EVALUATION OF COST RECOVERY FOR WATER SUPPLY IN MAKURDI TOWN, NIGERIA

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NOVEMBER, 2015

DECLARATION

I declare that the work in the dissertation entitled "**Evaluation of cost recovery for water supply town, Nigeria**" has been performed by me in the department of Urban and Regional Planning under the supervisions of Dr. Ma'aruf Sani and Prof Kaltho. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

…….. …… ……

Name of Student **Signature** **Date**

CERTIFICATION

This dissertation entitled **EVALUATION OF COST RECOVERY FOR WATER SUPPLY IN MAKURDI TOWN, NIGERIA** by Tamen Jonathan Terfa, meets the regulations governing the award of the degree of master in science urban management of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This dissertation entitled **EVALUATION OF COST RECOVERY FOR WATER SUPPLY IN MAKURDI TOWN, NIGERIA** by Tamen Jonathan Terfa, is dedicated to my father; Mr Augustine Kaakwagh Tamen who by the cold hand of death slept in the lord, but his living words of encouragement has remain forever and will ever provoke doggedness and perseverance in me to always take bold and giant steps to greatness. More importantly the dissertation is dedicated to my mother, my beloved spouse and my upcoming children.

ACKNOWLEDGEMENT

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ABSTRACT

As urban areas in Nigeria continue to grow, the need to meet increasing water demand for the population has become a major problem of concern to Urban Managers. The State water agency that are supposed to provide adequate and potable water supply to urban population have records of poor performance. To achieve the national and state water supply policy objectives of the issue of cost recovery reforms was introduced, imperatively, however to carry out cost recovery in our water sectors to provide efficient and sustainable water supply for the urban needs in a bid to protecting the vulnerable groups is important. In view of the stringent need to understand the intricate of cost recovery, the research study on the evaluation of cost recovery for water supply was instituted, the study evaluates the existing scenario of cost recovery for water supply service and its implications in Makurdi town with the population of 503.114. The survey investigation was based on a three settlement groups namely; high, medium and low residential density which has ten (10) substantive neighbourhoods settlements as the sampling framework in where a sample of 326 households was sampled (representing 0.3%sample size of the 95,577 total households in Makurdi) the sample size was drawn across the three settlement hierarchy named above which are served by the Water Board. Therefore, a systematic random sampling was used to administer questionnaires. Another sample of 1 questionnaire template was administered to the water board to source out information on their opinion pertaining cost recovery. The results obtained shows that the cost recovery for the operation and maintenance (O&M) of water supply in Makurdi urban area was only 43% and 57% of the cost recovery enquired during water supply and provisioning in the study area were not recovered by the water board. From the 43% of the cost recovery for water supply in the study area out of which appreciable percentage, precisely 22.7% is recovered from the vulnerable groups (i.e. low and medium income earners), while 77.3% of the cost is recovered from high income earner. Also, 59.2% of the households have their houses connected while 40.8% were not connected to official networks but depend on public taps and other sources. In addition, the result of the willingness and ability to pay for% water supply, by the households is 49% while those not willing to pay are 51% this express the challenge and stiff opposition cost recovery practice is experiencing in Makurdi. More so the result of the implications of cost recovery policy shows that, the standard of living and expenditure level of the vulnerable group i.e. low income earners is grossly affected. The study proposed prepaid metering system and/or cross subsidy in the tariff regime arrangement based on the selected cost recovery model and recommend strong political will and commitment from government to promote cost recovery for water supply system, establishment of management regulatory committee o taskforce for cost recovery in water supply. In view of the fact that there will be increase in tariff due to the new reform which some households may be unable topay for water supply, sector targeting measures, geographic targeting measures and social targeting measures are recommended. Basically the measures is targeting the poor such as low-cost options of obtaining water supply through the public stand posts and commercial distribution outlets. Finally, the research has provided useful insights as to the way forward for cost recovery for water supply commercialization in Nigeria, and that there is no one-model-suits-all approach to cost recovery for water supply. Each country must therefore design a framework most suitable to its environment

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.0. Introduction

The state of cost recovery in Nigeria has remained a matter of concern given the importance of cost recovery in the economic wellbeing of the entrepreneurs and the growth and development process of the economy. Unfortunately, cost recovery for water services has no consensual recommendation across the world. While some international organizations from the developed world tend to recommend it as being essential for the financial sustainability of water utilities (OECD, 2006), that is not the case for some worldwide reaching organizations such as the United Nations, which is more concerned with the impact such a principle would have on the poor, leading it to recognize the role that subsidization may have on the improvement of population provision levels in water supply and sewage drainage and treatment (UNDP, 2006. This may be due to the fact that in developed countries, the water outlays represent a very small portion of the average household income, whereas in developing countries the implementation of full cost recovery would put greater stress on households' budgets.

The provision of clean water to consumers entails a cost both in terms of initial capital outlay and ongoing operation, maintenance, management and extension of services. However, because of poor planning of cost-recovery, a lack of government funding and inadequate tariff rates, the ability of water services sector to recover costs is often limited even for routine operation and maintenance. This has led to problems in providing sustainable water services to poor communities.

Cost recovery is widely recognised as an essential component in sustainable water services provision. It is only one of a number of conditions that must be present in order to guarantee the continuation of benefits intended by community water projects. Yet, it is an aspect that continues to draw an inordinate amount of attention, in South Africa and elsewhere, because of the swift impact that failed cost recovery can have on service provision and community development (Hilary et al.1999:1). It is essential for long-term sustainability of the water services sector that costs are recovered by some mechanism, whether through application of full-based charges to consumers or by government support to the sector. Where cost-recovery and sector funding are being ignored, the effects are deterioration of infrastructure, which eventually leads to the breakdown of systems, absence of an adequate water supply and an increased public health risk. (Hazelton, 1997: 34).

The willingness to pay for water services amongst consumers should be promoted and maintained. Unless consumers are convinced of the need to pay for services, cost-recovery will remain problematic and the long-term sustainability of water provision will be compromised. However, this also means that service quality needs to be sufficiently good to encourage payment and that water suppliers are seen to be responsive to the demands of consumers (Rogerson, 1996: 374).

In the past, budgets for water and sewage systems were typically based on historical trends with inflationary and/or service level adjustments and in some cases, refinements

in regulations on drinking water quality and wastewater discharge quality. Now, as water and sewage systems deteriorate and maintenance costs increase, and managers incorporate approaches and tools such as business planning, level of service pricing and performance benchmarking, historical costs no longer serve as a reliable guide for budgeting. As a result, the gap between what should be spent and what is being spent continues to widen for many. This is not sustainable in light of ever more stringent regulations and increasing accountability of decision makers and operators.

Urban services comprising water and wastewater, bus transport, solid waste collection, disposal and management, and street lighting in most Indian cities and towns are underpriced, with damaging long-run consequences, on the one hand, for households who have inadequate access, and on the other hand, for urban service-supplying entities who are unable to invest and expand the coverage of services. Most urban service-supplying entities – be these the municipal governments, state or city level boards or corporations of the state governments, run at a loss, and cover the loss defined as the gap between revenues from the sale of services and cost of service provision from government subsidies and accelerated depreciation of capital.

The result is a low-level equilibrium: low tariff, poor services, and constraints on access, especially of poor households. Using city-level experiences of one urban service, i.e., water, this presentation attempts to bring out the challenges that are faced in striking a balance between cost and price, and provide a framework that spells out key areas of

reform.The cost recovery of water services, as a central target of the European Union's Water Framework Directive (WFD), is becoming known as an important element for water management internationally. A simple explanation of the cost recovery of water services might read: to recover all of the costs associated with a water system, programme or service to ensure long-term sustainability. Within the last decade or so, the issue of cost recovery to water service has attracted considerable attention in many developing countries. Also reliable cost recovery to water supplies service is highly instrumental to the promotion of socio-economic growth as well as development that can promote adequate services to the city (Ayila, 2001). It is not surprising that many developing nations have been forced to adopt stabilization and adjustment policies which demand better and more efficient method for cost recovery to water services with the view to achieving water supply service stability [World Health Organization (WHO, 2003)], since water is crucial for sustainable development. Within few decades ago, there have been efforts to increase provision of cost recovery to water supply services for both rural and urban homes. However, cost recovery to water is still fully release to many mainly those located in sub-Saharan Africa, South Asia and East Asia (Ellen &Kellog, 2005). As a result of the cost recovery to water supply service is unreleased, efforts are being made by the developed nations to increase provision of cost recovery to water supply service, but no serious efforts are made by the developing nations to meet this target.

In other parts of the country Nigeria, efforts geared towards cost recovery to urban services and development in Kwara State and towards "water for all by the year 2020"

have increased the assessment, exploration and exploitation of water resources both surface and underground (Ellen and Kellog, 2005). Although there were investments in the provision of potable water to local dwellers in the state by both government and non-governmental organizations, there is still a long way to go (Gay, et al., 2007). Many cost recovery to water supply service study have been done for urban communities in other north central States of Nigeria, Benue state particularly Makurdimetropolis need such study, reason being that are whinny cry from the public about the issue of cost sharing and allocation pertaining the water supply delivered. Therefore, studies need to be conducted so that records will be available for Makurdi metropolis. In the Benue state, the appreciable part of their capital budgets allocated to the provision of water services. Attempts to recover costs from these capital investments have generally failed. As with these urban municipalities, the Makurdi metropolis is faced with the dual problem of addressing the water service backlog by providing new water infrastructure and recovering costs from the existing water infrastructure.

1.1 Statements of Problem

Water supply in Makurdi, Benue state like any other city in Nigeria is increasingly becoming expensive as costs of production rise (due, for example, to the cost of inputs relative toa weak Nigerian currency). And, the decline public revenue and income;isaffecting the financial support and funding of government agencies (i.e. water board), this circumstancehave continually and increasingly raised the need for cost recovery.

In light of the increasing need for cost recovery on utility supply, the Benue state government like other states in Nigeria introduces a cost recovery policy regime for water supply or distribution. Apparently, the water board is expected to recover approximately eighty percent of her cost incurred during productionand distribution of water from among the consumers, the remaining twenty percent is to be supported by the government. Presumably, the overall objective of the policy is the commercializationof water service in order to enhance the wellbeing and productivity of Water Board, more so, to create an impetus for effective service delivery to users and growth of economics of Water Board.

The advent of cost recovery for water entrenched the right to eventual access to water as a social service rather as an economic service, these of course have implications on the vulnerable groups (i.e. low income earners), which has been confirmed by many studies in developed and developing world (Whittington, 1990; Israel,1992; Perrow,2007).

Drawing from Whittington (1990); Israel (1992) and Perrow (2007), which argued that cost recovery can affect the poor disproportionately such that those that are poor are forced to spend more of their income obtaining water or go for less safe alternative, while the higher income groups will capture the best services available. In the study area, it is observed that, there are quite a numbers of public outcry about the issue of tariff and charges for water supply that entrenched the right and access to water supply service and

degenerated or set off a successive challenge of satisfying the need and demand for water.

Therefore, providing adequate information on the implications of cost recovery for water supply to households and the water board towards planning and implementation, the evaluation principles is required to provide a disaggregated data at population cluster level, where certain attributes are important like income status, source of water supply, standard of living, and other relevant attributes are to be captured or surveyed.In proffering solution to the above problems, the study also seeks to answer the following questions.

1. What is the existing scenario and status of cost recovery for water supply in the study area?
2. What are the implications of cost recovery for water supply in the study area under the existing situation?

The answers to the research questions will provide input for recommendation that will improve cost recovery in water supply.

1.2. Aim

The aim of the study is to investigate the cost recovery scenario for water supply in Makurdi Urban area, with a view to understanding the implications of the situation for improvement.

1.3 Objectives

The specific objectives of the study are:

1. To explore the concept and significance of cost recovery in urban services provisioning.
2. To investigate the characteristicsthat surrounds cost recovery for water supply in the study area.
3. To identify the implications of cost recovery for water supply in the study area.
4. To evolve measures as recommendations that could lead to practical strategies to overcome the implications or consequence ofcost recovery for water supply in the study area.

1.4 Significance and Relevance of the Study

a. Significance

The policy of supplying free water to water users is fast and steadily becoming an old fashion due example is the commercialization and the desire to atleast recover the operation and maintenance cost incurred, since there are outcry that, enough funds to provide such free utilities i.e. water supply services is becoming possibly impossible, the urban poor are the first to suffer.

A better and much more equitable way would be to collect water charges from consumers and then improve and expand the system. That is, cost recovery is the key requirement for sustainable development in water supply. However, the charge should be based on the

ability and willingness to pay of the consumers for such services. Therefore, the study will try to find out whether it is possible to cover the full cost of supplying water supply services in urban areas, in this. That is, it provides the required information on the ability and willingness of the people not only to pay for water services but also to sustain their supplies that include paying for operation and maintenance and investment costs.

The study will also be an additional contribution to the number of studies done in the past to evaluate improved water services. As Griffin et al (1993) indicated, any attempt to estimate the behaviors and benefit in particular communities and in other settings can lead to serious, misleading and erroneous conclusions, even when natural conditions between communities and the services to be offered are quite similar.

In relation to this, there is a need to prove the relevance of the contingent valuation method in Nazareth town. Moreover, this study will differ from the previous studies done on water supply issues because it is aimed at cost recovery issues and its implications so as to improvethe efficiency of water supply service through cost recovery but not to entrench the right of consumers to access to water supply.

b. Relevance

The investigation of these research issues is very expedient in view of the following: Firstly, adequate understanding about cost recovery to water supply services is necessary

which will be secured as a basis for policy framework and service delivery strategies engenders efficient water supply in Makurdi Town.

This study is significant on the following grounds; the field investigations establishing the state of water supply services are few as it concern the study area, thus, the findings of the study will contribute additional information on the subject. Thus, the assessment of parameter of cost recovery to water supply services in its bid is to address the challenges and basis that are limiting cost recovery in water service delivery within the existing local social and economic characteristics or conditions.In addition, knowledge of policy makers pertaining to cost-recovery issues and the relationship between cost-recovery and community development shall be enhanced.

1.5 Scope and Limitations of the Study

The study of cost recovery in water supply service in developing country requires analyzing a number of parameters including demand-side and supply-side Kato, (1989). This study is concerned with only the domestic consumption of water relating with the recovery of cost.

The study will also assess the issue of fee collection and the factors influencing as well as the implications of cost recovery to water supply in Makurdi metropolis. For the same reason the study is restricted to Makurdi metropolis. Makurdi metropolis is selected

because the town is one of the few towns that are attaining fast growth in Benue state, and it is assigned as a capital of Benue state.

1.6 Conceptual Clarification of Terms

Cost recovery; Cost recovery in water supply and sanitation services means that the total revenue to the service provider equals (or exceeds) the cost of supply. A stable revenue stream helps prevent cash flow or financing difficulties for the utility. At least three types of cost recovery are relevant to this analysis: (a) operational cost recovery means that the revenues are at least equal to the operating expenses of providing a service; (b) full service cost recovery means that capital maintenance expenditure and costs of capital are also recovered: and (c) full environmental cost includes the external costs of a service, including any environmental damage. Also, it means the generation of sufficient revenues to pay the cost of water and other services i.e. sewage services. It includes user fees and charges for services that allocate costs to users in an equitable manner and are affordable.

1.7 Theoretical Framework;

Attempts at explaining the decision, actions and relationship between cost recovery parameters and water supply service cut across many fields of study, particularly economics and public administration, a variety of approaches have been developed and applied to urban service and utility studies. Some theoretical framework is state centered; analyzing the action of those within the system, while others are society centered, in that the regard the relationships within society as determining what happen in the system. In administration; the centered approaches tend to analyse the actions of those within the system as determining policy making.

The dominants approach-policy analysis is from which much of the urban management literature derives. In the idealized model; cost recovery parameters are assumed to be centrally motivated by certain factors and characteristics, or at least assume the existence of rules of the game which effectively prevents the pursuit of self-interest and are assumed to be not influenced by self-interested (Alonso, 1998). However, due to the failure of cost recovery in developing countries to water supply services, much attention is now paid by administrative theorist for reforms. Historically, Alonso, (1998) economics model, is used to analysis decisions actions and relationships. The Alonso's theory only provides explanation of the broad socio-economic system and is not helpful in analyzing the complex inter-relationship and interplay that often time changes between cost recovery to water supply services (Paker, 1995)

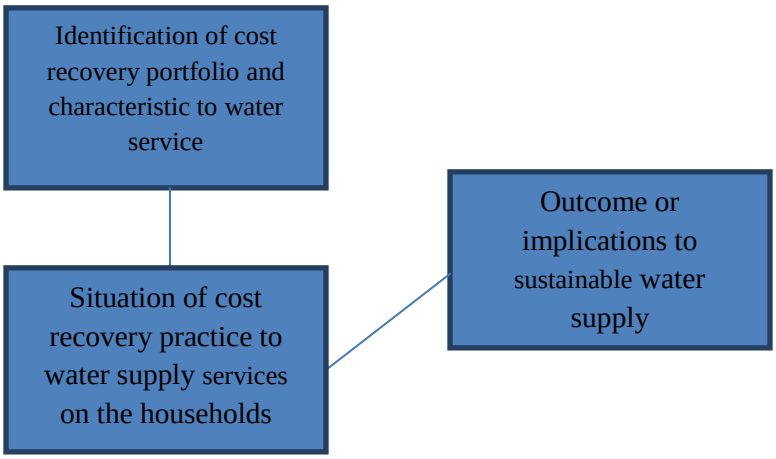
1.8 Conceptual Framework;

There is no over-arching approach which adequately explains the range of implications of cost recovery parameters among household and development of utilities in urban areas particularly to water supply services in developing countries. Paker, (1995) provides a useful framework for analyzing the role of household to cost recovery. The work hypothesizes, that the role of households is affected by both the content of cost recovery; the type of benefits which arise for service delivery. Drawing from the proceeding sections, a broad framework for analysis of cost recovery parameters for urban service delivery particularly water services can be arrived at. Thus, this study is interested in the outcome of the implications of cost recovery for a sustained water supply service in

Makurdi metropolis. Therefore, the conceptual framework used here relies heavily on the standard economic analysis of bills and charges incidence. Cost recovery are regarded by economic theorists as different from cost sharing for a service provided, thus, the main components of the framework is given in figure one (1) below.

- Identification of characteristics surrounding cost recovery for water supply services
- Identification of situation or the scenario of cost recovery for water supply services on the households
- Assessment of the outcome

Figure. 1.1 Model of relationship of cost recovery in water supply



(Source; Paker, 1995)

1.9. Research Content and Organisation

1.9.1 Research Content

The focus of this research is based on application cost recovery associated with water services provision. This case study design facilitated learning about this complex issue of cost recovery, based on a comprehensive understanding of the issues obtained by extensive description and analysis of the issue taken as a whole and in its context.

The unique socio-economic circumstances of this Municipality warranted its treatment as a special case. The rich context and manifestation of this cost recovery issue was further obtained from a thorough analysis of three settlement hierarchies within the Makurdi metropolis. The main issue of discussion in this research consists of generating argument for the governance of water supply services considering certain framework for evolving a policy and/or strategic framework for achieving sustainable water supply services in Makurdi and other part of the state.

1.9.2 Research Organization

- Chapter one presents an introduction to the research. It provides a brief background and an overview of the research. In addition, a highlight on the importance of cost recovery and the problem statement along with the aims, questions and objectives of this research is expressed.
- Chapter two provides a platform for Literature review. The literature review is to explore the knowledge streams on the concept and significance of cost recovery
- Chapter three presents the methodology of this research, as well as the introduction and the process flow of the methodology.
- Chapter four covers the data presentation and analysis and case findings. The actual analysis and results is to take into account the socio-economic and physical parameters for cost recovery
- Chapter five provides the comprehensive discussion considering the relevant potential and implications to improve the optimum water supply and cost recovery portfolio.

- Chapter six articulates the concluding remarks of this research. A series of recommendations extrapolated from the case findings and analysis are provided along with the suggestions for further research and studies. Finally references used in the research are presented.

1.10 Background of the Study Area

Benue State was created in 1976 with Makurdi as the capital town. Within the former structure of Benue-Plateau Province, Makurdi metropolis is one of the largest towns in Benue state both in spatial form and population size, due to its status as State capital, as well as hosting majority of the Federal establishments. The Makurdi metropolis is located north central of Nigeria. It is a cross-border metropolis spread between Guma, Gwer and Gwer West local government. It forms part of the Makurdi Municipality, which also includes North Bank and South Bank. The economic base of the study area is mainly in the administrative and business sectors.

