as to bring clarity and understanding about the service to be provided.

## **Conclusion**

A challenge is posed to the water service bodies and service providers, that there is a greater need for consumers' activities to be explored and considered when planning, developing strategies and delivering services to the consumers. It is argued that failure to attend to and to embrace the consumer's understanding or thoughts could lead to the lack of appreciation and ownership. Furthermore it leads to rejection and non-use of the service provided, consequently forcing water service provision to take on a backward stage without proceeding with further provision and development.

Finally, this article has provided evidence of the way in which the GST, applied within the proposed theoretical framework, can be used to bring together role players within a particular situation, such as water provision. The proposed theoretical framework should enable an understanding of the affiliation, interaction and contribution of subsystems involved in the context of a bigger environmental system, such as South African rural water service provision. Moreover, it highlights the consumers' role and the importance of taking their perceptions into account in addressing the issues and objectives of rural water service provision.

## **Acknowledgements**

The authors would like to thank the Water Research Commission for financial assistance. We are also thankful to the community of Madibogo for their cooperation during the research.

## **References**

BAILEY IW (2003) *The impact to introducing treated water on aspects of community in a rural community in Kwa-Zulu –Natal*. Umngeni, Water report no. 926/03.

DU PLESSIS PJ and ROUSSEAU GG (2003) *Buyer Behaviour: a multi-cultural approach* (3<sup>rd</sup> edn). Cape Town, Oxford University Press Southern Africa. Southern Book Publishers.

FLICK U (1999) *An Introduction to Qualitative Research*. London, Sage Publications.

MODISE SJ and KRIEG HM (2004) *Evaluation of nanofiltration for the treatment of rural ground water for potable water use*. Pretoria, Water Research Commission. WRC report no. 1230/1/04.

MOWEN JC and MINOR MS (2001) *Consumer behaviour: a framework*. Upper Saddle River, Prentice Hall.

MURPHY KO'H. 2002. *Guidelines for the implementation of benchmarking practices in the provision of water service in South Africa*. Pretoria, Water Research Commission. WRC report no. TT 125/00.

NETSHISWINZHE B (2002) *Free Basic Water-Tapping it's Developmental Potential in Rural Areas*. [Web:] <http://www.mvula.co.za>. [Date of access: 2004/08/1].

PETER JP and OLSON JC (2005). *Consumer Behaviour and marketing strategy* (9<sup>th</sup> edn) Boston, McGraw-Hill.

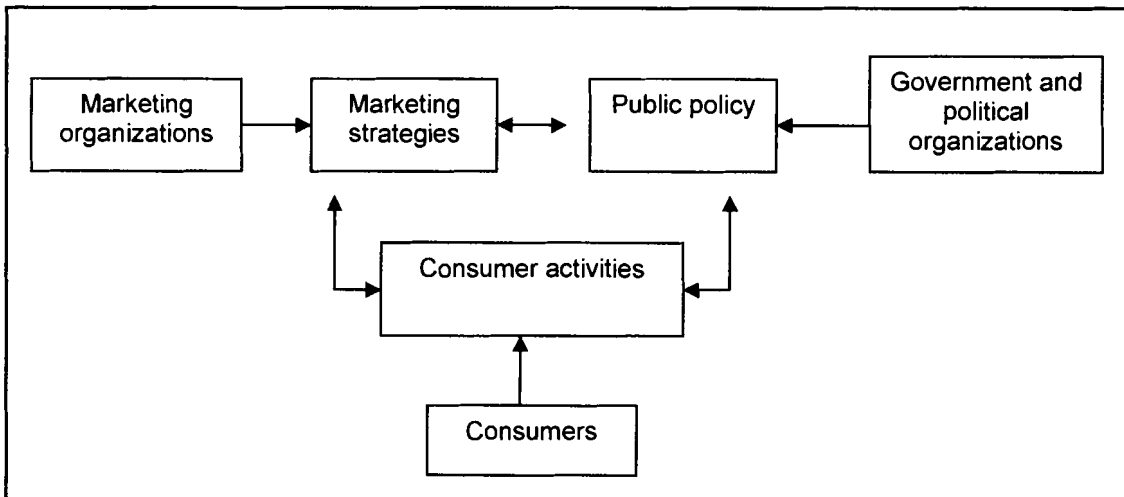
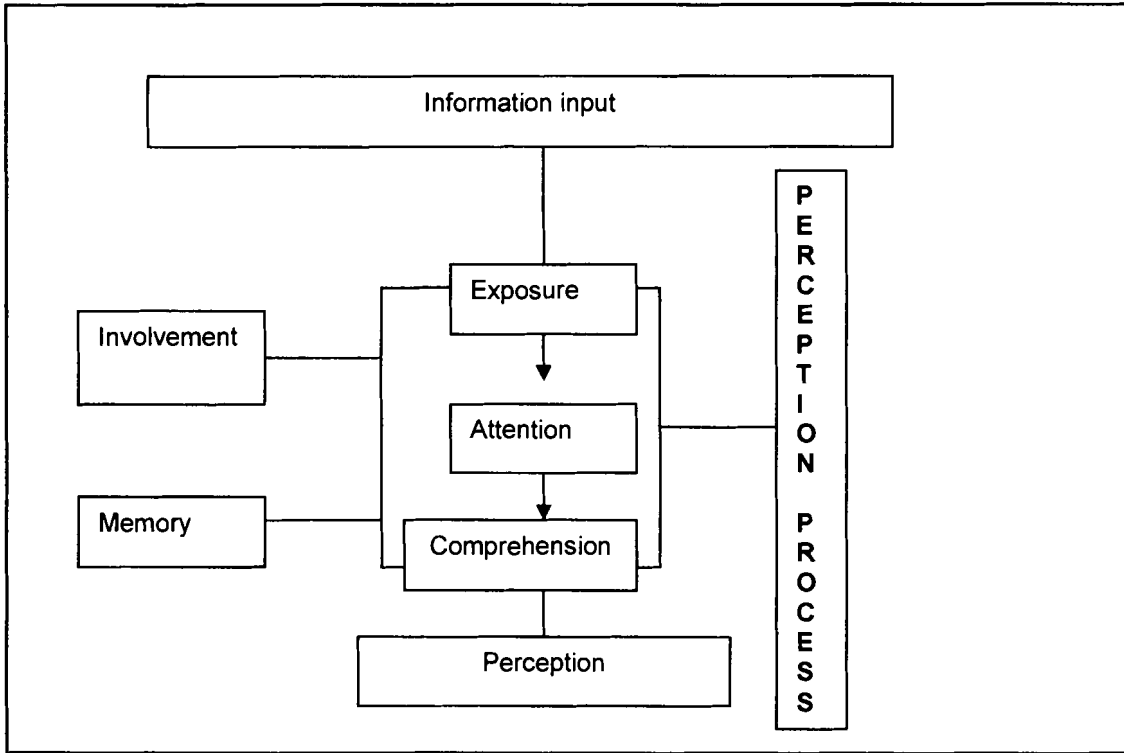
PILLAY VL and JACOB EP (2004) *The development of small-scale ultrafiltration systems for potable water production*. Pretoria, Water Research Commission . WRC report no.1070/1/04.

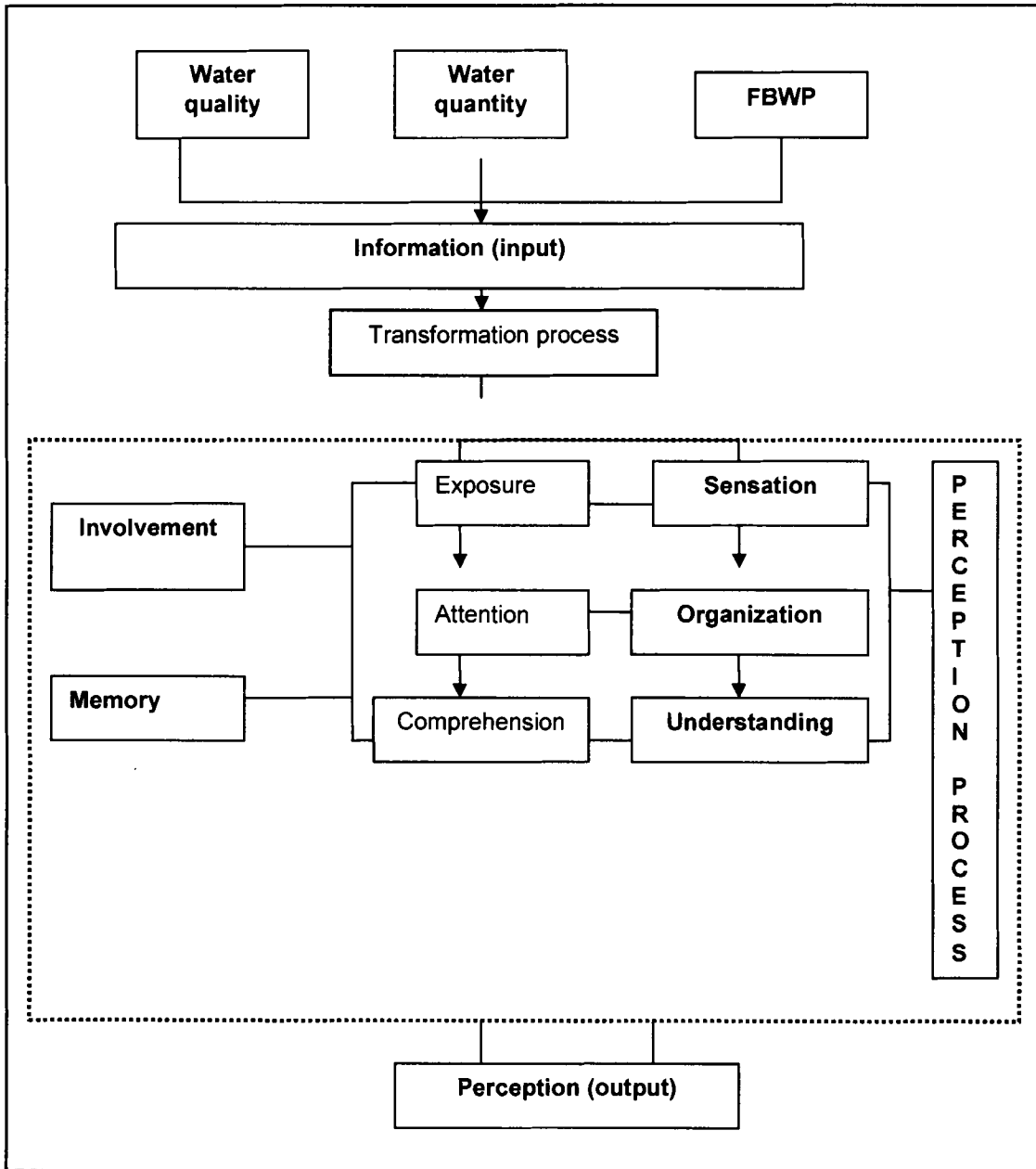
SCHIFFMAN LG and KANUK LL (2004) *Consumer Behaviour* (8<sup>th</sup> edn). Upper Saddle River, Prentice Hall.