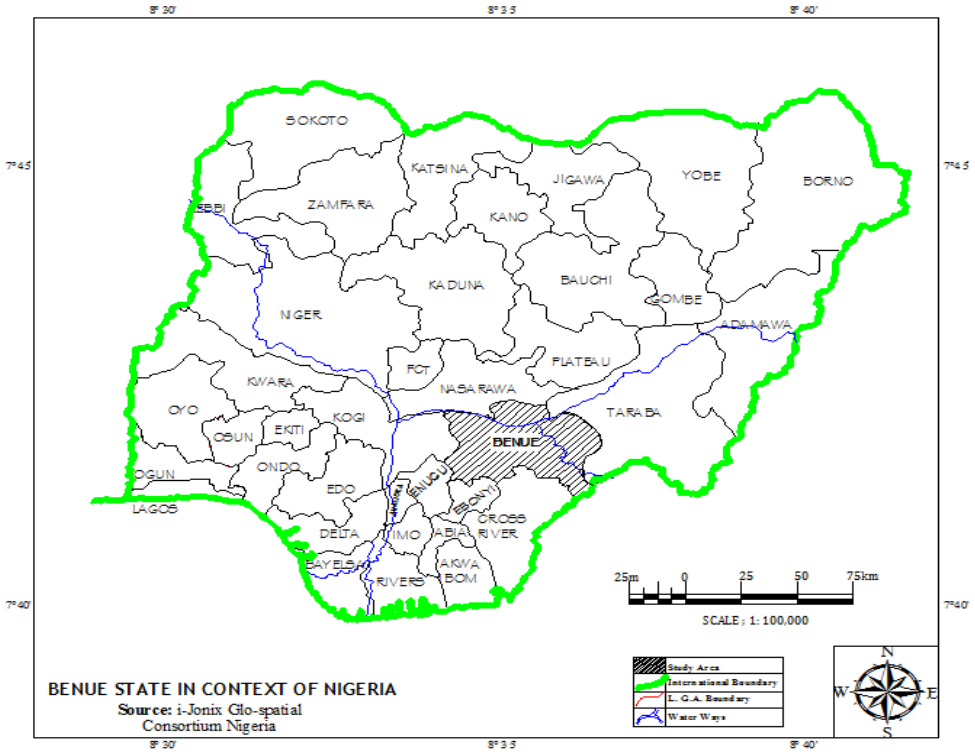
The population statistics vary greatly depending on the source of information used. Some sources indicate that there are about 300,311 people living in the area, while others suggest there are 530 000 people. From these two extremes it is estimated that the figure is closer to 875 000 people (Bureau of statistic, Benue state, 2009: 2). The vast majority of households (approximately 68%) within Makurdi metropolis earn less than eighteen thousand naira per month, with 31% of the households getting social grants from the government. Poverty is therefore extremely high. Only 2% of households have annual income of greater than one hundred and fifty thousand naira.

1.10.1 Location context of the study area

Benue State in the context of Nigeria is centrally located and it has both international and national boundaries, for the national boundary it is bordered by Calabar, Enugu, Nasarawa, Taraba and Kogi, Benue, and Republic of Cameroon as it international boundary. The State consists of Twenty three (23) Local Governments (see Fig.1.1) and has an estimated land area of 47,107.8 sq. Km with Longitude 7° 08' 38" East and Latitude 7° 24' 17" North. Makurdi metropolis is the Headquarter of Makurdi Local Government with a land area of 3,698.8 sq. Km. Makurdi metropolis is situated on Longitudes 7º 30¹ east and Latitude 7 º 48¹ north.

The area is located in the middle climatic belt that is generally very warm and humid with dry and rainy seasons, with a mean temperature range of 25 º C to 30 º C, a mean rainfall of 1120mm to 1500mm relative humidity of 60-80% and falls within the guinea savannah kind of vegetation; (Meteorological dept, 2009). The Makurdi metropolis region is the State's close settled cell with intensive land use in a corridor of development. That is, Enugu-Makurdi and Wukari Road passes through Makurdi metropolis where the corridor of urban development is most intense by the standard of the Northern and middle belts of Nigeria; (Greater Makurdi master plan 1991).

Figure 1.2 Benue State in a context of Nigeria

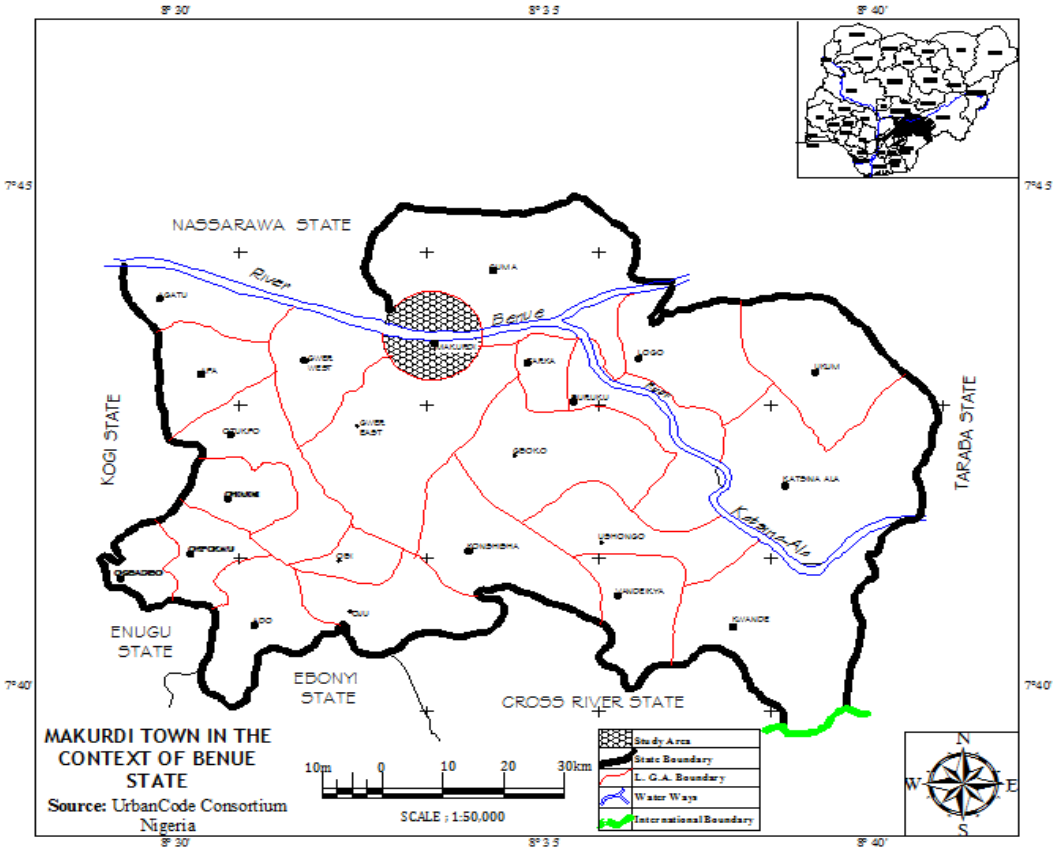


Source; Ministry of Lands and Survey Makurdi, 2014

1.11.2 Topography and Drainage

Makurdi metropolis and its surrounding settlements are within the Benue River Basin of the Benue valley platform. The area is largely an undulating plain which is drained by River Benue and its tributaries and by some tributaries of Guma and KatsinaAla River emptying into the Benue River.

Figure 1.3.Makurdi Town in the context of Benue



Source; Ministry of Lands and Survey Makurdi, 2014

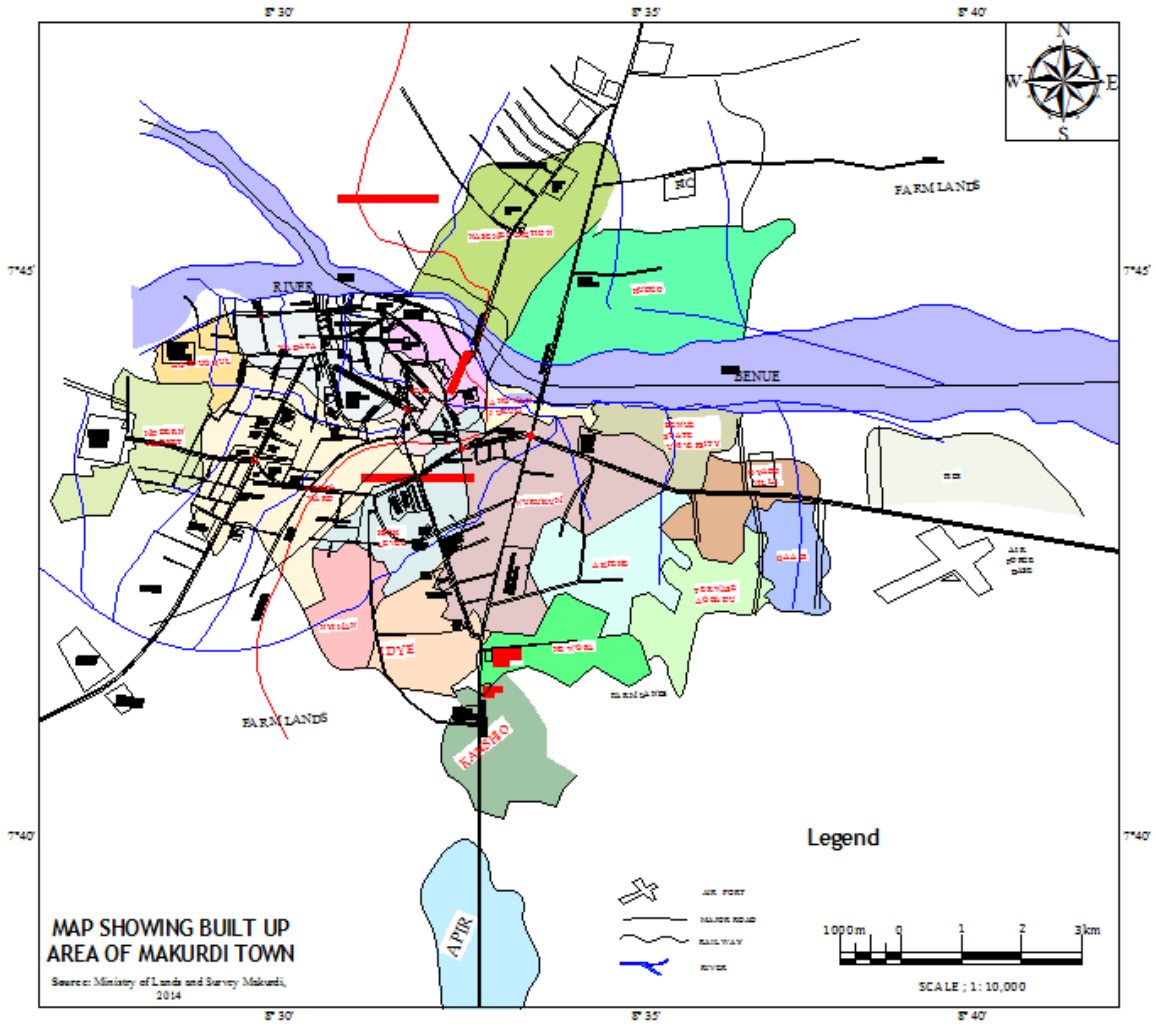
1.10.3 The Structure of Makurdi Metropolis.

Makurdi metropolis consists of two (2) structural units distinguished in terms of natural demarcation by the Benue River.These sectors (see table. 3 below).

Table 1.0 Makurdi; the Region, Wards and their substantive settlement units.

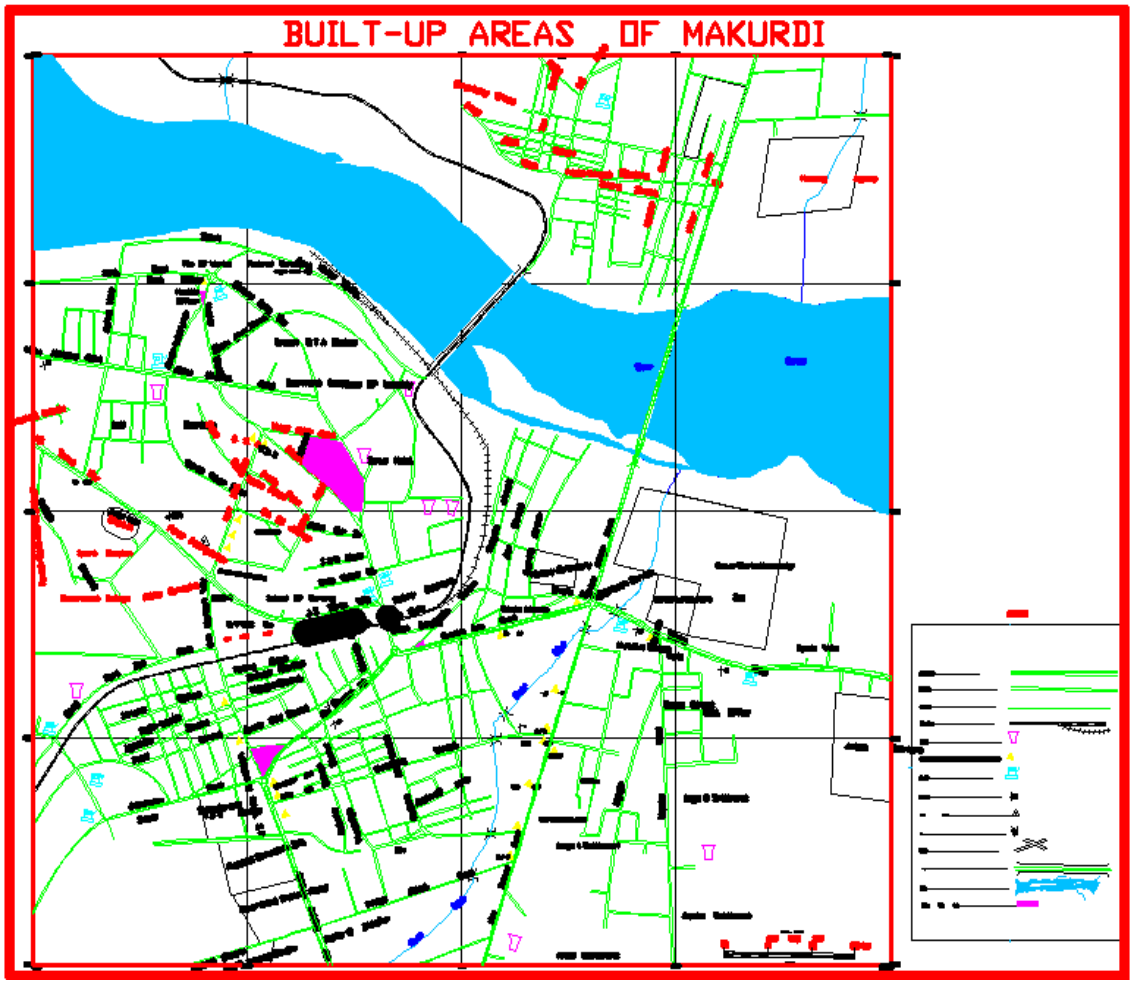
Region	Ward	Settlement Units
North Bank		
North Bank I &II		(a) Low Cost. (b) Court I & II. (c) Gyado Settlement
Agan		a) Agan Settlement.
Mbalagh		(a) Nigerian Army School of Engineering and Management (NASEM) settlement
South Bank		
Fiidi		(a) Air Force Base Settlement) (b) TerwaseAgbadu Settlement, (c) Judges quarters extension, (d) Owners-occupier settlement, (e) New GRA (f)Gyado villa Settlement.
Walomayo		(a) High & Low Level Settlement. (b) Wurukum Settlement. (c) Nyiman Settlement. (d) Logo I & II. (e) Achhusa settlement
Mission		(a) Lobi quarter (b) Old GRA
Clerk		(a) Kwararafa quarters and Angwan Jukum settlement
Bar		(a) Kanshio settlement (b) Saint Thomas Aquinas (c) Achusa settlement.

Figure 1.4 Built up area of Makurdi Town.



Source; Ministry Lands and Survey, Makurdi 2014

Figure 1.5Makurdi Town



Source; Ministry Lands and Survey, Makurdi 2014

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Operation and maintenance are usually the most neglected aspects of any form of development. Poor or non-existent administrative and technical support and lack of funds for proper operation are cited as the most frequent causes for the failure of rural water supply systems.In this chapter, literature about cost-recovery issues will be reviewed using books, journals and government documents. The first part focuses on the international overview of the cost-recovery policy, while the second part addresses water supply services and community development in Makurdi metropolis.

2.1. Conceptualization: Water Supply and Cost Recovery

2.1.1Conceptualization: Water Supply

The primary purpose of water supply is to provide a reliable supply of water in sufficient quantity and of adequate quality which is readily accessible to the consumers. However, itwas difficult to define exactly what constitutes an appropriate level of service to achieve the purpose of water supply. Whilst the principal benefits are improvements to health and reduction in time spent collecting water, there has been a mistaken tendency to regard the high level of service which most developed western countries enjoy as an objective in its own right. The question of adequate quality drinking water supply has probably been one of the main issues in the struggle to achieve better living standard and economic

development. That is why several efforts were made at different levels to contribute to understanding and achieving adequate supply and management of water in the country as well as other places. Agbaeze (2003) says that "the supply of potable water in adequate quantity and quality is a vital factor in the determination of the good health, welfare and productivity of the population". Helana (2005), defined public water supply as essential services for communities, part of the so called "services of general interest", is being vital to general welfare, public health and the collective security of populations, as well as to economic activities and environmental preservation. Michael and etal (2001) cited in Nyam (1999), says that "urban water supply consists of those activities necessary to secure, treat, transport, store, and distribute water for various human uses". This situation created disproportionate and inadequate water supply in the town. Owolabi (2004) observed that historically in Lagos State and throughout Nigeria, the government or public sector was solely responsible for water supply provision to the populace. The strategy adopted was based on an almost total dependence on large scale water supply schemes which are very expensive to install and maintain. Hamidu (1988), in a study of Yola metropolis discovered spatial inequalities in domestic water supply, which he attributed to the distribution system, technical disabilities, lack of adequate financial commitment as well as skilled manpower as major management deficiencies. While the researchers rightly attributed the problem of urban water shortage to lack of cost recovery, proper planning, management and inadequate budgetary allocation by government at all levels to water sector and corporations in the country. One peculiar omission from the above has been the failure to appraise and address squarely the implications of cost recovery issue of good performance in water supply. That is, the

policies and programme of Water Agencies such as water allocation process, pricing and cost recovery mechanism because water supply utilities owned and operated by the public sector were neither efficient in service delivery nor able to remain solvent financially; a position which forms part of this study.

The definition of water supply services varies clearly among countries: the narrow definition of water services is limited to traditional drinking water and sewage services, and the wider definition includes all man-made changes in the hydrological system that serve a given water use (e.g. a dam built for generating hydropower is viewed as a water service provided to the electricity company). Table 2.1 illustrates the diverse definitions of water services found in the countries reviewed, in the context of the present study.

Table 2.1 Comparison of the definitions of water supply services in various European countries, based on national legislation and literature

Country	Definition of water supply services
England and Wales	However, the Water Environment (WFD) (England and Wales) Regulations indicate the definition given by the WFD: 'All services which provide, for households, public institutions or any economic activity: abstraction, impoundment, storage, treatment and distribution of surface water or groundwater; wastewater collection and treatment facilities which subsequently discharge into surface

Scotland	Water services are defined in Section 23(4) of the Water Environment and Water Services (Scotland) Act. The definition is the same as in the WFD.
Netherlands	Water services are not defined in the Water Act. Since the Water Act refers to the WFD, it may be assumed that the definition of the WFD applies. In policymaking, the Netherlands distinguishes five types of water services: water production and supply; collection and removal of rainwater and wastewater; wastewater treatment; groundwater management; and management of regional water systems.
France	Article L2224-7 of the General Local Authorities Code states that: all services dealing with all or part of the production by catchment or pumping, the protection of the abstraction area, the treatment, the transportation, the storage and the distribution of water intended for human consumption is a drinking water supply service; all services dealing with all or part of the collection, the transportation, the sewage treatment and the elimination of sludge is a public service of wastewater treatment.

Source: Water Fund and Development (WFD), 1994

2.1.2 Conceptualization: What is Cost-Recovery?

According to Kumar (1996: 41), the costs involved in operating a water supply system can be classified into two components. First, it is fixed cost, which is mainly concerned with borrowed money from the financial institutions for the implementation of the project. The mode of debt servicing or repayment depends on the financing pattern of financial institutions.

The fixed cost contains mainly: the repayment of the principal amount borrowed, and the repayment of interest on borrowed capital. The second component involves variable costs. These costs deal mainly with operation and maintenance cost of the system as well sinking fund for the future replacement of the system. These costs mainly include: administrative expenses like salaries and wages, repair and maintenance charges, chemicals and consumables, electricity charges and depreciation charges. Cost recovery refers to the practice of charging consumers the full (or near full) costs of providing services such as water and electricity.

The concept of cost recovery is a simple one: the recovery of all, or most, of the costs associated with providing a particular service by the service provider. For publicly owned service providers, this may or may not include a surplus above and beyond the cost of production, while for private sector providers it necessarily includes a surplus (i.e. profit).

In either case, the objective is to recoup the full costs of production. It is argued by Whittington et al (1991:179), that for most water utilities and donor agencies, the actual water supply situation in the developing world is ``typically something of mystery`` with limited knowledge of the means by which households secure water, its use, costs or how much households might be willing to pay for improved services. The international experience underscores the fact that there are ``obvious dangers in designing rural water supply systems without reasonable information on what services people want and for what they are willing to pay (Briscoe et al, 1990:128). Moreover, according to the World Bank (1987:117), the design of water supply projects in rural parts of the developing world has been overly supply-oriented to the neglect of crucial considerations concerning consumer demand, more particularly, of consumer willingness to pay. It was indicated by World Health Organization (1990: 56), that in many countries, the issues of cost-recovery and sector sustainability were ignored for a long period. As a result, tariffs set were unrealistic and frequently there was insufficient government subsidy to make up the shortfall in the costs of the service provided.

In consequence, the infrastructure has deteriorated and service quality has declined. Inadequate cost recovery will result inability to operate and maintain existing supplies properly with consequent increase in leakage, water supply interruption and likely deterioration in both the quality and quantity of the water supplied. This will lead to increased public health risks, morbidity and mortality rates and increased burden on the health care system.

2.2 The Rationale behind Cost-Recovery

Having established what cost-recovery is in practical terms, the discussion now turns to the question of 'why': what is the rationale behind the introduction of cost-recovery on basic municipal services such as water. In answering this question the fiscal and moral arguments for and against cost recovery shall be presented. More especially, the emphasis shall be placed on how these arguments have been adopted in the South African context.