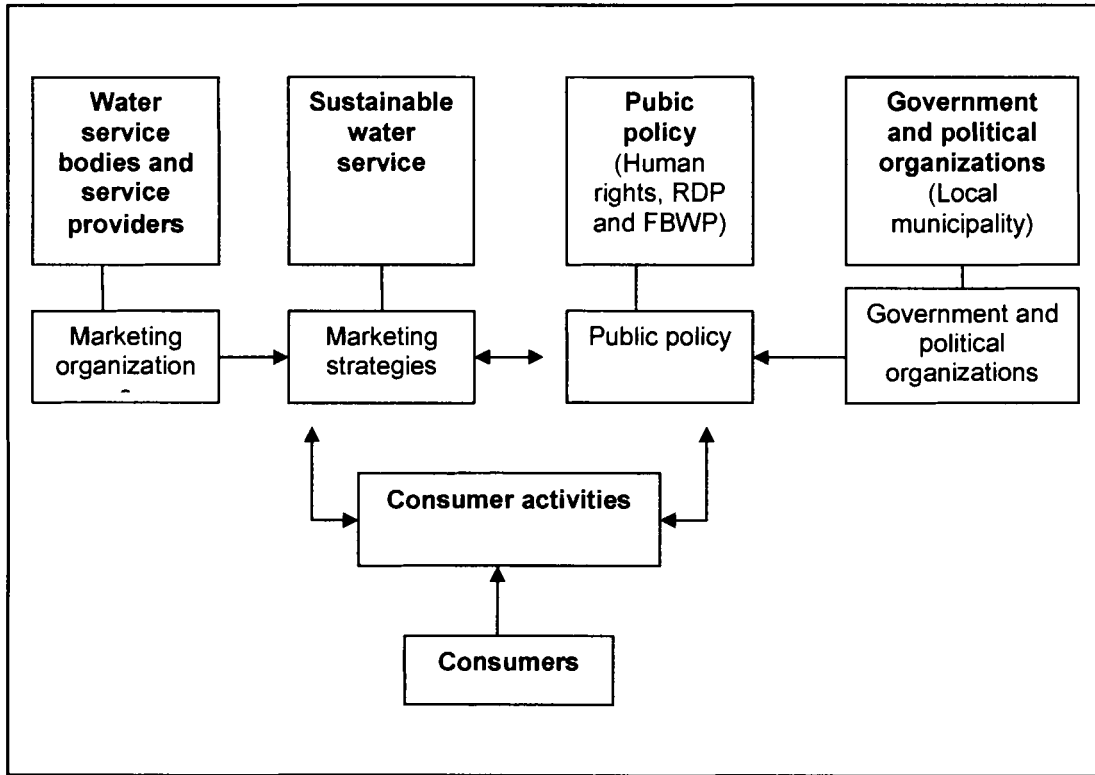
SHETH NJ, MITTAL B and NEWMAN BI (2000) *Consumer Behaviour and Beyond*. United States of America, The Dryden Press.

SPEARS MC and GREGOIRE MB (2004) *Foodservice organizations: a managerial and systems approach*. Upper Saddle, Prentice Hall.

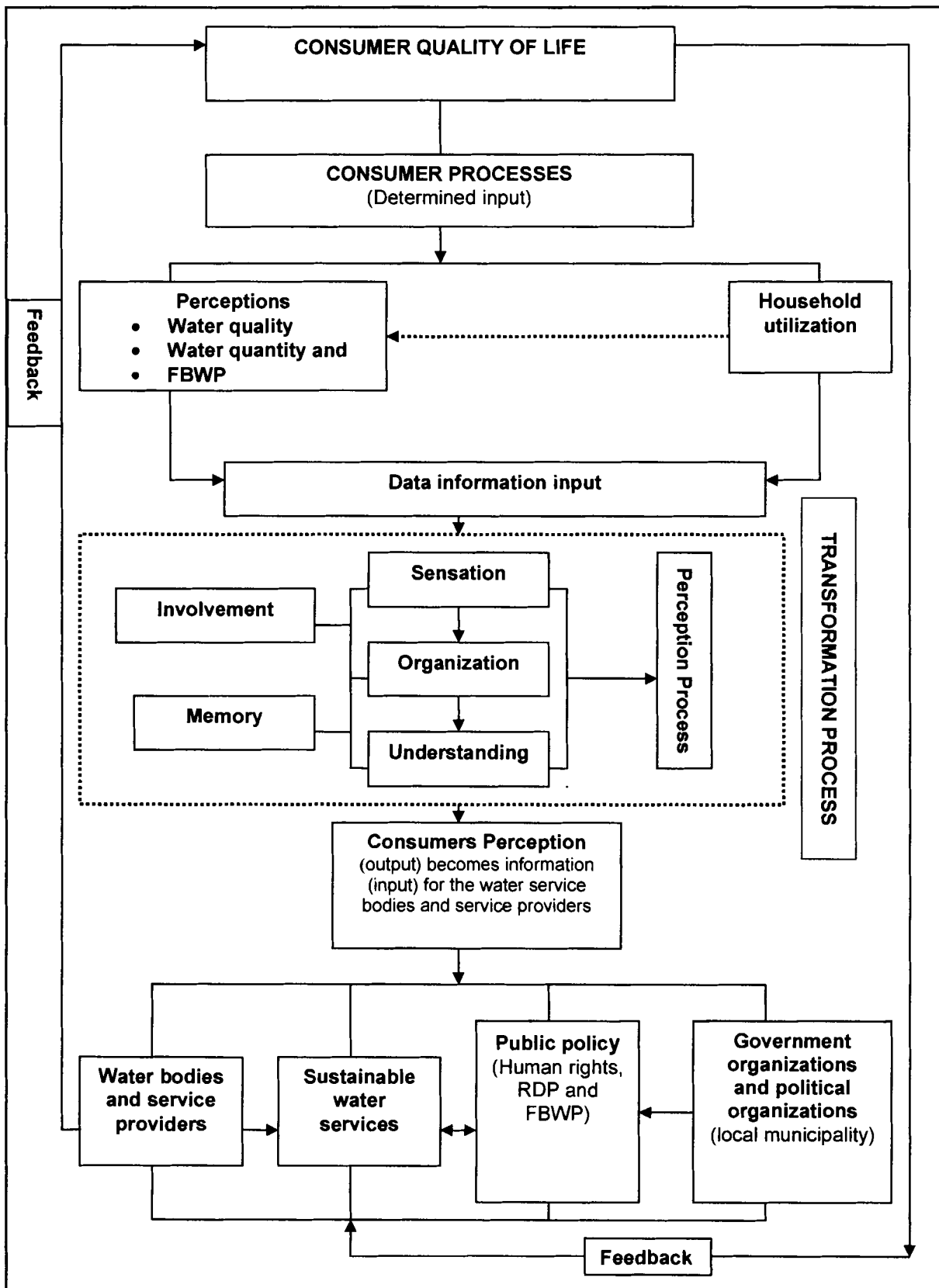
WICHTURCH GG and CONSTANTINE (1993) *Theory Sourcebook of family theories and methods: a contextual approach*. New York, Plenum Press.











**Figure 1**  
Consumers' perceptual process (Mowen et al., 2001)

**Figure 2**  
A model of the relationship among Action-Oriented Groups Interested in Consumer Behaviour  
(Peter and Olson, 2005)

**Figure 3**  
Amended figure of the perceptual process of a rural water service

**Figure 4**  
Amended model of the relationship among Action-Oriented Groups Interested in Consumer  
Behaviour

**Figure 5**  
A systems perspective of a rural water service provision and consumers' perception

# **ADDENDUM**

## GUIDE TO AUTHORS

### AIMS AND SCOPE

This journal publishes refereed, original work in all branches of water science, technology, engineering and policy. This includes water resource development; the hydrological cycle; surface hydrology; geohydrology and hydrometeorology; limnology; salinisation; treatment and management of municipal and industrial water and wastewater; treatment and disposal of sewage sludge; environmental pollution control; water quality and treatment; aquaculture in terms of its impact on the water resource; agricultural water science; etc.