2.2.1. Fiscal Argument

The single most important reason given for cost-recovery is the need to 'balance the books'. Cost recovery, as the World Bank (1996: 44) alluded to, is ``a matter of good public fiscal practice``, allowing governments to reduce the tax burden and thereby attract and retain human and financial capital. Cost-recovery in lower-income, it is argued, reduces the need for cross-subsidization from industry and higher income households, making a country or a municipality a more financially attractive place to locate. It is also argued that cost-recovery is necessary to sustain services on a long-term basis. Without cost recovery, the argument goes; the state will not have the funds to invest in future service and infrastructure upgrades and extensions. Cost recovery is seen as ``pro-poor`` because it provides the fiscal basis for further service improvements and expansion: ``when a public sector utility does not recover the cost of providing a service, it is often unable to extend the system-leaving poorer, marginal areas unconnected to the grid`` (Ayila, 2002: 57). The Benue state government adopts the same basic line of

argument, stating in the White Paper on Water Supply and Sanitation Policy (BSG 2000: 23), that if government does not recover operation and maintenance costs there will be a ``reduction in finances available for the development of basic services for those citizens who have nothing. It is therefore not equitable for any community to expect not to pay for the recurring costs of their services. It is not the Government who is paying for their free services but the un-served`.

2.2.2. Moral Argument

Another set of arguments used to justify cost recovery are moral in nature. The first of these revolves around liberal notions of rights and responsibilities. If people have the ``right`` to a service like water then they also have the ``responsibility`` to pay for it.

The 2006 Benue state Constitution and Bill of Rights are classic expression of this thesis. `Everyone has the right ``, for example, ``to have access to sufficient food and water`` (Bill of Rights, section 27 (1) b). But these rights are met with obligations. The ministry of Water resources in conjunction with water board, for example, has published a half-page newspaper advertisement entitled ``knowing your water and sanitation rights and obligation`` in which it is clearly stated that one obligation is ``paying your bills for services rendered``. According to the Municipal Systems Act (BSG 2002a,), this obligation applies across the board, with residents having ``duty`` to pay for all of their municipal services. A related argument is to be found in the burgeoning ``willingness to pay`` literature. The rationale here is that most people, low-income households included, accept their civic responsibility to pay the full costs of service delivery, and are happy to do so as long as the services are reliable, affordable and of good quality (Whittington et

al, 1991). Finally, it is argued that only by paying the full cost of a good service can one appreciate its true ``value``. Receiving a service for free, or having it heavily subsidized, distorts not only its exchange value but its use value as well; the very essence of the thing being consumed. According to the World Bank (1996, 44), only`` a fee reflecting the costs will encourage users to correctly value the service they receive``.

2.3 Advantages and Disadvantages of Cost-Recovery

Water supply services are known to provide benefits to communities in the form of health, opportunities for women and poverty reduction. It is widely accepted that water services must be improved, especially for the poor, who are the most likely to lack access to these services. But, providing water services is not free. As a result, strategic thinking is needed about how costs can be recovered whether from users, donors, government or others and what costs need to be recovered to encourage sustainability. Cost-recovery is about consumers paying partial or full costs for their municipal services. Municipalities use it to balance their financial books, to avoid deficit financing and to stabilize finances for service delivery (Donald, 2002: 87). It is intended to generate revenue for future service upgrades and extensions and can be used along with progressive block tariffs to generate subsidies for poor households. It can be a way to manage demand for power or water by penalizing over-users. Cost-recovery can also lay the groundwork for governments to sell services to private companies to run. Because such companies would not be interested in buying utilities that lose money, cost recovery is often seen as a pre-condition for privatisation. According to the Human Development Report (2003:120), cost-recovery in the water sector matters because although aid programmes are increasingly multi-sectoral, urgent needs for health and education, along with high debt

service level within developing country governments, constrain traditional sources of funding for the sector. The Human Development Report (2003:124), further indicates that cost-recovery principles matter in the context of governance, as the gaps in institutional and administrative capacity in many governments are wide, translating into less efficient planning and budgeting for the water sector. According to the Report, in order to reduce the gaps in service provision, cost-recovery should and does play a critical role. Drinking water programmes and projects are known to bring wider benefits to communities in the form of health, opportunities for women and poverty reduction (Bhatt et al, 2002:67). Given the overall societal gains that can be achieved, water services should be improved, especially for the poor, however, in spite of all efforts, internationally the number of people without improved water supply services remained practically the same in the past 10 years, and the majority of the people without services are those living in rural areas (WHO/UNICEF, 2000). Furthermore, it has been recognised that cost-recovery is today still one of the major obstacles towards sustainable drinking water (IRC-International Water and Sanitation Centre, 2001a). According to Terry and Calaguas (2003:90), cost-recovery should and does play a critical role in the water sector to reduce the gaps in service provision. Without cost-recovery, financially strapped local authorities are unable to finance network expansions into peri-urban and rural areas, in order to properly maintain the existing services.

They further indicate that low service levels and poor water quality decrease the willingness of customers to pay, which in turn lowers the service level. Poor cost recovery can lead to the waste of a possibly scarce resource, an inability to maintain

machinery (such as pumps), and possible health risks if people are compelled to use alternative, and often unsafe, source of water. In essence, low levels of cost-recovery from users and other sources lead to insufficient income for the effective and efficient operation and management of the service. This implies a poor ability to invest in the sector, whether through human investment or capital investment. As a result, poor service leads to the dissatisfaction of users thus decreasing willingness to pay, which, on top of already poor cost-recovery levels, further exacerbates the system.

2.4 Cost Recovery and the economy

Cost Recovery has linkages that have real financial and fiscal dimensions on the economy. An example of real linkage will be the employment effects in an economy. The long term effects of cost recovery, for instance, effects of cost recovery on poverty. Drawing from Whittington (1990) Israel, (1992) argued that cost recovery can affect the poor disproportionately such that those that are poor are forced to obtain more expensive and less safe alternatives, while the higher income groups will capture the best services available. The bottom line of the cost recovery-poverty nexus is those service deliveries that have a high potential to generate social benefit for the poor are particularly hurt by cost recovery.

For an agrarian economy like that of Nigeria, cost recovery is critical for economic development. According to Poyliquen (1999), absence of cost recovery thwarts performance for service delivery or growth and typically the poor are hurt the most, the links between cost recovery and the growth of the economy are either direct or indirect.

2.5 Key Factors behind Successful Cost-Recovery

As argued by one research team: ``water supply systems provide a low level of service (usually through public taps or hand pumps); they are heavily dependent on (often unreliable) government investment financing and transfers for operations and maintenance expenses; and the quality and quantity of services that are unreliable. According to Fernando (1996:86), there are factors, which we must first understand other factors why water systems are rejected or not completely adopted, despite the one of cost-recovery.

2.5.1 Suitable Design

A water supply system should be designed well to suit the people. The crux of community participation, with the involvement of women as well as men, is that ultimately the system must suit the users. Most users are women and therefore the system must suit the women. Otherwise, they reject it and they will have justifiable or, sound reasons for doing so.

2.5.2 Easy Access

A water supply system should be easily accessible to the community. When this is not so the community continues to use the traditional sources, which are nearer, or where they do not have to wait long.

2.5.3 Easy Handle

The community, especially women must be able to operate systems easily, as they are most affected when systems do not function properly. Safe sources of water, for example foot and hand pumps, may be rejected because they cause difficulties for some women and children.

2.5.4 Users' Income

According to the World Bank (1987:97), water schemes often fail to achieve the goals set for the number of households to be connected to the water system, the amount of water produced, and the gap between expectations and accomplishment is often great. The World Bank (1987), further indicates that there is a danger in designing rural water schemes without reasonable information on what services people want and for what they are willing to pay. The first step in planning water projects, whether in urban or rural areas, is for the resource planners to determine the percentage of household income that residents are able and willing to spend for individual potable water connections and subsequent commodity.

2.5.5. Users' Service Expectations

It was indicated in the African Sector Review (1997:54) that in many countries and cities the government took upon itself the responsibility of recovering the costs of providing water and the people grew to expert free services. The general observation is that where there is no form of cost recovery for recurring costs, schemes are not sustainable. Where communities have been responsible for developing their own services either with assistance from the government or NGOs or without assistance, cost-recovery procedures of various forms have been established.

2.5.6 Service Charge

Duba (2001:17) argues that the pricing of water is very important and also considered the primary motivation to bring in the private sector. Water is considered by most to be free but in most cases this encourages poor management and use of water. The price of water should be made affordable to everyone, including the poor. To enable them to obtain basic water services while also achieving full cost-recovery for sustainability. Sustainability is very important more especially, for scarce resources such as water. According to Clarke (1998:4), access to safe and affordable supply of drinking water is universally recognised as a human need for the present generation.

2.6 Approaches towards Cost Recovery

The International Water and Sanitation Centre`s approach to cost-recovery broadens what are usually considered as financial and economic costs. The IRC sees cost-recovery as the matching of all costs related to providing a sustainable service with all the available sources of funding. These funding sources may lie entirely with the users, but may also include external funding from governments or donors (IRC- International Water and Sanitation Centre, 2001a). The crucial point is that unless all of the costs related to providing and maintaining a service (technical, human resource, institutional) are identified, organised, and covered in a coherent manner with sources of funds, a system cannot be considered to be sustainable. Both financial and economic approaches to cost recovery typically consider the system construction, and maintenance, as well as the training of the community and local non-governmental organizations during project

implementation. In addition, Bolt (2001:34) indicated that in rural and low income urban areas user based cost-recovery strategies become crucial, as communities are progressively made responsible or co-responsible for the financial management of their system. Making communities responsible has proven to be an effective strategy for achieving sustainability in operation and maintenance of the system (IRC- International Water and Sanitation Centre, 2001a). However, to date, such responsibility has typically been limited to the funding of system management and operation and management costs with, in some cases, a minor contribution to capital costs.

According to Terry and Calaguas (2003:98), the traditional approach to cost recovery considers only the financial costs of a project or programme, such as operations and maintenance (O&M) costs, capital costs and possibly investments for future growth and rehabilitation. They further indicate that a less narrow economic perspective considers, in addition to the financial costs, opportunity and environmental costs to society and the broader water resources environment of delivering secure water and sanitation services, in addition to the external impacts on individuals or communities. Environmental costs may arise from increased wastewater flows or from reduced water available for ecosystem maintenance, but there are also possible benefits if improved sanitation reduces water pollution. Even full recovery of the financial costs associated with the operation and management of a system and those related with the environment does not guarantee that the system will continue to operate after it is constructed (Terry and Calaguas, 2003:99).

2.7 Mechanisms for Water Services Cost Recovery

2.7.1. Flat Rate

This entails all households in a community contributing an equal amount. The advantage of this system is that it can be community driven and requires very limited investment and the disadvantage of this approach is that household consumption does not play any role in the payable rate. The municipality still remains responsible for the operation and maintenance of the service.

2.7.2. District Metering

With district metering consumption in a specific area like, a village, is measured. A reservoir and water can therefore, be distributed more equitably between the various areas or villages benefiting from a commonly shared water source. The advantage of this system is that water usage can be measured and controlled to an extent but it ignores the individual households' consumption patterns. Control of this system is also community controlled and requires limited investment.

2.7.3. Prepaid Systems

In this system the municipality should theoretically recover the operation and maintenance costs of the scheme. The system does provide a method of controlling free basic water through programming of the individual household tokens. The system ignores systems already in place at municipalities who previously were responsible for cost recovery. In most cases, it requires the removal of conventional meters when there is a

problem. This system relies heavily on good support infrastructure such as electricity and telecommunication.

2.7.4. Conventional Metering and Billing

This system is the most commonly used system by municipalities to implement cost-recovery. In essence, the system provides that all households are provided with a direct-metered connection. Meters are then read on a pre-determined cycles that may vary from monthly to say quarterly. The data is then captured in a billing system and a bill is produced which is then delivered to the consumer through the mail, hand delivery and any other means. The onus is then on the consumer to pay the bill at the municipal offices or points established for this purpose.

2.8 Instruments for Cost Recovery

The appropriate cost recovery method will depend on two factors: (i) the possibility of identifying direct beneficiaries, and (ii) the possibility of individualizing expenditure as well as receipts.

a. When beneficiaries of the service can be identified, individual improvement costs may be attributed to them. Direct recovery is achieved when lots are sold in subdivisions, or upon sale of infrastructure "access rights" to sub-dividers. When beneficiaries cannot be individually identified, that is, when the service provided benefits a much larger group, the cost of the operation could be imputed to the local authority as a whole. Indirect cost recovery can be achieved at the municipal level, by local taxation, or at the national level, by national taxation. Redistribution of these funds and cost recovery are achieved by the

State or the municipality for the benefit of the agencies responsible for implementing the various types of infrastructure.

b. Problems relating to the possibility of identifying correct expenditure and receipts stem from the accounting system used by the agency responsible for the service provided. When local authorities are involved, their accounting systems are based on principles of public accounting and budgetary unity; as a result, a given receipt cannot be attributed to a given expenditure. Receipts sink into the mass of non-attributed resources which constitute the general account. Also, within this type of accounting system, it is difficult to precisely identify the costs of each operation implemented by the local authority. Such a system is justified by the primary role that municipalities are intended to fulfill, which is the production of "public services." When private services are involved, and costs should be identified and recovered from specific beneficiaries, services and accounting should be managed in a more or less autonomous manner.

In fact, different types of service management can be chosen by local authorities (direct or indirect autonomous agencies, concessions, etc.). Autonomous municipal agencies which are public bodies, emanating from the local authority, are granted: (i) status as independent entities, (ii) autonomous administration and management, and (iii) a separate budget with the possibility of developing an analytical accounting system.

This provides a frame of reference for the choice of cost recovery type that municipalities could adopt. It should. be further noted that the aim is to stay as close as possible to national objectives as far as fairness and social justice are concerned. The methods

proposed will avoid solutions that present difficulties in recovery (and high recovery costs), while taking into account the affordability of these services.

2.9. Best Practices of Cost Recovery

- Apply cost recovery only when it is consistent with government policy objectives.
- Apply cost recovery only where it is cost-effective.
- Do not recover costs for activities specifically funded by other sources, as that would be considered recovering twice for the same service.
- Be aware of additional funding sources, such as private and government grant opportunities, as well as what activities may qualify for federal reimbursement.
- Clearly identify cost recovery revenues through discrete coding. These recoveries should not be netted against the organization's expenses.

Cost recovery is based on the provision of services and should ideally be imposed under a fee-for-service arrangement. In some cases, a simple levy is also an option and may be the most cost-effective. Within the fee-for-service arrangement, certain events will require certain resources; charge only for those services used for that event, rather than imposing an average cost. This is the implementation of activity-based costing and ensures that the people who benefit are the ones who pay. Make event organizers aware of what the approximate charges will be and provide them with sufficient information regarding payment. They should be review cost recovery activities annually, it is necessary because funding sources may have changed, new funding opportunities may be available, the organization may have new objectives, administration methods may have changed, the cost of certain goods/services may have increased, or any number of other changes may have occurred that would require adjustment.

2.10 Institutional Issues Relating to Water Supply and Cost-Recovery: the European and Asian Experience

In India, the execution of new water supply schemes and augmentation are the responsibility of the state, level water supply and sewerage board and local self-government departments. Such schemes require large financial outlays. Therefore, judicious use of financial resources and measures to recover costs are a must to make the system sustainable. According to Kumar (1996:76), the water supply sector in India has not been performing very well, perhaps due to the following reasons;

- Pricing mechanisms are poorly organised, that is tariff, rates not reflecting the true market situation;
- High maintenance bills (including wages/salaries) resulting in high unit costs;
- Poor revenue realisation performance compared to the demand for tax/user charges;
- Heavy losses due to the old system of infrastructure (e.g. corroded pipe lines and leaking joints) pilferage and theft; and
- Large component of the slum/poor population necessitating increase in provision of the services without adequate financial return.

In Senegal, the government introduced a policy of decentralization and the users of public infrastructure facilities such as water and health were encouraged to be part of the operating costs. In principle, it was accepted that this would result in a higher level of involvement and responsibility by the users (Kerr, 1989: 67). In line with this principle, Senegalese communities have established village water committees. Through such committees, the villagers are able to control the hours of pumping in accordance with their needs, organize their own community budget to purchase diesel and some spare

parts, and contribute to the salary of the borehole custodian. Each village is able to retain control of its own community water fund until the need to purchase fuel or spare parts arise, and funds are kept exclusively for water, rather than form part of a more general community development budget. In terms of how the contribution could be raised, some villagers argue that it would be best to make an annual contribution, after the sale of the cash crop harvest, whereas others feel that a monthly contribution would be easier to control and would ensure year-round operation of the system. The actual sum of money to be contributed ranges from 6 to 12 US cents per person (Kerr, 1989: 69).

In India, the Government of India or state governments have usually financed capital costs, so that the term cost recovery tends to refer to covering the operating expenses. The extent to which cities actually cover replacement, renewal, expansion, and other aspects of routine maintenance varies from city to city, and often capital maintenance is not included. Internationally, in many countries full service cost recovery is more common and, to enable this, service providers often are institutionally clearly separated from governments, and given substantial autonomy for operations, and proposing tariffs, within a clearly defined regulatory framework which provides for third party review of tariffs.

a) Tariff

A tariff is the set of prices, charges, and taxes used to generate revenue. A well-designed tariff enables financially sustainable service delivery and encourages users to avoid wasteful consumption in one of the following ways:

b) Fixed charge.

This means that the tariff level per unit remains the same whatever the volume of water consumed. It is commonly applied where consumption is not metered, or when the meters are faulty or not read.

c) Volumetric charge.

Users are billed according to the volume of water consumed; this requires metering. Some service providers apply a flat rate per cubic meter (m^3) irrespective of total consumption. Others use a Block Tariff, whereby one rate applies for consumption up to a certain level, while a different rate applies to consumption beyond that level. Many utilities use an Increasing Block Tariff in which the first 'lifeline' block costs less and equates to typical household consumption per month for essential purposes (typically 6-10 m^3).This means that all households can access a basic level of service, while a higher tariff applies to consumption in the second block.

d) Two part charge. This comprises a fixed charge plus a volumetric component.

e) Economic Efficiency in Cost Recovery

User charges should be sufficient to meet the marginal cost of supply. If the cost of supplying water from a new source is higher than for the existing source, it may be necessary to adjust the tariff. Water supply and sanitation improvement programs may result in changes in operating costs, which also need to be captured in revised tariffs. Elasticity of tariffs is important: tariffs should be responsive to changes in population, household income, and inflation, which affect demand and production costs. In the past, charges have remained fixed for long periods irrespective of these factors. The second

part of the note (sections on ‘Tariffs and Cost Recovery’ and ‘Affordability and Services to the Poor’) discusses policy reform and practical initiatives and options to achieve improved cost recovery and, by implication, achieve service improvements, capital maintenance, and expansion of coverage.

f) Equity and Affordability in cost recovery

Equity in water services means that user charges treat similar customers equally, and that customers in different situations are not treated the same. Subsidies are often used to achieve equity, enable low-income households to gain house connections, or to make services affordable for the poor. Commercially viable services and rational tariffs, however, often bring efficiency gains that may benefit customers more than subsidies. When assessing affordability, it is important to consider both the costs of access (installation of facilities and connection to the city network) and consumption charges. Most utilities can plan for phased increases in tariffs to be compatible with users’ willingness and ability to pay.

g) Operating Ratio

The operating ratio is a primary indicator of efficiency, and expresses operating expenses divided by revenue. An operating ratio less than one indicates a surplus, while a ratio greater than one indicates a loss.

2.11. Country policies and strategies concerning cost recovery: The Africa Experience

Whilst countries like Liberia and Equatorial Guinea have no policies on water and sanitation, some of those countries with policies on water and sanitation have no concrete

strategies regarding cost recovery. e.g. Kenya, Ethiopia, Burkina Faso, etc. Even countries like Algeria and Benin, which recognize cost recovery in their water and sanitation policies, have amongst their leading constraints inadequate cost recovery frameworks. Table 2 provides a summary of the latest water assessment report from W.H.O in 2000, updated with recent information concerning water and sanitation policies and cost recovery strategies. Whilst there seems to be some level of cost recovery in some, mainly urban areas of Africa, in most of the cases of non-networked services, the amount recovered is far less than the cost of constructing and maintaining the services.

Table 2.2 Summary of water cost recovery strategies in selected countries

Country	Cost Recovery Strategy
Algeria	**Cost recovery through appropriate tariff structure**
Botswana	**Price determined by Department of Water Affairs and Central Government** **Water from standpipes free** **Aims at 33% recovery of O&M in smaller villages**
Burkina Faso	**Users pay 100% O&M and 5-20% capital costs**
Ethiopia	**Water as an economic good** **Recovery of O&M in rural schemes**
Ghana	**5% community contribution for capital costs** **100% community contribution for O&M**
Kenya	**Provision of water supply will be in line with the government policy of cost sharing and Minister of Water Affairs will fully encourage the active participation of beneficiaries in the development and operation of water supplies.**
Mozambique	**Attainment of full cost recovery by the year 2003 for urban water supply.**

Namibia	**Consumers must pay for their own water supplies and excessive water usage is discouraged.** **Water supply to rural areas shall be on cost-recovery basis at least for operation and maintenance.**
Nigeria	**Priority is given to rural communities that are prepared to pay at least 5% of the capital costs in cash or in kind.** **Communities must be prepared to meet all the O&M costs for the facilities.**
Senegal	**User contribution 3% for capital costs and** **100% for O&M**
South Africa	**Free basic water of 25 litres/person/day.** **Subsidy from national budget.** **The user pays for higher service levels.**
Uganda	**Users should contribute to 2-5% of the capital cost and 100% of the operation and maintenance costs.**
Zambia	**Full cost recovery in the long run**
Zimbabwe	**10-70% capital costs100% O&M**

Source: Adapted and updated from W.H.O, 2000.

2.11.1 Botswana

The Department of Water Affairs ran the water supply of the large villages, mostly district capitals, whilst the District Councils run the water supply in systems in other villages. Water is provided through standpipes and individual connections. Standpipes are found throughout the villages to provide each villager access to water within not more than 500 meters walking distance. For social and equity reasons, water from stand pipes is free. For individual connections, the price of water covers only the operational costs.

This price is determined by the DWA and the Central Government. The main features of rural water pricing in Botswana are:

- Partial cost recovery and high subsidies as supply costs tend to be higher in rural areas than in urban areas;
- The water tariffs staggered with a low-subsidized unit price for low consumption (up to $5m^3$ / month / connection) and a higher unit price for higher consumption levels;
- The same price applies throughout rural Botswana, irrespective of the costs of water supply in a particular village.

The situation in Kgalagadi North indicates there has been modest increase in aggregate water consumption, 69% in the lowest block, between the periodsof1993-1997 with price increases. In contrast, consumption by large water consumers has increased by 538% within the same period. These large consumers do not seem to be responsive to price increases as water bills for public services are centrally paid and the costs of commercial companies are passed on through the prices of goods and construction projects.

On the other hand the fact that small consumers do no increase their water consumption may be that they evade the high water bills through abuse of standpipes especially for activities such as watering livestock, gardens and construction activities. The dual water right which provides free standpipe water offers the opportunity for individual users to avoid paying any water at all. This may go against the water conservation policy effect intended with the water prices and the block tariffs.

The national policy also considers Government's social obligation to those who cannot afford the water prices by setting a low tariff at the minimum household requirements. The tariff aims at 33% recovery of the operating costs in smaller villages. In spite of these, cost recovery in the villages has not been achieved. This is attributed to poor billing and revenue collection as well as a small consumer base for the block tariffs to be effective. To halt the above situation the Department of Water Affairs upgraded the billing system in areas of their jurisdiction. This was aimed at improving the revenue collection and better accounting for water usage (Arntzen et al, 2000).

2.11.2 Burkina Faso

The national water policy of 1998 long term objective is Integrated Water Resources Management according to the principles adopted in Dublin (water as an economic good) and Rio. The policy follows 9 key principles which, among others, include social equity and polluter pays principles. The priority of water allocation is given to drinking water and for other uses; priorities will be defined taking into account local conditions. The policy mentions that all the costs of building infrastructures should be recovered as much as possible and recurrent costs should be covered 100% by the beneficiaries. Users should pay between 5-20% of capital costs depending on the technology.

2.11.3 Ethiopia

The water supply and sewerage development plan recognises water as an economic good and indicates moving towards full cost recovery in urban schemes and recover operation and maintenance costs in rural schemes. In 1992, the Ethiopian Social Rehabilitation and Development Fund (ESRDF) were set up and was the major source of financing for

community based total water supply. Investments averaged US$ 10 million per year. However, studies done in the last 5 years report that a third to a half of water schemes in rural areas are not functional. This ESRD fund will be closed and a new Water Resources Development Fund (WRDF) will take over, focusing more on urban areas. The minimum community cash contributions for capital costs has been suggested to be 5%, but data from 2001-2 shows that contributions from communities for capital investments have averaged 2% and user charges have covered 64.3% of total recurrent costs (WSP, 2004).

2.11.4 Ghana

Unlike before 1994, when water management was centralized and supply driven, the current policy for water supply and sanitation in Ghana is based on a system where local governments and communities plan together the desired systems, communities operate and maintain their own water services and the private sector is active in providing goods and services such as drilling, construction of systems and training of user groups. During the period characterized by the centralized management system, the parastatal agency was biased towards urban water supply. Revenue collection from rural users was very low. The government of Ghana then regarded water as a social good hence the reluctance to impose cost recovery on consumers. In contrast, it could not raise the capital for construction or to cover the operating costs required. Table 2.2 shows the new arrangement for cost sharing with communities under the National Community Water Supply Programme.

Table 2.3 Cost sharing with communities in Ghana

Item	Community Contribution
Capital cost for water supply	5%
Operation and Maintenance	100%
Individual Household Connections	100%

Source: Acheampong (2005a)

For the capital costs, the government/donor and the District Authority provide 90% and 5% respectively. The funds are raised differently from community to community. They include: per capita labour contribution of people above 17 years old, water vending, levies per household, sale of farm produce, kilo-kilo (kilogram(s) per adult person or household), contributions of cash crops such as cocoa and some food crops such as maize and vegetables. They can also include the sale of communal properties, often land and communal productive ventures. In some instances the higher income individuals make volunteer contributions for the communities' capital contributions.

The 5% percent community contribution is intended to promote a sense of community ownership, but it is believed that this policy may discriminate against the poorest so communities and local governments find ways to circumvent the policy if the poorest people are to be saved. This is often implemented through a community-managed cross subsidy, whereby the poor are identified and are exempted from paying. For operation and maintenance in Ghana, each community fixes their own tariff based on guidelines circulated from the CWSA - Community Water and Sanitation Agency - through local

governments. The decisions of the communities are endorsed by the water and sanitation development boards of each community and approved by the local government.

2.11.5 Kenya

The Kenya Finland Western Water Supply Programme was co-financed by the governments of Kenya and Finland. As a departure from the supply driven approach, the phase which started in 1993 was based on demand driven approach. Under this new approach beneficiaries were supposed to be willing and prepared to take over the responsibility for managing the projects and paying for construction, operations and maintenance costs.

The programme prepared promotional materials in the form of modules to facilitate the knowledge of the communities towards water supply development and sustainability. Among the 8 modules were the following: demand driven approach in water development which covers policy issues governing water supply development and how various development partners relate to one another self-management support which presents back-up support systems for sustaining water projects on a self-help basis. Before the implementation of the projects, communities were among other things supposed to form and register the management committee, open a bank account and proceed with land clearing. During the implementation, communities provided labour and materials which were quantified and deducted from their required monetary contributions. The private sector, comprising profit making organizations, businessmen, insurance companies,

contractors etc., were to advance loans and credit to communities in need of such services (Saxen-Rosendahl, 1995).

2.11.6 Mozambique

The new policy recognizes water has economic and social value and communities need to make upfront payments which would also enhance the sense of community ownership. The policy also recognizes that many of the people are poor and hence in this sense the draft implementation states that "the maximum rural communities would be asked to contribute is 2% of the average cost of the water point "(DNA 1997, in Breslin 2001). Communities are responsible for 100% operation, maintenance and replacement of these systems. In line with the government policies, communities were given a range of options for making capital contributions. Within the pilot province, communities were allowed to pay in kind instead of cash. Rather than contributing labour as in the past, communities preferred paying in the form of sacks of maize. It was learnt from responses to surveys that the 2% contribution was affordable to the communities as all the communities paid their capital cost contribution and in addition assumed ownership of the facilities. However, ability to contribute to capital costs does not mean that communities can subsequently meet the operation and maintenance cost of their water facilities.

Whilst the people had little problem contributing agricultural products to improved water sources, there were problems for acquiring spare parts. It was learnt that converting crops to cash in the province is not easy to do and in order to buy spare parts they might have to

travel about 140km, which is very expensive. Spare parts dealers are not willing to exchange spares for agricultural products. In addition, it was learnt that private vendors had little/ no interest in selling spare parts because they knew that the market was not interesting enough. Choice of technologies given to the communities was carried out in a way that allowed communities to avoid hard sustainability issues. The technology choice was not linked to a meaningful and realistic cost contribution. Communities selected hand pumps because the capital cost was low, but costs did not reflect what it would really cost to sustain the hand pumps in the future (Breslin, 2001).

2.11.7 Namibia

The National Water and Sanitation Policy of 1993 has the following broad sectoral objectives; Essential water supply and sanitation should become available to all Namibians and should be accessible at a cost which is affordable to the country as a whole; This equitable improvement should be achieved by the combined efforts of the government and the beneficiaries, based on community involvement, community participation and acceptance of mutual responsibility; Communities have the right, with due regard for environmental needs and the resources available, to determine which solution and service levels are acceptable to them. Beneficiaries contribute towards cost of services at increasing rates for standards of living exceeding the levels required for providing basic needs.

In the context of the above sectoral objectives, the agency responsible for service supply [Directorate of Rural Water Supply (DRWS)] is tasked to supply clean water to the

communal areas of Namibia. The policy aims at achieving cost recovery through community based management. This is clearly stated among the targets of DWRS which also describe the policies and the objectives of the directorate as follows; Community based management of all water points has been chosen as the strategy for achieving the targets in a sustainable manner.

2.11.8 Senegal

Currently, in Senegal, government and users share the operating and maintenance cost of water supply. Government is responsible for meeting expenses related to the renewal of boreholes, reservoirs or water towers and mains. The users are responsible for meeting the costs of fuel and lubricants, staff, maintenance and overhaul and repair of equipment, renewal of pumping systems, lateral mains and distribution points. The main tariff systems for recovering costs are the fixed subscription used by 49% of boreholes and the sale of water by volume (51% of boreholes).

The fixed subscription is the means used in areas where there are no meters or the meters have broken down. The sale per volume uses 25-liter containers. Households sometimes contribute in kind through participation in the construction of the facilities in order to minimize their cash contribution. Beneficiaries of community water facilities do mobilize amounts of money prior to the construction of the facilities. Cost recovery is done through sale of water to users by volume through volumetric meters installed on all public and private distribution structures for both human and animal consumption.

Standpipe operators are responsible for collecting money that corresponds to the volume of water fetched.

2.11.9 South Africa

The South African national water and sanitation programme is based on the human right to water and sanitation and these were enshrined in the constitution in 1996. The national programme has a clear policy and legislative framework, and implementation programme. The policy is clear on providing free basic water for all which aimed at ensuring that low affordability does not prevent access to water. The implementation is also being enhanced by the devolution of responsibility for the national to local government. However, there is concern about the capacity of local government for implementation of water and sanitation services and as well as the financial sustainability of free basic water. Until 1994, there were no coherent national policies and guidelines or support structures for water supply and sanitation. Whilst the white-ruled areas offered water and sanitation services with standards similar to those in developed countries, black-occupied rural areas were often with no services.

The situation in the black urban areas was however mixed. After the apartheid regime, the new government tasked the Department of Water Affairs and Forestry (DWAF) with the responsibility of ensuring that All South Africans have equitable access to water supply and sanitation. DWAF produced a policy on community water and sanitation in 1994 after consultation of a range of stakeholders. This policy provided the foundation for the legislative and regulatory framework, which was later enacted with the Water

Services Act in 1997. It is estimated that the average cost of providing water per person is $90, which is regarded as high for rural water supply. This is due to high engineering-driven design standards, technologies that might be difficult for local governments to maintain and too expensive for users to fund. The constitution also states that water must be available within every 200m of every person's house, which implies high costs for reaching scattered rural populations. The South Africa government provides 100% of capital costs for both water and sanitation. For operation and maintenance the basic level of water of 25 liters per person per day is free, but higher levels of service should be paid for by the users. The operation and maintenance of the free basic water is paid by a subsidy from the national budget. In spite of this, there is evidence of many users who are failing to pay for the higher levels of service and thus leaving the operation and maintenance costs wholly on national subsidy.

2.11.10 Uganda

The reform for water and sanitation in Uganda began in 1998 and led to the development of the National Water Policy (NWP) in 1999. The reform is tailored towards ensuring that water supply and sanitation services is provided with increased performance and cost effectiveness. The reformed process has strengthened the regulatory framework and provides the basis for cost recovery. It has stipulates that users should contribute to 2-5% of the capital cost and 100% of the operation and maintenance costs. The central and local governments are to offer support for rehabilitation and major repairs of water facilities (Robinson, 2002b). For small towns, whilst ownership for the systems remains with the local government, the service delivery is to be contracted out to local service water and sanitation authorities or local private sector. An independent institution was to

be set up for regulating private sector participation. All except one of the eight small towns that have been operating under management contracts since mid-2001 are approaching full cost recovery for operation and maintenance (Okuni and Rockhold, 1995).

According to the national policy, individual households are responsible for raising 100% capital costs for household latrines with no subsidy from government. The sanitation component of the rural water supply and sanitation investment plan only covers provision of communal public latrines, sanitation promotion and support to district programmes. Like for other African countries, the World Health Organisation Assessment in 2000 identified the lack of adequate cost recovery frameworks as one of the limitations of the sector.

2.11.11 Zambia

The water and sanitation policy was prepared by the Ministry of Local Government and Housing and the Ministry of Energy and Water Resources. Whilst the policy recognizes cost sharing and recovery, there is no clear implementation strategy in that regard. According to the policy, "Sustainability is assured using a cost recovery approach to the provision of water by encouraging user communities to contribute towards the investment cost of the water and sanitation schemes, in cash or in kind as may be agreed with the community concerned and to establish a revenue collection mechanism as contribution towards operation and maintenance (O&M) of the water scheme" (Phiri, 1999).

2.11.12 Zimbabwe

The Integrated Rural Water Supply and Sanitation Programme (IRWSSP) was initiated in 1985 which was tailored towards providing the entire population of Zimbabwe's communal and resettlement areas with access to safe and adequate water and sanitation by the year 2005. Initially, the national programme was hesitant in funding household-owned water facilities like the family wells. However with the failure of the centralized operation and maintenance system, the inability of the communities to maintain community water points leading to the frequent breakdown of boreholes and other communal facilities, the productive benefits and the financial sustenance of the family wells (Acheampong 2005b), the national programme considered household-owned family wells as one of the subsidized technologies for rural water supply. See table 2.3 for user contribution for water supply and sanitation facilities.

Table 2.4 Funding capital costs of water supply and sanitation facilities

Facility	User Contribution	Subsidy Programme
Family	70	30
Deep Well	10	90
Borehole	10	90
Shallow Well	10	90

Source; Water Supply and Sanitation agency, Zimbabwe

The 1985 National Management Plan for the IRWSSP stipulated centralized operation and maintenance. Government was wholly responsible for recurrent expenditure in order to increase sustainability. This system popularly known as the three tier maintenance system became less effective as the number of water facilities grew and government

allocation dwindled. During the period, O&M costs for communal water facilities were funded by government whilst households were responsible for the 100% operation and maintenance of family wells and Blair Latrines. The adoption of the Community Based Management in 1999 leaves users responsible for meeting 100% of O&M cost of all facilities. The inability of users to raise enough funds due to the current negative effects of the economic crises of the country, and the lack of skills for O&M for pump maintenance has resulted in the breakdown of greater number of communal water points.

2.11.13 Nigeria

Nigeria's National Water Supply and Sanitation Policy have recently been adopted, precisely in year 2000. The policy makes water supply and sanitation a right to all Nigerians but it also recognizes water as an economic good and calls for the running of water supplies as businesses. It also recognizes the specific needs of women and the poor and thus recommends "free" water for the poor (Federal Republic of Nigeria, 2000). This is seen to make the policy inconsistent. The principles underlying the current policy for rural water supply are that communities must:

- Choose the level of service that they are willing and able to pay for and make their own rules as to the use of water;
- Take full responsibility for all aspects of maintenance and operation of their water systems;
- Pay the full price for maintenance and operation of their water supply systems and a part of the capital costs which is 5%

The policy is silent on cost recovery strategy for sanitation. In implementing the policy, the programme intends to first invest in States which are sufficiently well developed to make rapid progress, while others are brought gradually (but urgently) up to the same level. There are two considerations for implementation: Available resources are spent as cost effective as possible; and Resources are devoted to the highest priority among investment alternatives.

This is based on the belief that the more money can be mobilized and the better it is spent and recovered, the faster the improvement will come and the sooner adequate service will be achieved. However, there is the possibility of paying less attention to the very poor with limited resources. One of the policy strategy or principles of the National water supply and sanitation policy of Nigeria 2000 is that water has "an organic, social and concurrently an economic value. To ensure that service provision is viable, the price of water should reflect its economic value, with the eventual objective of covering the cost of supply". Because of the differences in institutional aspects, content and magnitude between the urban and the rural water and sanitation sector, the policy presents the urban and the rural sector separately. For the urban areas, the policy states that water will be provided at costs, in order to make the water supply system sustainable.

(a) Perceptions on the Water and Sanitation Policy of Nigeria

The policy does not state what it sees as basic services. It is often stated that water is a human right, however does not clarify what is meant with that in the Nigerian context (amount, quality, time to get water etc.). In general, the Nigerian National Policy on

water and sanitation is considered to be a reasonable policy. It is non-controversial and logical and contains all important elements a water and sanitation policy should cover. A number of sector players indicated that it should be translated into operational rules and regulations, which is lacking at the moment. The policy states for example that special attention should be given to the cost recovery, though no indication is given on how to achieve this.

The policy requires explanation in a lot of places, the policy does not state what is being regarded as basic services and cost recovery. It is often stated that water is a human right, but it has not been clarified what is meant with that in the Nigerian context (in terms of willingness to pay, accessibility among others). In general cost recovery is considered to be an important instrument to ensure ownership and in that way improve the sustainability. It is feared that if user groups do not share in the costs, they will be completely dependent and will not share in the responsibility. Therefore would not feel responsible for the efficient operation and maintenance of the water supply system. If the users pay for their services, it would give them a voice and certain rights as well. If poor people are asked to contribute as well, this should give them also a voice in the site selection of the water supply facility in the rural area and will give the urban water user the right to demand better water supply services. Another important reason why cost recovery is considered to be very important is to reduce donor dependency. The policy state that users should bear part of the costs. However, different opinions circulate about which costs should be recovered from the users and in what way. Most international and bilateral donors for the water supply service sector demand that at least the costs of

operation and maintenance (O&M) should be met in- country and by the users. In Bangladesh, there is little controversy on this point. Recovery of the capital costs on the other hand, is more a point of discussion. As discussed above, the policy prescribes that the capital costs should be recovered from the users as a percentage of the actual costs. This is considered neither practical nor fair by a lot of stakeholders. Other stakeholders argue that a larger part than the prescribed costs should be recovered. Advocators for more recovery of the capital costs often refer to the fact that historically a large part of the pumps have been bought and installed privately. In that case, 100% of the costs have thus been borne by the users. In the remaining cases, water supply facilities have been implemented by the government and NGOs, with (financial) support of donors. The idea is thus that a large part of the people is willing and able to pay for their private water facilities.

The challenge is to create a strategy for the people who do not have the capacity to do this. At the moment, the subsidies are available for all. The policy does not indicate who should and who should not benefit from the subsidies. However it does mention that the subsidies should be gradually reduced, by introducing cost sharing. In this time, water supply was heavily subsidized. Because of the power structure in the community, most benefits of these subsidies went to the rich in the time that water supply was heavily subsidized and thus almost for free. The rich have been able to benefit from all the subsidies. Therefore, more and more people are becoming convinced that subsidies are no longer the right way and that other strategies should be examined, so that life can be made easier for the poor.

(b) Challenges of Developing Workable Cost Recovery Policies for Water Services in Nigeria

Clearly, the cost recovery on water service over the last ten decades in Nigeria has passed through several phases and developments mostly characterized by:

- Too many short-lived and incoherent policies and very little action;
- lack of proper policy coordination mechanism;
- excessive politicization of service and corruption;
- lack of policy continuity;
- excessive international pressures with poor local institutional and technical capacities to adapt;
- very many agencies with none effectively in charge;
- unrealistic assumptions of situations and;
- Poor implementation as a result of a lack of political commitment and corruption.

2.12. The Water Supply Policy of Benue State

In Benue state, due to political reasons, many of the water board administrations either did not or could not ensure that operating and maintenance costs were paid by consumers and soon found that their entire budgets were consumed in maintaining the existing very low levels of services. The result was that a small portion of the population enjoyed free services whilst the majority had no services. Donald (2002) also mentions that the other reason why operation and maintenance costs should be borne by the communities is the principle of community based development. If the community expects some outside agency to be responsible for keeping their supplies going, they will have no control over

the processes and lose leverage and ownership. Responsibility for keeping the service going is placed with a remote authority and accountability is lost. This will have impact on the reliability of the supplies since the person who has to carry water every day is likely to be far more interested in the sustainability of the village water scheme than some remote government officials. According to the ministry of Water resources (2008), for cost recovery to work effectively, particularly where both the beneficiary households or settlement hierarchy and an external subsidy are covering costs, there must be clarity on the responsibilities for paying different costs.

There are many Water supply board water supply service schemes where the settlement hierarchies are supposed to be paying for diesel (for example), but where the government ends up paying the bill. If funding is coming from more than one source, then a transparent allocation of costs is essential. Donald (2002), argues that the `` ability to pay`` is the real problem with unemployment rates in the study area at 35-40% (as high as 90% in some settlement hierarchies), with average household incomes in high density area below ten thousand naira per month, many households are simply unable to pay the costs of services they use. For water, the promise of six free kilolitres per household per month also offers little financial respite due to the fact most poor households need much more than six kilolitres (partly because of the larger number of people per household but also because the old and poorly constructed apartheid era infrastructure means that up to 40% of water going into townships is lost to leaks). Rapid tariff increases after this free block can then mean that poor families are paying more, and not less, for water. Most importantly, the six kilolitrefigure is based on an average household size of eight people

and works out to 25 litres per person per day- half of the World Health Organisation's recommended minimum of 50 litres per person per day for basic needs and a healthy existence. The fact that these free services are calculated on a per household basis regardless of the actual number of household occupants, and regardless of household income, biases yet again against poor South African households.