Contributions may take the form of a paper, a critical review, a short communication, a rapid communication, a technical note or comments on papers already published. A **paper** is a comprehensive contribution to the subject, including introduction, experimental information and discussion of results. A **review** is an authoritative, critical account of recent and current research in a specific field to which the author has made notable contributions. A **short communication** is a concise account of new and significant findings to inform readers of preliminary or limited research results. A **rapid communication** is an original contribution which merits prompt publication to publicise the findings of very recent research with immediate significance. A **technical note** describes an original process or technique without necessarily including extensive data, theory or critical evaluation. **Comments** on papers already published are sent to the authors of the paper for reply and both the comments and the authors' reply will be published in the upcoming issue of *Water SA*.

Preference is given to concise contributions.

### GENERAL

#### Submission of manuscript

Each submission must be accompanied by a covering letter, stating the name(s) and title(s) and contact details of each author, as well as the author to whom correspondence should be addressed. The submission of a paper will be taken to indicate that it has not, and will not, without the consent of the Editor, be submitted for publication elsewhere. Manuscripts, in English only, have to be submitted in MS Word by E-mail to [ingridb@wrc.org.za](mailto:ingridb@wrc.org.za). The Internet address is <http://www.wrc.org.za>.

#### Reprints

Ten free offprints of each paper will be provided.

## **Illustrations and line drawings**

Electronic figures, tables and photographs should be submitted in their **original format** (e.g. Excel, TIFF, JPG) and not be embedded in the MS Word or other word-processing document. Scanned figures are not acceptable.

## **Revised manuscripts**

The **final accepted** and **updated** manuscript should be submitted on disk or by e-mail. MS Word is the preferred software format. Please indicate which program was used. Electronic figures, tables and photographs have to be submitted as a separate file (e.g. Excel, TIFF, JPG) to facilitate electronic layout.

## **References**

Authors are responsible for the accuracy of references. References to published literature should be quoted in the text as follows: Smith (1982) or (Smith, 1982). Where more than two authors are involved, the first author's name followed by et al. and the date should be used.

All references are listed alphabetically at the end of each paper and not given as footnotes. The names of all authors should be given in the list of references. Titles of journals or periodicals are abbreviated according to **Chemical Abstracts Service Source Index** (Cassi).

Two examples of the presentation of references are the following:

GRABOW WOK, COUBROUGH P, NUPEN EM and BATEMAN BW (1984) Evaluations of coliphages as indicators of the virological quality of sewage-polluted water. *Water SA* **10** (1) 7-14.

WENZEL RG (1975) *Limnology*. WB Saunders Company, Philadelphia. 324 pp.

## **Abstracts**

Papers have to be accompanied by an abstract and keywords. Abstracts have become increasingly important with the growth of electronic data storage. In preparing abstracts, authors should give brief, factual information about the objectives, methods, results and conclusions of the work. Unsubstantiated viewpoints should not be included. Do not cite references in an abstract.

## **Refereeing**

Manuscripts will be submitted to and assessed by referees. The evaluation of any manuscript is undertaken with the understanding that neither the substance of the article nor the figures or tables have been published or will be submitted for publication elsewhere during the period of review. Authors bear sole responsibility for the factual accuracy of their publications.

## **Correspondence**

State the name and address of the author to whom correspondence should be addressed on the title page.

## **SCRIPT REQUIREMENTS**

### **Lay-out of manuscript**

An MS Word script should be submitted by e-mail. The **title** should be concise and followed by authors' names and complete addresses. Clearly indicate who the corresponding is and provide a footnote on the title page with full contact details, i.e. e-mail address, telephone and fax numbers. A paper may be organised under main headings such as **Abstract, Introduction, Experimental, Results, Discussion** (or **Results and Discussion**), **Conclusions, Acknowledgements** and **References**.

### **Contents of manuscripts**

The International System of Units (SI) applies. Technical and familiar abbreviations may be used, but must be defined if any doubt exists.

### **Tables**

Tables are numbered in Arabic numerals (Table 1) and should bear a short but adequate descriptive caption. Their appropriate position in the text should be indicated.

## **CHAPTER 6**

### **SUMMARY, RECOMMENDATIONS AND LIMITATIONS**

---

#### **6.1 Introduction**

In the previous chapter the findings of this study with regard to consumers' perceptions and household utilization of a rural water service were reflected and discussed. It is through the objectives listed in chapter one and the findings of this study that this chapter will show whether the purpose of the study has been achieved. This chapter aims to give a brief summary of the findings and propose relevant recommendations for further studies and to propose a model for the perceptions of a rural water service provision.

#### **6.2 General summary**

A brief summary of the consumers' perceptions and household utilization of a rural water service will be reflected addressing issues such as the consumers' perception towards water quality, water quantity, FBWP and household utilization of a rural water service.

##### **6.2.1 The perception of water quality**

In chapter two it was proposed that the water quality was determined by the microbial, chemical and physical properties. Consumers found the physical properties of the water to be a very important determinant of the quality of water. The microbial and chemical properties were of lesser importance to the consumer when faced with the task of evaluating the quality of water (WRC, 2000:3)

The importance of the physical properties to the consumers was further illustrated by the concept of the physical water qualities that were identified. In this instance the consumers were particularly emphatic about the aesthetic quality of the water such as the colour of the water. Furthermore, physical water quality was brought forward in relation to taste and performance in the household. However, these physical qualities were related to aspects of safety in which rain water was considered to be the best form of safe drinking water.