2.12.1. Policy Context

In year 2000; millions of Benue state citizens were living without access to safe water supply and sanitation. At this time, it was estimated that over two thousand million people in areas had inadequate access to basic water supply services and that 21 million did not have the basic level of sanitation (Benue state, 2002:106). It is acknowledged that the Department of Water Affairs and environment has come to realise that many people do not have access to an adequate supply of drinking water and basic sanitation. It is thus a goal of the government to ensure that everyone has essential basic water supply and basic sanitation (Benue state government official Gazette of 2007, Act no 108, section 3).

According to the White Paper on Water and Sanitation (2007: 15), basic water supply is defined as 25 litres per person per day for direct consumption within 200 meters of the home and of acceptable quality. Water is essential for our lives and should be made available for all domestic activities as stated in the White Paper on Water and Sanitation (2007:11). It can be saved by closing taps and not leaving them running, by repairing leaks and using wastewater from the house to irrigate crops and trees. Adequate and safe drinking water supplies and appropriate sanitation facilities form part of a sound basis for

improvement in community health. Maximum health benefits can be achieved only if water and sanitation facilities operate continuously and to the full capacity with the acceptable standard of quality and quantity. Therefore, operation and maintenance must be carried out effectively and with efficiency (Ministry of Water Resource and Rural Development, Benue state 2008:14). White Paper on Water and Sanitation (2007) states that sustainable water services must always take into consideration the protection and sustainability of the environment because environment is a foundation from which resources are derived and it is important to protect and conserve the environment. From the Benue state perspective, the contribution of water services to development is of course far wider than their impact on households. Water is a key factor of production in manufacturing industry, power generation, mining and agriculture. It sustains the natural environment, which is why it is the quantity of water available, which is critical, but also its quality, its fitness for use. For this reason, both sanitation services and economic activities, which can pollute water and render it unfit for use, must be controlled (White Paper on Water and Sanitation, 2007:2).

2.12.2. Critique of the free basic water policy

For water, the promise of six free kilolitres per household per month also offers little financial respite due to the fact that most poor households need much more than six kilolitres (partly because of the larger number of people per household but also because old and poorly constructed apartheid era infrastructure means that up to 40% of water going into townships is lost to leaks). Rapid tariff increases after this free block can then mean that poor families are paying more, not less, for water. Most importantly, the 6 kilolitre figure is based on an average household size of eight people and works out to 25

litres per person per day- half of the World Health Organisation's recommended minimum of 50 litres per person per day for basic needs and a healthy existence. The fact that these free services are calculated on a per household basis regardless of the actual number of occupants, and regardless of household income biases yet again against poor Benue state household.

2.12.3. Payment of Water Services

The Water Services Act emphasises that the primary consideration in the water services policy is the provision of a `` basic water supply`` to all households. The purpose of this regulation is to ensure that the tariff for a basic level of service is affordable even to the very poor. According to the Water supply board`s policy on a free basic water supply, a water institution should make every effort to supply the basic water supply quantity of six kiloliters per household per month free of charge. It would be the norm for users supplied out of standpipes and by means of controlled volume supplies to use not more than a basic supply and it would also be expected that these users would generally be representative of lower income groups. It should thus be the norm for such users to be supplied free of charge, or at the lowest cost that the water service institution can afford. (Guidelines for Compulsory State Standards for Water Services Tariffs, 2008:71)

2.12.4. Different Mechanisms available for Cost Recovery

According to Kuma (1996) the different possible tools available for cost recovery are:

- Water tariff
- Water tax as a percentage of rate able value where the properties do not have a metered water supply or water tax on the basis of floor area.

- Water kiosks systems for revenue generation through stand posts.
- One-time development charges/ water utility service charges collected through Land Development Authority.
- By internal cross subsidization by diverting other sources of funds like for water supply purpose.

2.12.5. Guidelines for Cost Recovery

For any water supply scheme, the pricing structure should be such that 100 percent cost recovery should be ensured with a minimum burden on the poorest.

- Factors such as capacity to pay, benefits derived and proportionate cost of the service has to be considered.
- The rate must be enough to fetch the necessary revenue and at the same time not so excessive as to discourage consumers from making use of water or opting for alternative sources, which ultimately affect the pricing.
- Pricing system should be attractive; otherwise beneficiaries will explore the possibilities of alternative arrangements.

2.12.6 Consequences of poor cost-recovery

In many countries, the issues of cost-recovery and sector sustainability were ignored for a long period. As a result, tariffs set were unrealistic and frequently there was insufficient Government subsidy to make up the shortfall in the costs of the service provided. In consequence, the infrastructure has deteriorated and service quality has declined. This process is outlined in figure 1 below.

Inadequate cost-recovery will result in an inability to operate and maintain existing supplies properly with consequent increased of leakage, water supply interruption and

likely deterioration in both the quality and quantity of the water supplied. This will lead to increased public health risks, a likely increase in morbidity and mortality rates and an increased burden on the health care system.

Inadequate cost-recovery will also result in an inability to extend water supplies to unserved areas, thus continuing a cycle of inequitable access to water supplies. This not only fails to satisfy the basic human right of all peoples to have access to an adequate water supply (UN, 1977), but will continue to place a continued extra burden on the health care system. It is vital that sufficient resources are raised from existing water supplies not just to ensure their continued functioning, but also to extend services to the urban and rural populations who lack access to an adequate water supply.

2.13. Cost-Recovery Issues in Makurdi Metropolis

According to the White Paper on Water Supply and Sanitation Policy (1994:23), households and other water consuming groups must pay for the operation and maintenance costs to ensure both equity and sustainability. Where they do not pay, and government must cover these costs on their behalf, the result is a rapid reduction in finances available for the development of basic services for those citizens who have nothing. Cost-recovery has not been the modus operandi of the Benue state government particularly Makurdi metropolis. During apartheid, many inhabitants of city received subsidized services and infrastructure. Elite suburbanites and government owned establishment benefited the most from these subsidies, with service levels and subsidies in elite settlement areas that equaled, and often surpassed, European and North American standards (Donald, 2002). Much of this subsidization came at the expense of average

workers and consumers who generated the economic surplus and paid the taxes necessary for lavish state spending in elite areas. It is indicated by Donald (2002), that from 1976 as Benue state became a democratic state particularly Makurdi the state capital, the government claimed, for example, to have provided approximately 1.5 million people with access to potable water, connected fifth thousand households to the great Makurdi water works. What these otherwise impressive statistics hide, however, is that hundreds of thousands of low-income households are unable to afford the prices being charged for these services-due in part to policies of increased cost recovery, and are unable to benefit from the infrastructure being provided.

Donald (2002:) highlights that the most tragic example of inability to afford services began in mid-2000 in Benue state cities, when the provincial government in Makurdi began charging residents for water that used to be free. Thousands of poor households could not afford these costs and began using nearby rivers and well water. Within weeks, cholera broke out, claimed more than 250 lives and caused more than 100,000 cases of illness. Cost-recovery then seemed to be a major factor as it was the cause of the cholera outbreak. It cost the Benue state government much to deal with the cholera crisis than it did to provide free water. To give some sense of the scale of the problem, Donald (2002), indicates that, approximately 20,000 people (mostly children under the age of five) die from diarrhea related illness in every year. Direct medical costs for all are $1.2 billion naira, with broader losses in economic production totaling another $2.5 billion, and to supply proper water and sanitation to everybody in the country would cost less than two-thirds of that. As indicated by MacDonnell (2001:34), scarce financial, human and water

resources are major constraints on the delivery of sustainable water supplies to the previously disadvantaged rural communities of Benue state. During the period 1994-2000, the prevailing view in the Benue state water sector was that some form of cost-recovery from the beneficiary communities was necessary to compensate for the scarcity of external funding. Cost-recovery became so central to sustainability that, in many schemes, it became almost an end in itself.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This section presents the methods and procedures used to conduct the study. Apparently, the chapter describes the items necessary for the study. The items discussed include the research design, sources of data collection for the study, the selection of areas for the study, the research instrument and the techniques to be used in administering the instrument and procedures of analyses.

3.1 Research Design

The research involves field survey of socio-economic potentials that influence cost recovery from household, in addition to secondary data from the water board on the cost recovery portfolio. The rich context and manifestation of this cost recovery issues is toobtained from a thorough analysis of the indicators to cost recovery and implications of the evaluation to sustainable water supply. To achieve the goal of the study, the following information background is to be determined.

- Cost of water supply service survey from the agencies in-charge of water services.
- The socio-economic survey; to determine the demand-side capacity of household's in-terms of their scale and capacity of demand; ability and willingness among other things.

3.2 Study Variables and Sources of Data;

The study variables included those derived from the review of the activities of cost recovery practice of the water board and an activity survey of the users of water supply services of the urban area using questionnaires. Both surveys are aimed primarily at providing data on the existing cost recovery situation and the evaluation of the feasibility of the cost recovery indicators in water supply services in the study area. Two sources of data are to be used; the primary source is primarily deals with the field survey which is to

be conducted on the household heads, while the secondary data is to be obtained from search and reviewed materials like; books, journals, magazines among other relevant published and unpublished materials.

3.2.1 Description of the Existing Cost Recovery Indicators

The survey is designed to generate background information on the existing status of cost recovery in water supply service. This seeks to address the feasibility cost recovery in water supply with focus on the indicators and socio-economic potentials. The approach is that of applying the cost recovery indicators and socio-economic characteristics of households as used by World Bank (2003). For this purpose, data is to be sought from the records of the water board and with the management staff as well as with the household heads as shown in table 3.1

3.2.2 Indicators for Cost recovery Survey

Tariff Structure

Billing Efficiency (i.e. Moderate, High, Low

Operation Expenses (Production and Supply Cost)

Operation Revenue Generated

Table 3.1EvaluationMatrix for Cost Recovery in water supply

INDICATORS	LEVEL AND POINTS			
	Very	Strong	Medium	Weak

	Strong			
Level of accounted water supply	>50%	35-50%	20-35%	5-20%
Annual amount for water production from the government	>100% of CR	70% of CR	>50% of CR	<50% of CR
Annual revenue collected from consumers	>100% of O& M	<100% of O & M	>50% of O & M	<50% of O & M

Source; Akintola, F.O (2002)

3.2.3 Description of Survey to be conducted

A household is defined as independent family units comprised of married or single persons and their dependents, excluding extended family units. In Makurdi, as in all Nigerian cities, residences are commonly consisting of multiplicity of households sharing a compound. Since the focus is on residential units, only one households head is to be interviewed in each compound. A structured questionnaire is to be addressed to the household head; the questionnaire is tailored towards obtaining information background on the cost recovery characteristics, willingness to pay the charges/bills for water service delivered. The information concerning water board is to be sought from their records

Table 3.2 Structure of the Household Survey

Subject	Household

Characteristics	Age, Income, Household Size, Type of Housing Units and Daily consumption
Expenditure on water supply	Monthly expenditure on public water supply and Annual expenditure on public water supply
Access to water supply	Alternative sources of water supply to households,
Willingness to pay for the service	Maximum amount willing to pay for the service delivered
Opinion and Suggestions	Present situation and implications with existing tariff and bills payment

Source; Author, 2014

3.3 Technical Criteria used in evaluation of cost recovery and cost allocation in water supply

The feasibility of cost recovery for water supply in the study area is to be evaluated in terms operational cost and revenue generation, however, the evaluation of cost recovery is not isolated from the cost allocation and the socio-economic potentials of household to pay a predetermined fee that would constitute cost recovery. This is clearly; a direct approach to the evaluation of cost recovery as it does relate to the socio-economic potentials and characteristics of the consumers. It is for this reason that the willingness to pay (WTP) survey, in which the potential capacity to recover cost in water supply is to be determined hypothetically. Willingness to pay survey aim at securing relevant data for

the identification of strategic options for cost allocation towards cost recovery in which water supply is to be sustained.

3.3.1 Estimating willingness to pay

Contingent valuation (CV) is the most widely employed method in the assessment of willingness to pay especially in the water supply. The method involves the presentation of a scenario of an improved service in a questionnaire survey where the respondents would be asked to pledge an amount they feel they can and will pay should the cost recovery is to be at a specific standard (Whittington et al 1989; 1993). The aggregate and mean values are to be used for comparing with the cost recovery and allocation estimates to determine the level of willingness to pay. However, the method obviously could have some shortcomings such as: - Attaching a realistic economic value of water supply from the public piped facility may be difficult in such case; the interviewer may have to salvage the situation by informing the respondents of the actual cost of providing the water to anchor their thoughts and have them respond accordingly. However, this problem may lead to what is described as hypothetical bias. Also, the respondents may not answer truthfully the questionnaires, such that what they could say they are willing to pay may not reflect what they would actually pay in reality. Thus, the study is to make use of open-ended question method to avoid giving the respondents the actual cost of the service or implications of the amount. The purpose is to capture the essential attributes of establishing a dichotomy between willingness to pay and the cost allocation and recovery in water supply with a cut-off figure that represent the cost of operation and maintenance.

Table 3.3 Computation and Unit of Measurements (evaluation) for Cost Recovery in Water Supply

Computation	The indicator can be computed as; 100(WFC/COM) WFC= water fees collected COM= cost of operation and maintenance Note: This indicator can be above 100; in this case the indicator shows there is full recovery of O&M costs.
Units of Evaluation (Measurements)	Indicator measured as a percentage determinants measured in national currency
Data Sources	Secondary data; Annual financial statement of water supply board and field survey data; the socio-economic potentials to cost recovery
Geographic or Spatial Coverage	The built-up areas of Makurdi
Interpretation	Reflects the feasibility of cost recovery in the provision of facilities and water supply sustainability.

Source; Author, 2014

3.4 Study Population and Sampling Design

Considering the "socio-economic feasibility and cost recovery indicator" planning for urban services like water requires analysis and forecast of the city's population. These is achieved by analyzing the nature, and rates of past changes in population, together with a careful estimation of the probable effects of more influential factors, provided valuable clues to future population size.

The Makurdi urban population is estimated at about 300, 377 distributions and the population is projected to 2014 giving rise to about 503,114 people in about 10 neighbourhoods situated in the eight (8) main administrative units 2006 based on the National Population Census (NPC) official gazette was 300377 and the projected population is 503,114 using an interval of 7 years from the base population of 2006 to the research year of 2014.Spatially, this constitutes the Makurdi Urban Area as defined in the Makurdi Master Plan (Benue, 1982).

They key reference point in defining the sample is its spatial spread. This is to as much as possible enable an even spread in the selection of households to be sampled, therefore, on the basis of this spatial structure, a three-stage sampling is adopted. Multiple stage sampling is found suitable for a number of considerations including the following:-

i. The need for a fairly even spread of sampled compounds across the entire urban area necessitated its fragmentation into units that purposively covers the study area.
ii. The lack of current and detailed maps makes it difficult to identify residential units and households categories even within the neighbourhoods.
iii. The likelihood of variability among the categories of households identified in view of the social difference and proximity to the public water supply system is more readily brought to bear in evaluating the data on cost recovery portfolio and socio-economic potential used in this sampling design. Thus, this technique made it possible to draw samples from across socio-spatial areas.

3.5 Sample Size and Selection

The sample size in the study is calculated using the Leslie Kish and Taro Yamene sample size formula (Kish, 1965; Yamene, 1967): According to the purpose of the study, to the population size and the available resources, the sample size of 326 was adopted with 50% as precision level, 95% level of confidence and 0.05 degree of variability (Kish, 1965; Yamene, 1967). Equation 3.0 was used to determine sample size:

$$n = \frac{N}{1 + N(e)^2} \qquad \text{...} (3)$$

N = population size,

n = sample size,

e =desired level of precision error of the sample taken as 0.05

Table 3.6 indicates that a total of 326 questionnaires administered through face to face interviews to the selected residential areas.

Table 3.4 Number of housing units in the Settlement hierarchies and the number of sample instrument per settlement

Disaggregated areas	Average number of Housing unit	Population	Number of Sample
Low Density	4281	17124	15 Questionnaires
Medium Density	42535	255210	145 Questionnaires
High Density	48761	390088	166 Questionnaires

Source; Author, 2014

3.6 Data Collection Tools

The study collected both qualitative and quantitative data. The study will examine the cost recovery situation in water supply of Makurdi. Qualitative data is simply non-measurable data on which, for example, the public's views, attitudes and perceptions on cost-recovery can be obtained. Quantitative data is simply measurable data on which the researcher can collect data on dependent variables on the operating expenses and revenue, expenditures on water services, amount paid, tariff structure, household size, age of respondent, income. The study is to use a questionnaire and interview technique in order to collect information on what causes the households to be unable to pay for water services and the extent to which cost-recovery indicators affects water supply. Both open-ended and close-ended questions are used. The researcher also relied on available secondary material from books, journals and government policy documents.

3.7 Data Quality Control

The instrument is to be pre-tested to determine the reliability and validity of instruments. Pre -testing is to be done before the actual field study among some people who are by the requested is to answer the questionnaires. Instrument validity is to be ascertained by discussing the questionnaire with the supervisor. Validity of the questionnaire was ascertained by checking the accuracy and completeness of responses. Reliability was ascertained by consistence in the responses.

3.8 Data Presentation and Analysis

3.8.1 Data Presentation; contingency tables or graph is the major tools to be used for presenting the results of separate observable indictors, data that will be presented, is to be subjected for descriptive and inferential statistics analysis.

3.8.2 Data Analysis; the interrogation of the data is necessary therefore, using data from the household survey and the portfolio and situation of cost recovery the following is to be achieved;

i. Description of the present situation or portfolio of cost recovery of the water board and establishing the spatial pattern and characteristics of the cost recovery system and cost allocation in the study area.
ii. Evaluating the feasibility of cost recovery on the basis of responses to the willingness to pay survey as reflected across the different neighbourhood and in aggregate terms for the whole urban area. This analysis sought to establish the economic feasibility and role in water supply and its likely implications on the improvement in water supply services.

a. Description of the present cost recovery situation; this category of analysis constitutes the first phase of evaluation of the relationships between the variables

of the study. At this stage, tables or charts of the magnitudes of the existing situation and portfolio of cost recovery system to reflect the following;

i. The operations of water Board; in term of the operation and maintenance cost of producing and supply water and the operational revenue generated.

ii. The institutional framework for cost recovery in water supply.

iii. The current status of cost allocation and recovery, tariff structure; involving analysis of data from the household survey to reveal the spatial pattern of cost allocation and recovery as well as willingness to pay.

b. Evaluation of cost recovery and its implications. As indicated, the feasibility of the cost recovery practice can be evaluated using a comparison between observed willing to pay and the cut off in the cost of production and maintenance of water supply. The cost is benchmarked against the willingness to pay levels (WTP) based on the separate data from neighbourhoods and from the aggregate data for the whole of Makurdi Urban area.

3.8.2 (a) Comparative Analysis

A common thread in the evaluation (analysis) of cost recovery is the depiction of pattern of the observed characteristic descriptively and inferentially along spatial lines, that is, between the neighbourhoods and relative to various socio-economic variables.

Spatial Pattern; this involved analyzing the data to reveal the pattern among the neighbourhoods in term of pattern of cost allocation and recovery, expenditure on water and willingness to pay for water supply. The Hartley method of testing homogeneity of variance of the differences within and between the samples is used, which based on the calculation of an F_{max} value, which is then tested for significance. If F_{max} value is

significant, then the groups are having significantly different variances. In case F_{max} value is insignificant, then the groups will be considered or are declared to be homogeneous in their variance. The Hartley method is based on the procedures which are exactly similar to those of ANOVA where the variance of the non-nominal data are analyse.

Socio-economic Potentials to cost recovery Analysis; the difference arising from the incidence of the key indicators such as per capital income, willingness to pay, expenditure on water supply service are to be assessed using multiple correlation analysis. The analysis is to be employed to establish the strength of the relationships and implications to cost allocation and recovery in water supply in the study area.

CHAPTER FOUR

ANALYSIS AND INTERPRETATION OF DATA

4.0 Introduction

The focus of this chapter is to analyse and interpret the research data collected from the field; this is to establish the cost recovery situation and existing potential for cost allocation and recovery in water supply in Makurdi urban area. The study put on the spotlight the three disaggregated hierarchies that use water in the study area. The data is to be analysed and interpreted from a sample of 326 households for different disaggregated residential types or categories namely; low, medium and high density areas which is coded as ($x_1$means low residential density (high income earners) which 15 views are sampled from the respondents, x_2 means medium residential density (intermediate income earners) which 145 views are sampled from the respondents and x_3 means high residential density (low income earners) which 166 views are sampled from the respondents and 1 questionnaire template for the Water Board.

4.1 Age profile distribution analysis and interpretation; the age profile analysis and interpretation is a nominal data that often exposed the age characteristics of the households in the study area. The purpose of the analysis and interpretation of the data would exposethe age differences among the three residential categories in the study area.

Table 4.1 Age profile distribution of the respondents in the study area

Age categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
18-30	0	5	10	15	5	0	25	100
31-40	2	40	37	79	24	4	1600	1369
41-50	5	60	76	141	43	25	3600	5776
51-60	7	25	30	62	19	49	625	2401
Above 60	1	15	13	29	9	1	225	169
$\sum_X$	15	145	166	326	100	79	6075	9815
Mean value	3	29	33.2	65.2				
N	5	5	5					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	3345.17	4	1115.06	0.59	3.44	< 0.05	There is significant difference in the age status of households
W. Group	15024.5	10	1878.06				

Source; Field Survey, 2014

From table 4.1 and figure above, the percentage of the ageof household is high between the age blankets of 40-51 with 43% (141), 24% (79) are within the age blanket of 31-40, 19% (62) being within the age 51-60, 9% (29) are within sixty (60) years of age and above and 5% (15) are within the age blanket of 18-30in the study area. There is significant difference between and within the age amongst the three groups and the pattern is not uniform.

4.2Housing type distribution analysis and interpretation; the housing type analysis and interpretation is to explore the housing characteristics among the households in the study area.

Table 4.2Housing type distribution of the respondents in the study area

Housing Type	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Compound	0	25	73	98	30	0	625	5329
Block of Flat	10	50	37	97	29	100	2500	1369
Bungalow	5	70	56	131	41	25	4900	3136
$\sum X$	15	145	166	326	100	79	6075	9815
Mean value	5	48.3	55.3	108.7				
N	3	3	3					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	3345.17	2	1115.06	0.59	3.44	< 0.05	There is significant difference in the housing type of households
W. Group	15024.5	6	1878.06				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.2 above and figure 4.2 below, the percentage of the housing type predominately found in the study area is the bungalow with 41% (131), 30% (98) are compound houses and 29% (97). The table also revealed thatthe exclusive mean value of 108.7 signifying that,there is a significant difference between and within the housing types amongst the three groups and the pattern is not uniform as it appears.

4.3Educational qualification analysis and interpretation; the educational qualification analysis and interpretation is explore characteristics of educational qualification of the households in a study area.

Table 4.3 Distribution Educational Qualifications of the respondents in the study area

Educational Categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
No formal education	0	0	3	3	1	0	0	9
Primary education	0	5	12	17	5	0	25	144
Secondary education	2	25	104	131	40	4	625	10816
Tertiary education	13	115	47	175	54	169	13225	2209
$\sum x$	15	145	166	326	100	173	13875	13178
Mean value	3.8	36.3	41.5	81.5				
N	4	4	4					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	3345.17	3	1115.06	0.59	3.44	< 0.05	There is significant difference in the educational status of households
W. Group	15024.5	8	1878.06				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.3 above and figure 4 below, shows the percentage of educational statusof the study area which predominately is the tertiary with 54% (175) second is the secondary education with 40%. The table also revealedthatthe exclusive value of F_{max} for the educational status of the household is 0.59 less than the $F_{critical}$ value of 3.44 at 0.05

level of significant, with a total mean of 81.5 above average mean of 50**.** This is signifying that**,** there is significant difference between and within the educational status amongst the three groups and are significantly not the same.

4.4 Source of Income analysis and interpretation; the source of income analysis and interpretation is to explore the different source of income categories of the households in a study area.

Table 4.4. Sources of income for the Respondents' Households

Source of Income Categories	**Group 1 (X_1)**	**Group 2 (X_2)**	**Group 3 (X_3)**	**Total**	**%**	**$(X_1)^2$**	**$(X_2)^2$**	**$(X_3)^2$**
Unemployed	**1**	**2**	**23**	**26**	**8**	**1**	**4**	**529**
Civil Servant	**12**	**123**	**34**	**169**	**52**	**144**	**15129**	**144**
Self Employed	**2**	**17**	**104**	**123**	**38**	**4**	**289**	**10816**
Social Grant	**0**	**3**	**5**	**8**	**2**	**0**	**9**	**100**
$\sum x$	**15**	**145**	**166**	**326**	**100**	**149**	**15431**	**11589**
Mean Value	**3.8**	**36.3**	**41.5**	**81.5**				
N	**4**	**4**	**4**					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	**Sum of Square**	**Df**	**Variance Estimate**	**F-Ratio**	**F Critical**	**P**	**Remarks**
B. Group	**3345.17**	**3**	**1115.06**	**0.59**	**3.44**	**< 0.05**	There is significant difference in the incomes sources of Households heads
W. Group	**15024.5**	**8**	**1878.06**				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.4 above, the percentage of the source of incomepredominately found in the study area is between civil servant and self-employment with 52% and 38% respectively. The table also revealed thatthe exclusive value of F_{max} for the source of income of the household is 0.59less than the $F_{critical}$ value of 3.44 at 0.05 level of significant with total mean value of 81.5 high than the average mean value of 50**.** This implies that there is

significant difference between and within the sources of income amongst the three groups and are significantly not the same. This depict that the level of cost recovery is perhaps the explanation for this.

4.5Average estimation of the monthly income analysis and interpretation; the average estimation of the monthly income analysis and interpretation of the household is to explore the different level of income status in a study area.

Table 4.5. Average estimation of monthly income earned by the Respondents' Households

Monthly Income Categories (Naira)	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
< 5000	0	0	3	3	1	0	0	9
5000-10000	0	0	5	5	2	0	0	25
15000-20000	0	5	27	32	10	0	25	729
25000-30000	1	30	41	72	21	1	900	1681
35000-40000	3	35	88	126	38	9	1225	7744
45000-50000	4	75	2	81	24	16	5625	4
Above 50000	7	0	0	7	4	49	0	0
$\sum x$	15	145	166	326	100	75	7775	10192
Mean Value	2.1	20.7	23.7	46.6				
N	7	7	7					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	1911.52	6	318.79	5.28	3.44	< 0.05	See below
W. Group	1183.59	14	84.54				

Source; Field Survey, 2014

Remark; there is significant difference in the average monthly income of the household heads

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.5 above, the percentage of the average estimation ofmonthly income predominately found in the study area is within 40000 and 50000 with 38% and 24% respectively. The table also revealedthatthe exclusive value of F_{max} for the source of income of the household is 5.28 greater than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 46.6 low than the average mean value of 50. This implies that, there is no significant difference between and within the monthly earning amongst the three groups and are significant not the same. This depict that the level of cost recovery could perhaps be the explanation for this monthly earning.

4.6Water supply status analysis and interpretation; the water supply status analysis and interpretation among the household is to explore the different characteristics of the water supply statusin a study area.

Table 4.6. Water supply status for residents

Water supply status Categories	**Group 1 (X_1)**	**Group 2 (X_2)**	**Group 3 (X_3)**	**Total**	**%**	**$(X_1)^2$**	**$(X_2)^2$**	**$(X_3)^2$**
Daily	**9**	**25**	**5**	**39**	**12**	**81**	**625**	**25**
Twice a Week	**5**	**88**	**111**	**204**	**63**	**25**	**7744**	**12321**
Once a Week	**1**	**32**	**50**	**83**	**25**	**1**	**1024**	**2500**
∑x	**15**	**145**	**166**	**326**	**100**	**107**	**9393**	**44846**
Mean Value	**5**	**48.3**	**55.3**	**108.7**				
N	**3**	**3**	**3**					

Testing Homogeneity of Variance (F_{max}) value:							
Source of Variance	**Sum of Square**	**Df**	**Variance Estimate**	**F-Ratio**	**F Critical**	**P**	**Remarks**
B. Group	**2676.1**	**2**	**1338.05**	**0.54**	**3.44**	**< 0.05**	There is significant difference in the water supply status of household
W. Group	**14861.6**	**6**	**2476.93**				

Source; Field Survey, 2014

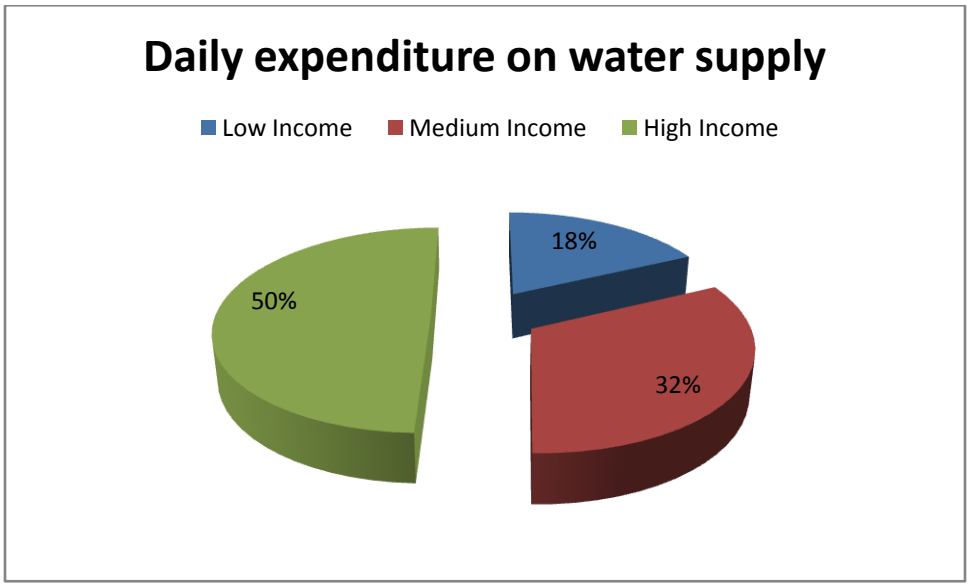
Remark; there is significant difference in the average monthly income of the household heads

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.6 above, the percentage of the water supply status among the households in the study area is predominately found to be twice and once a week, with 63% and 25% respectively..The table also revealedthatthe exclusive value of F_{max} for the source of income of the household is 0.54 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value with total mean of 108.7 high than the average mean of 50. This implies that, there is significant difference between and within the water supply status amongst the three groups and are significant the same. This depict that the level of cost recovery could perhaps be the explanation for this water supply status.

4.7Analysis into daily expenditure on water; the analysis and interpretation into the daily expenditure of households on water explores the different characteristics into the expenditure on water supply in a study area. See the pie chart figure 4.1 below.

Figure 4.1 Daily expenditure on water supply



Source; Field Survey, 2014

From figure 4.1 above, the percentage of daily expenditure on water supply sources among the categories of residential density in the study area is predominately found is approximately N100-150 (N3100/month) representing 50% of the total samples, while the medium and high residential densities have 32% and 18% of the sampled views respectively.This implies that, many households supplement their water needs with purchases from vendors especially during the dry season. And the low income residential density actually spends more daily to meet up with their water need and demand due to the parochial nature of water supply from the water board, the large financial expenditure is made by all categories of households in many of the neighbourhoods areas receiving relatively poorer services i.e. high residential areas (Wadata, Wurukum, Akpehe).

4.8Comparison of water purchase with present tariff analysis and interpretation; the analysis and interpretation into the water purchase and present tariff among

thehouseholds on water is to comparison the different characteristics of water purchase and the tariff on water supply in a study area.

Table 4.8. Comparison of Water Purchase with present Tariff

Comparison	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Monthly water purchase	4650	25	5	39	12	81	625	25
Monthly Bill/Tariff	5	88	111	204	63	25	7744	12321
					25	1	1024	2500
$\sum x$	15	145	166	326	100	107	9393	44846
Mean Value	5	48.3	55.3	108.7				
N	3	3	3					
Testing Homogeneity of Variance (F_{max})								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	2	1338.05	0.54	3.44	< 0.05	There is significant difference between the water purchase and the tariff.
W. Group	14861.6	6	2476.93				

Source; Field Survey, 2014

From table 4.8 the comparison of water purchase and the present water supplyis discovered to be substantially higher, these because the monthly flat single tariff which is high as N350, while, the monthly purchase for water is higher as N9000. In comparison to income (table 4.8), the expenditure comes up as much as 22.8% of the minimum wage of 18,000, which is well over the estimate of 3% of income that households are expected to spend on water supply (World Bank, 2004). The implication is that there is scope for increasing the tariff towards cost recovery levels.

4.9 Analysis and interpretation on the willingness to pay connection chargethe analysis and interpretation into the willingness to pay the connection charges among the households for water supply was to explore the different into the characteristics that beset the willingness to pay for water supply in a study area.

Table 4.9. Willingness to pay connection charges for water supply.

Connection charges Categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
<10000	1	5	24	30	9	1	25	576
10000	2	7	13	22	6	4	49	169
15000	4	85	93	182	56	16	7225	8649
20000	3	39	30	72	22	9	1521	900
25000	2	5	3	10	4	4	25	9
30000	2	2	2	6	2	4	4	4
Above 30000	1	2	1	5	1	1	4	1
$\sum X$	15	145	166	326	100	39	8853	10308
Mean Value	2.1	20.7	23.7	46.6				
N	7	7	7					
Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	6	446.02	4.63	3.44	< 0.05	There is significant difference in the connection charges
W. Group	1348.40	14	96.32				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.9 above, the percentage of the willingness to pay the connection charges for water supply among the households in the study area is predominately found to be between 15000 and 20000 with 56% and 22% respectively. The table also revealed thatthe exclusive value of F_{max} for the source of income of the household is 4.63greater than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 46.6 low than the average mean value of 50. This implies that there is no significant difference between and within the connection charges

for water supply amongst the three groups and are significantly relative to the level of cost recovery could perhaps be the explanation for this water supply status.

4.10 Analysis and interpretation on willingness to pay the increased charges on water supply

To evaluate the result of the willingness to pay surveys for increased charges for water supply, the comparison was made with estimates of the will to pay and the will not to pay. The table below disaggregates the data on the willingness to pay the increased charges on water supply.

Table 4.10.Willingness to pay the increased charges for water supply service.

Willingness Categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Will to pay	9	25	5	39	12	81	625	25
Not will to pay	5	88	111	204	63	25	7744	12321
Indifferent	1	32	50	83	25	1	1024	2500
$\sum x$	15	145	166	326	100	107	9393	44846
Mean Value	5	48.3	55.3	108.7				
N	3	3	3					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	2	1338.05	0.54	3.44	< 0.05	There is significant difference in the willingness to pay the increased water supply
W. Group	14861.6	6	2476.93				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.10 above, the percentage of the willingness to pay the increased charges for water supply among the households in the study area is predominately found to be not willing to pay increasedand indifferent views with 63% and 25% respectively. The table

also revealed thatthe exclusive value of F_{max} for the willing category of the household to pay for increased water supply charges is 0.54 less greater than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 46.6 low than the average mean value of 50. This implies that there is significant difference between and within the willingness category to pay for increased charges for water supply amongst the three groups and this is significantly relative to the level of cost that would be recovered from the consumers of water services and perhaps can influence the status and performance of water supply agent " the water board'.

4.11 Amount households willing to pay for water supplyAnalysis and interpretation;to evaluate the result of the amount household are willing to pay surveys, it is reasonable to assume that the Makurdi water system operates at a similar level, considering that it is able to sustain current service

Table 4.11.Amount Households are willing to pay for water supply service.

Amount Willing to pay categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
< 250	0	0	3	3	1	0	0	9
500	0	1	13	14	4	0	1	169
1000	1	7	54	62	19	1	7	2916
1500	3	53	74	128	39	9	2809	5476
2000	5	68	20	93	29	25	4624	400
Above 2000	6	16	2	24	8	36	256	4
$\sum x$	15	145	166	326	100	71	7697	8974
Mean Value	2.5	24.2	27.7	54.4				
N	6	6	6					

Testing Homogeneity of Variance (F_{max}) value:							
Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	5	535.22	0.43	3.44	< 0.05	There is significant difference in the will to pay for water supply
W. Group	14861.6	12	1238.47				

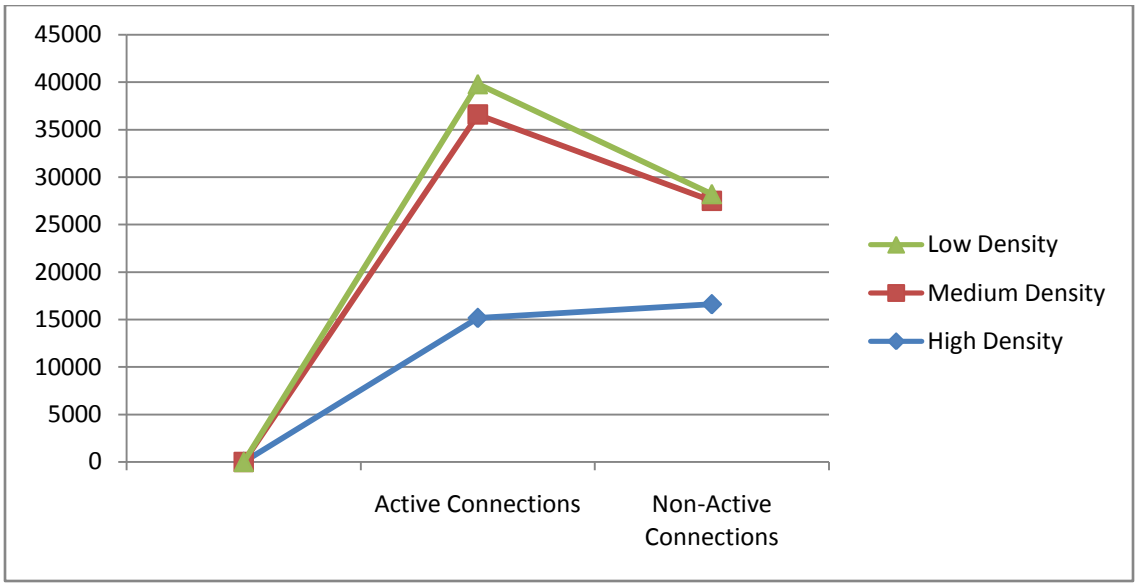
Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.11 above, the amount households are willingness to pay for water supply is predominately found to between 1500 and 2000 naira only representing 39% and 29% respectively. The table also revealed thatthe exclusive value of F_{max} for the amount to pay willingly for the water supply services is 0.43 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 54.4 low than the average mean value of 50. This implies that there is significant difference between and within the amount households are willingto pay for water supply amongst the three categories of residential density in the study area. Apparently, it appears that households in areas receiving relatively poorer services i.e. high residential areas (Wadata, Wurukum, Akpehe) have higher values than areas with better services i.e. low residential density (GRA, Judges Quarters, Owners occupier estate). Therefore, it is significantly relative to the level of cost that would be recovered from the consumers of water services and perhaps can affect the operational performance of water board.

4.12 Analysis and interpretation on the number of active and non-active connection to water supply; To evaluate the result of the active and non-active connection to water supply surveys, it is reasonable to assume that the Makurdi water supply system operates at a similar level, considering that it is able to sustain current services.

Figure4.2Total Number of Active and Non-active connections to water supply



Source; Field survey, 2014

From figure 4.2. The head of Water board was requested to indicate the number of household heads that have active connection and those with non-active connection and disconnected. The data is presented using a line graph above; the graph showed a wide range of differences among the three different residential densities or the income categories i.e. low, medium and high income earners. The result indicate that, the high income earning group (the low residential density) and the medium income earning group (Medium residential density) has the highest number of active connection than the non-active connections. The low income earning group (High residential density) has the highest number of non-active connection to the public water supply system than the number of active connections. The interrogation of the data on the situation of active and non-active connection to water supply system implies that, water supply status will be poor in the low income earning group (High residential density).

4.13Analysis and interpretation intothe duration of public water supply;to interrogate data on the duration of public water supply surveys, it is reasonable to use the days since water supply service is expected to be provide daily.

Table 4.13Duration ofpublic water supply.

Water Supply Durations	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
< 1 day	0	20	40	60	18	0	400	1600
1 day	5	15	4	24	7	25	225	16
2 days	0	32	78	110	34	0	1024	6084
3 days	3	69	42	114	35	9	4761	1754
4 days	6	8	0	14	4	36	64	0
5 days	1	3	0	4	2	1	9	0
6 days	0	0	0	0	0	0	0	0
7 days	0	0	0	0	0	0	0	0
$\sum x$	15	145	166	326	100	71	6475	9454
Mean Value	1.9	18.1	20.8	40.8				
N	8	8	8					

Testing Homogeneity of Variance (F_{max}) value:							
Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	7	382.3	0.41	3.44	< 0.05	There is significant difference in the will to pay for water
W. Group	14861.6	16	928.85				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.13 above, the durationof water supply in the study area is predominately found to between 3 days and 2 days representing 35% and 34% respectively. The table also revealed thatthe exclusive value of F_{max} for the duration of water supply services is 0.41 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 54.4 low than the average mean value of 50. This implies that there is significant difference between and within the amount households are willing to pay for water supply amongst the three categories of residential

density in the study area. Apparently, it appears that households in areas receiving relatively poorer services i.e. high residential areas (Wadata, Wurukum, Akpehe) have higher values than areas with better services i.e. low residential density (GRA, Judges Quarters, Owners occupier estate). Therefore, it is significantly relative to the level of cost that would be recovered from the consumers of water services and perhaps can affect the operational performance of water board.

4.14 Analysis and interpretation into the main sources of water supply;the interrogation of data on the main sources of water supply surveysrequires a close consideration of the different sources of water supply, i.e. well, private and public borehole etc.

Table 4.14Main sources of water supply

Water Supply Sources	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Well	0	3	5	8	18	0	400	1600
Private Borehole	4	27	12	43	7	25	225	16
Public Borehole	1	17	39	57	34	0	1024	6084
Public Supply Network	5	25	21	51	35	9	4761	1754
Commercial Borehole	1	30	37	68	4	36	64	0
Rain Harvest	2	7	5	14	2	1	9	0
Vendors	2	36	47	85	0	0	0	0
$\sum x$	15	145	166	326	100	71	6475	9454
Mean Value	1.9	18.1	20.8	40.8				
N	8	8	8					
Testing Homogeneity of Variance (F_{max})								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	7	382.3	0.41	3.44	< 0.05	There is significant difference in the
W. Group	14861.6	16	928.85				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.14 above, the duration of water supply in the study area is predominately found to between 3 days and 2 days representing 35% and 34% respectively. The table also revealed thatthe exclusive value of F_{max} for the duration of water supply services is 0.41 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 54.4 low than the average mean value of 50.