Consumers also relayed the physical water qualities to treatment applied to the water as the colour of water after treatment was not acceptable to the consumers and needed to be improved through the use of additives such as cement.

It is therefore evident that consumers constantly referred to physical water quality in all aspects related to water, ranging from safety to the aesthetic, the palability, the performance and the water treatment. The physical properties of water are not always water quality indicators (WRC, 1999a:5). The assumption that rain water is generally safe to drink is also a concern that should be addressed. The general idea that consumers have about the fact that water is safe is a thought that needs some caution as WRC (1999a:5 and 2000:3) has indicated that such judgment, based on the appearance of water, might not be a valid measure of water quality. Bates (2000:29) is of the opinion that consumers sometimes are ignorant of the water quality as they think that water which is provided should be safe.

From the above discussion several questions come to mind. It may be questioned whether consumers are ignorant of the microbial and the chemical properties? This is an indication for an education programme in line with physical properties of water. Through the above discussion it is proposed that the service providers need to take a note of what concerns the consumers the most about the water service. However, that does not mean that the other water quality properties should be ignored, as according to WRC (2000:5) the imbalance of one of the water quality properties has an effect on the physical property of the water quality.

### **6.2.2 The perception of water quantity**

Several authors such as De Fontaine (2000:1) and Modise and Kreig (2004:1) defined water quantity in relation to affordability, accessibility and availability of the water service. The findings of this study pointed to an aspect of reliability of the water service. This was argued by the consumers in light of community concerns relating to vandalism, faulty pumps and theft. These issues are community related and can be addressed through a programme of community

ownership (Mathabatha & Naidoo, 2004:1). It is therefore proposed that through community ownership the negative connotations such as vandalism and theft can be overcome.

Furthermore the findings are in contrast to the literature regarding the distance proposed, causing a desire for household/yard taps to be within reach of every consumer even for elderly consumers. This desire has implications of which Netshiswinzhe (2002:1) mentioned the cost implications found in providing consumers with yard taps. To maintain this statement it was suggested that the volume of water usage might increase through frequent utilization of the water source thereby increasing the cost of the water source for service as well as for the consumer.

The issue of water quality for consumers was further brought forward as an issue of trust. First of all this trust was pointing towards people who were in charge of the water service through the way in which they cared for the service. This trust was further elaborated on, in terms of skills with which these water source people were equipped. It is proposed that such distrust can be avoided as the lack of trust was the outcome of a lack of transparency and involvement of the community in the water service development. Thus, in chapter one Pybus *et al.* (2001:12) as well as Mathabatha and Naidoo (2004:1) recommended the involvement of the community at the early stages of the water service development project. Such involvement is crucial as it empowers and helps the consumer to be aware of the procedures involved in the water service development project. This in turn is proposed to increase the trust of the consumer in the water service providers.

### **6.2.3 The perception of Free Basic Water Policy**

Chapter two has discussed FBWP as a vehicle used to deliver development to improve the quality of life of the South African citizens. However, the findings according to the participants' comment, reflected that FBWP is perceived as 'free water' that does not benefit the rural areas but benefits the urban areas as discussed in chapter five. This is through the fact that the rural water service

consumers claimed that they were struggling with important things such as water quality improvement. They seemed not to be satisfied with the way these issues were addressed by the FBWP. Even though they are receiving 'free water', the 'free water' does not satisfy their basic needs. Moreover, it has additional economic implications in their lives such as buying water from the people who own boreholes and adding powdered soap to bathing water.

It can now be argued that as much as the government is trying to improve the lives of all South Africans the intentions are not fully appreciated by the rural water services' consumers. It is a pity that such good intentions by the government fail to meet with the expectations of the consumers and are not properly understood by them. The question arises whether this is the correct way in which the FBWP's efforts should be interpreted and understood. If not, then whose responsibility is it to inform the consumers and to explain the main aims of the FBWP? With all these questions in mind, one wonders whether the water policy has been introduced and implemented in a proper way. For example, in this study the way in which the participants were introduced to the FBWP, is questionable as its intentions were not clearly stated, but misused for political issues. At this point it is suggested that proper channels be followed to inform and to educate the consumers about the FBWP. It is proposed that this would help the consumers to have a better understanding of the government's aims for developing and implementing this kind of service.

#### **6.2.4 The perception of household water utilization**

The importance of water in the life of the consumer has been discussed in chapter two. However, the findings reflected that the rural water service did not satisfy the consumers' needs. It was on a sensory level that some of the problem areas and frustrations could be detected, especially, with regard to food preparation and other household activities. Further dissatisfaction found during the utilization of the water was related to the negative effect this source had on the personal images and social relations of these people. These findings reinforced the fact that the physical quality of the water as supplied by the services needs to be addressed

All the above discussed water-related aspects play important roles in the way in which consumers perceive the water service. It is therefore, proposed that consumers' perceptual processes be known and understood by the water service providers. The literature provided good models that illustrated the relationship between the consumer and the water service providers that can be used to achieve this.