This implies that there is significant difference between and within the amount households are willing to pay for water supply amongst the three categories of residential density in the study area. Apparently, it appears that households in the high residential density areas (low income earners) are receiving relatively poorer services i.e. high residential areas like Wadata, Wurukum, Akpehe. The lowresidential density areas (high income earners) have better services i.e. low residential density like GRA, Judges Quarters, and Owners occupier estate. Therefore, it will be significantly relative to the level of cost that would be recovered from the consumers of water services and perhaps can affect the operational performance and economics of water board.

4.15 Analysis and interpretation of the implications of cost recovery on the households;the interrogation of data of the implications of cost recovery on the households requires a close consideration of certain parameters such include Affecting income level/personal savings, affecting demand and supply etc.

Table 4.15 Implications of cost recovery on the households

Parameters	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Affect personal saving	1	49	50	100	31	1	2401	2500
Affect water demand/need	3	37	42	82	25	9	1369	1764
Affect water supply	2	29	31	74	23	4	841	1849
Affect public health	9	30	43	70	21	81	900	961
$\sum x$	15	145	166	326	100	71	5511	7074
Mean Value	3.8	36.3	77.8	117.9				
N	4	4	4					
Testing Homogeneity of Variance (F_{max})								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	3	892.0	0.48	3.44	< 0.05	
W. Group	14861.6	8	1857.7				

Source; Field Survey, 2014

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

Remarks: there is significant difference in the parameters of implications of cost recovery for water supply service on the households between the three categories of residential density in the study area.

From table 4.15 above, the parameters used to measure the implications of cost recovery for water supply on the households in the study indicates that cost recovery has the potential quality or capacity to cause implications on all the parameters. However, the more pronounced implications of cost recovery on the households are the causing less personal saving and pronounced is the cause in the demand change for water. The table also revealed thatthe exclusive value of F_{max} for the parameters of implications of cost recovery for water supply on households is 0.48 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 117.9 low than the average mean value of 50. This implies that there is significant

difference between and within the parameters used to measure the implications of cost recovery for water supply amongst the three categories of residential density in the study area.

4.16 Analysis and interpretation on reasons households are not connected to water supply; the interrogation of data on the reasons households are not connected to water supply requires a close consideration of certain parameters such include poor or epileptic water supply, vendors efficient, high cost of tariff etc.

Table 4.16. Reasons for not connecting to the public water supply service

Ctegories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Poor water supply status	8	41	75	124	38	64	1681	5625
High cost tariff	2	30	34	66	20	4	900	1156
Availability of well water	1	28	31	60	18	1	784	961
Vendors efficient	4	41	26	71	21	16	1681	676
Indifferent	0	4	3	7	2	0	16	9
Not applicable	0	2	0	2	1	0	4	0
$\sum x$	15	145	166	326	100	85	5066	8427
Mean Value	2.5	24.6	27.6	54.4				
N	6	6	6					
Testing Homogeneity of Variance (F_{max})								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	5	535.2	0.43	3.44	< 0.05	
W. Group	14861.6	12	1238.4				

Source; Field Survey, 2014

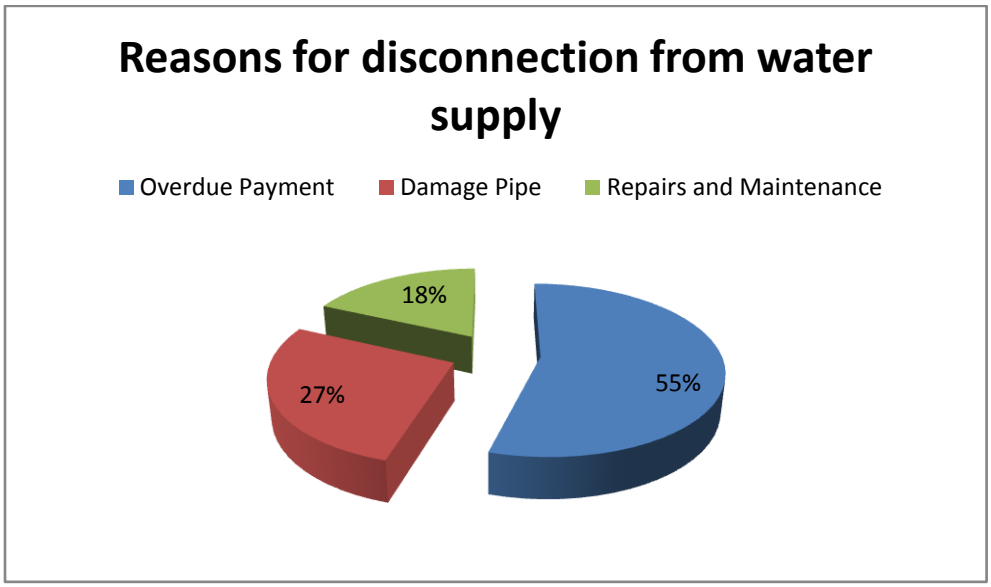
Note; B. Group means (Between the groups) and W. Group means (Within the groups)

Remarks: there is significant difference in the reasons why households are not connected to water supply services in the study area among the three different categories of residential density in the study area.

From table 4.16 above, the parameters used to measure the situation of households not connected to water supply in the study area, indicates differences in the reasons. The more pronounced reasons is poor or epileptic nature of water supply. Secondly, the efficient services of water vendor/hawkers. The table also revealed thatthe exclusive value of F_{max} for the reasons for households not connected to water supplyis 0.43 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant**.** Since the $F_{calculated}$ is less than the $F_{critical}$value, with total mean value of 54.4 low than the average mean value of 50. This implies that there is significant difference between and within the parameters used to measure the implications of cost recovery for water supply amongst the three categories of residential density in the study area.

4.17 Analysis and interpretation on the reasons for disconnection from the water supply;the interrogation of data on the reasons households are disconnected from water supply requires a close consideration of certain parameters amongst include; overdue payment of water bills, damage of pipe etc. the figure below illustrate the aggregate differences in the reasons households are disconnected from water supply.

Figure 4.3. Reason for disconnection from water supply



Source; Field Survey, 2014

From figure 4.3; the reasons for disconnection of water supply enquiry were made, using open ended question format. The head of the Water Board was requested to provide information background regarding the ranks in the listofreasons for disconnection of water supply. The data is presented revealed; a wide range of reasons for water supply disconnection in the study area, where overdue payment of water charged bills is considered the more pronounced reason with a grade point of 15 with 55% and damage pipe has 7.5 mean points with 27%, while repair and maintenance has 5.0 mean points, with 18%. The implication is that overdue payments of water charges are actually the predominant reason for disconnection of water supply not only in the area but across the developing cities and countries.

4.18 Analysis and interpretation on the regularity of bill payment;the interrogation of data on the regularity of bill payment of households on the water supply charge requires a close consideration of certain parameters such as very regular, regular, irregular etc.

Table 4.18 Regularity of Bill Payment

Water supply Cut-off Categories	Group 1 (X_1)	Group 2 (X_2)	Group 3 (X_3)	Total	%	$(X_1)^2$	$(X_2)^2$	$(X_3)^2$
Very regular	2	3	5	10	3	4	9	25
Regular	1	50	53	104	32	1	3844	4356
Irregular	12	62	66	140	43	144	2500	2809
Very Irregular	0	25	31	56	17	0	625	961
Others	0	5	11	16	5	0	25	121
$\sum X$	15	145	166	326	100	149	7003	8272
Mean Value	3	29	33.2	65.2				
N	5	5	5					
Testing Homogeneity of Variance (F_{max}) value:								

Source of Variance	Sum of Square	Df	Variance Estimate	F-Ratio	F Critical	P	Remarks
B. Group	2676.1	4	669	1.36	3.44	< 0.05	See Below
W. Group	4915.6	10	491.5				

Source; Field Survey, 2014

Remark;There is significant difference in the regularity of bill payment; the bills are irregularly paid among the three different categories of residential densities. However, the high income earners (low residential density) pay appreciable more regular the water supply bills while the low income earners (High residential density) payment of water supply bills are not regular.

Note; B. Group means (Between the groups) and W. Group means (Within the groups)

From table 4.18; the enquiry into the regularity of payment of tariff for water supply was made. Five parameters are used and the data is presented revealed that, the bill payment is irregular and significantly different between the three residential densities in the study area. The table above, the exclusive value of F_{max} for the reasons for regularity of bill payment is1.36 less than the $F_{critical}$ value of 3.44 at 0.05 level of significant with mean value of 65.2 high than the average mean value of 50**.** This implies that,there is significant difference between and within the regularity of bill payment for water supply; the pattern is not uniform among the three groups of households. The implication is that it is a potential capacity that can affect cost recovery.

Table 4.19 Water provision and cost recovery in Makurdi

Delivery System	Provider	Source	Price and Payment or cost recovery system	Cost production to the Providers	Remark
Dug wells in Households	Households owners	Facility	Nil	Nil	Free
Privately owned Borehole	Private individual	Utility	N10 per 20 litre Jerri-can	Approximately 50k per litre	Cost recovered
Water Vendors	Individual or organize	From private or public utility	N 25 per 20 litresjerrican (N250 of 200 litres)	N 100 per 200 litres (10 jerrican of 20 litres	Cost recovered
Public owned water supply system	Government	Utility	N 89 per cubic litre of water	N 65 per cubic litre of water supply	Cost not recovered

Source: Field survey, 2014

From table 4.19; Water provision and cost recovery enquiry was made, using open-close ended question format. Heads of different provisions of water system organisations were requested to indicate the cost of water production and price or payment system for water supply. The data presented revealed that, the water vendors or hawker and the privately owned water supply system normally recover cost, these because there water supply provision and pricing or payment system is efficient on like the public for water supply where the provisions and pricing or payment system is considered not being efficient.

4.20 Estimated Receipt and Expenditure of the Water Board in Makurdi

The Board expenditure on water supply from 2007 to 2013 show that the Board receipt a total of N383, 658,118.10 and spent more than the amount received which stand at N420, 520,520.11. The receipt for 2013 stand at N6, 541,300 and about N1, 726,170 were gotten from revenue collection of the Board while the remaining balance came from Government subvention as shown in the table 4.22.

Table 4.20 Receipt and Expenditure from 2007-2013 of BSWB

Year	Receipt	Expenditure
2007	N41, 352,901.00	N40, 935,012.00
2008	N49, 172,863.00	N55, 719,800.00
2009	N64, 051,259.60	N67, 206,353.65
2010	N56, 361,500.00	N72, 105,913.00
2011	N75, 473,201.10	N108, 477,885.00
2012	N83, 093,994.40	N118, 953,506.46
2013	N66, 541,300.00	N121, 122,050.00 Jan-July
Total	N439, 047,019.10	N615, 520,520.11

Source: Water Board, 2012

From table 4.20; above, indicate that, the receipt and expenditure of the Water Board have not been stable, the receipt to a certain level increases and declines because of poor

revenue collection, broken and damaged pipes, disconnection from system as a result of non-payment of bill, inadequate power supply and poor subvention sometimes from the State government have been responsible for the fall and decline in revenue and expenditure as shown in the table and figure above keep increasing as result increase in the operation and maintenance of inputs and distributions. These have contributed to low performance and inefficient operation of the Water Board.

4.21 Estimated Cost and Revenue generation of Water Supply in Makurdi

The overall efficiency of the production of potable water depends solely on the operational cost management and cost allocation. Operating revenue generated plays an important role, as lack of funding for consumables and spare parts put considerable constraints on management. This subsequently results in poor water quality, premature breakdowns and reduction of water supply to consumer.

Therefore, it is important that an effective and reliable management structure is formed to undertake the respective tasks of operating and managing the water supply and distribution or allocation cost in the water supply service system of Makurdi town. Since cost recovery is typically understood to refer; balancing operating expenses and revenue to make profits, it is essential to look at the balance of the two to understand the success of cost recovery portfolio of the Benue state water supply Board in Makurdi. Table 4.20 above, indicates that, the trajectories of operating revenues and expenses for water does not remained similar over the years under-review. The total operating revenue fell below expenses considerably with only 55% being recovered; the expenses grow more rapidly than revenue over the time period.

The Benue State Water Board largely depends upon government subvention N850, 245 monthly, that is, over N10 million per annum. It also gets additional funds monthly through revenue collection. The board averagely generate over twenty thousand naira monthly as operational revenue. While the Board receive approximately over a million naira monthly for Makurdi town only, this shows depreciation in the revenue collection due to inability of the Water Board to produce and distribute water monthly or yearly. At the time of this study, Makurdi water scheme was closed down because contract for the rehabilitation and expansion of the water scheme was awarded and is ongoing which has led to decline in revenue collection of the Board.

Table 4.21 Estimated Monthly water bills collection by (Jan-Jul, 2013) in Makurdi.

Month	Amount
Jan	234,600
Feb	259,770
Mar	271,400
April	337,900
May	256,800
June	195,800
July	167,900
Total Amount	1,726,170

Source: State Water Board, 2012

From table 4.21**;** shows that for over seven months the Water Board has access only 17.3% is the highest percentage given to water board from the annual subvention from the government. The implication of this situation is that funds are not readily available

from the government to the water board, making difficult for the operation, maintenance and distribution of water by the Water Board. Hence, there is need for cost allocation and recovery.

4.22 Analysis and interpretation on the Revenue generation and Cost during water production and distribution;toanalysis and interpretation is to take care of the link between the cost and the cubic meters of water produced also, the revenue and the cubic meter of water produced as well as recovered in the study area.

Table 4.22 Cost and Revenue generated per $m^3$of water supply in Makurdi

Year	Av. cost of m^3 of water	Av. amount of water produced	Av. target price per m^3	Av. amount of water utilize	Av. uncounted water	Total expenditure on P,O&M of water supply	Targeted Revenue	Total Revenue Collected	Av. amount of Revenue lost/percent
2007	N55	744273	N60	68250	676023	40,935,012	44,656,380	41,352,401	3303979(7.4%)
2008	N60	928663	N65	756506	172157	55,719,800	60,363,095	49,172,862	11190233 (19%)
2009	N65	987790	N70	957879	29911	67,206,353	69,145,300	64,051,359	2093941 (3%)
2010	N68	1060381	N75	754153	306228	72,105,913	79,528,575	56,561,500	22967075 (29%)
2011	N70	1556827	N80	943415	613412	108977885	124,546,160	75,473,201	49072959 (39%)
2012	N72	1652132	N85	977576	674556	118,953,500	140,431,220	83,093,994	57337226 (41%)
2013	N75	1614961	N89	747655	867306	121,122,050	143731529	66541300	77190229 (54%)

Source: Field Survey, 2014

Table 4.22; indicates average amount of water produced is not the actual amount of water utilize and also, the targeted revenue to be generated per cubic meter of water produced in the study area is not realized. The annual revenue generation is weak from the year's under-review, and thepercentage of the targeted revenue is not recovered; these of course

has created the imbalance in the average amount of water produced and utilize causing deficits in the targeted revenue that was to be generated in the study area.

Table 4.23 Cost Recovery Evaluation of water supply in Makurdi

Year	Cost of producing water per annum	Total revenue receipt per annum	Surplus	Deficit	Percentage	Remarks
2007	N40, 935, 012	N41, 352, 401	N417, 389	Nil	>100% excess	CR Very strong
2008	N55, 719, 800	N49, 172, 862	Nil	N 6, 546, 938	11% loss	CR partial strong
2009	N67, 206, 353	N64, 051, 359	Nil	N 3, 154, 994	4% loss	CR strong
2010	N72, 105, 913	N56, 561, 500	Nil	N 15, 544, 413	23% loss	CR partial weak
2011	N108, 977, 885	N75, 473, 201	Nil	N 33, 504, 684	31% loss	CR partial weak
2012	N118, 953, 506	N83, 093, 994	Nil	N 34, 859, 512	29% loss	CR partial weak
2013	N121, 122, 950	N66, 541, 300	Nil	N 54, 580, 750	20% loss	CR partial strong

Source: Field Survey, 2014

Note! The abbreviation CR means cost recovery

From table 4.23; indicates the evaluation of cost recovery scenario in water supply of Makurdi town. The evaluation revealed the cost recovery for services delivery is not very strong neither is too weak but it is medium with some fluctuating percentage of cost not been recovered. The annual revenue collection from consumer in the years under review indicates that cost was recovered in year 2007 with cost recovery (CR) of >100%. But in the preceding years 2008-2013 the cost recovery scenario was partially weak with <100% recovery but above the weak point of <50% recovery, the points are benchmarking exercise of the Water Board to gain a reasonable indication of how well they are performing.

Table 4.24 Reason for Poor Bill Payment and Collection

Reasons	Ranking					Computation		
	1	2	3	4	5	Total Points	Mean cut-off Point	Average cut-off point is 3 as a measure of success
Management Problems	X	X	X	√	X	4	3.5	Management problems is above cut off point of 3 this implies it is one among the reasons of poor cost recovery
Corruption	X	√	X	X	X	2	7.5	Corruption is the most pronounced reason for poor cost recovery with 7.5 mean point of influence
Water supply Technical reasons	X	X	X	X	√	5	3	Technical problems has mean point of 5 above the cutoff point of 3 this implies that it can partially affect poor cost recovery
Cost recovery Mechanism Problems	X	X	X	√	X	4	3.5	Mechanism problems is shortly above the cutoff point ; this implies it is one among the reasons of poor cost recovery
Others reasons (i.e. poverty)	X	X	√	X	X	3	5	Other reasons i.e. poverty has 5 points which is above the cutoff point ; this implies that it also cause poor cost recovery

Source; Author, 2014

Table 4.24. Reasons to poor tariff collection enquiry was made, using open ended question format. The head of the Water Board was requested to tick appropriately the rank of the listed reasons for poor tariff on water supply. The data is presented separately in using the arithmetic mean; a wide range of reasons for poor cost recovery on water supply is between corruption, other reasons like poverty, mechanism used for cost recovery water supply and management problems, with 7.5 mean points, 5.0 mean points and 3.5 mean points. The implication is that there is potential capacity for poor cost recovery.

Table 4.25 Needs for Tariff Increase

Reasons	Ranking					Computation		
	1	2	3	4	5	Total Points	Mean Point	Average cut-off mark is 3 as a measure of interest to increase tariff
Increased power bills	X	√	X	X	X	4	7.5	Increased power bills is the most pronounced reasons that is triggering the need for tariff increase on water supply.
Salary increase	X	X	X	X	√	5	3	Salary increase is a partial reason since it has exactly the cutoff points of the reasons for tariff increase
Loan Repayment depreciation	X	X	√	X	X	3	5	Loan repayment has mean point of 5 above the cutoff point of 3 this implies that it is one of the reasons triggering the need for tariff increase
Increase in prices of water purity	X	X	√	X	X	3	5	Change in the price of chlorine is above the cutoff point ; this implies it is also the reasons stimulating increase in water supply tariff .

Source; Author, 2014

Table 4.25. The enquiry was made on the reasons stimulating the need for water supply tariff increase, using open ended question format. The head of the Water Board was requested to tick appropriately the rank of the listed reasons that has set off a successive need that water supply tariff to be increase. The data is presented separately using the arithmetic mean; a wide range of reasons for tariff increase on water supply was established, the reasons are because of change in power bills (i.e. electricity bill increase) with mean points of 7.5 and change in prices of water purification reagents and repayment of loans which has mean points of 5 above the cutoff mark.

CHAPTER FIVE

SUMMARY OF RESEARCH FINDINGS AND IMPLICATIONS OF COST RECOVERY

5.0 Summary of research findings

The emerging issued from the research findings about the cost recovery scenario in the study is summarized; the findings of this study strongly depict a typical situation of cost recovery in most Nigerian urban cities with regard to poor or the disadvantage in the society disproportionally being at the centre of the affections or implications. The evaluation of cost recovery portfolio of the water supply board in the study area is dismal and a variety of factors constrain efficiency of cost recovery for water service delivery, amongst include, willingness to pay, low income status, poor or epileptic supply of water. Apparently, to a considerable extent, the operation of the Water Board in the Makurdi metropolis is closely similar to what is reported in the developing countries in terms of performance indicators of cost recovery: though it is significant because, the Water Board has been able to stay afloat with respect to recurrent expenses that are met from revenue generated internally with an overall bills payment portfolio of approximately 60% compared to data from other developing countries. Despite this limitation, it can still be contended that in view of the willingness to pay findings and the possibility of flat charges among uses as practiced, there is scope that cost recovery of the water supply system in Makurdi can be economically feasible. Although there are some variations among the neighbourhoods, they are not strong enough to counter the validity in the

postulation that cost recovery of public water supply is indeed feasible if the data is viewed in aggregate terms.

5.1. Implications of cost recovery and specific recommendation.

Regardless of different contexts, scale and many other conditions that surround cost recovery in the study area, in general, the cost recovery share similar underlying implicationsand characteristics with other towns and cities. Such implications are;

a. Implications of Cost recovery on the vulnerable groups in the Study Area.

With regards to the low-income group, water supply in the study area presents a typical situation. On the one hand, the low-income groups spend more to secure low quality water, more also these people are incapable of financing the utility. This situation is comprehensible due to the peculiar circumstance of the low-income group regarding water consumption which is low and incremental.

Payments for a utility require lump sum spending to secure a connection and to maintain it. As shown from similar experience worldwide (Anonymous, 2000), the nature of the income of this category of household rules out the possibility of any lump sum payments. Thus, securing a connection and paying bills regularly as the utility agencies require for recovering costs can be a serious problem. Therefore, incremental purchase becomes the main but costlier alternative.