### **6.3 The proposed theoretical framework for the study of water service provision**

Figure 6.1, is presented as a consolidation of the discussed models. It illustrates the way in which the parts of the systems perspective of a rural water service provision interlink with each other to form a system. It is proposed that the system is initiated through the quality of life of which the consumer is part. Furthermore the consumer researcher aimed to understand the aspects which needed to be addressed to improve the consumer's quality of life. This was achieved through studying the consumer's psychological processes through two concepts namely, perception and household utilization adopted from Figure 1.1. These two concepts are regarded as input of this system that will be transformed to get an output that will be the actual consumer perception.

The outcome of the consumer perceptual process becomes input in the subsystem of the water service bodies. This input could be used to improve and amend the plans and strategies of the water service bodies, so that they can deliver valuable and consumable services that will be beneficial to the consumers and eventually improve their quality of life. Figure 2.7 presented a consolidation of consumers' perceptions and water service providers from a systems perspective and is incorporated in Figure 6.1.

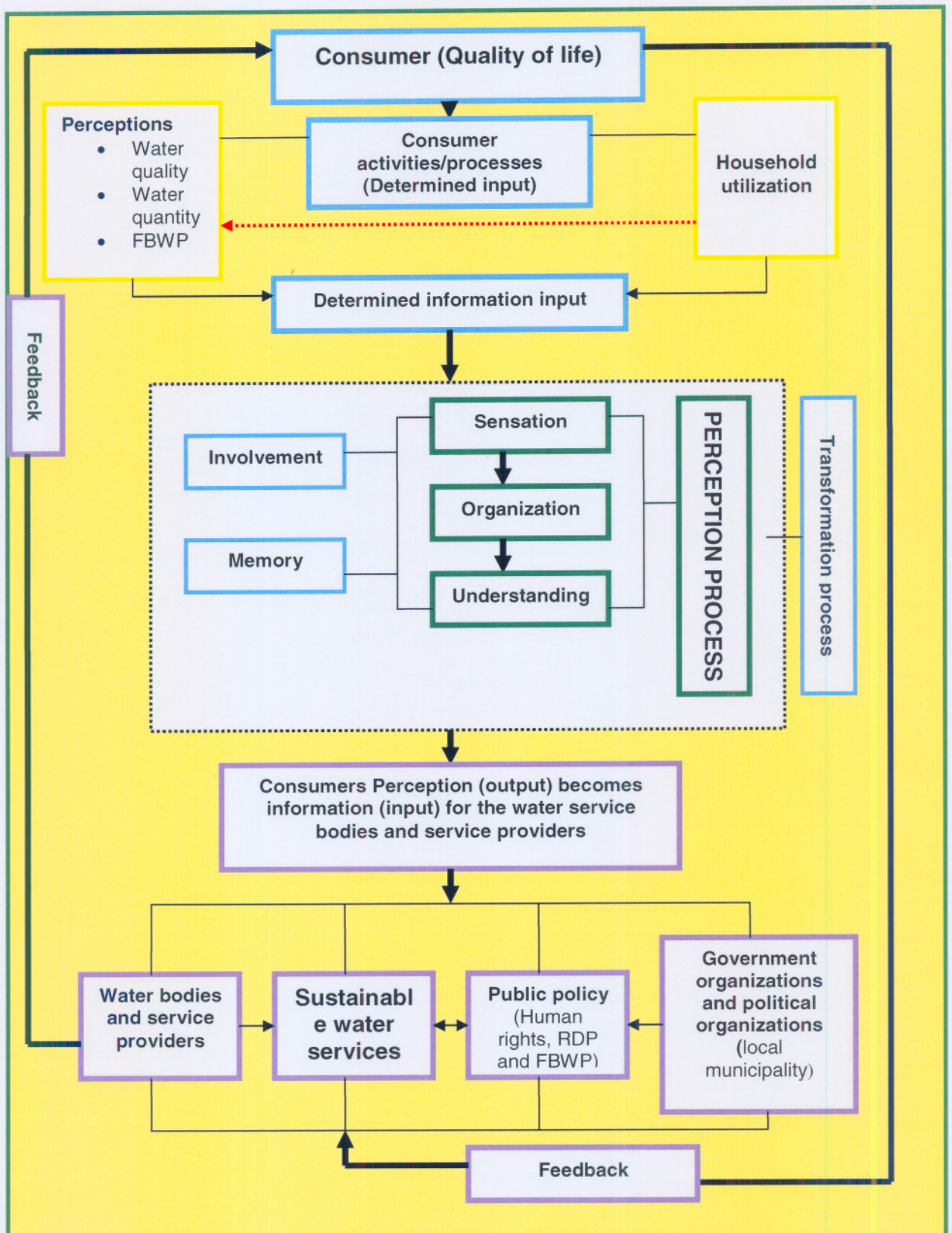


Figure 6.1: A system perspective of a rural water service provision and consumer perception

The water service providers' subsystem is composed of hierarchies and environmental factors external such as laws, policies, programmes and others which will influence the transformation process intended to improve the quality of life of the consumer. The outcome of this process may result in a further feedback and evaluation of the experiences of the consumers after implementation of the research findings and information on the consumers' perceptions.