Specific Recommendation to manage cost recovery on the vulnerability groups of consumers; the cross subsidization and metering system of water supply is required; therefore policy and decision makers should ensure that cross subsidization and metering system is introduced into cost recovery and distribution of water in the study area. Most importantly, the implementation of cost recovery should regard the design of appropriate strategies for securing and safe-guarding the vulnerable groups high residential density areas (low-income earners) and generally, the entire urban cities of Nigeria.

Hence, the success of cost recovery can therefore be bright because it checks the negative effects of patronage and other ills associated with generally subsidized public sector provide systems while at the same time making the service available to all. The question of access of the low income group to urban services in general and those provided on user-pay basis in particular is a major concern in the design of policies for urban development.

b. The Implications of Cost recovery on Access to Water Supply

Considerable the low income residential areas or groups in the study area namely; Wadata, Wurukum and Akpehehave been experiencinginequitable distribution or low accesstowater supply skewed or linked by regularityof bill payment and willingness to pay for water supply among the household. The advent of cost recovery not only gave rise to disparities in the distribution of water supply, but it also do not entrenched right to eventual access to water among all residents. This therefore has affectaccessibility to water supply among the low income, since

Specific recommendation to manage cost recovery implication on access to water supply;the problem of access of the low-income is resolved through appropriate interventions cost recovery which may actually favouraffected group and would not entrench the right to accessing water supply. Therefore, it is important to formulate policies, strategies and programme that will encourage intervention measures int cost recovery.

c. The Implications of Cost recovery on Income Expenditure and Standard of Living

Cost recovery has implication on poverty. Drawing from Whittington (1990) and Perrow (2007), argued that cost recovery implementation can affect the poor disproportionately such that those that are poor are forced to spend more of their income earning or are forced to settle for less safe alternative sources of water supply. While, the higher income groups will capture the best services available because they have the resources.

Specific recommendation to manage the implication of cost recovery on income expenditure; the amount charged for water supply or distribution should be commensurate the amount of water consume. Hence, it is indeed necessary to encourage or deploy pay-as-you use or pay-as-you consume (PAYU or PAYC) mechanism through metering system approach for water distribution among the three different residential densities in the study area to set-off a successive commensuration between the amount of water consumed and the amount of bill or tariff to pay.

d. The Implications of Cost recovery on the Economics of the Water Board

To a considerable extent, operation of the Makurdi metropolis of the Water Board are similar to what is reported in the developing countries in terms of performance indicators of cost recovery: However, it is significant that the Water Board has been able to stay afloat with respect to recurrent expenses that are met from revenue generated internally. An overall bills payment portfolio of approximately 60% of cost is recovered, however, the water board is yet to meet its targeted revenue generation, due example is table 4.20.

Specific recommendation; Appropriate documentation of the operation and maintenance cost incurred is the first criteria to guarantee the economic prudency of the Water Board and until the cost statement account and cost recovery techniques, mechanism and tools of the Water Board are well articulated than it will give room for proper and consistency in the cost recovery. Apparently, the techniques and tools are the metering system approach or different settlement tariff arrangement with well qualified manpower and legislations that could strength the powers of the Water Board to recovery cost.

5.2 The summary of the specific recommendation for the implications of cost recovery for water supply

The implications of cost recovery for water supply and its specific recommendation is summarize in the table below.

Table 5.1 Summary of the specific recommendation for the implications of cost recovery for water supply.

Implications	Specific Recommendation
Implications of Cost recovery on the vulnerable groups in the Study Area.	The cross subsidization and metering system of water supply is required; therefore policy and decision makers should ensure that cross subsidization and metering system is introduced into cost recovery and distribution of water in the study area. Most importantly, the implementation of cost recovery should regard the design of appropriate strategies for securing and safe-guarding the vulnerable groups high residential density areas (low-income earners) and generally, the entire urban cities of Nigeria. Hence, the success of cost recovery can therefore be bright because it checks the negative effects of patronage and other ills associated with generally subsidized public sector provide systems while at the same time making the service available to all.
The Implications of Cost recovery on Access to Water Supply	The problem of access of the low-income is resolved through appropriate interventions cost recovery which may actually favour affected group and would not entrench the right to accessing water supply. Therefore, it is important to formulate policies, strategies and programme that will encourage intervention measures int cost recovery.
The Implications of Cost recovery on Income Expenditure and Standard of Living	The amount charged for water supply or distribution should be commensurate the amount of water consume. Hence, it is indeed necessary to encourage or deploy pay-as-you use or pay-as-you consume (PAYU or PAYC)

	mechanism through metering system approach for water distribution among the three different residential densities in the study area to set-off a successive commensuration between the amount of water consumed and the amount of bill or tariff to pay.
The Implications of Cost recovery on the Economics of the Water Board	Appropriate documentation of the operation and maintenance cost incurred is the first criteria to guarantee the economic prudency of the Water Board and until the cost statement account and cost recovery techniques, mechanism and tools of the Water Board are well articulated than it will give room for proper and consistency in the cost recovery. Apparently, the techniques and tools are the metering system approach or different settlement tariff arrangement with well qualified manpower and legislations that could strength the powers of the Water Board to recovery cost.

Source; Author, 2014.

CHAPTER SIX

SUMMARY, CONCLUSIONAND RECOMMENDATION

6.1 Summary

Water is a basic human need, and sufficient water for goof hygiene and several other requirements is a prerequisite of public health and for effectual urban development in general. Thus, governments have historically subsidized the cost of water supply. As developments in the last few decades show however, the combination of various forces, notably relentless urban growth and the persistent rise in the demand for water it occasion; shortage of funds to operate and expand water supply systems and the incapacitation of the utilities have forced a re-think on the continuation of subsidies and management under public sector parastatals. Under this situation, subsidies have failed to reach the poor and utilities suffer shortage of funds to provide the services.

In turn, the utilities are crippled and services become unsustainable, spawning a protracted and vicious cycle of inefficiency in service delivery. The entire scenario translates into major costs for the urban economy and public health as people struggle to secure low quality alternatives to the public piped water supply system. These considerations have informed much of the recent policies for urban water supply in Nigeria. The tendencies are towards the attainment of full cost recovery through the commercialization/privatization of water supply managed under semi-public or private institutions. This is the background to the ensuring policies of pursuing privatization of

urban water systems under various arrangements like public-private partnership or community participation in cost recovery approach.

This study has therefore been based on the on-going attempt at resolving the quagmire that urban water supply in Nigeria faces concerning its sustainability through cost recovery. The study has reviewed some examples of the implementation of cost recovery policies in developing countries. It is shown from the review that the evidence is not sufficiently far reaching or conclusive to warrant blanket application of the cost recovery mechanism or parameters policy universally without further studies. There is need for exercising caution and for examining a number of issues surrounding the policy before its implementation in Nigeria. This had been the main premise for this study in view of the adoption of the cost recovery policy in Nigeria as in the National Policy for Water Supply and Sanitation (NPWSS) and the initiatives undertaken by some state governments.

In particulars, the financial viability of the policy, as adjudged from certain indicators, and its likely effect especially on low-income households needs to be verified. None of these has been done in Nigerian context, despite the official adoption, in principle and increasingly in practice, of the tenets of the policy as evidenced by the actions already taken. It is therefore not clear how matter will eventually play out regarding the prospects and implications of the policy. This constituted the kernel of this study, conducted to examine whether the policy is financially viable and how households would fare under it.

The study showed that the conditions of cost recovery in water supply system in the study area accede to what is generally reported concerning access to potable water supply by the urban population in Nigeria and elsewhere among the developing countries. Mounting financial and management problems have translated into very poor performances by the Water Board.

Concerning the economic feasibility of cost recovery for water supply, the study showed that the population will in aggregate terms be able to support a commercially based water supply system as shown by the mean willingness to pay bids and other indicators. However, a substantial number of households will not be able to have direct access, largely due to the inability to finance initial connection costs. These are the low-income households. The occurrence of such households points to the potential of alienating substantial parts of the urban population from direct access should cost recovery regime proceed without addressing the issue. This will negate the process of urban development in view of the public nature of water supply – a service whose inadequacy can have major public health implication for the whole population.

This consideration has been the basis for recommendations that ensure access of the low-income group to water supply under cost recovery operations. In the recommendations, measures were suggested to improve the performance of the delivery system of urban water supply and alleviate the problems of access by the low-income group under cost recovery. These include a variety of strategies which may be employed to promote both

economic efficiency of cost allocation and recovery, and equity, to ensure adequate access to the service. These should hopefully make cost recovery not inimical but indeed favourable to the interest of all the three categories of urban residents, especially the low-income.

6.2 General Recommendations

Recommendations are now proffered in respect of a few selected issues linked to the theme of this study and relevant to the improvement of the water supply situation in the study area and similar circumstances in Nigeria especially in the context of the National Policy on Water Supply and Sanitation. These include the question of cost recovery as the basis for urban water supply, appropriate institutional framework for the management of the system, community participation, and access for low-income households and tariff policies. A summary of the recommendation is presented in Table 6.1.

Table 6.1 Summary of general Recommendations

Policy Issue	Existing Situation	Recommendation
Decoupling cost recovery from socio-economic and political implications	Not clearly defined	Continually evaluate the existing situation and determine suitable framework that could decouple socio-economic and political implications that beset cost recovery.
Community Participation	Not clearly defined	Regular consultations with public on key cost recovery policies issues and programme so as to determine appropriate mechanisms for cost recovery.
Accessing cost allocation and	No framework for public	Supplement the low income and

recovery from the low income	participation. And no consultation with local communities on policies and programs of the water board.	vulnerable groups cost allocation charges through deliberatepolicies that will based solely on defined subsidizing the services
Tariff Policy regime	Flat tariff structure	Institute Prepaid Metre system and district or settlement cross subsidy regime to assist the vulnerable consumers(i.e. low income earners)

Source; Author, 2014.

6.2.1 The place of Cost Recovery of Urban Water Supply in the Realm of Socio-Economic Implication.

The issue of cost recovery in urban water supply underlies the sustainability of the service and defines the direction and content of policies that address the sector. As reviewed in this study, it is necessary to define the socio-economic strikes and/or implications for reforms in the sector. This much is evident under current circumstances globally, and it can be advanced that this role is likely to wax stronger in the future in Nigeria. Therefore, cost recovery and its fallouts in the forms of socio-economics implications, institutional and policy frameworks will be at the commanding heights of programs for urban development.

The National Policy for Water Supply and Sanitation contains clear allusions to cost recovery as the main pillar of water supply in Nigeria. This is apparent in the repeated reference to financial sustainability and cost recovery as well as privatization "*wherever feasible".* The findings from this study are essentially partial or not supportive of this

stance in all policy and add to the mounting evidence on the potentials for financial sustainability in urban water supply systems once the necessary institutional frame is in place, subject to moderations as necessitated by local circumstances to assist people who may not afford to pay.

However, cost recovery also has "*negative"* implications that should equally be carried along in its evaluations. These include the potentials for alienating parts of the population from access and the attendant social and environmental implications. The potentials for this have been shown in this study, as some households are unable to connect to the water supply system due to economic reasons.

The implication would therefore be that before any cost recovery strategy is formulated for particular schemes; all these socio-economic characteristics have to be brought into the equation and ranked according to their perceived significance. It therefore means that there must be clarity on the objective to be pursed with a balanced clearly in sight and sufficiency quantified between economic, social and environmental objectives. This also implies that economic rationally, through closely linked to social objectives, and may not dictate the last words in the search for policy directions.

Additionally, as MacDonnell (2002) shows, achieving cost recovery may not be all that simple or cheap in view of what it takes in terms of institutional reforms and financial

and technical wherewithal. Thus, if not handled adequately, the quest for cost recovery may actual cost the very objectives it is set to achieve. The experience with privatization in some Latin America and Asian countries demonstrates the potential fallacy that may befall cost recovery policies. Here in Nigeria, the initial forays from Lagos State on cost recovery the Lagos water supply system is already meeting stiff opposition from the general public and human rights campaigners. Although these oppositions have not surfaced strongly, there is the possibility of that occurring and derailing the process if the implementation becomes incentives to public outcries.

What this entails is that implementing the cost recovery policy requires a full Cost-Benefit Analysis (CBA) which should reflect on the issues that play key roles in its success. Thus, cost recovery, adjudged economically sound, should not in the end be the sole determinant in the evaluation of future urban water supply schemes. It should be a factor in a CBA frame in which it takes the appropriate weight allocation.

- **Identification of the main socio-economic objectives and priorities of the policy:** This should involve the weighting of economic (need to recover financial cost). Social (increase accountability, safeguard public health, community empowerment, income redistribution etc.) and environmental (conserve waters resources) objectives in a Cost-Benefit Analysis framework.
- **Identification of an appropriate institutional framework and reflect private and public sector roles:** What is instructive in this instance is that the essential objectives of cost recovery and financial sustainability under each project setting

should be maintained under all circumstances. As discussed previously, this can occur irrespective of the particular mix of public-private partnership relationship that is worked out.

- **Appropriate cost recovery techniques that are suitable to local social and economic conditions:** The design of cost recovery methods in terms of tariffs level and structure, mode of billing and charging as well as the mode of access to the service should be tailored to the specific social and economic context in the respective localities.

6.2.2 Community Participation in cost recovery for Urban Water Supply

An important component of institutional framework and management is community participation. It has been shown that the lack of inclusiveness in the design of policies and projects for cost recovery in water supply services provisioning generally is a major factor in the level of success. Benefiting communities are frequently not consulted on programs.

In the urban water supply sector, much of the reason for the lack of effective cost recovery in water supply services hinges on this information gap. It is common in our urban areas that the SWA does not have data on its customer base, preferred levels of service, willingness and ability to pay, willingness to participate in service provision or even the quality of water produced among others.

Service users are generally ill-informed about prevailing policies or plans for new investment or institutional reform. In Makurdi town for example, wide consultations with the public have not yet been part of the process for initiating commercialization and private sector participation although workshops on the subject involving experts have been held. Neither was it so in the formation of the National Policy for Water Supply and Sanitation and the Urban Water Supply Reform Program at the National Level.

Much of this trend in the lack of consultations is applicable to the situation revealed in the case study. As the opinion survey and suggestions of households' shows, the responses are suggestive of a general unawareness and lack of involvement in the activities or decisions making of the Water Board. Similarly, the expansion project for the Makurdi Water Supply System being proposed by the Water Board are only close-held secrets of the Board, three years into its inception.

Community participation has proved to be decisive in determining success or failure of most urban services delivery systems even when they are based on user-pay. Not only do communities contribute by way of ideas in respect of what to provide, they even contribute directly in the provisioning process. Therefore, despite its limitations in the context of urban areas, community participation remains a veritable force in improving service delivery and should be imbibed as part of the management process of the Water Board.

Community participation through direct involvement in the management and operations of the water supply systems has been shown to be more effective in the context of rural water supply systems (Karikari, 1996; Jaglyn, 2002). This is understandable, in view of the complexity and scale of operation and the requirement for single service providers especially under private sector participation. However, the scope of urban water supply in the context of developing countries especially Nigeria with faltering conventional systems necessarily includes non-network facilities like wells and boreholes which play very important supporting roles to the piped system and which are "rural" in character. These can be subjected to community management effectively.

Thus, the improvement of service provision should be driven by a combination of institutional and technological innovations which increase the participation of the community and decentralize elements of the systems. Institutional innovation can occur at three levels: within the community; at the interface between utility and community; and at the levels of financial and political decision making in state or in the national government policy and strategies.

6.2.3 Tariff Policy, Tariff Structure and Subsidy Options

A tariff is a set of rules that define the structure of user-pay systems. Its purpose is achieving a multiplicity of objectives including cost recovery equity and economy in the use of the services. In the case of water, the tariff may reflect different aspects of its provision and use. This may include the volume consumed, type of access provided,

location and other parameters. A combination of these may be used to determine charges on a variety of models to attain different objectives. These include uniform rates that increase in direct proportion to consumption and block rates that increasing or decrease in block increments. A variety of modifications to these are also used in different systems (Wedgwood and Samson, 2003).

The level of tariff to charge, its structure and mode of administration are central to the success to any user pay system in urban services delivery. Tariff issues in urban water supply have been a major source of controversy in policy making, attracting a variety of responses. A number of issues are of concern in this regard especially when major reforms that involve the use of full cost recovery are contemplated. These include the technical definition of what should constitute the basis for the tariff itself, how to raise tariff to cost recovery levels, how to regulate utilities and what safely nets to be designed to safeguard minimal access (Nedjoh, and Thogersen 2002).

The technical definition of tariff levels, which is usually moderate by other non-economic consideration, is to base it on the marginal cost of production. This is the basic rule under commercialized operations and it considers a determination of costs that reflects both capital and operational costs, which usually varies with different localities and projects. As in most other countries, it will not be expected that tariff systems in Nigeria cities will be based strictly on this principle, in view of social and political concerns that will necessarily engender moderations.

Therefore it is recommended firstly, that tariff policies, while varying from state to state and from city to city, should be guided by certain principles. These include a reflection of the key objectives of the National Policy on Water Supply and Sanitation. There should also be incremental rather than sudden price changes whenever the need for this arises. Additionally, cross subsidies should be employed as well as the conduction of surveys on user's willingness to pay.

Secondly, effective regulation is necessary where the management of water supply is based on private sector participation to check the misuse of monopoly powers. As the experience with monopoly based service provisioning shows, utilities will tend to charge prices that are well above what would have obtained under competitive provisioning. Regulations are therefore necessary to check this and safeguard the interest of the users.

Thirdly, although in aggregate terms full cost recovery should be the main guiding principle for the operation of the water supply systems, subsidies, targeted at particular groups will need to play an important role. Targeting subsidies in recognized as one of the most effective ways to address the needs of the low income group. As practiced in different parts of the world (World Bank, 2004), a variety of subsidy strategies may be applied depending on the local situations. The following subsidy targeting models may be adopted in Nigeria:

1 ***Sector Targeting:*** Subsidies and tariffs based on land used and consumption levels; this implies that, residential uses are usually subsidized by industrial and commercial uses. In some countries, such subsidies have been reported to cover more than half of the cost that would otherwise and/or ordinarily have accrued to domestic consumers and is extended to include connection cost subsidies or waivers (Whittington, 2000).

The existing tariff policy of the water Board in Makurdi shows some limited elements of cross subsidy. In the first instance, residential users are being subsidized by commercial and industrial users. But this is general and not exclusive to the low-income. This is due to the flat rate tariff regime. In effect therefore, the subsidies are not well targeted at the low income.

2. ***Geographic Targeting;***whereby tariffs are based on location, with low-income areas having separate tariff and lower tariffs form from other areas of the city. There is an element of geographic targeting in existence in the Makurdi public water supply system, but not tariff. This is evident in the differentiation according to the density of residential development. However, it only isolates the GRA as the recognized high income area, which makes the significance of this particular tariff policy and water supply services of limited value. However, the effectiveness of the policy can be improved if neighbourhoods with clear concentration of the low income are targeted for special rates.

3. ***Social Targeting;*** this is a situationwhereby the low-income are specifically identified and subsidized through the application of lower tariffs or other measures. The

social targeting of cost recovery for water has been shown to be effective in the former socialist Eastern European cities.

Overall, it should be pointed out that operation of the urban water supply sector is such that local circumstances requirehavingtailor-made strategies to address the problem of socio-economic diversity and/or dynamics. In addition, for any given situation, detailed studies has to be carried out or are needed to be carried out in order to determine particular courses of action at all levels from the design of cost recovery for water supply through strategies and implementation to keep all the parameters in check.

6.3 Conclusion

On the whole, the findings show that the prospects are high for instituting cost recovery policy for water supply in the study area. This subject to the limitations of the low-income households in having direct access imposed by the inability to pay for connection costs and the inherent elements of inconclusiveness in the willingness to pay tariff in the data. It can therefore be averred that while cost recovery may be feasible and essential for improving the adequacy of water supply in the study area, it will be necessary to apply strategies that cushion its effects on the urban poor, who ironically tend to spend more on water supply through incremental purchases.

There are also limitations inherent in the methodology for studies in this nature. For example, the existence of a favourable willingness to pay and other indicators of the viability of cost recovery do not in themselves translate automatically to an efficient service delivery. As augured in the preceding discussions, a necessary concomitant is the presence of an appropriate institutional frame, which may be publicly or privately based

to undertake necessary economic and management reforms that are based on local circumstances to take advantage of these potentials. Therefore the application of cost recovery requires the use of appropriate management strategies that enable the institutionalization of a management framework that is disposed towards efficient service delivery and involve the use of suitable mechanism or options that target the low income households.

In conclusion, it can be said that the fundamental outcome of recent findings including those from this study on the provision of urban services especially water is the recognition that the most crucial problems to contend with are not so much to do with economic encumbrance to cost recovery. The developments noted are indicative of the fact that economic factors are not at the root of the problem of poor cost recovery in urban water supply in the study area and by extension other Nigerian urban areas where similar circumstances obtain. As studies in many developing countries have shown, other factors related to organizational and institutional problems that characterize public sector management of cost recovery for urban services are at the core of the problems.

The evidence generally points to the fact that the incapacitation of public institutions responsible for urban services and cost recovery owes to a good extent to factor related to internal management structure which as presently constituted, do not permit effective performance by the Boards. The findings from this study correspond with this submission. This in effect places the search for strategies for addressing poor

performance in cost recovery for urban service delivery in the ambit of management reforms. This defines one of the frontiers for future research on the subject.

Considering the situation in Nigeria presently, it seems that there is no question of abandoning the principle of cost recovery and user-pay systems to achieve the much-needed reforms in the sector. The question as far as recent development s in the water supply sector and other urban services is one of defining its specializations and delimiting its extent in relation to different social and economic groups in the urban population.

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