The findings of this study revealed an imbalance in the systems' equilibrium, as the consumers were not satisfied with the water service they were receiving. According to the GST, this imbalance can be brought into equilibrium through feedback (Whitchurch & Constantine, 1993:328). A challenge is therefore, posed to the water service bodies and service providers, that there is a greater need for consumers' activities to be explored and considered, when planning and developing strategies and when delivering services to the consumers. It is argued that failure to attend and to embrace the consumer's understanding or thoughts could lead to the lack of appreciation and ownership, as well as rejection and non-use of the service provided consequently forcing water service provision, to take on a backward stage and not proceed into further provision and development. Thus, in this study a theoretical framework highlighting the affiliation, interaction and contribution of subsystems involved in the context of a bigger environmental system such as South African rural water service provision was developed.

#### **6.4 Recommendations**

1. Education should be part of the water development projects, especially to minimize or eliminate misunderstandings and misconceptions, for example in connection with water quality.
2. The community ownership through the formation of community structures should be encouraged as this would build trust among the people involved in the development.

3. The levels of communication and the ways of information transference should be adapted to suit the target group.
4. The water should be acceptable to the consumers; the physical quality should not be taken for granted.
5. Information adapted to suit the targeted group should be transferred through the right channels.

#### **Recommendations for further studies**

1. This study can be repeated in another region in the North West Province as it was done on a small scale community.
2. The impact of education programmes (implementation and evaluation) in influencing consumers should be explored.
3. Further research on consumer processes such as attitudes, motivation and other behavioural processes towards water services and water provision in South Africa, especially in the North West Province, should be considered.
4. Further investigation regarding FBWP should be conducted and feedback obtained directly from the consumers themselves should be incorporated and should serve as a guide when amendments are considered. This applies especially to remote rural areas where communication might probably be limited.

#### **6.5 Limitations of the study**

In the light of the fact that this study has predominantly used verbal data methods with which to gather data, such as focus groups and personal interviews, the limitations of this method lies in the fact that participants may have tried to impress the researcher or other groups through their responses. The competitive nature of different groups may also limit the quality of verbal data as these responses may not be truthful but augmented and exaggerated. In order to address the limitations of a verbal data gathering method the researcher was not misled by the impressive nature of the responses but rather enquired more facts

from the groups. It is therefore advised that researchers should be aware that this situation might occur within a verbal context.

The sample used in this study relied on available community members from various community organizations such as teachers, church and political youth organizations, soccer teams and community members. In this regard the research methodology did not target any specific age, gender or socio-economic groups within the community. The study design rather relies on a variety of opinions, gathered from a broad community base that would assist the researcher in gathering the perceptions of community members with regard to rural water services.

## 6.6 References

BATES, A.J. 2000. Water as consumed and its impact on the consumer: do we understand the variables? *Food and Chemical Toxicology*. 38(1):S29-S36, April. [Web:] <http://www.ncbi.nlm.nih.gov/entrez/query>. [Date of access: 2004/05/20].

De FONTAINE, J. 2000. Trouble shooting guide for the domestic consumer.. Pretoria: Water Research Commission. WRC report no. 963/1/00.

MATHABATHA, S. & NAIDOO, D. 2004. A review of public participation in the rural water and sanitation setting. Pretoria: Water Research Commission. WRC report no. 1381/1/04.

MODISE, S.J. & KRIEG, H.M. 2004. Evaluation of nanofiltration for the treatment of rural ground water for potable water use. Pretoria: Water Research Commission. WRC report no. 1230/1/04.

NETSHISWINZHE, B. 2002. Free Basic water-Tapping its Developmental Potential in rural Areas. [Web] [http:// www.mvula.co.za](http://www.mvula.co.za) [Date of access: 2004/08/1].

PYBUS, P.; SCHOEMAN, G. & HART, T. 2001. The level of communication between communities and engineers in the provision of engineering service. Pretoria: Water Research Commission. WRC report no.TT 133/00.

WHITCHURCH, G.G. & CONSTANTINE, L.L. 1993. Theory Sourcebook of family theories and methods: a contextual approach. New York: Plenum Press.

WRC. 1999a. Quality of Domestic Water Supplies. Assessment Guide. Volume 1. 2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no.TT 101/98.

WRC. 2000. Quality of Domestic water Supplies. Analysis Guide . Volume 3.  
2<sup>nd</sup> ed. Pretoria: Water Research Commission. WRC report no. TT 129/00.